The Formation and Evolution of Entrepreneurial Teams during Incubation: A Longitudinal Exploratory Study Within a Saudi Technology Incubator

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The Formation and Evolution of Entrepreneurial Teams during Incubation: A Longitudinal Exploratory Study Within a Saudi Technology Incubator

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Declaration

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of Doctor of Philosophy is entirely my own work, and that I have exercised reasonable care to ensure that the work is original, and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

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Abstract

The Formation and Evolution of Entrepreneurial Teams during Incubation: A Longitudinal Exploratory Study Within a Saudi Technology Incubator - Sarah Al Ayyash, MBA, BSc

This research explores the formation and evolution of entrepreneurial teams (ET) in technology-based new firms during the incubation period in a Technology Business Incubator (TBI). Previous work in the incubation literature has overlooked these important TBI prime-micro processes, the processes related to the formation and evolution of the ET during incubation. Informed by a critical realism perspective, a multiple case study methodology coupled with a longitudinal perspective is adopted to study 12 entrepreneurial teams in the context of a technology incubator, BADIR, in Riyadh, the capital of Saudi Arabia. Data on entrepreneurial team members, incubator advisors, and incubator management was collected through 98 interviews, 8 focus groups, 10 informal discussions, and four non-participant observations, over three rounds of data collection across a twelve-month period from January 2019 to January 2020. This research shows that the ETs in these new firms were unstable, changing entities during the period of incubation and that the TBI was deeply involved with, and intervened significantly in, the entrepreneurial teams. Team formation was characterised by three formation dynamics (the initial creation of the ET; changes in membership; and the emergence of sub-teams). ET evolution, which was towards increased professionalisation, was characterised by three social processes (role allocation; leadership transitions; and team conflict). The entrepreneurial team - incubator relationship evolved overtime, and was characterised by (i) resentment, (ii) independence, (iii) conflict, (iv) co-operation, and (v) sufficiency. This research shows the importance of the incubator as a "multifaceted" context characterised by distinct "knowledge", "administrative", "social", "advisory", and "mediatory" contexts. Furthermore, the model of incubation adopted in the TBI was shaped by the national context (Saudi Arabia) via national policy goals which emphasised the building of strong entrepreneurial teams in technology-based firms as a priority for TBIs.

Chapter 1: Introduction

1.1 Introduction - Technology Business Incubators

Technology Business Incubators (TBIs) are valuable political tools and regional enablers, promoting innovation, technology transfer and entrepreneurship (Phan et al., 2016; Lamine et al., 2018; Lukeš et al., 2019). Such empowerment results from intensifying efforts to make TBIs integrated and ideal environments, bolstering incubated new technology firms against challenges to their threshold and potential failure, and so enhancing their survival rates (Mian et al., 2012; Mian, 2014). Accordingly, TBIs provide various tangible and intangible resources essential for new technology firms to achieve independence and growth (Hansen, 2000; Galbraith et al., 2019; McAdam et al., 2016).

The extensive promotion of TBIs has arisen from their perception as valuable policy tools and regional enablers over recent decades (Lamine et al., 2018; Harmaakorpi and Rinkinen, 2020). Regional empowerment lies in their ability to achieve goals such as strengthening the economy and revitalising rural areas and minority communities (Lamine et al., 2018; Surana et al., 2020). Regional empowerment is also achieved by job creation, stimulating advanced technology, innovation, and automation (Hobbs et al., 2017; Wang et al., 2020). Technology incubators are recognised as fundamental enablers of regional development at the macro level in developing countries (Radosevic and Myrzakhmet, 2009; Carayannis and Von Zedtwitz, 2005); economies in transition (Koh et al., 2005; Hong et al., 2019); converging economies (Ratinho and Henriques, 2010); and middle-sized countries (Sofouli and Vonortas, 2007). Measuring such impact confirms TBIs' role in technology transfer initiatives and establishing high-tech firms (Kruger and Steyn, 2020; Galbraith et al., 2022).

Such a significant reliance on TBIs at the macro level has led to the realisation that the empowerment of entities requires intensive efforts. Such efforts result in technology incubators being embedded as principal elements and contributors to technology clusters to enhance knowledge flows and transformation (Hu et al., 2015). These efforts also contribute to facilitating innovation activities, achieving advanced industries, and reaping competitive advantages (Hausberg and Korreck, 2021). However, achieving such transformational national goals is conditional on sufficient investment levels (Allen and Weinberg, 1988; Aernoudt, 2004). Based on this, it is generally affirmed that TBIs are essential components and integral parts of national innovation systems. This entails effective management of public financial resources for science, technology, and innovation (STI) activities (Gkypali et al., 2016). Indeed, the availability of financial support is posited as the basis for incubators' sustainability and performance (Aernoudt, 2004). In other words, the low funding of TBIs may be a critical turning point in their ideal performance (Messeghem et al., 2018). Nevertheless, financial support is not the sole determinant of TBIs' sustainability (Chan and Lau, 2005; Surana et al., 2020). Rather, their sustainability entails a tripartite framework dependent on the mechanisms of growth, technological capabilities, and the nature of TBIs' integration within national and/or global markets (Koh et al., 2005). The main growth mechanisms involve government-led infrastructure provision, agglomeration effects, and continuous self-renewal through new firm creation (Phan et al., 2005).

In the same regard, it is argued that it is necessary to position TBIs in a triple helix through strategic partnerships among key stakeholders (Etzkowitz, 2002). This involves universities for research and human resources development, industry for investments and innovation, and government for regulatory support (Lamine et al., 2018; Etzkowitz and Zhou, 2018). Such interactions and partnerships with stakeholders, in turn, are reflected in tailoring incubation models at the micro-level, ensuring that incubation programs' outcomes correspond to stakeholders' objectives (McAdam et al., 2016). Enabling TBIs at the macro level does not solely depend on communication with stakeholders; instead, the need for intensive work on improving the entire ecosystem is considered vital. Improving the ecosystem means stimulating all initiatives and environments that foster innovation, of which TBI is the cornerstone (Etzkowitz and Klofsten, 2005). These initiatives emphasise bridging the gap between entrepreneurship education and experiential knowledge. Bridging this gap is grounded on identifying the future challenges of technology entrepreneurship education (Lamine et al., 2018). Thus, it is recognised that the starting point is the proposal of practical questions for systematic and theoretical research to create effective instructional models (Etzkowitz, 2002).

Considering the above, it can be said that adherence to a set of pivotal factors is essential to enable TBIs to fulfil their assigned role as sustainable regional platforms for incubating technology-based enterprises and thus as regional drivers of innovative entrepreneurship (Surana et al., 2020). Drawing from Lamine et al.'s study (2018) on American and French TBIs, these determinants encompass the adaptability of incubator models in response to changing contextual needs, underscored by the pursuit of realistic objectives. Moreover, providing high-quality value-added services requires professionally competent management and continued financial strength (Mian et al., 2012).

1.2 Research Background and Questions

In tracing the sequence and evolution of the literature on technology incubation, it is noted that the initial concern was a general interest in verifying the effectiveness of incubators (Alsos et al., 2011). In response to this, major research efforts emerged that answer questions such as the extent to which incubators achieve the goals for which they are established (Theodorakopoulos et al., 2014). Moreover, there has been a significant emphasis on developing conceptual frameworks to assess the performance and success of incubators and identify best practices. However, the internal workings of the incubator and the specific processes tied to the birth of new tech ventures have received less attention (Aerts et al., 2007). Consequently, there have been strong appeals to delve deeper into this 'black box' within the incubation literature (Albort-Morant and Ribeiro-Soriano, 2016). A stream of research has thus emerged in response to those calls that is dedicated to examining the incubation model. This research stream seeks to identify the phases experienced by incubated New Technology Based Firms (NTBFs) within the incubation model (Bergek and Norrman, 2008). It includes the admission stage, in which the potential incubatee is subjected to screening and selection criteria; the

prime micro-processes of incubation, in which the incubatee utilises resources and services to acquire added value; and the graduation phase, in which the incubatee leaves after completing incubation (Bruneel et al., 2012).

In relation to incubation processes (the prime micro-processes of incubation), in particular, recent review papers indicate that the ambiguity attributed to the incubation model is due to the ambiguity of these processes (Mian et al., 2016). Despite research attempts, efforts to investigate the prime micro-processes of incubation are still developing. However, the scope of studies to date has been limited (Hausberg and Korreck, 2021). One of the most prominent of these processes during the incubation phase is building the entrepreneurial team (ET), a topic that is often neglected in the literature on business incubation (Phan et al., 2005; Mian et al., 2016). The entrepreneurial team is vital for mobilising resources and leading a venture's growth and strategic direction (Foss et al., 2008). Entrepreneurial team building refers to the dynamics experienced by the team in terms of its formation and subsequent evolution (Patzelt et al., 2021). As such, a comprehensive understanding is required of the entrepreneurial team, its formation and its evolution during incubation period as the basis for creating a new-tech venture. Achieving such an understanding requires answers to the 'how' of entrepreneurial team formation and evolution during incubation, as well as exploring the 'what' and 'how' of the incubator's involvement in ET formation and evolution.
The thesis focuses on the following key research questions:

(R1) How does the composition and structure of entrepreneurial teams evolve over the incubation period?

(R2) What role does the incubator play in influencing the evolution and dynamics of entrepreneurial teams?

(R3) How do social interaction processes influence the evolution of entrepreneurial teams during the incubation period?

(R4) What role does the incubator play in the social interaction processes in entrepreneurial teams?

This study explores the formation and evolution dynamics of Entrepreneurial Teams (ETs) during incubation; and specifically, how the technology business incubator influences ET formation and evolution. These dynamics accompanying formation and evolution occur over time: time is required for entrepreneurial teams to form and evolve and, similarly, incubatees may progress over time through different stages. Consequently, this research relies on a longitudinal perspective to capture ET formation and evolution. The study utilises a multiple case study approach within the context of one incubator. This research seeks to develop insights into the formation and evolution of the entrepreneurial team as one of the main processes of new venture creation that occurs during the period of incubation. Thus, this research contributes to opening the 'black box' of the incubation model and increasing our understanding of the prime micro-processes that have long been described as ambiguous (Nair and Blomquist, 2021).

1.3 The Research Context

The context of this research is a Saudi government-sponsored technology incubator. It is part of the BADIR Program for Incubation that was launched in 2007 as a translation of the transformation strategy to diversify sources of income set out in the Vision 2030 of Saudi Arabia.

Saudi Arabia has recently sought to diversify its economy to transform it from one that is heavily dependent on natural resources to one focusing on improving human capital and creating a knowledge- based economy (Nurunnabi, 2017; AlArjani et al., 2021). It is argued that innovation and entrepreneurship are pertinent factors behind Saudi Arabia's ambitions for economic diversification (Amirat and Zaidi, 2020). Accordingly, Saudi Arabia has established higher education initiatives to develop human capital and stimulate entrepreneurship and innovation (Yusuf and Atassi, 2016). The goal, today, is to transform Saudi Arabia into a global innovation and entrepreneurship leader in preparation for the eventual depletion of oil resources (Mahmud, 2020). With Saudi Arabia's Vision 2030 emphasising technology and innovation, the tech start-up sector in the kingdom is beginning to come of age (Al-Filali and Gallarotti, 2012; Aloulou and Al-Othman, 2021). Recent years have seen the ecosystem evolve rapidly, and the recent launch of a range of new funding programmes are anticipated to help it gain momentum in the coming years (Vision 2030, n.d.(a)).

The Public Investment Fund (PIF) is considered Saudi Arabia's Sovereign Wealth Fund, a pivotal factor in achieving the Kingdom's Vision 2030, and a leading economic catalyst. PIF has established more than 30 companies across 10 strategic sectors to grow PIF assets by unlocking new sectors to diversify Saudi Arabia's economy, localising and investing in promising sectors (PIF, 2022). One of the most prominent of these sectors is the technology sector, by allocating the SANABIL investment portfolio to invest in promising technology start-ups (SANABIL, 2022). Based on this, SANABIL contributes to increasing PIF's investment returns while formulating strategic partnerships that blaze the trail for a more prosperous future. The value of the company's assets reached approximately SAR 30 billion by the end of Q3 2020 (PIF, 2022). Also, Saudi Arabia launched the Saudi Venture Capital Company (SVC) in 2018, with funding worth US$1.33 billion to match investments or invest in funds. The government also aims to raise the contribution of tech SMEs to the GDP from 20% to 35% by 2030 (SVC, n.d.). Therefore, a serious increase has been noticed in the value of start-up deals in the Kingdom. In 2019, a number of big-ticket investments were observed, including an $8.6 million investment in Noon Academy, marking the largest ever funding round raised by a MENA edtech start-up (Noon Academy, 2019).

ArabNet (2017) documents four main reasons why tech start-ups have not gained as much traction in Saudi Arabia as in other markets in the region. First, investment has usually been geared towards lower-risk sectors, such as energy and health care, providing big-ticket returns (Watson, 2005). Second, risk aversion may reduce the number of potential entrepreneurs (Al-Mani, 2020: Gimenez-Jimenez et al., 2022). With secure public sector jobs highly available and multinational

companies and major local companies attracting talented young Saudis, the incentive to start new businesses is lower. Third, the education system has not traditionally been geared toward entrepreneurship, tending rather to underline skills that will ensure secure employment (Sindakis and Aggarwal, 2022). Lastly, in contrast to Dubai, business incorporation regulations and the regulations of a starting business have proved a hindrance, allowing Dubai to push ahead by creating a fertile environment for start-ups.

However, all these factors are shifting. According to GEM (2021), due to Vision 2030, there has been renewed entrepreneurial spirit across all sectors in Saudi Arabia, from government agencies to universities, businesses, and among the youth population. Saudi Arabia attained its highest position in 2016 based on all four GEM metrics: the perception of entrepreneurship as a viable career path, the elevated status and favourable media coverage entrepreneurs enjoy, and the perceived simplicity of launching a business. Indeed, a significant 90% of Saudis believe it is easy to start a business, placing Saudi Arabia at the top among GEM economies. During the pandemic, both the government's actions and the resilience of entrepreneurs were ranked highest among GEM economies, especially for technology-based firms. Despite the global economic challenges of the pandemic, start-up activity in Saudi Arabia grew from 14% in 2019 to 17% in 2020. Additionally, 80% of Saudis saw the pandemic as an opportunity to start a business, showcasing the nation's optimism and adaptability. Moreover, significant funds have been allocated to strengthen local technological expertise. It includes a series of government-driven programs launched in 2022 aimed at improving the digital competencies of 100,000 Saudi citizens, particularly in areas like AI, programming, cybersecurity, and gaming (Aad, 2023). Furthermore, an additional USD 1.4 billion has been set aside to encourage entrepreneurship and boost digital content. A special highlight is the role of Saudi women in this entrepreneurial wave (GEM, 2021). Saudi Arabia is the only country among the 23 high-income GEM economies where women have a higher start-up rate than men. Furthermore, a new initiative was launched by Saudi Arabia's Ministry of Industry and Mineral Resources (ArabNews, 2023) to boost entrepreneurs in the country via incubator projects for SMEs.

BADIR Riyadh for Information Technology & Communications serves as the focal point of this research. As a government-sponsored technology incubator in Saudi Arabia, BADIR Riyadh is a testament to the nation's commitment to fostering innovation and entrepreneurship. Established under the umbrella of the BADIR Program for Incubation, this initiative was inaugurated in 2007 by the King Abdulaziz City for Science and Technology. The program's inception was a strategic move aligned with Saudi Arabia's Vision 2030, aiming to diversify the nation's income sources and bolster its technological prowess (Khorsheed et al., 2014). The term "badir" in Arabic translates to "to initiate", symbolising the government's proactive role in catalysing the start-up ecosystem. Today, the BADIR Program stands as a testament to the government's enduring commitment to this sector (Aloulou, 2021).

Situated in the heart of Saudi Arabia, BADIR Riyadh stands as a beacon for technological innovation and entrepreneurial spirit. The incubator's strategic location in Riyadh, the nation's capital, positions it as a nexus for both local and international collaborations, drawing in a diverse array of tech-driven start-ups and visionary entrepreneurs. BADIR Riyadh's commitment to fostering innovation is not just limited to providing resources; it actively engages in nurturing the entrepreneurial mindset, emphasising the importance of team dynamics, and ensuring that start-ups are equipped to navigate the challenges of the tech industry (Thomas, 2017). As this research delves into the intricacies of Entrepreneurial Teams (ETs) and their evolution within TBIs, BADIR Riyadh offers a rich and multifaceted backdrop, making it an ideal setting to explore the nuances of team formation and incubator influence in real-time.

BADIR's expansive network encompasses 10 incubators and 8 accelerators spread across the Kingdom, a fact frequently noted in various studies (Startupscene, 2020). This extensive infrastructure is a testament to its widespread influence and reach within the entrepreneurial ecosystem of Saudi Arabia. The program welcomes Saudi entrepreneurs harbouring early-stage technology-centric projects, even those at the conceptual stage. BADIR's operational model is bifurcated: initially aiding entrepreneurs in their developmental phase through seed funding in accelerators and subsequently assisting them in procuring expansion capital. Its offerings include business consultancy, office and laboratory facilities, administrative support, and guidance in business planning, financial modelling, and investor pitching (Aleidi and Chandran, 2019). Furthermore, BADIR's incubators cater to a diverse range of sectors, including ICT, biotechnology, and advanced manufacturing technology.

By mid-2017, BADIR had supported more than 200 start-ups, and aimed to have created 600 start-ups, generating 3600 jobs, by 2020 (Shokeir and Alsukaity, 2019). The organisation operates several incubators across the Kingdom, with two in Riyadh and others in Taif and Jeddah. The programme is open to all Saudi entrepreneurs with early-stage technology-based projects, including those with promising product concepts (Aloulou, 2021). BADIR operates two streams, first supporting entrepreneurs in development, through seed funding in accelerators, and then helping them find funding for expansion. The first part of its remit includes business consultancy, providing office and laboratory space, secretarial and administrative services, as well as support with business planning, financial modelling and pitching (Aleidi and Chandran, 2019). The organisation has a range of incubators targeting different sectors: ICT, biotechnology, and advanced manufacturing technology. It also operates a technology incubator in Taif, in the Western Province. BADIR’s leading success stories include restaurant management technology developer, Foodics, founded by young entrepreneurs in Khobar in 2013, which completed its first successful funding round in September 2017, raising SR15m ($4m) (Khan and Khan, 2020).

In 2009, BADIR established the Saudi Business Incubator Network (SBIN), helping pool resources and administrative capacity between incubators and creating a unified system of regulations and operating standards (Burton, 2016). This was followed by the establishment in 2012 of SIRB, an angel investor network designed to help boost early-stage funding and push innovative businesses from the concept stage to series-A financing (Saudi Angel Investors Network, n.d.). BADIR's partners in the network include King Abdullah University of Science and Technology, Jeddah Chamber of Commerce and Industry, College of Business Administration and Dar Al Hekma University in Jeddah. In 2015, having acknowledged that some entrepreneurs had issues with intellectual property, the organisation established an inventors' office to help Saudi entrepreneurs apply for patents (Shokeir and Alsukaity, 2019). This was followed in 2016 by a "transfer inventions to market" accelerator, which addressed another bottleneck in the system – uncommercialised intellectual property (Oxfordbusinessgroup, 2018).

The establishment of the Saudi Authority for Intellectual Property (SAIP) in 2018 marked a pivotal shift in Saudi Arabia's intellectual property (IP) landscape, further building upon previous efforts like the "transfer inventions to market" accelerator in 2016. As the centralised authority for all IP matters in Saudi Arabia, SAIP is tasked with both promoting local innovation and regulating, protecting, and enforcing IP rights (Al-Debassi, 2020). Dedicated to fostering an IP-aware culture, SAIP has rolled out a series of initiatives such as IP Clinics for SMEs and IP education programs. The IP Respect Council, a brainchild of SAIP, underscores its commitment to bridging the gap between the public and private sectors, addressing IP challenges head-on. These endeavours aim to address the persisting challenge of uncommercialised intellectual property and accelerate the transition of innovations to market-ready solutions, in alignment with the Saudi Vision 2030. On the international front, SAIP is assertively bolstering Saudi Arabia's global IP presence. Moreover, out of the Inventions Transfer Accelerator initiative, twenty Saudi start-ups graduated. They speed up the process of turning technology into patents and starting businesses. They also present attractive opportunities for capital to invest and open up new markets, strengthening the Kingdom's economic position and elevating its benchmark in the Global Innovation Index (ITP, 2019) By initiating collaborations and agreements with major global IP entities like CNIPA, EPO, and USPTO, SAIP aims to harmonise its IP regulations. This move is further supported by SAIP's ongoing efforts to join several WIPO-administered treaties, aiming to align Saudi's IP practices with global standards. The benefits of this international engagement are manifold: from facilitating IP expertise exchanges to streamlining patent procedures via mechanisms like PPH agreements. The overarching goal is to ensure that Saudi inventions not only find their footing domestically but also seamlessly transition to global markets, addressing the challenge of uncommercialised intellectual property on an expansive scale.

BADIR is now in the process of rolling out its "soft landing" programme to encourage foreign entrepreneurs to bring start-ups to Saudi Arabia (Oxford Business Group, 2018; Wamda, 2017a). It is aiming for 20% of overall incubated start-ups to be established under foreign ownership.

The initiative intends to harness technology and talent from around the world, enriching the domestic start-up environment, and supporting economic development and diversification, much the same as what California and Berlin have done successfully (Khan and Khan, 2020). Foreign investors will gain access to the large, growing and tech-savvy Saudi market, with support on contacts, logistics and information to help them understand local conditions; hence, providing a "softer landing" in a complex and unfamiliar environment (Sindakis and Aggarwal, 2022).

Another important player in the start-up scene is the Riyadh Valley Company (RVC), founded in 2010 by King Saud University, with the aim of supporting the development of a knowledge-based economy (Sindi, 2015). The company launched a VC fund with initial capital of SR229m ($61m), which has invested in a diverse portfolio that includes educational technology, biosciences and ICT systems. While established by a public sector university, part of RVC's mission is to help develop an environment in which private sector investors will take on an increasing role. RVC is one of a growing range of funds in the tech-focused start-up space (Al-Kwifi et al., 2020). One of the earliest was N2V, established in 2007 by National Technology Group, the region's largest ICT conglomerate, with a broad range of investments in segments, including e-commerce, social media, games and mobile apps. In 2011, Aramco founded Wa'ed Firms, a $200m firm fund focusing on companies with technologies of strategic importance to the energy giant, with the additional aim of localising innovative industries and supporting entrepreneurship (Al-mani, 2020).

Musharakah represents a partnership-based model in Islamic finance where all involved parties share the profits and losses of a business venture (Institute of Islamic Banking and Insurance, n.d.). This term denotes a financing method used by Islamic banks, where bank contributes funds that are combined with those of the business and potentially other investors. While all capital contributors have the option to partake in management, it is not mandatory. Profits are allocated among partners based on pre-agreed percentages, whereas losses are shouldered according to each partner's initial investment. The first Musharakah deal was signed in August 2016, with Silicon Valley-based Blue Vine Management establishing a Saudi investment arm to manage a SR600m ($160m) fund focusing on high- tech manufacturing, sales and distribution (Al-Kwifi et al., 2020). The fund has SR300m ($80m) from private and institutional investors, backed by a further SR300m ($80m) from Banque Saudi Fransi, guaranteed by Takamol. By mid-2017, the programme had selected a total of five funds to participate in, with guarantees worth SR1.1bn ($293.3m) being awarded (Al-mani, 2020).

1.4 Research Methodology

To explore the research questions, informed by a critical realism perspective, a multiple case study approach coupled with a longitudinal perspective was deemed appropriate. The main purpose of

adopting a multiple case study was to capture and analyse the complex dynamics, interactions, and events experienced by ETs and the incubator's role in their formation and evolution. In addition, the adoption of a multiple case study methodology reflected the necessity of probing the complexity and boundaries of the phenomenon. Such complexity stems from heterogeneity, which is known as a dominant and recognised feature of both the entrepreneurial team and the incubation process. To build a rich picture, this research focuses on achieving insights based on "how" and "what" type questions. Additionally, multiple cases were utilised to help to compare the differences and the similarities between the cases and to enable data analysis both within and across situations.

The empirical data in this research drew on multiple data sources including semi-structured interviews, focus groups, informal discussions, and non-participant observations. Each data collection method was chosen due to the unique data insights each method could provide. These are detailed in Chapter 4, Table 4.6.

The formation and evolution dynamics of the ET within the TBI and the incubator's involvement in these dynamics and events required the measurement of the ETs as research objects on more than one occasion (Goldstein, 1979). In other words, collecting data about changes for two or more time periods allowed at least a measure of the change and possibly an interpretation of the change (Menard, 2008). Longitudinal data collection was adopted also in response to calls by scholars in technology incubation (e.g., Mian et al., 2016), for more longitudinal research to cover temporal and processual phenomena encapsulated in the incubator.

Data was collected from the entrepreneurial team members, the incubator's advisors, and the incubator's management at various facilities of BADIR Riyadh over a 12-month period. The information obtained was based on pre-prepared questions posed by the researcher to explore the formation and evolution of entrepreneurial teams during the incubation period and to understand the incubator's role in this process (Refer to the interview questions in the Appendix B).

Over a period of 12 months, three distinct data collection rounds were conducted at BADIR Riyadh. The first round, in January 2019, was a comprehensive collection of data about the team and its interactions with the incubator regarding its formation and evolution. This stage was crucial in becoming familiar with the team for the first time and immersing oneself in the incubator's environment. It was also vital to establish empathy with the team members and the incubator staff to enable discussions on team matters, emphasising privacy and confidentiality. Six months later, in June 2019, the second round was dedicated to following up on specific issues that emerged from the first round. The third round, in January 2020, focused on specific issues of formation and evolution for the entrepreneurial teams that had been identified in the earlier rounds. Challenges encountered during each round of data collection are discussed in Chapter 4. The first round was introductory and more comprehensive to get to know the teams and members and to identify issues of teams in principle. The second round delved into follow-up issues that had emerged from the first round.

Finally, the third round was to follow up on the issues that emerged from the previous two rounds and to focus on pivotal issues.

Four data collection methods were employed: 98 interviews, eight focus groups, ten informal discussions, and four non-participant observations across the three rounds from January 2019 to January 2020. Data from the interviews and focus groups were recorded and transcribed.

Informed by Faultline theory (Lau and Murnighan, 1998), a within case analysis explored both the formation and evolution of the ET and the role that the incubator played in ET formation and evolution. This was followed by cross case analysis. In the case analysis a constant comparative method was used, whereby the research sought to find patterns within the data and present those patterns as emerging themes.

1.5 Findings

The longitudinal nature of this research allows for insights into the formation and evolution of entrepreneurial teams during incubation. Simultaneously, the research also captures insights into the incubator's role during all the formation and evolution dynamics of teams.

1.5.1 The Formation and Evolution of the ET during the Incubation

This research indicates that entrepreneurial teams are unstable. Regarding formation, the cases illustrated three distinct dynamics during the period of incubation. These dynamics involved: (i) the initial creation of the entrepreneurial team; (ii) changes in membership composition; and (iii) the emergence of sub-teams within the main entrepreneurial teams. Regarding ET evolution, the cases suggest that the path of the entrepreneurial teams towards professionalisation involved three social processes: (i) role allocation; (ii) leadership transitions; and (iii) conflict. The cases also revealed another aspect of the evolution of the entrepreneurial teams during the incubation in terms of the nature of the relationship of the entrepreneurial team with the incubator. The ET-incubator relationship was characterised by (i) resentment, (ii) independence, (iii) conflict, (iv) co-operation, and (v) sufficiency.

1.5.2 The TBI’s Role in the ET Formation and Evolution

During the significant changes in the formation and evolution of the entrepreneurial teams, the incubator role was prominent and “multifaceted”. The distinct and different resources and capabilities of the incubator had different impacts on the ETs. Five important aspects of the incubator were the incubator as a distinct “knowledge”, “administrative”, “social”, “advisory”, and “mediatory” context. Additionally, reflecting the Saudi context, the incubator was intensively involved in influencing ET formation and evolution. This stems from a reliance on the incubator as a reliable government tool for implementing Vision 2030 by empowering entrepreneurs and tech entrepreneurship towards transformation into a knowledge-based economy. The Saudi model of

incubation emphases the necessity of investing and focusing on the entrepreneurial teams and striving for their success as the nucleus that will lead to creating an effective entrepreneurial environment. The success of these teams will lead to their firms' success and then enable them to drive the success of other firms (Hansen et al., 2000).

1.6 Contributions of this Research

1.6.1 Contribution to the Technology Incubation Literature

Recent studies emphasise the importance of focusing on the practices of incubators to gain a deeper understanding of how they support incubatees (van Weele et al., 2018). Responding to this call, this research delves deep into the intricate world of incubation, aiming to demystify the 'black box' of incubation processes (Mohan and Chinchwadkar, 2022). Specifically, this exploration captures and analyses micro-processes within Technology Business Incubators (TBI) as highlighted by Mian et al. (2016). By narrowing the focus to micro-level activities, we gain insights into the evolving nature of incubation processes and mechanisms, a perspective also advocated by Friesl et al. (2019). In our quest to comprehend the nuances of how these processes manifest in various settings, we have employed a qualitative approach, which has been posited as particularly effective by Busch and Barkema (2020). Hence, this study contributes to the significant shift in recent research endeavours.

Moreover, it does not only enrich the academic understanding of micro-level incubation processes but also shines a spotlight on the human facets intertwined with these processes. Despite the critical role of the human element in incubation, it has hitherto been side-lined in scholarly discussions, a sentiment echoed by Scillitoe and Chakrabarti (2010). It seeks to bridge this gap, underscoring the paramount importance of understanding the intricate dance between incubation processes and the people who navigate them. Indeed, the current emphasis in theoretical development, particularly at the micro-level, is more skewed towards the dynamics between firms and their incubators. Unfortunately, this leaves out other crucial players such as management, advisors, and incubatees (Mian et al., 2016). While there is burgeoning interest in probing specific incubation processes, there is a conspicuous absence of in-depth study regarding entrepreneurial teams, even though they are at the heart of the incubation process (Phan et al., 2005; Mian et al., 2016). Building on this gap, this study integrates the Faultline Theory, offering a fresh perspective on the dynamics spawned from the formation of entrepreneurial teams and their evolution within the incubation ecosystem.

Furthermore, previous literature on technology incubation considers incubation as a one-sided context (Ahmad, 2014). Set against the unique socio-cultural, political, and economic backdrop of Saudi Arabia, the research critically assesses how Vision 2030's aspirations intersect with the actualities of the incubation model. The government's emphasis on incubators as tools for a knowledge-based economy transformation has amplified the significance of ETs. Yet, in the Saudi

context, the incubator's role transcends traditional boundaries. It actively shapes and is shaped by the socio-cultural milieu, evident in its efforts to empower female leaders and talents, align financial practices with Islamic Sharia, especially for family entrepreneurial teams, and maintain gender-specific departments. These nuances, deeply rooted in Saudi Arabia's cultural and social fabric, have a profound impact on the incubation process, making the Saudi incubation model distinct. The incubator emerges as a 'multifaceted context', with each facet reflecting a distinct influence stemming from specific embedded resources. As Khan (2013) highlighted, limited access to resources in Saudi Arabia including to the leadership in different governmental and private sector organisations makes research in this realm challenging. Therefore, these findings not only augment academic understanding but also provide actionable insights for Saudi policymakers and incubator managers, underscoring the importance of a tailored approach to nurture innovation and entrepreneurship in specific cultural and geopolitical settings.

1.6.2 Contribution to the Entrepreneurial Team Literature

The study's longitudinal approach, spanning 12 case studies, delves into the entrepreneurial team's journey, capturing the nuances from its inception to its evolution and the dynamics therein. It enriches the ET literature by viewing formation and evolution as intertwined processes and highlights the pivotal role of the incubator in shaping these processes. This nuanced approach addresses gaps identified in the ET literature (Lazar et al., 2020; Patzelt et al., 2021) and provides an updated account of entrepreneurship ecosystem of Saudi Arabia, as studied by Khan (2013).

Indeed, Lazar et al. (2020) have underscored the necessity of contextualising the entrepreneurial team discourse, advocating for a more in-depth exploration of the environments that mould and shape these teams. Rooted in the belief that entrepreneurial teams, as dynamic constructs, will inevitably be swayed by their embedding contexts, this research emphasises the pivotal role of incubators—from advisory, to mediatory, and even as repositories of knowledge and networking hubs—. The study unravels the significant influence and active participation of incubators in the evolutionary journey of entrepreneurial teams, positioning them as versatile actors. This versatility is epitomized by the incubator's multifaceted involvement, wherein each facet, equipped with unique resources, casts distinct influences on the team's developmental trajectory.

Adding another layer to this narrative is the elucidation of the evolving relationship dynamics between ETs and TBIs. Highlighting patterns of growing independence, periods of dissatisfaction, instances of conflict, selective interpersonal interactions, and collaborative endeavours, the research introduces a fresh perspective. It demonstrates that the ET-TBI relationship isn't linear but is marked by ebbs and flows, reflecting the complexities inherent in the entrepreneurial incubation space.

A recent critique by Patzelt et al. (2021) suggests that the entrepreneurial team literature needs a shift in focus from mere 'what' questions to the more intricate 'how' and 'why' dimensions, especially concerning the processes, dynamics, and ensuing transformations that these teams undergo. A significant contribution of this research is its detailed exploration of how entrepreneurial teams evolve professionally. It provides clear insights into the assignment of roles, shifts in leadership, and the range of conflicts within teams, painting a comprehensive picture of the growth stages of entrepreneurial teams. Additionally, the research illuminates key external and internal factors, like when venture opportunities are identified and specific growth markers, that impact these evolutionary dynamics.

Lastly, by spotlighting the primary motivators driving ETs' decisions to align with incubators, this research underscores the multifarious reasons entrepreneurial teams seek incubation. Whether it's the allure of accessing critical resources, the quest for enhanced legitimacy, or being the focus of targeted recruitment drives by incubator management, this exploration adds depth to our understanding of ETs' motivations.

1.7 Structure of the Thesis

The thesis comprises nine chapters. Following this chapter, ***Chapter 2*** reviews the literature on technology incubation, focusing on the three phases of incubation. ***Chapter 3*** reviews the literature on entrepreneurial team formation and evolution processes and related dynamics. In ***Chapter 4***, the methodology employed in the research is described, outlining the critical realism philosophy underpinning the research and detailing how the research was undertaken. ***Chapter 5*** describes the formation and evolution of twelve entrepreneurial teams on a case-by-case basis (within case analysis). The cross-case analysis in ***Chapter 6*** presents and discusses themes related to formation of ETs. The cross-case analysis in ***Chapter 7*** presents and discusses themes related to the evolution of the ETs in relation to their relationships with the incubator. The cross-case analysis in ***Chapter 8*** presents and discusses themes related to the evolution of the ETs in relation to their social interaction process. Finally, ***Chapter 9*** sets out the contributions and limitations of the study, the suggestions for future research, and policy and managerial implications.

Chapter 2: Literature Review - The Technology Business Incubator

2.1 Introduction

To situate the thesis within the field of technology incubation, this chapter focuses on the Technology Business Incubator (TBI) model, which is an extension of recent research aiming to open the 'black box' of incubation. The incubation model refers to what occurs inside the incubator and how it occurs (Mrkajic, 2017). Yet, early incubation literature is often fragmented and anecdotal, lacking a unified theory (Hackett and Dilts, 2004; Mian, 2011). Despite attempts to synthesise existing literature (Mian et al., 2016; Hausberg and Korreck, 2020), a cohesive framework remains elusive due to the unique characteristics of incubators across various contexts.

This chapter aims to review the literature on the model of the TBI. To present the incubation model within an 'integrated picture', the Technology Business Incubator (TBI) is first defined. Second, the historical narrative is presented, including the roots of the incubation industry. The chapter also considers the evolution of the incubation model based on its components, what it offers to the incubated new technology firms, and associated added value across three generations, as well as its heterogeneity. Third, theories which previous scholars relied upon to study and advance the incubation model are addressed. Lastly, the inferred gaps and how this research can address them are explained.

2.2 Defining Business Incubators

In the past decades business incubation has become an essential part of innovation and entrepreneurial development worldwide. A broad definition by Hackett and Dilts (2004) defines incubation as "enterprises that facilitate the early-stage development of firms by providing office space, shared services, and business assistance". Of course, the forms of assistance and shared services take on many shapes depending on each incubator's goals, fund and function.

The first known example of a business incubator originated from Batavia New York in 1959, where the real estate developer, Charles Mancuso, divided a rented space into multi-tenancy after it was not possible to lease the site (Hackett and Dilts, 2004b). Subsequently, some of these tenants began to seek advice and/or assistance in raising capital (Mian, 2016). Interestingly, the building hosted a chicken company, whose presence helped coin the name 'incubator' for the facility as this is the term for the heated enclosures used for hatching eggs (Aerts et al., 2007).

In the mid-1960s, incubation programs gradually began to spread and by the 1970s, business incubators began to emerge progressively worldwide (Albert and Gaynor, 2001). The rise of business incubators was especially rapid in the US where there was an increasing belief in the importance and role of incubation programs in supporting the economy and creating jobs. In addition, the U.S. legal

system also recognised the importance of incubators in innovation and the protection of intellectual property rights.

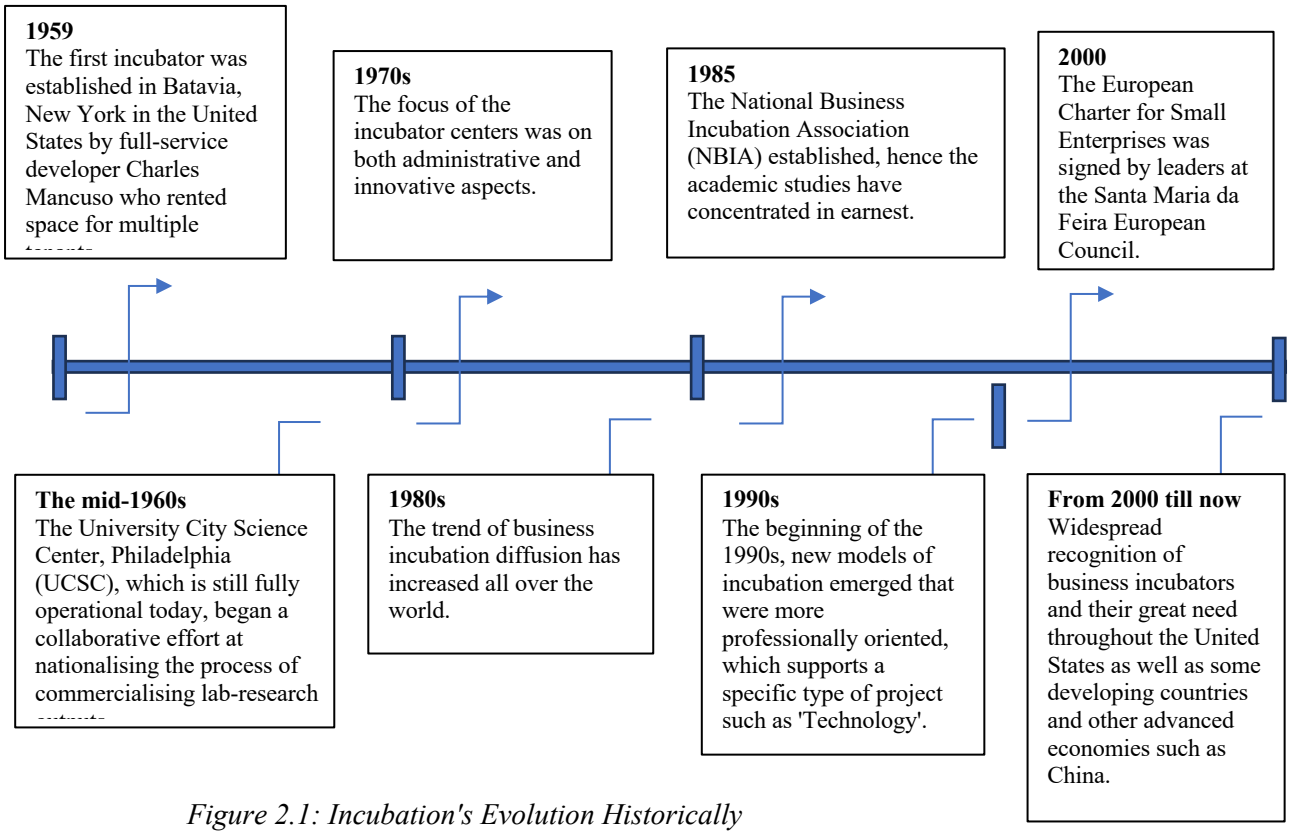

Figure 2.1: Incubation's Evolution Historically

(Source: Researcher's own)

The most notable event in the incubation industry's development was the establishment of the National Business Incubation Association (NBIA) in the mid-eighties. The beginning of the NBIA coincided with the evolution of incubation programs in Europe and America regarding the provision of services. Consequently, in the 1980s and 1990s business incubation programs provided new and diverse services, such as consulting and networking (Mian, 2016). Besides the wide recognition of incubators' success and their contribution to economic growth, they also developed in advanced economies, such as China, Korea, Israel, Malaysia, Taiwan, France, Turkey, Korea and Brazil (Mian et al., 2016). Therefore, the 1980s and 1990s witnessed the pinnacle of the incubation industry's development.

In the 1990s, growth continued. At the start of the decade, new incubation models emerged and were strongly supported. These models concentrated on specific firms, such as Information Communications Technology (ICT) start-ups (NBIA, 2001). In the late 1990s, there was a rush of for-profit incubators (Hannon, 2005). This was accompanied by an extensive media campaign in the United States that contributed to disseminating the idea of incubators as innovation hatcheries (Hackett and Dilts, 2004a).

The beginning of the millennium embraced a noteworthy event; EU leaders signed the European Charter for Small Enterprises at the Santa Maria da Feira European Council (OECD and European Commission, 2019). One of its main targets was to create world-class small business support systems (Aerts et al., 2007). Therefore, this era witnessed the number of incubators rising and spreading worldwide to 3,000. The European Commission (2002) report documented this spread; one-third (33%) were located in North America, and 30% in Western Europe. The rest were dispersed over the Far East (20%), South America (7%), Eastern Europe (5%) and Africa, the Middle East, and other regions (5%).

2.2.1 The Evolution of Technology Business Incubation Models

As the field has grown, incubators have increasingly tried to distinguish themselves in three common ways: by specialising in one particular field, e.g., high technology incubation (Schwartz and Hornych, 2010); by customising the incubation experience to suit the team's needs (Grimaldi and Grandi, 2005); or aligning to the goals (Vanderstraeten and Matthyssens, 2012). Not only is this done to gain more success with specific incubatees but also to ensure the incubator's survival and growth as a business.

Schwartz and Hornych (2008) find that a specialised incubator is likely to have key benefits for entrepreneurs, such as high-quality equipment, improvement of services and consultancy offerings, and a head start in the industry, based on proximity to the incubator. Because of this new incubation model, which is at the centre of this thesis, has become widespread in the past decades: The Technology Business Incubation Model (TBI).

The gradual evolution of the incubation industry is reflected in the evolution of technology incubation models, particularly the support provided by the incubator with its associated added values (Mian, 2016). Traditionally, TBI incubation models of the first generation from the 1960s to the end of the 1980s draw upon the tangible format of shared office space and the associated infrastructure services (Figure 2.2). This includes multiple facilities, such as meeting and conference rooms, canteen, and secretarial services (Allen and Rahman, 1985). Accordingly, the added values gained by the incubatees through this model and what it contains were related to reducing costs (Bruneel et al., 2012).

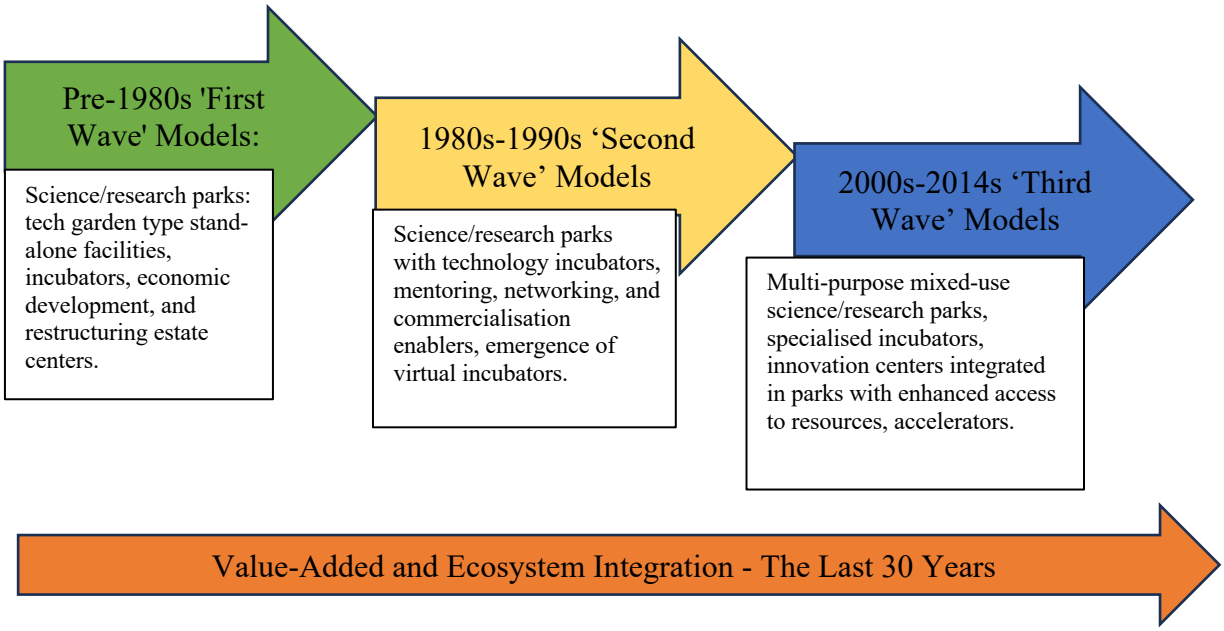

Figure 2.2: The Evolution of Technology Business Incubation Models

(Source: Mian et al., 2016, p. 119)

From the end of the 1980s until the end of the 1990s, the second generation of TBIs emerged, which was distinguished from the first generation by new added values. In addition to providing tangible resources, there was a tendency to provide professional business support, such as training, coaching, and mentorship. This was in parallel to professional advice and support in financial, administrative, legal, marketing, strategy, and accounting matters in addition to providing access to social networks and links to universities (Mian, 1996, 1997; Bergek and Norrman, 2008). Accordingly, the added values gained by the incubatees were related to accelerating the learning curve of incubatees (Bruneel et al., 2012).

At the end of the nineties and the beginning of the millennium, the third generation TBI model emerged, described as the most mature compared to its antecedents. The third-generation model embraced the unique value-added model associated with providing access to social networks within the incubator with peers. Not only that, but this model also provided 'mediation', to facilitate the incubators' access to extensive external technological, professional, financial, and stakeholders' networks (Colombo and Delmastro, 2002; Mian et., 2016). Accordingly, the added values gained by the incubatees through this model were related to access to external resources, knowledge and legitimacy (Bruneel et al., 2012). Meanwhile, a new incubation model emerged; the Internet-based virtual incubation model that supports new firm growth, particularly in specialised firms, such ICT start-ups, e.g., Idealab (founded in 1996).

Initially, the objective of technology incubators was to provide logistical services (Chan and Lau, 2005), so as to reduce the start-up costs for new firms and, in the majority of cases, to

provide local visibility for emerging business (Grandi and Grimaldi, 2004). The focus of more recent private incubating experience seems to be on shortening clients' time-to-market, providing more specialised services, and bringing start-ups, technological and commercial big players into a common network (Grandi and Grimaldi, 2005). They also seem to monitor their tenants more carefully, providing day-to-day operational support, and access to advanced sources of technical and management expertise (Mian, 1997). Moreover, the development of Information Technologies has allowed other actors to step in and to try to increase the returns on their operations by playing a critical role at a very early stage in the development of new firms (Grandi and Grimaldi, 2005).

2.3 Measuring Incubator Performance

Variations in definitions, evaluation criteria, and assessments of value incubator methods, emphasise the need for a clear understanding of success determinants (Albort-Morant and Ribeiro-Soriano, 2016). Previous research offers several classifications of incubators. For instance, Allen and McCluskey (1990) delineated six types based on value addition, while Aernoudt (2004) and Von Zedtwidtz and Grimaldi (2006) proposed classifications rooted in philosophy, objectives, competitive scope, and strategic goals. Other scholars have enriched this discourse with their unique perspectives on incubator nature and purpose (Grimaldi and Grandi, 2005; Clarysse et al., 2005; Becker and Gassmann, 2006; Bergek and Norrman, 2008).

Moreover, the realm of incubator performance measurement has been a focal point of academic discourse, with scholars grappling to find a universally accepted metric or model (Rice, 2002; Phan et al., 2005). This challenge is further exacerbated by the difficulty in obtaining objective and direct performance indicators (Aerts et al., 2007).

A significant strand in the literature revolves around R&D indicators. Westhead (1997), a leading voice in this domain, emphasises the importance of both input and output R&D indicators. On the input side, metrics such as the proportion of Qualified Scientists and Engineers (QSEs) and financial indicators like R&D spending are highlighted. In contrast, the output side focuses on tangible outcomes like patents and the introduction of new products or services. Barbero et al. (2014) discovered significant differences in the innovations produced by different incubator types and that incubators differ not only in their objectives but also in their operational strategies and outcomes. For instance, basic research incubators, often linked to technological centres or emerging from natural clusters, tend to have a higher specialisation level. This specialisation often leads to a focus on technical innovations, as opposed to administrative ones (Damanpour, 1987; Subramanian and Nilakanta, 1996). On the other hand, private incubators, which represent the incubation efforts of larger companies, tend to produce more organisational innovations, reflecting the characteristics and priorities of their parent companies (Subramanian and Nilakanta, 1996; Walker, 2008). The relationship between incubator type and innovation output is further complicated by external factors. For example, the nature and intensity of relationships between ventures and other entities play a

crucial role in the innovation process (Bayona et al., 2002). Basic research and private incubators, by their very nature, are most effective in fostering these external relationships, leading to enhanced innovation outcomes.

Moreover, the managerial knowledge and expertise embedded within incubators significantly influence their effectiveness. Basic research incubators often possess deep technical knowledge in specific sectors, while private incubators benefit from the broader experience of managers from their parent companies' core activities (Sammarra and Biggiero, 2008). In contrast, university incubators tend to offer more generalised knowledge, and economic development incubators provide non-specialised support.

The implications of these findings are manifold. For entrepreneurs, the type of innovation an incubator specialises in can be a significant factor in their choice of incubation support. Incubator managers need to be acutely aware of their positioning in the ecosystem and adapt their strategies to maximize their impact. Policymakers, too, must consider the heterogeneity of incubators when allocating resources and support (Westhead, 1997; McAdam and McAdam, 2008).

Furthermore, the venture survival rate, despite its popularity as a performance metric, has not been immune to criticism. Scholars have pointed out its potential lack of validity, especially given the inherent objective of incubators to ensure the longevity of ventures (Phan et al., 2005). Lastly, growth metrics, represented primarily by employment and sales growth, have also been spotlighted in the literature. While some studies occasionally include profit growth as a performance measure, there is a prevailing argument against its relevance, particularly for early-stage firms (Delmar, 1997; Delmar et al., 2003).

The evaluation of incubator performance has been a focal point of academic discourse, emphasising the importance of distinguishing between different incubator archetypes to ensure accurate assessments. The literature underscores the pitfalls of making "apples to pears" comparisons (Aernoudt, 2004) suggesting that lumping diverse incubator types together can distort performance evaluations. A more nuanced approach, as advocated by scholars, is to measure performance against the specific objectives set for each archetype. Indeed, the objectives set for incubators have emerged as a primary criterion to differentiate between their types and the success of an incubator is intrinsically linked to its ability to meet these objectives (Barbero et al., 2012; Barbero et al., 2014):

First, basic research incubators predominantly focused on technology development, these incubators are characterised by their substantial investments in R&D. Their leadership in patent generation and the introduction of new products/services is a testament to their efficient fund utilisation. Interestingly, despite their non-aggressive stance in securing R&D funds, their performance metrics remain commendable.

Second, university Incubators are adept at securing significant R&D funds, with a notable contribution from University Technology Transfer Offices. While they excel in acquiring qualified personnel, they exhibit a lag in patent generation and product launches. Their core objective, which revolves around licensing IP from university research, is satisfactorily achieved. However, a discernible gap emerges in their ability to spin off ventures, as reflected in their product launch rankings.

Third, economic Development Incubators present a concerning picture, with performance metrics trailing across all categories. Their foundational objectives, cantered around regional development, wealth creation, and employment generation, remain unfulfilled. Their performance, especially in employment generation and sales growth, is lacklustre, particularly when juxtaposed with regional GDP growth or inflation metrics.

Fourth, private incubators, aligned with the objective of generating substantial returns for parent companies, showcase exemplary performance. They lead the pack in sales growth, occupy the second spot in new product launches, and rank third in patent generation, underscoring their effective alignment with set objectives.

Lastly, more recently, Technology Business Incubators (TBIs), primarily focusing on technology-based firms, stand out as a type of incubator (Clarysse et al., 2005). While it shares similarities with other typologies such as innovation/technology centres, science/research/technology parks, business/seed accelerators, and technopolis, each of these terms represents distinct models with their own unique characteristics and objectives (Mian et al., 2016). Introduced by Smilor and Gill (1986), technology incubators serve as a nexus between technology, entrepreneurial talent, capital, and expertise. By limiting market exposure and granting access to essential resources, TBIs help regional development (Xiao and North 2017) and help start-ups get past the "liability of newness" (Ferguson and Olofsson 2004). These property-based entities provide start-ups with business services, networking (Bergek and Norrman, 2008), professional services (Sherman and Chappell, 1998), university resources, and funding (Mian, 1996) to ensure their growth and sustainability. This definition is further echoed by the European Commission, which emphasises the role of technology incubators in fostering the diffusion of innovative technologies and nurturing a select group of technology-based firms with significant growth potential (OECD and European Commission, 2019, p.6).

In conclusion, while a comprehensive model would ideally evaluate all influential factors, such models are best suited for case studies with smaller sample sizes. For broader empirical research, a set of widely-accepted indicators from literature, focusing on input and output R&D metrics, is recommended.

2.4 Theoretical Approaches to Understanding the Incubation Process

Van de Ven (1989) emphasised the importance of a well-developed theory for the advancement of any scientific discipline. However, much of the early literature on business incubation was fragmented, anecdotal, and primarily theoretical (Mian, 2021). This lack of cohesive research, combined with a dearth of systematic longitudinal studies, made it challenging to develop a generalisable theory for business and technology incubators. This challenge was further compounded by the unique characteristics of science parks, incubators, and accelerators, which vary based on geographic, political, social, and economic systems.

Theoretical Lens Employed	Authors
Market Failure View of Venture Creation – The incubator compensates for perceived failures or imperfections in the marketplace to counter the problems caused by an inefficient allocation of resources	Plosila and Allen (1985); Bøllingtoft and Ulhøi (2005)
Resource Based View - The incubator as an organisationawarding a stock of tangible and intangible resources to client firms that result in development of the client firms	McAdam and McAdam (2008); Patton et al. (2009); Todorovic and Moenter (2010); Mian et al. (2016)
Stakeholders' View - Incubators act as a bridging mechanism to implement the interests of key regional stakeholders (Triple Helix, Quadruple Helix)	Mian (1997); Corona et al. (2006); Etzkowitz (2002); Cadorn et al. (2019)
Structural Contingency Theory - Incubation mechanisms are configured to fit the external environment and be tailored to local needs and norms	Ketchn et al. (1993); Phan et al. (2005); Klofsten et al. (2020)
Social Capital/Network Theory - Incubation mechanism as a system for increasing client firms' internal and external network density	Tötterman and Sten (2005); Hansen et al. (2000)
Real Options View - Client firms are supported from a pool of available options through selection criteria based on fit with incubator strategy	Hackett and Dilts (2004)
Dyadic Theory – An interdependent co-production dyad where incubation assistance is co-produced by the incubator management and tenant entrepreneur	Rice (2002); Warren et al. (2009)
Institutional Theory – The incubator's support mechanism rules and contracts offer a more structured approach to reduce uncertainty and risk and accelerate the process	Guerrero and Urbano (2012); Phan et al. (2005)
Mechanism-Driven Theory – The incubator implements its own internal policies through an understanding of the relations that are value laden and context-based within the incubator organisation	Ahmad (2014); Bergek and Norrman (2008)
Virtual Incubation View - The Incubator offers knowledge brokering and information dissemination in the market space of ideas to develop innovative ventures	Nowak and Grantham (2000); Wójcik (2005)
Open Innovation View - This lens helps to understand particularly the modern corporate incubator with its focused absorptive capacity from the perspective of its corporate sponsor	Gans and Stern (2003); Weiblen and Chesbrough (2015); Hausberg and Korreck (2020)
Absorptive Capacity - This lens can help to explain the resources that a corporate incubator/accelerate can leverage from their sponsor(s)	Cohen and Levinthal (1990); Hausberg and Korreck (2020)

Table 2.1. Theoretical lenses employed to study the business incubation process

(Source: Mian, 2021 p. 29)

2.4.1. Market Failure View of Venture Creation

The market failure view of venture creation posits that incubators act as a corrective mechanism to address perceived failures or inefficiencies in the marketplace (Nair and Blomquist, 2020). These failures often manifest as an inadequate allocation of resources, which can hinder the growth and success of new ventures. Incubators, in this context, provide the necessary support and resources to counterbalance these market imperfections, ensuring that start-ups have a better chance of survival and success.

Several scholars have explored the market failure view in the context of business incubation and the entrepreneurial process. Campbell et al. (1985), Brooks (1986), Smilor (1987), Hisrich (1988), Lumpkin and Ireland (1988), Allen and McCluskey (1990), Aerts et al. (2007), and Bergek and Norrman (2008) have all drawn from the literature on new venture creation and entrepreneurship. These researchers generally perceive incubation as a structured and rational process that bestows legitimacy upon start-ups, facilitates access to essential networks, and amplifies community support for entrepreneurs.

Under the market failure view, the incubation process is often broken down into distinct stages or components. For instance, Campbell et al. (1985) and Brooks (1986) identify stages such as the diagnosis of needs, selection and monitoring, capital investment, and access to expert networks. These stages are seen as critical steps in the incubation process, ensuring that start-ups receive the tailored support they need at different phases of their growth journey.

Furthermore, the literature has also proposed various typologies or models of incubation. Lumpkin and Ireland (1988), Allen and McCluskey (1990), and Weinberg et al. (1991) have categorised incubators based on their primary focus or affiliation. Some of the commonly identified models include not-for-profit incubators, university-based incubators, corporate incubators, and high-tech incubators (Peter et al., 2004). Each of these models is characterised by its unique approach or style of incubation. For instance, university-based incubators might prioritise academic spin-offs and research-driven start-ups, while corporate incubators might focus on ventures that align with the parent company's strategic objectives.

However, while the literature provides a detailed breakdown of the incubation process and various incubator models, conceptualising incubation as a step-by-step or staged process, presents several challenges. This model suggests a linear progression, potentially overlooking the dynamic and often non-linear nature of entrepreneurship. Such a focus might inadvertently sideline the pivotal role of the entrepreneurial team or founders, especially given that modern literature on venture creation emphasises their significance (Shepherd et al., 2021). By adhering strictly to this model, there is a risk of neglecting the broader external environment such as the entrepreneurial ecosystem, which includes market dynamics, technological shifts, and socio-cultural influences. The entrepreneurial

landscape, with its emerging trends like digital transformation and sustainability, is continually evolving, and a staged model might not be adept at addressing these contemporary challenges. To summarise, the primary limitation stemming from applying new venture creation theory to incubation is a lack of comprehension of new venture creation as a dynamic, multifaceted, and evolving process that goes beyond linear stages and requires a holistic, adaptive approach that integrates diverse entrepreneurial contexts, trends, and multidisciplinary insights.

2.4.2. The Resource-Based View RBV

The Resource-Based View (RBV) of the firm, rooted in Penrose's (1959) seminal work, has been employed by several researchers to understand incubation processes. Scholars such as McAdam and McAdam (2008), Patton et al. (2009), and Todorovic and Moenter (2010) have leveraged the RBV to conceptualise incubation as a mechanism that provides both tangible and intangible resources to client firms. The underlying premise is that by equipping these firms with a rich stock of resources, incubators can catalyse various benefits, most notably, growth.

In the context of incubation, resources extend beyond mere tangible assets. They encompass intangibles such as proximity to markets, access to knowledge sources like universities, and clustering effects akin to a Community of Practice. The infusion of these resources into client firms facilitates access to new knowledge, expertise, and networks, propelling them towards growth. At its core, the RBV perspective posits that the essence of incubation lies in efficiently and timely provisioning resources to nascent firms, ensuring their survival and success.

While the RBV offers a compelling lens to view incubation, it is not without its limitations, especially when one delves deeper into the classical assumptions underpinning the theory. Its approach is distinct from other theories as it does not present clear hypotheses (Lockett et al., 2009). One of the primary challenges with the RBV is its potential for tautological reasoning. As highlighted by Priem and Butler (2001a, b) in their exchange with Barney (2001a), the RBV can sometimes circle back on its own arguments, making it difficult to derive definitive conclusions. Additionally, the task of identifying and quantifying the intangible resources, which are central to the RBV, proves to be a significant hurdle (Ambrosini and Bowman, 2001; Godfrey and Hill, 1995; Rouse and Daellenbach, 1999). This often leads researchers to focus on resources that are easily measurable but not necessarily the most relevant. The complexity is further heightened in large firms, where myriad small initiatives can influence performance, making it challenging to isolate the effects of specific resources (Lockett et al., 2008). The term 'competitive advantage' within the RBV framework is also open to various interpretations (Foss and Knudsen, 2003; Powell, 2001), leading to different empirical approaches and potential inconsistencies. The RBV traditionally emphasises the internal resources of a firm as the primary drivers of competitive advantage. However, in the context of incubation, external factors, such as networking opportunities, mentorship, and market dynamics, play a crucial role in a start-up’s trajectory. Solely focusing on resources might overlook the significance of these external

elements. Lastly, many empirical studies grounded in the RBV grapple with determining the direction of causality, especially when using single equation, cross-sectional designs (Swann, 2006).

To move forward, there is a need to integrate the RBV with other complementary theories that account for the dynamic nature of start-ups and the external factors influencing their growth. A more holistic approach, which combines the resource-centric perspective of the RBV with the external, dynamic elements of the entrepreneurial ecosystem, can offer a richer and more nuanced understanding of the incubation process.

2.4.3. Social Network Theory

Incubator-incubation researchers have employed social network theory to study how internal and external network connections influence the development and growth of incubatees (Bøllingtoft and Ulhøi, 2005; Evald and Bager, 2008; Hughes et al., 2007; McAdam and McAdam, 2006; McAdam and Marlow, 2007; Tötterman and Sten, 2005). They perceive incubation as a means to enhance the network density of client firms. Key insights from these studies indicate that an incubator's physical layout and the mix of companies within it significantly affect its networking dynamics. Specifically, the architectural design of the incubator and the type of companies inducted within it can foster active networking.

Researchers have provided valuable insights into the inner workings of incubators. They emphasise the significance of internal networks over external ones for a successful incubation process. Based on network and social capital theory, there is a consensus that incubators help establish entrepreneurial connections (Podsakoff et al., 2000). A key measure of incubation quality is the "network density" of a firm, which refers to the new and active connections made by companies due to the incubator's strategic efforts. The general belief is that a higher network density leads to greater satisfaction with the incubator's services and increases a firm's chances of success after incubation.

Internal social networks included in TBIs are gaining importance as they are a proven resource for acquiring knowledge, decreasing the learning curve, facilitating internal cooperation between incubated firms, and acting as practical tools in raising capital and product development (Rubin et al., 2015). Instead of merely learning from each other, incubated companies can leverage mutual benefits, like acquiring missing competencies or outsourcing tasks (Bøllingtoft and Ulhøi, 2005). Moreover, throughout their life cycle, NTBFs leverage social networks tailored to their current phase. In the product development stage, these networks bolster technological capabilities and innovation (Chen and Wang, 2008). During formalisation, they assist in knowledge acquisition and HR management (Martin-Rios, 2017). These networks' learning mechanisms align with established companies' learning systems (Fang et al., 2010), highlighting the rich knowledge they offer, spanning entrepreneurial to market insights (Becker and Gassmann, 2006).

Incubated NTBFs aim to network not just within the incubator but also with vital external entities for their growth (Patton and Marlow, 2011; Rubin et al., 2015). Being in an incubator offers legitimacy, aiding in establishing these external connections (Salvador, 2011). The incubator serves a dual role: directly linking NTBFs with potential partners like customers, suppliers, and universities (Rothaermel and Thursby, 2005), and acting as a hub where client-advisors bridge NTBFs with key stakeholders, including investors (Mian, 2014).

However, recent studies challenge the idea that networking among client firms always results in synergies, R&D collaborations, and innovation (McAdam and Marlow, 2007; Evald and Bager, 2008). While it is assumed that firms in incubators naturally pursue networking, factors like organisational values and leadership can influence this behaviour (Podsakoff et al., 2000). Some researchers point out the downsides of networking within incubators, suggesting it can hinder social network development. In-depth studies reveal that incubator environments can be marked by power dynamics, changing alliances, self-centred motives, secrecy, and even deceit (McAdam and Marlow, 2007). Disharmony and political tension are often expected in incubation settings due to two main reasons: firstly, firms that are closely located and have similar business attributes can naturally clash (McAdam and Marlow, 2007). Secondly, the complex structure of incubators with multiple competing interests can cause changing goals, leading to conflicts (Evald and Bager, 2008). Therefore, it is crucial for incubators to foster a cooperative environment that minimises political disputes and self-centred behaviours.

Social network theory is an important paradigm of social structure research, however, in essence, current social network research often lacks depth, systematicness, and comprehensiveness, leaning heavily towards static analyses and specific types of networks (Li et al., 2021). Indeed, most studies focus on single hierarchy structures, with limited exploration of multi-level structures like micro, meso, and macro levels. Moreover, the majority of studies offer a static view of social networks, analysing their structure and characteristics at a particular point. Fewer delve into the dynamic evolution of these networks, even though dynamic research can reveal insights static studies might miss. Lastly, traditional social network analysis methods dominate the field, with fewer studies adopting a complex network perspective. Despite the rapid development of complex network theory, its in-depth study and application in various fields remain limited. There is still limited knowledge on which architectural designs enhance networking within incubators and which companies are more inclined to network and their reasons. It is evident that not all networking opportunities are beneficial, and clients' engagement in networking varies. To truly grasp the incubation process, we need to explore how and under what circumstances networking among client firms is encouraged.

2.4.4. Stakeholder view

Incubators, which support start-ups and emerging businesses, face challenges in balancing their operations between business-like practices and political influences due to their reliance on public funding (CSES, 2002). These entities must cater to a variety of stakeholders, each with distinct objectives. Key stakeholders, especially governmental funding partners, play a pivotal role in the survival of incubators. For incubators to thrive, they must attract top-tier start-ups and offer services that bolster these firms' growth (Pfeffer and Salancik, 1978). However, balancing the needs of various stakeholders, including the ideal and actual start-ups they support, is complex (Reynolds et al., 2006). While financial sustainability is a primary market goal, political motives might hinder incubators' realisation.

Existing studies on incubation predominantly centre on the 'process' aspect, delving into the intricacies of how incubation unfolds (as noted by Hackett and Dilts, 2004; Galbraith and McAdam, 2013). As a result, there has been a discussion on the challenges faced during incubation and potential solutions to enhance growth within this micro-environment, as pointed out by Ahmad and Ingle (2011), underscoring the need to shift the research lens towards incubation models at the meso level. In the realm of incubation, the meso level is characterised by a complex web of interactions between both internal and external stakeholders. This intricate network is aptly depicted in the stakeholder interpretation of the quadruple helix model, which also takes into account distinct organisational attributes such as culture, available resources, and skill sets. From this perspective, drawing upon Stakeholder theory, McAdam et al. (2016) have embarked on exploring the influence of the 'meso' environment on incubation models. Their efforts have significantly enriched our comprehension of how regional contexts can shape and influence these models. The study found that variances in incubation models between the two universities were influenced by both regional (macro environment) and organisational (meso environment) factors, such as the type of university, its inherent culture, research approach, and disciplines in determining the specific incubation model that is adopted.

Nevertheless, the current application of Stakeholder Theory in incubation tends to prioritise economic outcomes, often side-lining other forms of value creation that can benefit a broader range of stakeholders, including society at large. According to Alsos et al. (2011) incubator managers often balance stakeholder interests over extended periods rather than on individual decisions (Reynolds et al., 2006). When conflicts arise, managers might reinterpret stakeholder expectations, shift focus between stakeholders, or even abandon certain stakeholders, especially when funding is at risk (Pfeffer and Salancik, 1978). Stakeholder Theory, as applied in incubation, often lacks depth in terms of understanding the nuances of stakeholder relationships, their evolving needs, and the potential for joint value creation. By not focusing on continuous engagement and joint value creation, incubators may miss out on opportunities for collaboration, innovation, and leveraging stakeholder expertise.

2.4.5 Dyadic theory

The concept of "co-production dyad" in the context of business incubation is a transformative idea that redefines the traditional roles of incubators and entrepreneurs (Hackett and Dilts, 2004). Researchers such as Rice (2002) have delved into this paradigm shift, emphasising the symbiotic relationship between incubator managers (IMs) and incubator companies. At the heart of this approach is the idea that both the IM and the entrepreneur are active participants in the incubation process. It represents a departure from the conventional understanding where the incubator is seen as the primary provider of resources and the entrepreneur as a mere beneficiary. Dyadic theory, which focuses on the interactions between two entities, offers a lens to understand this co-production process. Previous research on incubation has focused on measuring the effectiveness of services delivered to client firms, neglecting the valuation of incubation by the clients themselves (Allen and McCluskey, 1990; Markley and McNamara, 1995; Sherman and Chappell, 1998; Colombo and Delmastro, 2002; Bhabra-Remedios and Cornelius, 2003; Wynarczyk and Raine, 2005; Lendner and Dowling, 2007). Other research (Auh et al., 2007; Bettencourt et al., 2002; Rice, 2002) shows that client contact staff and clients' interpersonal ties, communication skills, and knowledge all help co-production.

By tailoring this co-production based on the entrepreneur's readiness, IMs can amplify the overall benefits for their incubator companies (Ahmad, 2014). It is critical to pinpoint the elements that affect co-production such as client interaction, service provider employees, and clientele. Past research often overlooked this aspect, primarily focusing on evaluating the effectiveness of services provided by incubators or aligning incubator objectives with specific outcomes. Such evaluations often missed the incubation clients' perspective and their assessment of the incubation's value to their growth.

Rice's (2002) work shifted this focus, paving the way for more client-focused evaluations of incubators. Various factors within the IM-entrepreneur relationship determine the incubation's success dimensions, such as its quality, frequency, and overall results. Hence, it is crucial for researchers to identify conditions that foster effective dyadic relationships. Future studies should delve deeper into understanding the behaviours that activate this co-production dyad and examine how the incubation process evolves over time, influenced by dyadic norms and the structural attributes of incubators (Abeysekera, 2015). It could also focus on examining the factors that influence the effectiveness of dyadic relationships in co-production and exploring strategies to enhance collaboration between consumers and producers.

2.4.6 Real Options Theory

The real options theory, traditionally rooted in finance and investment, has been adapted by Hackett and Dilts (2004b, 2008) to provide a nuanced understanding of the incubation process. They propose

that the act of selecting an incubatee is akin to creating an option. Following this selection, the resources provided, and the ongoing support can be seen as exercising this option. Since the very nature of incubation is fraught with uncertainty, incubators often have to decide which start-ups to support without complete information about their future success. In such scenarios, the real options theory can provide a strategic framework for making these decisions. It allows incubators to evaluate start-ups not just based on their current value but their potential future value under various scenarios.

Originally, the real options approach was designed to assess technological assets, like R&D projects, which are often systematic and well-defined (Cave and Minty, 2004). However, when applied to entrepreneurial ventures, the process appears less structured than R&D investments (Grant and Perren, 2002). A critical point of contention arises when considering whether a start-up applying for incubation can genuinely be seen as a "real option" for an incubator. Hackett and Dilts' perspective implies that this "option" would allow the incubator to capitalise on future value increases. However, for this to be true, the incubator would need to have a financial stake in the start-up. This model doesn't fit not-for-profit incubators, often established by universities or governments. Moreover, the traditional assumptions of the real options theory, such as arbitrage-free markets and continuous interest rates (Black and Scholes, 1973), might not be directly applicable in this context and may require significant adjustments. Hackett and Dilts also equate successful incubation outcomes with successful option exercises. However, incubation success is multifaceted. Incubator programs have other goals which are weighed in equally important terms and that incubator evaluations account for other variables also. These include internal incubator network formation (Lichtenstein, 1992), incubator-industry network and incubator support services network density (Nowak and Grantham, 2000), IM and client relationships (Autio and Kloftsen, 1998), incubator effectiveness (Sherman and Chappell, 1998) and client selection process (Kuratko and LaFollette, 1987).

In essence, while the real options theory offers an intriguing lens to view the incubation process, its application has limitations. The theory's emphasis on rational selection based on set criteria might not be universally applicable given the diverse nature of incubators, start-ups, and the markets they operate in.

Ahmad's (2014) concerns are valid, it is essential to view the real options theory beyond its financial or investment dimensions. The theory has evolved and is now being used as a foundation for making strategic decisions in the realm of strategic management. For instance, when considering human assets, the real options theory can be instrumental (Bhattacharya and Wright, 2005). Given the inherent uncertainty associated with start-ups and their potential for growth, incubators can use this theory to select entrepreneurial teams. These teams, with their unique skills and potential, can be seen as "options" that might yield significant future benefits. This theoretical framework lays the groundwork for empirical research into the relationship between various human capital management risks and the availability of HR alternatives.

2.4.7 Mechanisms-driven theory

Ahmad (2014) delves into a new conceptualisation of business incubation based on mechanisms. According to Schwartz and Hornych (2008), mechanisms can be categorised into three types: cognitive, relational, and environmental (as per Hedström and Swedberg, 1998). The research particularly identifies two relational mechanisms: norms and ground rules, and triggers of incubation. This leads to a fresh theoretical approach to incubation rooted in social mechanisms theory. In this context, incubation is described as a sequence or set of social events initiated within an incubator organisation. Such sequence examines how a cause (X) can lead to an effect (Y) in the interactions between the incubator and its clients.

While this definition might seem to simply focus on the cause-effect relationship, it is more profound under the pragmatist-interpretive worldview. The hunt for mechanisms is essentially a quest for deep-rooted causes that operate in various combinations and sequences, leading to different outcomes. However, a challenge with this approach is the unpredictability of the incubation process. For instance, many clients mentioned that their journey into incubation often began with unplanned conversations or encounters, making it hard to pinpoint exact cause-effect relationships.

Yet, the mechanisms-based approach offers potential insights into understanding incubation. To advance research, one must determine the primary points of analysis when studying social mechanisms. As Gross (2009) suggests, people's reactions to situations are confined by their known behaviours and what they deem appropriate. Social mechanisms, then, can be seen as a combination of actors, situations, and habitual reactions, with the expectation of a new response emerging. Various methods can be employed to analyse the order in social processes (Abbott, 1983). These include nonparametric methods in multivariate analysis and the use of permutation statistics. Moreover, the Markov approach offers tractability and simplification in analysing sequences of events. It reduces the complexity of possible jurisdictional sequences to a transition matrix, allowing for extensive differentiation in the state space. Incorporating other attributes, such as the sex of practitioners, education, or percentage of solo practice, can provide a comprehensive analysis of social processes. This aligns with the prevailing multivariate orthodoxy. Lastly, sequences of social events can be examined using methods that reflect the complexity of the case. It can involve analysing sequences of fixed length or identifying patterns in the sequences The future research direction should aim to uncover the reasons behind the responses of parties in incubation to specific challenges, influenced by their cognitive habits and actions.

2.4.8. Institutional Theory

The institutional perspective assist in assessing the structure, practices, and coordination mechanisms of stakeholders in the incubation system, including government, industry, academia, and the community. Institutional theory, rooted in social structure, offers a framework to examine the design,

rules, and environment of Business Incubators (Jamil et al., 2015). Some see this institutional environment as a means of organisational control, influencing resource allocation and setting future directions. The theory emphasises control systems, their role in sustainability, and their societal behaviour. Originating from Selznick's research (1949), it suggests organisations evolve over time, blending technical systems with values. Powell and DiMaggio (1991), posits that institutionalisation is a specific social design, like an estate, and its success hinges on the institutional structure that exerts pressure on organisations.

In incubation research, the predominant use of institutional theory, as seen in works by Bruton and Ahlstrom (2003) and Gstraunthaler (2010), leans heavily on the concepts of new institutionalism from the 1970s and 1980s, as proposed by Meyer and Rowan (1977) and DiMaggio and Powell (1983). Despite increasing calls to integrate the evolved insights of institutional theory into incubation studies, as suggested by Hackett and Dilts (2004), researchers in the incubation field have not fully tapped into the theory's potential, as noted by Ahmad and Thornberry (2018). This leads to a recommendation for deeper institutional analysis in incubator studies, as proposed by Mrkajic (2017).

The current application of institutional theory in incubation highlights existing gaps in institutional analysis within incubator research. A literature review identifies two under-researched areas. Firstly, even though institutional theory has evolved significantly beyond neo institutionalism in recent decades, as pointed out by Hadler (2015), these newer theoretical advancements are seldom incorporated into incubation studies. A critical examination, like the one by Mian et al. (2021), shows a lag of 10 to 15 years in the adoption of new institutionalism concepts by incubation researchers. This trend of delayed application of institutional theory insights in incubation research seems to continue.

Secondly, there is a noticeable lack of focus on incubation processes, especially at the levels of the incubatee, incubation programs, entrepreneurial teams, and incubated firms, through the lens of institutional theory, as observed by Khokhawala and Iyer (2021). These two observations are interlinked. In incubation research, the application of institutional theory is often limited to the incubator's relationship with its external environment, neglecting micro-level organisational issues, as highlighted by McAdam et al. (2016) and Hausberg and Korreck (2020).

In conclusion, the recent advancements in institutional theory, which emphasise micro-level organisational analysis, could provide valuable insights into understanding the intricate dynamics of incubation at the micro level.

2.4.9. Absorptive Capacity

Incubation researchers, such as Hausberg and Korreck (2020), utilised absorptive capacity theory to elucidate the benefits incubators gain from their strong affiliations with sponsors, particularly in terms

of resources. Essentially, they study how an incubator's association with sponsors influence its ability to gather diverse resources. Accordingly, the true value of an incubator lies in offering start-ups a structured and supportive setting in their formative phases, aiding them in amassing the essential capabilities and resources for growth.

Modern literature is increasingly emphasising the significance of diverse support mechanisms provided by incubators for the resource and capability enhancement of nascent firms. This trend marks a fresh wave in incubation literature, moving beyond merely understanding the internal workings of incubation to exploring solutions that address growth optimisation challenges within the incubation micro-environment, as discussed by scholars like Ahmad and Ingle (2011) and McAdam et al. (2016). Breivik-Meyer et al. (2020), inspired by an organisational sponsorship framework, delved into the role of incubator support, termed as buffering and bridging mechanisms, in fostering capabilities and external resources in start-ups. They identified two buffering mechanisms within business incubation: sheltering and building. Recognising that the impact of incubator services on firm growth varies and hinges on how firms leverage these services, the study scrutinised firms' engagement with diverse incubator services and their subsequent influence on resource and capability accumulation. Data from 253 tenant firms in Norwegian business incubators indicated that both bridging (external network support) and sheltering mechanisms offered by incubator management play pivotal roles in aiding firms to secure external resources and hone capabilities.

While appreciating the recent scholarly endeavours in this realm, it is crucial to explore how these notions can bolster organisational resilience. The resilience concept has recently witnessed a resurgence in organisational studies, as seen in works by Clement and Rivera (2017), DesJardine et al. (2017), and others. It is increasingly viewed as a potent framework to elucidate how organisations can persevere and flourish in challenging conditions (Hillmann and Guenther, 2021). Thus, "enhancing incubator resilience" should become a staple in incubator management discourse. To pave the way for research focusing on the organisational resilience of incubators, future studies should delve into operationalising resilience, which entails crafting pertinent research questions and embracing theoretical breadth over narrowness.

2.4.10. Open Innovation

Open innovation promotes the idea of leveraging both external and internal innovations for business advancement. This paradigm shift from the traditional closed innovation model has profound implications for understanding business incubation.

Through the lens of open innovation, researchers like Weiblen and Chesbrough (2015) and Hausberg and Korreck (2020) have delved into the role of corporate incubators as tools for both outside-in and inside-out open innovation in corporate entrepreneurship. In simpler terms, corporate incubators not

only bring external innovations into the company (outside-in) but also promote the external use of unused internal innovations (inside-out). Hausberg and Korreck (2020), drawing from the open innovation perspective, emphasise the importance of developing and commercialising radical innovations. One traditional method to achieve this is the skunkworks model of innovation, as highlighted by Jenkins (2001). The skunkworks model, characterised by a small, isolated team working on advanced projects, can be seen as a precursor to modern corporate accelerators and company builders. It is essential to understand this lineage to truly appreciate what's novel about today's corporate accelerators in the realm of corporate venturing and entrepreneurship. Thus, this lens helps to understand particularly the modern corporate incubator with its focused absorptive capacity from the perspective of its corporate sponsor.

Although Mian et al. (2016) identified various theoretical perspectives to analyse incubators, the application of open innovation as a theoretical framework, as suggested by Weiblen and Chesbrough (2015), remains in its infancy. Open innovation might provide insights into the corporate incubator from the viewpoint of its corporate backer, and the concept of absorptive capacity (Cohen and Levinthal 1990) might elucidate the benefits incubators gain from their close association with corporate sponsors.

Yet, the research landscape still lacks depth in this area. The services provided by corporate incubators are well-documented, but there is scant information on what these incubators expect in return. There is a noticeable lack of critical comparative studies between corporate-backed and independent private incubators. It is important to consider how corporate incubators manage the interests of both the parent corporation and the start-ups they support. The significant power disparity between a well-established corporation and emerging start-ups has its implications. Corporate incubators might have distinct collaborative advantages over their private or public counterparts. Additionally, differences might exist in success indicators such as graduation rates, longevity, and revenue growth.

Furthermore, there is a pressing need for comprehensive multi-level quantitative studies (Hausberg and Korreck, 2020). While research has explored the factors and results of business incubation across various levels, including start-ups, incubators, and their broader ecosystems, the interplay and dynamics between these levels remain murky. This gap becomes even more pronounced when considering corporate incubators, as they introduce a dominant corporate entity into the incubation mix, adding another layer of complexity to an already intricate process.

2.4.11. Virtual Incubation

Zedtwitz (2003) describes virtual incubators as online platforms that do not operate within a physical space. Instead, they specialise in connecting entrepreneurs with investors and advisors. This model shifts the emphasis from traditional physical incubation processes to a "virtual value chain." These incubators excel in consolidating services, aiding start-ups with legal counsel, accounting, and

business plan consultation. Given their expansive online networks, they can also facilitate talent acquisition for start-ups more efficiently.

Lewis et al. (2011) further defines virtual incubators as entities that do not allocate physical spaces to start-ups, although they might still maintain a central office for coordination. While physical incubation environments, as highlighted by Bonacina Roldan et al. (2018), can significantly influence growth and performance due to community interactions, virtual incubators offer cost efficiency and flexibility. They are especially beneficial in regions where commuting is a challenge. However, Bonacina et al. (2018) also note that virtual incubators face hurdles in promoting networking, potentially leading to reduced knowledge exchange, collaborations, and funding opportunities.

Fadil, Persada, and Baihaqi (2019) present a comprehensive view of the virtual incubator, or E-incubator, highlighting its five core functions: digital stakeholder management, learning, coaching, investment, and auction. These digital services, supported by government and academic institutions, can significantly benefit small and medium-sized enterprises.

Luik, Ng, and Hook (2019) expand on Nowak and Grantham's framework, discussing virtual hubs that offer remote support to entrepreneurs, often mirroring the services of physical incubators. They emphasise the importance of online hackathons and community sharing spaces. However, Durão et al. (2005) and Shepard (2013) argue that virtual platforms should complement, not replace, traditional incubators. Aernoudt (2004) and Aaboen (2009) stress that the essence of an incubator is not its physical space but its business support, while Lai and Lin (2015) emphasise the importance of office facilities in incubation.

The rise of virtual incubators has ushered in new challenges, particularly in delivering consistent support to start-ups spanning diverse geographical regions. Concerns about their operational efficacy are mounting, given the varying levels of support they might offer to start-ups based in different locations. While these virtual platforms show promise in partnering with local incubators known for their strong community ties, future research should delve into devising and refining robust mechanisms that facilitate efficient information exchange and coordination.

With the relentless pace of technological advancements breaking down global barriers, it's imperative for future studies to assess the preparedness of virtual incubators in championing high-growth tech ventures on an international scale. In locales where entrepreneurial infrastructure is scant, these virtual entities often emerge as the linchpin for budding enterprises. Thus, a comprehensive investigation into the efficacy and broader impact of virtual incubators in such contexts is a pressing research priority.

2.4.12. Faultline Theory

Though Faultline theory is discussed in more detail in chapter 3 in regard to Entrepreneurial Teams, it is also important to touch upon the theory in regard to incubation. The theory originates from the study of diverse teams and refers to hypothetical dividing lines that may split a group into subgroups

based on one or more attributes (Meyer et al., 2015). These attributes can include age, education, functional background, tenure, and other demographic or functional characteristics (Harrison and Klein, 2007). When these attributes align and overlap, the potential for a Faultline to emerge increases. In the context of incubators, which are platforms designed to nurture and accelerate the growth of start-ups, Faultline theory can be applied to understand the dynamics within the start-up teams they house. Given that incubators often bring together diverse individuals with varying backgrounds, expertise, and visions, understanding faultlines is crucial.

In the context of incubators supporting academic spin-offs, the blending of roles between academics and industry practitioners can give rise to a Faultline (Ben-Hafaïedh et al., 2018). This identity-based Faultline is often more distinct than those stemming from demographic differences. It suggests that the primary source of division between, for instance, a 30-year-old male academic and a 40-year-old female entrepreneur isn't necessarily age or gender, but rather divergent core values (as pointed out by Lazarsfeld and Merton in 1954). Such differences in values can disrupt team dynamics, resulting in reduced team cohesion, increased interpersonal conflicts, mistrust, and a decline in task performance (Harrison and Klein, 2007). Hence, if one subgroup within the incubated start-up holds a majority of equity, this could amplify the existing Faultline, potentially influencing the start-up's trajectory and outcomes. A more in-depth analysis of elements that minimise cognitive differences (Knockaert et al., 2011) would be beneficial. Visintin and Pittino (2014) suggested that specific demographic aspects, such as the size of the team or diversity in the roles of academic members, might promote integration, thus reducing the effects of the Faultline. Hence, Faultline Theory offers a lens through which we can understand the dynamics of entrepreneurial teams. By being aware of potential faultlines and actively working to bridge them, entrepreneurial teams can harness the power of their diversity and drive incubator's success. Therefore, further research in this domain is encouraged.

2.5 Conclusion, Gap, And Future Direction

The domain of entrepreneurship literature has persistently endeavoured to comprehend the intricacies of incubation processes. This critical literature review revealed that historically, the emphasis predominantly revolved around the tangible outcomes and performance metrics of incubation, often side-lining the nuanced exploration of the underlying processes. This trajectory has culminated in a body of research that, while rich in descriptive accounts, frequently lacks the depth required for explanatory insights.

Indeed, the Market Failure Perspective perceives incubators as solutions to market inefficiencies, yet this view has been critiqued for its linear approach, which may overlook the dynamic nature of entrepreneurship. On the other hand, the Resource-Based View (RBV) emphasises the crucial role of resources, both tangible and intangible, that incubators provide to start-ups.

However, the RBV has been criticised for its potential tautological reasoning and its focus primarily on internal resources. The Social Network Theory highlights the essential role of networking for emerging ventures, but some have challenged its assumption that networking always leads to positive outcomes. The Stakeholder Theory, a dominant framework in incubation literature, focuses on the incubation process, but its emphasis on economic outcomes sometimes eclipses other forms of value creation. The Dyadic Theory underscores the mutual relationship between incubator managers and entrepreneurs, spotlighting their joint involvement in the incubation process. Borrowed from finance, the Real Options Theory likens the act of selecting an incubatee to creating a financial option, but its assumptions may not always align with the varied nature of incubators and start-ups. Introduced by Ahmad in 2014, the Mechanisms-driven Theory is rooted in the idea of mechanisms, viewing incubation as a series of interconnected social events. The Institutional Theory provides a framework to understand the practices and coordination mechanisms of stakeholders in the incubation ecosystem, but there has been a noticeable delay in incorporating its latest insights into incubation research. The Absorptive Capacity theory delves deep into the relationships between incubators and their sponsors, with a particular focus on resource dynamics. The Open Innovation framework advocates for the amalgamation of both external and internal innovations, making it especially relevant for corporate incubators. The Virtual Incubation perspective offers insights into online platforms that connect entrepreneurs with various stakeholders, representing a significant departure from traditional incubation approaches.

However, these theories often overlook the intricate dynamics within Entrepreneurial Teams (ET) that can arise from such amalgamations, especially in corporate incubators. Patzelt et al. (2021) have specifically argued that further research is required on how outsiders, mediators and incubating environments can play a role in creating an entrepreneurial team originating from a group. More specifically, they ask if it is possible for a group to become an entrepreneurial team that seeks to exploit an opportunity, which in time, becomes the basis for adding new members and what procedures will the founding group take to create the team if this occurs.

Faultline Theory therefore becomes particularly relevant when looking at Entrepreneurial Teams within incubators. It delves into the potential divisions within ETs based on overlapping attributes, such as professional backgrounds or tenure. Such divisions can significantly impact the collaborative spirit and overall success of innovation initiatives.

However, our critical analysis of the literature reveals significant gaps. Even within established frameworks like the Faultline Theory, there is a dearth of insights into how these faultlines manifest and influence Entrepreneurial Teams (ETs) in the realms of open innovation and corporate incubators. This gap is further widened when we consider the Virtual Incubation perspective. While it offers a glimpse into the world of online platforms connecting entrepreneurs with stakeholders, it often

overlooks the potential faultlines that can arise in these virtual environments, marking a significant shift from traditional incubation paradigms.

Numerous scholarly appeals have underscored the imperative to delve deeper into the intricacies of incubation, metaphorically urging the academic community to "open the black box" of this phenomenon (Guo et al., 2022). However, a meticulous review of the extant literature reveals a consistent oversight of three pivotal elements. First, incubation, inherently dynamic and non-linear, goes beyond the simple provision of resources or mentorship. It demands an in-depth comprehension of the multifaceted stages, the intricate transitions, and the feedback mechanisms that start-ups undergo within the incubator ecosystem. Concurrently, there is a pressing call within the academic community for theoretical frameworks that shed light on the foundational mechanisms that underlie incubation (Mvulirwenande and When, 2020). It is not enough to merely document what is observed; there is a profound need to uncover the causative forces driving these observations. Second, understanding the incubation process requires recognising its rich tapestry of both internal and external factors. Relying solely on a single theoretical perspective can be limiting, potentially hindering a holistic understanding of the incubation process. It is essential to recognise that the entrepreneurial team (ET) operates within a complex web of social processes. These processes, characterised by recurring forms of social interactions, dictate how individuals and groups, including ETs, engage and form bonds (Denzin, 2017). Such interactions span a spectrum, from cooperation and conflict to competition and accommodation. Maclver (1913) aptly describes a social process as the unique character that emerges in the relationships of group members, including those within an ET, when they collaborate. The dynamics and interactions within the ET, as a microcosm of these broader social processes, play a pivotal role in shaping the overall incubation experience and outcomes.

Despite the commendable advancements in incubation literature, a significant research gap remains glaringly evident. While numerous studies offer detailed descriptive accounts, they often fall short in providing the necessary explanatory depth. This oversight becomes particularly pronounced when we consider the entrepreneurial team (ET) within the incubation process. The neglect of the ET, with its intricate dynamics and social processes, stands out as a clear lacuna in the existing body of research. This study does not merely touch upon the ET but places it at the forefront of its investigation and examines the ET from an interpretive perspective, underscoring its role as a fluid social entity. By utilising a mechanism-focused theoretical approach, we aim to deeply understand the foundational dynamics and forces that shape the ET.

2.6 Chapter Summary

This chapter discusses the model-based technology incubation literature. Accordingly, a critical review of the model is provided by reviewing the definition of TBIs, the historical development of

the incubation industry, and its reflection on the emergence of four generations of incubation models. After that, it delves into the theories that researchers have adopted to answer questions about the model. Finally, the chapter discusses the research gap identified from the literature on the incubation model. In the next chapter (Chapter 3), the focus will be on the literature examining the entrepreneurial team, delving into the nature of an entrepreneurial team and its formation and evolution dynamics.

Chapter 3: Literature Review – The Entrepreneurial Team (ET)

3.1 Introduction

A detailed critical review of the entrepreneurial team literature is presented in this chapter. The structure is as follows. First, the emergence of entrepreneurial teams as a prominent concept in the entrepreneurship literature is outlined. Second, the entrepreneurial team is defined with an emphasis on the discussion of structures and boundaries. Third, entrepreneurial teams in NTBFs are discussed, with a focus on what makes these teams different when compared to entrepreneurial teams more generally. Fourth, the ET formation and its characteristics are scrutinised. Fifth, the subsequent social processes of entrepreneurial team are reviewed. Lastly, the theoretical lenses used in the literature on entrepreneurial teams is discussed, with a focus on Faultline Theory.

3.2 The Initial Emergence of ET as a Concept in the Entrepreneurship Literature

In 1975, Timmons posited a critical inquiry regarding the entrepreneur: was it emblematic of the American dream or rather a manifestation of a nightmare? This contemplation catalysed a burgeoning interest in the entrepreneurial team within the scholarly domain of entrepreneurship, an interest that has remained salient up to contemporary times. Prior to this pivotal moment, the prevailing discourse in entrepreneurship predominantly cantered on the archetype of the singular, heroic entrepreneur (Amit et al., 1990; Birley, 1985). Consequently, academic luminaries began to pivot towards the conceptualisation of the entrepreneurial team, challenging the erstwhile paradigm that confined entrepreneurial valour to individuals (Reich, 1987). This paradigmatic shift towards a collective, team-centric perspective is often heralded by scholars as indicative of the theoretical evolution and maturation of entrepreneurship research (Forbes et al., 2006). This maturation is further underscored by the nuanced exploration within the entrepreneurship literature, which has progressively delved into the inception and governance of nascent enterprises across diverse analytical strata (Aldrich, 1999; Van de Ven, 1993).

Notwithstanding the proliferation of the team paradigm and the collective endeavour (teamwork) as a pivotal construct linked to success and expansion (Etzkowitz, 2003), scholarly literature underscores the imperative of harmonising the dual notions of the singular lead entrepreneur and the collective team (Sine et al., 2006). Such discourse posits that irrespective of the efficacy of team formation endeavours, it remains quintessential for such a team to encompass a principal entrepreneur, one endowed with the capacity for perpetual motivation, innovation, and judicious decision-making, especially concerning resource allocation and managerial oversight (Shaver and Scott, 1992; Ben-Hafaïedh, 2017). In essence, the potency of a team is not merely predicated on the amalgamation of individuals but hinges on the inclusion of at least one visionary lead entrepreneur (Timmons, 1994; Ensley et al., 2000; de Mol et al., 2015).

Empirical investigations have elucidated that the significance of teams in the enterprise genesis process is anchored in the team's possession of a compendium of synergistic resources, derivatives of the collective contributions of its members (Klotz et al., 2014). These resources encompass emotional, cognitive, financial, and experiential assets (Grant and Jones, 1993). Academics have accentuated the merits of propelling nascent enterprises by harnessing and amalgamating the diverse competencies of team members (Vesper, 1990; Kamm and Aldrich, 1991), whilst concurrently augmenting the repertoire of skills and expertise to counterbalance individual deficits (Kamm and Nurick, 1993). Consequently, empirical findings suggest that teams, in general, exhibit superior performance compared to individuals, especially in the genesis of seminal innovations, such as technological patents or academic publications (Kollmann et al., 2017). However, contemporary research has unveiled a pivotal determinant in ascertaining whether team outputs surpass those of solitary inventors: the architectural intricacy of the invention, specifically, its modularity. An overarching assumption that consistently promotes the value of teams could unintentionally hinder innovation initiatives within technologically advanced enterprises. It is essential to recognise that individual inventors, particularly those deeply engaged in extensive collaborative networks, should be regarded as indispensable contributors to comprehensive and unified innovation efforts.

3.2.1 Defining the Entrepreneurial Team (ET) Concept and Boundaries

In the context of emerging enterprises, the terminology used to describe the team’s leading these ventures varies and includes designations like founding teams, entrepreneurial teams, or start-up teams (Klotz et al., 2014). However, it is worth noting that the concept of an entrepreneurial team (ET) lacks a comprehensive and universally accepted definition (Stockley and Birley, 2000). Different scholars offer distinct interpretations: some define entrepreneurial teams as comprising two or more individuals involved in jointly establishing a firm with a financial stake (Kamm et al., 1990; Cooney, 2005), while others emphasise the team members' contributions to decision-making processes (Gartner et al., 1988; Klotz et al., 2014), their influence on the new firm's strategic direction (Ensley et al., 1998), or their formal roles within the team (Eisenhardt and Schoonhoven, 1990).

The confusion surrounding the entrepreneurial team concept is further compounded by its overlap with the notion of a top management team (TMT) in larger organisations (Yusubova et al., 2019). Both TMT and ET are often defined using the concept of a group, defined as "two or more individuals, interacting and interdependent, who have come together to achieve particular objectives" (Robbins and Judge, 2008, p. 123). Consequently, TMT is described as a group of individuals with managerial responsibilities (Hambrick et al., 2015), while ET is delineated as "two or more individuals who have a significant financial interest and participate actively in the development of the enterprise" (Cooney, 2005, p. 229). Nevertheless, it is suggested that entrepreneurial teams face greater uncertainty and personal risk compared to general organisational teams (Chan, 2009) and

may exhibit more streamlined organisational structures and greater homogeneity than teams in larger organisations (Chan, 2009).

Scholars argue that defining ET is critical in addressing issues related to its formation and development (Schjoedt and Kraus, 2009; Lazar et al., 2020; Yusubova et al., 2020). To provide clarity and establish a common foundation for research on entrepreneurial teams, this study adopts Cooney's (2005) definition. Importantly, Cooney (2005) acknowledges that the 'development of the enterprise' encompasses the dynamic nature of entrepreneurial teams, where members can enter or exit the team throughout the firm's development process. Accordingly, entrepreneurial teams are viewed as adaptable entities with an evolutionary nature in the methods of member recruitment and departure.

3.2.2 The Entrepreneurial Team of New Technology Firms (NTBFs)

Technology entrepreneurship (TE) has received increasing interest in the academic literature (Grichnik and Harms, 2007; Beyhan, 2014; Ferreira et al., 2015). TE can be defined as ‘recognising, creating and exploiting opportunities, and assembling resources around a technological solution, irrespective of the organisational context’ (Ratinho, et al., 2015). The field's primary distinction from general entrepreneurship is its emphasis on technical potential, which need for both strong management and technological skills (Prahalad and Hamel, 1990; Walsh and Linton, 2011). In particular, tech-based entrepreneurs grapple with heightened uncertainty related to technology, encounter more substantial financial needs, possess a broader range of essential skills, and must take into account particular industry frameworks in their ventures (Harms and Walsh, 2015). These distinct hurdles in the realm of technology entrepreneurship outline its unique domain as a business management discipline, characterised by its institutional and functional distinctions.

In the realm of technology entrepreneurship, decision-making processes are primarily characterised by collaborative efforts rather than individual choices (Bailetti, 2012). These activities necessitate the involvement of specialised human resources equipped with the skills and capabilities to collectively explore and harness scientific and technological advancements for the purpose of seising collaborative opportunities (Debackere and Veugelers, 2005). Yet, TE not only revolves around recognising technology or market opportunities but also actively investing in and executing the firm's projects (Bailetti, 2012). Therefore, in contrast to the conventional notion of technology entrepreneurship being cantered around an individual and their inventions (Bailetti, 2012), it should be viewed as a collaborative endeavour where responsibilities and roles are shared among team members working cooperatively and collaboratively towards shared objectives (Lindenberg and Foss, 2011). In technology-based start-ups, the primary challenge lies in harmonising technological expertise with market orientation, setting technology entrepreneurial teams apart (Ben-Hafaïedh et al., 2018).

It is worth noting that entrepreneurial teams are responsible for founding a significant majority of firms in the high-tech industry (Cooper et al., 1990). Consequently, research avenues have emerged within the domain of technology entrepreneurship (Chowdhury, 2005; Chen, 2007) with a specific focus on issues pertaining to teams. However, these endeavours have been described as somewhat limited in scope (Lazar et al., 2020). Many of these studies have delved into team processes and their effectiveness but have not placed particular emphasis on the diversity of team composition and its impact (de Mol et al., 2015; Jin et al., 2017), nor have they thoroughly explored the dynamics of team formation and evolution throughout the developmental journey (Yusubova et al., 2020).

While research on ET and TE and evolution dynamics exists (Chen et al., 2017), it has often been fragmented and lacks comprehensive investigation into their structural changes over time (Yusubova et al., 2020). Numerous writers have emphasised that studies of entrepreneurial teams have to include individuals who are not in top management positions within the company, rather than only top managers (e.g., Klaas et al. 2010). Studies suggest that the historical focus on the entrepreneurial/CEO, which was expanded to include top management teams more recently, does not yet fully capture the richness and potential of venture teams by highlighting the critical role that non-top managers play in the development of technology ventures.

Additionally, contexts such as business incubators, which may significantly influence these teams during their formation and evolution, have been addressed in a limited manner (Clarysse and Moray 2004; Ben-Hafaïedh, 2017). Effectively monitoring these dynamics over extended periods necessitates longitudinal research, as implicit in the nature of entrepreneurial team formation and evolution is the dimension of time (Rosa, 1998; Clarysse and Moray, 2004; Vanaelst et al., 2006; Mosey and Wright, 2007).

One criticism often levelled at the entrepreneurial team literature is its fragmentation (Patzelt et al., 2021). Empirical research, up to this point, has not comprehensively addressed the entirety of the entrepreneurial team's journey from its formation to subsequent evolution dynamics, considering them as interconnected components of a continuous and interdependent process (Patzelt et al., 2021). As noted by Lazar et al. (2020, p. 30), there exists a dearth of systematic synthesis regarding the pertinent questions surrounding the formation and subsequent evolution dynamics of entrepreneurial teams, notably for technology-based firms, leaving a gap in our understanding. The ensuing sections delve into the literature concerning the formation and evolution dynamics of entrepreneurial teams.

3.3 Formation of Entrepreneurial Teams (ET)

The ET starts when the members meet to form a team, which is called the initial formation (See Figure 3.1)— members' joining at the ideation stage, during concept proposal and idea screening, product development, prototype proposal and before launching products to market is known as the team initial formation and initial/new creation of the team. Thus, members' joining after that in the

later stages is considered a dynamic of the later formation's process, which belongs to the change of membership dynamic (Forbes et al., 2006).

3.3.1 The Origins of New Entrepreneurial Teams

Understanding entrepreneurial team formation is fundamental as it is often a defining factor for the success of a company (Dridi, 2010). But what are the driving factors behind the creation of entrepreneurial teams? Regarding firms initially based on the ideas of an individual entrepreneur, research suggests that the process of entrepreneurial team formation is initiated by the individual to maximise efficiency and facilitate practical implementation by seeking team members who share their vision and contribute to the creative process with their own set of expertise (Gartner, 1988; Kamm et al., 1990; Sarasvathy, 2001). In cases where the team is established before a specific business idea, academic literature identifies two primary pathways. Often group forms for the straightforward reason that they want to collaborate with each other, and this shared desire leads to the birth of a new business. But often, new firms are established by pre-formed teams that have already previously worked together on research or innovation projects (Agarwal et al., 2016; Discua Cruz et al., 2013). In these cases, the process of entrepreneurial team formation typically involves three stages: identifying an opportunity, developing a business idea, and marketing scientific discoveries (Vohora et al., 2004). It is important to note that this process of entrepreneurial team formation is often initiated by individuals leaving existing companies to embark on new projects, challenging the notion that pre-formed teams working on innovation projects always stick together (Lazar et al., 2020).

In addition, Lazar et al. (2020) asserts that the contexts within which ETs originate have distinctive features that shape the formation process. They suggest three distinct contextual factors: the setting, social networks, and sociocultural environment within which founders are embedded before or during team formation. The first contextual factor (settings) captures the different settings associated with academic entrepreneurship, employee entrepreneurship, user entrepreneurship, family businesses, and incubation programs. In academic entrepreneurship, team members frequently come together to work collectively on research-based innovations in universities and laboratories (Vanaelst et al., 2006). Subsequently, this team focuses on turning these innovations into goods and services for the marketplace (Lockett et al., 2003).

3.3.2 Strategies of Adding New Members

Selecting the right team members is a crucial aspect of entrepreneurial team formation, and three primary strategies are commonly employed. The first is the Interpersonal-Attraction Strategy, where members are often chosen based on shared interests, admirable qualities, and a mutual liking for one another (de Mol et al., 2015). This principle aligns with the idea that "birds of a feather flock

together," with co-founding relationships stemming from a desire to collaborate with like-minded individuals. Founders typically begin their search in close networks, such as family and friends, to ensure compatibility and trust (Francis and Sandberg, 2000; Discua Cruz et al., 2013). The second is the Resource-Seeking Strategy, where entrepreneurs select team members based on the resources required for establishing a new firm. This strategy focuses on the complementary fit, emphasising members' human capital, including their knowledge, skills, and access to valuable resources (Davidsson and Honig, 2003; Mosey and Wright, 2007; Agarwal and Shah, 2014). Last but not least is the hybrid strategy, which combines both interpersonal attraction and resource-seeking strategies to find members who not only share similar interests but also possess the necessary resources and capabilities (Forbes et al., 2006; Grossman et al., 2012; Shah et al., 2019). These strategies encompass various approaches to team member selection and cater to different entrepreneurial contexts, emphasising the importance of a well-considered choice when building entrepreneurial teams.

Concept and Key Question(s)	Definition	Exemplary Articles
Origin: Why do entrepreneurial teams form?		
Lead entrepreneur	A sole founder initiates an idea for a new venture, and then searches for cofounders to actualise this opportunity (the idea precedes the group)	Grossman et al. (2012), Kamm and Nurick (1993), Kamm et al. (1990), Shah et al. (2019), Timmons (1975)
Group approach	A group of founders decide to start a new business together, and then collectively generate the idea for the new venture (the group precedes the idea)	Kamm et al. (1990), Kamm and Nurick (1993), Timmons (1975), Vohora et al. (2004)
Formation strategy: How do cofounders select each other?		
Interest/attraction	Cofounding relations are based on close relationships, similarity, and interpersonal fit	Discua Cruz et al. (2013), Francis and Sandberg (2000)
Resource seeking	Cofounding relations are based on instrumental and functional criteria, such as complementary knowledge and skills	Davidsson and Honig (2003), Mosey and Wright (2007)
Hybrid strategy	Cofounding relations stem from attention to both similarity and complementarities	Forbes et al. (2006), Grossman et al. (2012), Shah et al. (2019)
Context: Where are founding teams embedded?		
Academic entrepreneurship	Founders are initially embedded in university or laboratory setting (e.g., university-based or academic spin-offs)	Agarwal and Shah (2014), Vanaelst et al. (2006), Vohora et al. (2004)
Employee entrepreneurship	Founders are initially embedded in an industry (e.g., industry spinouts)	Agarwal and Shah (2014), Iacobucci and Rosa (2010), Rosa (1998), Shah et al. (2019)
User entrepreneurship	Founders actualise a solution for their own need	Agarwal and Shah (2014)
Family businesses	Founders are embedded in family-relations and kinship ties	Discua Cruz et al. (2013), Schojedt et al. (2013)
Accelerators	Founders are embedded in pre-seed and seed accelerators	Lundqvist (2014)
Social network: Where do founders look for potential cofounders?		
Small world	Local clusters in which founders have higher chances to cofound with others within their cluster	Aldrich and Kim (2007), Francis and Sandberg (2000), Zhang (2010)
Truncated scale free	Distributed network in which founders have higher chances to cofound with others on a	Aldrich and Kim (2007), Franklin, et al. (2001)

	preferential basis (i.e., the rich get richer)	
Cultural values	The set of norms, meaning systems, and core principles which influence one's tendency to join or cofound a new venture	Frese and Gielnik (2014), Hayton et al. (2002)
Dynamism of the team formation process: When (and why) are there changes in membership of the incipient founding team		
Critical milestone	Membership changes occur around important landmarks during the pre-start-up phase or before the shift from the pre-start-up to start-up phase (e.g., capital raising and moving between developmental stages)	Vanaelst et al. (2006), Vohora et al. (2004)
Crises/failure	Membership changes occur when the founding team faces an unforeseen obstacle (e.g., failing to provide a demo)	Bird (1992), Clarysse and Moray (2004)
Internal recognised need	A demand acknowledged by the team (i.e., lack of workforce)	Discua Cruz et al. (2013), Matlay and Westhead (2005)
External recognised need/ requirement	A demand acknowledged by external stakeholders (e.g., VCs, TTOs, and potential customers) or agents (e.g., mentors)	Bjornati and Gulbrandsen (2010), Clarysse and Moray (2004), Vohora et al. (2004)

Figure 3.1: The ET's Formation Processes and Subsequent Phases of Evolution

(Source: Lazar et al., 2020, p.34)

3.3.3. Changes in Membership

Entrepreneurial Teams are constantly evolving, adding and losing new members throughout various stages of development. The search for potential members is a constant, ongoing process, as they do not all join the team simultaneously during the initial period of team formation, but also at later phases including after the first launch and selling products (Clarysse and Moray, 2004; Mosey and Wright, 2007; Lazar et al., 2020).

The ET literature has two general explanations for the selection of new members. One perspective is that the selection of members is a rational process driven by economic and instrumental considerations, while the other perspective is that interpersonal attraction and social networks drive the selection of members (Klotz et al., 2014). According to the first explanation, new members are added in response to a search process set in motion by the team's desire to fill precise resource needs (Lazar et al., 2020). Thus, founders assemble ETs to "fill the gaps" in their competencies and skills (Sandberg, 1992). As such, this provides the necessary human capital to pursue the goals and strategies of the new firm (Ucbasaran et al., 2003). Kamm and Nurick discuss how members are identified and selected, arguing that the decision to add a member begets a series of follow-on decisions: "...a constellation of decisions follows: where to find partners; how to choose the best one(s); and how to convince them to participate" (1993, p. 21). Likewise, Larson and Starr (1993) depict the choice as motivated by resource acquisition.

The second explanation for new member addition is rooted in the social and psychological needs of existing team members (Bird, 1989). Sapienza et al. suggest: "Whom [the existing team founders] want to add," in their view, "is in part driven by a desire to duplicate their qualities and in part by a desire to perpetuate the type of business or atmosphere which already exists" (1991, p. 265). This explanation asserts the crucial role those personal relationships play in the process by which teams search for new members and that the selection of new members' proceeds following strategic criteria (Larson and Starr, 1993). Likewise, it is posited as an intentional, rational process; they also acknowledge that "ready access" and "chemistry" play a part in new members' identification and selection (Kamm and Nurick, 1993). The cost and convenience of the search also play a part in the process, since social networks provide inexpensive and trusted sources of information about available resources (Carland et al., 1999). According to Forbes et al. "In short, even when teams engage in a rational, conscious decision to add members with skills and knowledge defined as necessary for firm success, the search set may be affected by relationships, networks, and features of the individuals that make them similar to the existing team" (2006, p. 226).

But not only additions to teams play a key role in the development of ETs. Departures are also an important, often understudied, factor in entrepreneurial success (Gregori and Parastuty, 2021). Studies suggest that there are two main reasons for the departure of members from an entrepreneurial team. First, those that relate to personal reasons of the members, such as better prospects, opportunities, or offers elsewhere, such as study, training, or a job (Loane et al., 2014). Second, those that relate to the interaction of members with each other and the outbreak of affective conflict resulting from relationships and personality clashes. Interpersonal incompatibility and disagreements over personal issues often cause relationship conflict (de Wit et al., 2013). When there is a high level of relationship conflict, the quality of, and opportunities for, social exchange are undermined, so team cohesion is negatively affected (Chen et al., 2017). Consequently, the team members experience alienation, anger, and conflicts that, in turn, can result in the departure of one or more members (Ensley et al., 2002; Chandler et al., 2005).

Within this literature on member exit from ETs a stream has emerged that focuses on exit routes (Gregori and Parastuty, 2021). It is suggested that member exits may be hostile or amicable, indicating a strong emotional component in the interaction of team members regarding the moment of the exit decision (Gregori and Parastuty, 2021). Amicable team exits occur in situations where the future of the firm is at the forefront of the decision, while hostile exits arise in times of team conflict (Loane et al., 2014).

The existing literature on entrepreneurial team dynamics provides valuable insights into the composition, functioning, and performance of entrepreneurial teams. However, it can be observed that this literature has, to some extent, remained stagnant, with limited exploration of critical aspects of the early stages of team formation and the immediate challenges and questions that individuals within these teams grapple with.

One noticeable gap in the literature is the relative absence of in-depth investigation into the first moments after individuals decide to come together and form an entrepreneurial team. While the formation of the team is a pivotal moment, it seems that this critical phase is underrepresented in the current body of knowledge. The initial stage of team formation is laden with high uncertainty. During this time, individuals may confront various questions and uncertainties, such as who will emerge as the leader, who will hold authority, and how control will be established within the team. Additionally, questions about each member's role, contribution, and fit within the team surface. However, these crucial questions and the dynamics surrounding them are not adequately explored in existing literature.

Henry Ford's famous quote, "Coming together is a beginning. Keeping together is progress. Working together is success," encapsulates the essence of the entrepreneurial team journey. Yet, do individuals actively seek to address these fundamental questions before committing to forming a team that will

embark on this journey together? Do they consider whether they share common tastes, preferences, likings, and attitudes that can enable them to work cohesively toward a shared goal? These aspects of team formation remain relatively uncharted territory in the current literature.

Moreover, an unexplored dimension relates to the influence of external parties during the initial formation of entrepreneurial teams. This is a critical area that merits attention, as external stakeholders can play a significant role in shaping the early stages of an entrepreneurial team.

Therefore, it is imperative for future studies to focus on observing and analysing the last moments leading to the decision to form an entrepreneurial team and the immediate moments following the formation. These pivotal moments carry substantial weight and can significantly impact the success and sustainability of the team. This thesis aims to delve deeper into the nuanced interactions, negotiations, and decisions that take place during this phase.

3.4 Social Interaction Processes within Entrepreneurial Teams

The entrepreneurial team, as a dynamic and social entity, engages in a multifaceted process that is crucial for the success of entrepreneurial endeavours. Interactions within these teams play a pivotal role in shaping the team's dynamics, decision-making, and ultimately, the outcomes of their entrepreneurial ventures. To understand the evolution of ETs in the incubation period it is therefore vital to understand the social interaction processes and issues within the teams. This literature identifies three main social interaction processes that most influence the formation and development of entrepreneurial teams: the initial allocation and professionalisation of roles; leadership transitions; and conflict in teams. In addition, it also identifies three major characteristics that define social processes within ETs: composition, team processes and emergent states.

Team characteristics: What are the consequences of team formation for the collective features and structure of the newly founded team?		
Diversity	Differences between founders (e.g., personal, demographic, and functional diversity)	Aldrich and Kim (2007), Parker (2009), Ruef et al. (2003)
Leadership	Power and social influence of founders in the newly founded team (e.g., single vs. shared leadership)	Ensley et al. (2000)
Equity distribution	Founder equity allocation in the newly formed team (e.g., equal vs. unequal equity distribution)	Hellmann and Thiele (2015), Hellmann and Wasserman (2017)
Structure/boundaries	Composition and external agents of the newly formed team (e.g., core vs. peripheral members; multiple-tier structure; external agents)	Discua Cruz et al. (2013), Iacobucci and Rosa (2010), Matlay and Westhead (2005)

Team processes: What are the consequences of team foundation for the dynamics and emergent states of the newly founded team?		
Coordination-related processes	Dynamics/emergent states facilitating smooth communication (e.g., shared perspectives, emotion-based trust, and coordination)	Forbes et al. (2006), Francis and Sandberg (2000), Grossman et al. (2012)
Specialisation-related processes	Dynamics/emergent states facilitating knowledge utilisation (e.g., cognition-based trust, absorptive capacity, and specialisation)	Clarysse and Moray (2004), Harper (2008), Shah et al. (2019), Vohora et al. (2004)

Figure 3.2: The ET's Processes

(Source: Lazar et al., 2020, p.35)

3.4.1 Role Allocation and Professionalisation

As early as the 1960s, McGrath (1964) noted that one common approach in the context of the entrepreneurial team is the perspective of different informal team roles exhibited by the team members during early stages of team formation. At the starting phase of any start-up entrepreneurial teams' roles, tasks and responsibilities are highly flexible, loose and lacking in clarity (Ben-Hafaïedh, 2017). This is because the team members depend on their skills, motivations and personalities, taking on different roles simultaneously and across various business areas (de Mol et al., 2015). Team members frequently assume leadership roles across a wide range of business areas, depending on the team members' skills, motivations and personalities (Chandler et al., 2005). Entrepreneurial teams in new ventures therefore often lack clear roles or titles which can often lead to friction or discussion within teams.

Prior research shows that the formation dynamics involving the addition or departure of team members has a critical impact on the teams' interaction processes (Polanyi, 1967; Cardon et al., 2015).

The most prominent features of this process are role distribution, with assignments entailing obvious functions, tasks, and responsibilities (Salas et al., 2000; Chandler et al., 2005).

Previous studies argue that, during an incorporation or growth phase, a firm becomes more formal and stable, which requires its team to establish clear structures, work together in a more structured way, and develop more elaborate plans (Doz and Kosonen, 2010). In particular, the entrepreneurial team may find itself confronted with feelings of urgency about tasks that need to be completed and that lead the business to its next stage, such as hiring employees, entering a new market, or entering the next investment round. During this phase, entrepreneurial teams need to 'grow up' and introduce a certain level of professionalism; that is, "clear internal structures, processes, and routines for both day-to-day business as well as unforeseen events" (Preller et al., 2020, p. 19). This professionalism also involves a certain level of planning, which becomes more feasible when uncertainty decreases (Patzelt et al., 2021).

In the literature on the entrepreneurial team, 'legal incorporation' is a key milestone in entrepreneurial team formation. It is accompanied by formalising roles in the management team and/or creating a formal board of directors (Vanaelst et al., 2006; Nikiforou et al., 2018). External legitimacy milestones/markers relate to both financing and customer acquisition. Moreover, raising capital, and seed funding are milestones within the formation process that engender member entry or exit or mark the end of the formation phase (Vanaelst et al., 2006; Rasmussen et al., 2011).

3.4.2 Leadership Transition

Another vital social process within ETs that is closely related to the allocation of roles, is the selection of a leader. Research into power in entrepreneurial firms suggests that when power shifts to the 'best-suited' leaders within a team, team performance is improved (Finkelstein, 1992; Smith et al., 2006). Clarysse and Moray (2004) argue that leadership transition among members results from the team's experiential learning, as maturity is essential in leadership. They also point out that conventional wisdom and the literature on small businesses suggests that new businesses rapidly outgrow the capabilities of the entrepreneurial team and of managers and therefore new ventures require new management as they grow.

Research has also found that it often takes time for entrepreneurial teams to realise that their current leader lacks the correct leadership skills. Matthews (1996) adds that the reason for leadership transitions is the growth process experienced by the team and firm or changes in the environment. It is asserted that the most successful firms require a change in leadership as they outgrow the skills and competencies of their previous leaders. Zaech and Baldegger (2017) suggest leadership may be exchanged in the entrepreneurial team to ultimately settle on the leader who can motivate the followers and inspire them to perform beyond their perceived capabilities.

It is important to note that a leadership transition can be more complex than just a switch from one leader to another. Entrepreneurial teams might also decide to transition from a shared leadership to a hierarchical leadership style or vice versa. Research has focused on conditions that enable shared leadership, for example, to achieve better performance (Zhou et al., 2015); and on the role of the composition of the team in understanding how shared leadership in an entrepreneurial team is associated with better performance (Zhou, 2016). According to Lyndon and Pandey (2019) three factors are associated with the adoption of a shared leadership style: first, the entire team's involvement; second, the desire to achieve integration and satisfaction levels by recognising the participatory nature of each member's contribution; third, creating spaces to encourage cooperation during shared activities during the expansion phase. Hence, an important question is what leadership functions are shared by members of an entrepreneurial team. Four functions of leadership may be shared: (i) executing the team task, (ii) monitoring and managing work processes, (iii) designing the team and its context, and (iv) setting overall direction for the team (Zaccaro et al., 2001). Another suggestion is that leadership sharing might be around three functions, including vision, building culture, and managing stress (Leithwood and Riehl, 2004).

Hierarchical leadership is frequently adopted by teams in response to the institutional pressures associated with raising capital. Investor involvement can be an external pressure in a new venture for a restructure of the business and the management (Clarysse and Moray, 2004). In order to grow, the new firm may have to attract additional financial resources through several rounds of venture capital. This may have implications for the entrepreneurial team, where the different roles performed by the team members are analysed by the external investors. Additionally, the process of raising finance frequently is associated with the use of more formal terms to indicate the roles performed within the team (Vanaelst et al., 2006). Patzelt et al. (2021) asserts that, during the firm development phase, entrepreneurial teams need to determine their internal structure and decide how much power to assign to certain roles, including the CEO. These decisions have important implications for an entrepreneurial team, such as how future decisions will be made and how the team is represented to external stakeholders.

3.4.3 Conflict in ET

Research on the entrepreneurial team's interpersonal processes mainly focuses on conflict and related consequences (Breugst and Preller, 2020). Conflict in the entrepreneurial team is an inevitable social process that results from composition, diversity, perceived incompatibility, heterogeneity, or epistemic differences between members (Chen, 2006). A distinction is made between two types of conflict within the entrepreneurial team. The first is the cognitive conflict about tasks, called task-based or task conflict. The second is affective conflict, which results from the conflict of relationships and emotions (Ben-Hafaïedh, 2017).

Task-based conflict (or cognitive conflict) centres on disagreements related to task content, solutions, and underlying assumptions (Chen, 2006; de Wit et al., 2012; De Dreu and Weingart, 2003). Interestingly, such conflicts can be beneficial, encouraging strategic decisions and boosting performance (Amason and Sapienza,1997; Ensley et al., 2002; Vanaelst et al., 2006). Affective conflict is rooted in emotional and relational differences. Demographic diversity in teams can ignite such conflicts, leading to reduced team morale, effectiveness, and even members leaving the team (Eisenhardt et al., 1997; Pelled et al., 1999; Jehn, 1995; Vanaelst et al., 2006). Such conflicts often arise from unconscious biases and categorisations based on demographic characteristics, which foster stereotypes and lead to hostile intergroup dynamics (Tajfel, 1982; Eisenhardt, 2013). The resulting negative emotions compromise team effectiveness by fostering anxiety, lack of cooperation, and poor communication (Jehn and Bezrukova, 2010).

Ensley and Pearce (2001) examined the relationship between conflict within entrepreneurial teams and firm performance and demonstrated why it is important to distinguish between these two types of conflict. Their results indicated that task-based conflict positively correlates with profit, sales and growth in new firms. Affective conflict, on the other hand, was inversely related to all three firm outcomes. Similarly, Ensley et al. (2002) provided further evidence of a strong negative relationship between affective conflict in entrepreneurial teams and firm performance. These findings are echoed by Higashide and Birley (2002), who further found that conflict around team goals was an indicator of strengthened firm performance. Finally, Vanaelst et al. (2006) found that affective conflict predicted member exits from the entrepreneurial team, while cognitive conflict facilitated strategic decision-making, thereby enhancing firm performance (Klotz et al., 2014).

3.4.4 Entrepreneurial Team Characteristics (Composition)

As previously mentioned, one of the main determinants of how social interaction plays out within entrepreneurial teams is the team's composition, especially in regard to conflict with ETs. Team composition, particularly concerning diversity, encompasses both demographic-personal and functional-informational dimensions. Demographic-personal diversity is identified via surface attributes such as age, tenure, gender, and race, as well as deeper-level aspects, including personality traits and values (Discua Cruz et al., 2013; Francis and Sandberg, 2000; Ruef et al., 2003; Shah et al., 2019). Functional-informational diversity, on the other hand, is gauged through founders' educational backgrounds, professional experiences, and prior expertise (Davidsson and Honig, 2003; Shah et al., 2019; Ucbasaran, Lockett, Wright, and Westhead, 2003).

Additionally, research on team composition has delved into the allocation of equity within founding teams, particularly the question of whether equity is evenly or unevenly distributed among co-founders (Hellmann and Thiele, 2015; Hellmann and Wasserman, 2017). This distribution is often linked to the leadership structure, which refers to whether leadership responsibilities, including the

vision, goals, and strategy of the new venture, are concentrated in a single founder or shared among multiple founders (Ensley, Carland, and Carland, 2000; Ensley et al., 1999; Jaskiewicz, Combs, Shanine, and Kacmar, 2017; Rasmussen, 2011).

Founding teams often exhibit structural boundaries, distinguishing between core members with enduring commitment and peripheral members who contribute sporadically. Such distinctions apply to various contexts and may align with equity distribution or involve "sleeping partners" offering minimal involvement (Lloyd, 1986). Some teams have blurred boundaries, including external consultants or surrogates with vital expertise, often joining during later venture stages (Vohora et al., 2004). Additionally, structural boundaries may manifest as double-tier teams, with junior subteams pursuing specific opportunities while senior members oversee broader venture management. These structures are common in family-based or portfolio entrepreneurship settings (Discua Cruz et al., 2013; Jaskiewicz et al., 2017; Iacobucci and Rosa, 2010).

The characteristics of the entrepreneurial team members are among the most and earliest discussed topics in the literature on ET in terms of its impact on performance (Humphrey and Aime, 2014; Mathieu et al., 2017; Shuffler et al., 2018). These works drew on the upper echelon theory, which states that organisational outcomes are partially predicted by the managerial background characteristics of the top-level management team (Hambrick and Mason, 1984; Hambrick, 2015).

Lastly, recent research has explored the emergence of sub-teams within the primary entrepreneurial team. Such exploration stems from the realisation that team diversity can lead to processes other than conflict, like alignment (Ben-Hafaïedh et al., 2022; Yoon, 2018). Instead of the entire team, members often align based on shared characteristics, forming sub-teams. For instance, teams may form sub-groups based on shared identities, like entrepreneurs paired with tech-focused founders, or a division between idea-focused founders and equity-based investors (Ben-Hafaïedh et al., 2018).

3.4.5 Entrepreneurial Team Processes

Prior research has extensively investigated team processes as outcomes of team characteristics (Klotz et al., 2014). As previously shown, conflict in ETs is inevitable and the quality of the relationship between co-founders can either facilitate or hinder effective communication, mutual trust, and the smooth coordination of knowledge and perspectives (Francis and Sandberg, 2000). These coordination-related processes also encompass the alignment of values and vision (Discua Cruz et al., 2013; Shah et al., 2019) as well as the development of cohesion through interpersonal emotional bonds within tightly knit teams (Jaskiewicz et al., 2017). It is worth noting that, in certain contexts, improved coordination processes have been associated with enhanced performance outcomes (Francis and Sandberg, 2000; Shah et al., 2019).

Another interpersonal process employed by ETs and founders is the specialisation-related processes which empower co-founders to leverage diverse knowledge bases, deepen their expertise in specialised domains, and enhance the capabilities of their ventures, thereby gaining access to a broader pool of resources (Clarysse and Moray, 2004; Iacobucci and Rosa, 2010). Similar to coordination processes, specialisation processes have demonstrated links to superior performance outcomes due to the sustained ability to harness expertise and absorb and apply in-depth knowledge from an extensive team knowledge base (Forbes et al., 2006; Shah et al., 2019).

Another important factor defining ET success is the process they use for decision-making. Research has recently shifted from its initial focus on individuals towards examining team dynamics, finding that the composition of a team, especially its diversity, greatly influences its decision-making processes (Shepherd et al., 2015). Ethnically diverse teams, for example, especially those with immigrant members, exhibited a stronger inclination towards entrepreneurial endeavours (Chaganti et al., 2008). This inclination is often attributed to a more proactive strategic approach compared to less diverse teams.

3.4.6 Entrepreneurial Team Emergent States

While ET team processes describe team activities, emergent states refer to "member attitudes, values, cognitions, and motivations" (Marks et al., 2001, p. 357). They play a pivotal role in fostering effective teamwork. Some of the emergent states highlighted in the literature include team confidence, empowerment, climate, cohesion, and trust, all of which touch upon emotional connections within the team or beliefs about task performance (Breugst and Preller, 2020). Distinctively, entrepreneurial team cognition captures the manner in which the team organises, represents, and distributes knowledge (Zhou and Vredenburgh, 2017).

Team cognition as an emergent state is "how knowledge important to team functioning is mentally organised, represented, and distributed within the team and allows team members to anticipate and execute actions" (DeChurch and Mesmer-Magnus, 2010, p. 3). It is the bedrock that allows team members to predict and perform actions cohesively. Central to this is the concept of shared cognition, which denotes the simultaneous mental engagement of team members (de Mol, 2015). It encompasses how members understand one another and interpret each other's social cues. This shared understanding ultimately shapes the team's knowledge framework (West, 2007).

Entrepreneurial team cohesion is an emergent state that captures the quality of social integration within the team, being an output rather than a process (Klotz et al., 2014). It is not just about working together but also about the personal bonds formed. Indicators of cohesion include team members being drawn to one another, satisfaction with team interactions, and socialisation (Chen et al., 2017). When a team exhibits high cohesion, it implies strong affinity, partnerships, and emotional

connections (Lechler, 2001). Cohesion, therefore, is a reflection of trust, commitment, and patterns of social exchange (Mullen and Copper, 1994).

The foundation of team cohesion lies in social exchange activities. Such exchanges encompass aspects like swapping status, forming friendships, offering advice, and sharing crucial information (Cropanzano and Mitchell, 2005; Lechler, 2001). These exchanges foster the perception of relationships as valuable and stable, deepening over time (Lawler and Yoon, 1996). Moreover, regular interactions lead to better understanding among team members, making behaviours more predictable (Cropanzano and Mitchell, 2005; Chen et al., 2017). This reduced uncertainty coupled with enhanced positive emotions contributes to stronger interpersonal bonds among team members (Chen et al., 2017).

3.5 Theoretical Approaches to Understanding ETS in NTBFs

Research concerning diversity within entrepreneurial teams (ETD) has reached a critical juncture due to inconsistent findings that impede the further development of theories in this area. These inconsistencies primarily arise from one-dimensional theoretical viewpoints that hinder a comprehensive understanding of the advantages and challenges associated with ETD from an interdisciplinary standpoint. In response to this limitation, Sundermeier and Mahlert (2022) have undertaken a systematic review of the existing literature, categorising 44 studies within an 'inputs-mediators-outcomes' (IMO) framework. The analysis reveals a notable degree of fragmentation within the field, particularly concerning the disciplinary perspectives adopted, the contexts studied, the dimensions of diversity considered, and the variables used to measure outcomes.

Disciplinary Perspectives

Economic lens

- Human capital theory
- Capability- and resource-based view
- Upper echelons theory

Sociological and psychological lens

- **Social categorisation logic**
  - Homophily theory
  - Social identity theory
  - Social and cognitive categorisation theory
  - Social integration theory
- **Informational/decision-making logic**
  - Social capital theory
  - Social learning theory

Table 3.3: Disciplinary perspectives in research on entrepreneurial team diversity.

(Source: Sundermeier and Mahlert, 2022, p.4)

The economic perspective has its foundation in the seminal work of Schumpeter (1934). Researchers using this perspective are primarily interested in understanding how the variety in skills, experience, and other resources among founding team members affects the process of creating new ventures. Much of the research in this domain emphasises the impact of human capital diversity. This emphasis emerges from well-established theories such as human capital theory, capability and resource-based views, upper echelons theory, growth theory, and contingency theory (Chaganti et al., 2008; Dai et al., 2019; Zhou et al., 2015; Beckman and Burton, 2008; Hart, 2014; Hoogendoorn et al., 2017; Foo et al., 2006; Moog and Soost, 2020; Kirschenhofer and Lechner, 2012; Xie et al., 2020). Some researchers have also employed proxies like ethnicity, gender, and nationality to represent human capital diversity (Chaganti et al., 2008; Dai et al., 2019; Hart, 2014). Human capital aligns with the broader entrepreneurship literature that sees it as a critical factor in entrepreneurial success (Marvel et al., 2016).

However, the relationship between human capital and venture creation is nuanced. Several studies confirm a positive link between human capital diversity and team performance (Foo et al., 2006; Kirschenhofer and Lechner, 2012; Zhou et al., 2015), as well as new venture performance (Hmieleski and Ensley, 2007; McGee et al., 1995; Xie et al., 2020). Yet, other research highlights moderate (Chaganti et al., 2008; Hart, 2014) or even negative consequences of such diversity on venture performance (Amason et al., 2006; Hoogendoorn et al., 2017) and team turnover (Ucbasaran et al., 2003). Despite these findings, economic-based theories do not provide clear explanations for these mixed results, indicating that other factors are at play (Lazar et al., 2019).

Research from the sociological and psychological perspectives has a rich history of studying work group dynamics (O'Reilly et al., 1989; van Knippenberg et al., 2004). These domains offer insights into the mechanisms determining the outcomes of work group diversity, insights that are equally applicable to entrepreneurial teams (Kollmann et al., 2017). This research can be distilled into two main logics.

First, the Social Categorisation Logic focuses on the relational aspects influenced by diversity. Central concepts include homophily, social identity, cognitive categorisation, and social integration theory. These concepts revolve around how individuals categorize and relate to others based on perceived differences such as gender, ethnicity, values, and social status (Eisenhardt and Schoonhoven, 1990; de Mol et al., 2019; Kim and Song, 2020; Ko et al., 2021; Khan et al., 2015; Kollmann et al., 2017; Chandler et al., 2005; Reynolds and Turner, 2006; Tajfel and Turner, 1986). Due to these categorisation processes, homogeneous groups often exhibit more harmonious and efficient team processes. In contrast, higher diversity levels can reduce social cohesion and increase conflicts, potentially hurting team performance (Harrison and Klein, 2007; Van Knippenberg et al., 2004).

Second, Informational/Decision-Making Logic argues that diversity can enhance team performance by bringing a broader range of knowledge, skills, and abilities to the table. It's anchored in theories like social capital and social learning, suggesting that diverse teams have advantages in group processes that reflect in the activities they perform (Aven and Hillmann, 2018; Beckman, 2016; Khan et al., 2014). However, Khan et al. (2014) noted that the benefits might be negated by conflicts stemming from social categorisation. However, the relationship between these two logics remains an area of exploration. Most studies tend to focus on one logic, examining either the positive or negative effects of entrepreneurial team diversity, leaving a gap in our understanding of their interplay.

3.6.1. Faultline Theory

Sundermeier and Mahlert (2020) suggest that the fragmented findings on this topic result from a lack of a holistic approach, with different academic streams and theoretical backgrounds. While upper echelon theory posits that diverse managerial backgrounds and demographics plays a critical role in business success due to the subjective nature of decision-making, studies from sociological or psychological disciplines take a more nuanced approach, focusing on social aspects and activities within the team and how they lead to categorisation and group-building within entrepreneurial teams (Sundermeier and Mahlert, 2020).

Recently, a growing body of researchers has turned to Faultline theory to study the effect of diversity on team performance, entrepreneurial orientation, and the quality of entrepreneurial opportunities (Lim et al., 2013; Yoon, 2018; Ben-Hafaïedh et al., 2022). In contrast to upper echelon theory, Faultline theory shows that greater entrepreneurial diversity does not necessarily have a positive effect and that certain configurations are more suited to specific objectives (Ben-Hafaïedh et al., 2018). In addition, Faultline theory also draws on sociological concepts, such as social categorisation, making it more nuanced and adept for case-by-case studies.

Lau and Murnighan (1998) presented the concept of faultlines to decode the underlying dynamics of subgroup formations within entrepreneurial teams based on attributes like race, gender, age, nationality, and educational background (Bezrukova et al., 2009). For example, an entrepreneurial team may become segmented due to differences in professional backgrounds, gender, and experience, leading to distinct internal subgroups (Lau and Murnighan, 1998). Such divisions can profoundly impact the communication flow, unity, and decision-making. Interestingly, not all entrepreneurial teams divide cleanly. Some members might straddle multiple demographic subgroups, resulting in softer faultlines with milder implications on team operations (Lau and Murnighan, 1998; Crisp et al., 2001).

Research suggests that faultlines can significantly impact various aspects of nascent firms, from internal conflicts to overall performance. Studies by Li and Hambrick (2005), Sawyer et al. (2006), and others highlight challenges faced by entrepreneurial teams with pronounced faultlines, such as

trust issues and decreased output. However, there is a silver lining. Strong faultlines can sometimes be advantageous. As Lau and Murnighan (2005) discovered, start-ups with clear faultlines often reported better internal understanding, reduced disagreements, and higher morale.

However, solely banking on Faultline theory for predicting outcomes might be too simplistic. As highlighted by van Knippenberg and Schippers (2007), how faultlines are interpreted and applied is crucial. Not all demographic nuances necessarily lead to marked subgroup formations in new companies.

Lau and Murnighan (1998) tackled this with the 'Faultline Activation' concept. They argued that the visibility of demographic differences depends heavily on the firm's context. Three factors shape this: comparative fit (how well the categorisation mirrors actual differences), normative fit (the relevance of the categorisation in the objectives), and cognitive accessibility (how readily team members discern these differences). For faultlines to truly have an effect, all three elements must align. For instance, gender divisions in a tech-based firm may become prominent if the project at hand emphasises gender-specific user experiences.

Using this lens, Lau and Murnighan (1998) suggested that discussions on niche marketing could magnify ethnic faultlines, while debates on product roles might amplify professional background faultlines. If such activations don't occur, faultlines stay dormant, letting start-ups function without internal divisions. Despite the centrality of Faultline activation in their thesis, this domain remains relatively uncharted in entrepreneurial research.

In this research, Faultline theory can help explore later formation dynamics of ET: the emergence of sub-teams in the main entrepreneurial teams after the activation of faultlines during incubation. This research captures the formation of Faultline-based subgroups within the entrepreneurial team and the resulting dynamics. Therefore, Faultline theory is the most appropriate theory to provide explanations about the diversity and heterogeneity that leads to the emergence of the Faultline and thus the reflection of its effects on team structure and social interactions. Although Lau and Murnighan (2005) recently studied faultlines in teams that performed tasks without obvious Faultline-relevant issues, they suggested that such groups had received only "minimal Faultline stimulation" (p. 655) and that the activation of group faultlines would have resulted in significantly different effects.

3.7 Entrepreneurial Teams in Business Incubators

Research on Entrepreneurial Teams within incubator programs, where early-stage companies are given access to mentorship, investors and other support to help them get established, is limited. Of the few studies that have, the majority have focus on university-funded or initiated incubator programs, also commonly referred to as academic spin-offs or spin-outs, focusing on technology-

based firms (Lundqvist, 2014; Ben-Hafaïedh and Micozzi, 2018; Ben-Hafaïedh et al., 2015; Vanaelst et al., 2016).

Vanaelst et al. (2006) and Lundqvist (2014) were able to find that incubation programs can have a significant positive effect on venture performance. Direct interventions in entrepreneurial team formation, including coaching and action-based education, can even be especially effective to foster successful technology ventures (Lundqvist, 2014).

However, the two studies incorporating Faultline theory show that certain configurations are more suited to certain objectives and that while the same involvement in entrepreneurial team formation might be effective for some it is not for others (Ben-Hafaïedh and Micozzi, 2018; Ben-Hafaïedh et al., 2015). These varied results in the success of incubation programs can be explained by large rifts, or faultlines, between the original team members and external experts based on clashing demographics and characteristics which differ between each team.

Yet all of the mentioned studies have only focused on academic incubation programs. Lundqvist (2014) even specifically highlights the importance of strong and engaged university environments in shaping entrepreneurial teams for the success of technology ventures. This begs to ask if incubator programs outside of an academic setting yield similar results. In addition, all of the previously mentioned studies are based on Western European data samples (Italy, Sweden and Belgium). Given the importance of demographics and social settings in entrepreneurial team building, how greatly does entrepreneurial team formation and development differ in a Western European and a Saudi Arabian setting?

So far, few studies are able to give answers to these questions. A study by Diakanastasi et al. (2018), which does not focus on academic spin-offs, found several factors that improve the success of Entrepreneurial Teams in incubation. However, it does not account for how the incubation setting itself influences dynamics and outcomes within the Entrepreneurial Team. In addition, while there are several studies on business incubation in Saudi Arabia (Siddiqui et al. 2021; Salem, 2014; Binsawad, 2019) they mainly look at resources and possible success factors without sufficiently taking entrepreneurial team development into account.

This thesis seeks to address this gap in research. By focusing on the formation and development of entrepreneurial teams within Saudi technology incubators, this thesis has the potential to contribute new findings in different fields of research including entrepreneurial team development, incubation processes and start-up development in Saudi Arabia.

3.6 Research Gaps and Research Questions

Recent literature has been able to shed light on many aspects of entrepreneurial team building and has shown that entrepreneurship is way more complex and dynamic than the “lone wolf

entrepreneur" stereotype often gives it credit. This literature review has highlighted the intricate dynamics and processes that shape entrepreneurial teams during their crucial phases, from their formation to development to expansion, and demonstrated the multifaceted interplay between team members and the external environment. Faultline theory was identified as a theoretical grounding from which to understand the rifts and differences between members of teams and how, when taken into account for, they can help researchers understand why certain business methods work for some teams and not others.

Yet, our exploration has also unveiled several gaps in the existing body of knowledge. For one, entrepreneurial team formation and development within the context of incubation programs has been insufficiently researched. Given the success of incubation programs in start-up development and the influence of entrepreneurial team formation on success, this is a key gap that must be addressed. And while a few studies have shown that Faultline theory can help explain incubators influence on entrepreneurial teams, research has only focused on largely homogeneous academic incubator settings (Ben-Hafaïedh and Micozzi, 2018; Ben-Hafaïedh et al., 2015). For this reason, the first two research question this study seeks to answer are:
(R1) How does the composition and structure of entrepreneurial teams evolve over the incubation period?
(R2) What role does the incubator play in influencing the evolution and dynamics of entrepreneurial teams?

In addition, the literature review has shown that interactions and social processes within teams play a pivotal role in shaping team dynamics, decision-making, and ultimately, the outcomes of their entrepreneurial ventures. This is especially of interest in an incubation program, as teams are encouraged and even forced to work with new members, mentors and experts, increasing the social processes and interactions in the team. For this reason, this study's third and fourth research questions are:
(R3) How do social interaction processes influence the evolution of entrepreneurial teams during the incubation period?
(R4) What role does the incubator play in the social interaction processes in entrepreneurial teams?

Lastly, literature has shown that demographics and social interaction are key factors influencing not only the formation of entrepreneurial teams but also their success. As these factors are inherently cultural and this thesis focuses on entrepreneurship within the BADIR incubator in Saudi Arabia, all research questions are answered in a manner that takes Saudi Arabian cultural, regional and social factors into account.

3.7 Chapter Summary

This chapter critiqued the entrepreneurial team literature. The chapter first describes the emergence of the entrepreneurial team as a concept within the field. Next, the chapter discusses the definition of the entrepreneurial team and the boundaries of the concept. The chapter also highlights the technology entrepreneurial team and what makes it a distinctive type of entrepreneurial team. The chapter then delves into the issues of the initial formation of the entrepreneurial team and the subsequent developmental dynamics of structure and social processes. Lastly, the chapter explains the choice of Faultline Theory as a framework that provides an explanation for the subsequent formation dynamics of the entrepreneurial teams in this research. In the next chapter (Chapter 4), the justification for the adopted methodology will be detailed.

Chapter 4: Research Methodology

4.1 Introduction

This chapter provides an overview of the philosophical underpinnings and the research stance taken for this thesis (as shown in Figure 4.1). It discusses the justification for following a critical realism philosophy approach and describes the contextual and methodological aspects considered in conducting research. The research design framing the empirical studies is discussed, providing details about the sample group and data collection. The chapter outlines the qualitative approaches and techniques underpinning the twelve case studies and thus provides a comprehensive account of the data collection processes. The chapter concludes with an explanation of the data analysis protocol adopted.

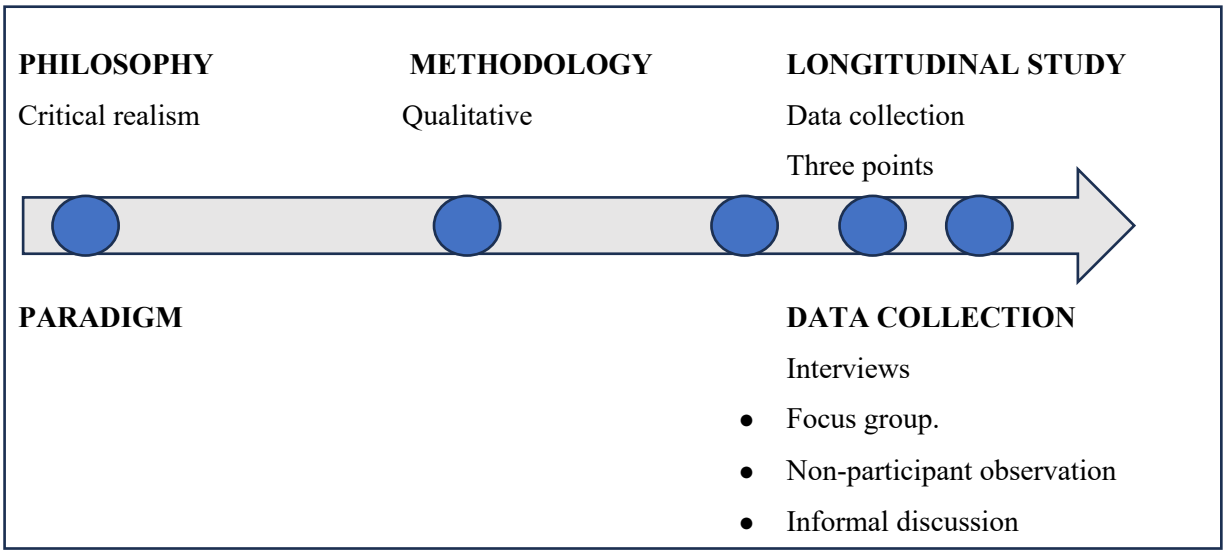

Figure 4.1: Research Stance Taken
(Source: Researcher's own)

"Undertaking credible social research requires that the questions asked, and the designs employed are shaped by the researcher's underlying ontological and epistemological assumptions" (Leitch et al., 2010, p. 69).

It is essential that researchers are aware of their own philosophical assumptions (e.g., the underlying assumptions through which the researcher views the world), as these assumptions may affect how researchers perceive information, adopt methodological approaches, and/or draw conclusions and communicate findings (Saunders et al., 2009a).

In entrepreneurship research, choices of research philosophy and methodology are crucial, which enable the ability to examine the subtleties of the phenomenon of entrepreneurship. This occurs by emphasising the range of its dimensions and the interplay between theses dimensions. In so doing, it captures the complex, dynamic and emergent processes and the interplay between actors, processes, and contexts (Karatas-Ozkan et al., 2014).

4.2 Research Paradigm

Given (2017, p.1) defines a paradigm as follows:

"A paradigm is a set of assumptions and perceptual orientations shared by members of a research community. Paradigms determine how members of research communities view both the phenomena their particular community studies and the research methods that should be employed to study those phenomena."

A research paradigm clarifies aspects of the research inquiry in terms of the research epistemology, ontology and axiology. Based on the stance taken on these dimensions, research paradigms emerge, which manifest as shared beliefs within research communities, helping to guide the researcher's action, choice and approach when studying a phenomenon (Tuli, 2010).

Much of entrepreneurship research has focused on studying the field using a positivist stance (Hindle and Lansdowne, 2005). Studies adopting a positivist paradigm are oriented around objectivity, measured and rigorous study, repeated examination and the aim to find generalisable results (Scotland, 2012). Positivism's ontology is one of realism, which assumes a knowable reality external to the observer, "driven by immutable natural laws" (Guba, 1990, p.19) with the aim of positivism to discover those laws. Researchers typically adops a distant, non-interactive posture and view themselves as separate from the world they study. (Krauss, 2005). From an epistemological perspective, they assume the existence of an objective reality, independent of the knower (Scotland, 2012). Studies adopting this approach tend to describe empirical objects as causal relationships among variables and apply inferential statistics to quantitative data to test hypotheses. Hypotheses are stated in propositional form and subject to empirical testing for verification (Guba and Lincoln, 1994).

While the positivist paradigm can have its advantages in entrepreneurial research, especially when analysing causal relationships, research has begun to move to other paradigms such as interpretivism and realism (Kirkwood and Campbell-Hunt, 2007; Ramoglou and Tsang, 2016). This shift or transformation coincides with a shift in focus within entrepreneurship from the individual entrepreneur to the entrepreneurial process (Bygrave, 1993). Stemming from the discussion of interpretivism as research philosophy, the interpretive paradigm orients around understanding the subjective experience of individuals (Burrell and Morgan, 2017), in other words explaining the "point of view of the actors directly involved in a social process" (Scotland, 2012, p.14). An interpretive paradigm's ontology proposes that there is no single reality, and its epistemology seeks understanding through individuals' constructions of experience in the world rather than some external reality. Interpretive research relies on qualitative methods to understand and interpret the phenomenon (Carson et al., 2001). This study also follows the recent trend in entrepreneurial

research of drawing on philosophical and methodological approaches related interpretivist paradigm rather than solely focusing on positivist approaches.

4.2.1 Critical Realism

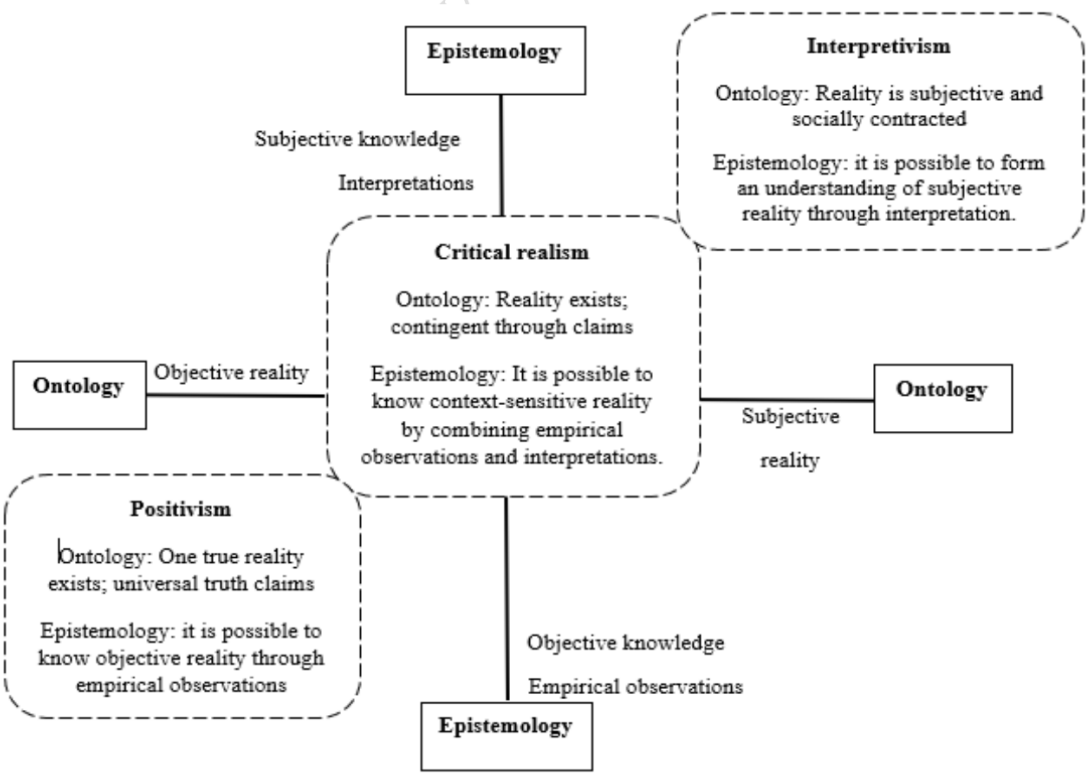

Figure 4.2: Ontological and Epistemological Comparison of Three Research Paradigm
(Source: Crossan, 2003, p.61)

Critical realism is a philosophy that grew from a critique of positivism by philosopher Roy Bhaskar—particularly the assumption that humans are able to fully and infallibly know and measure reality (Bhaskar, 1975). Instead, critical realism states that the evidence we observe can come close to reality but is always a fallible, social and subjective account of reality (Collier, 1994). Nevertheless, in contrast to constructivism, critical realism also challenges the assumption that equates human perceptions of reality with reality itself. Instead, critical realism posits that reality is mind independent. While human perspectives are essential, these are always 'accounts of reality' (Bhaskar, 1975, p. 31).

Critical realism also claims that the mind-independent nature of reality applies not only to physical dimensions but also to social and cultural aspects (Archer and Archer, 1995). The mind-independent nature of culture means that human perceptions of cultures remain and cannot be equated with the cultures themselves. This respects that people can have beliefs and personal understandings, but this also does not change the state of that independent reality (Archer et al., 2013).

Critical realism can be used for research methods to explain outcomes and events in natural settings—pertaining to questions about how and why events or phenomena occur. From this approach, critical realism recognises that interventions and systems consist of 'emergent mechanisms' that can explain the outcomes (Bhaskar, 2013). Emergence describes the synergism that occurs between components of a complex process so that the outcome is 'more than the sum of the parts' and that different components can combine across multiple layers of a system (Sayer, 1992, p.143). Emergence significantly contributes to the unpredictability of outcomes in a complex system.

Additionally, from the perspective of critical realism, reality isn't just a subjective experience; there's an external reality that's governed by unchangeable laws of nature (Guba , 1990). This viewpoint contrasts with positivist theories, which see science primarily as a tool to identify underlying causes. Within the realm of social sciences, critical realism pushes the idea that scientific inquiries should not just identify but also critically assess societal constructs and systems (Fletcher, 2017). In essence, critical realism interprets our world through various lenses, understanding it as a combination of systems, occurrences, and personal experiences. These are categorised into three distinct domains of reality, visualised in Figure 4.2. Hence, critical realists aim to break down reality into a tiered model, differentiating among these three domains (Bhaskar, 1978; Easton, 2010).

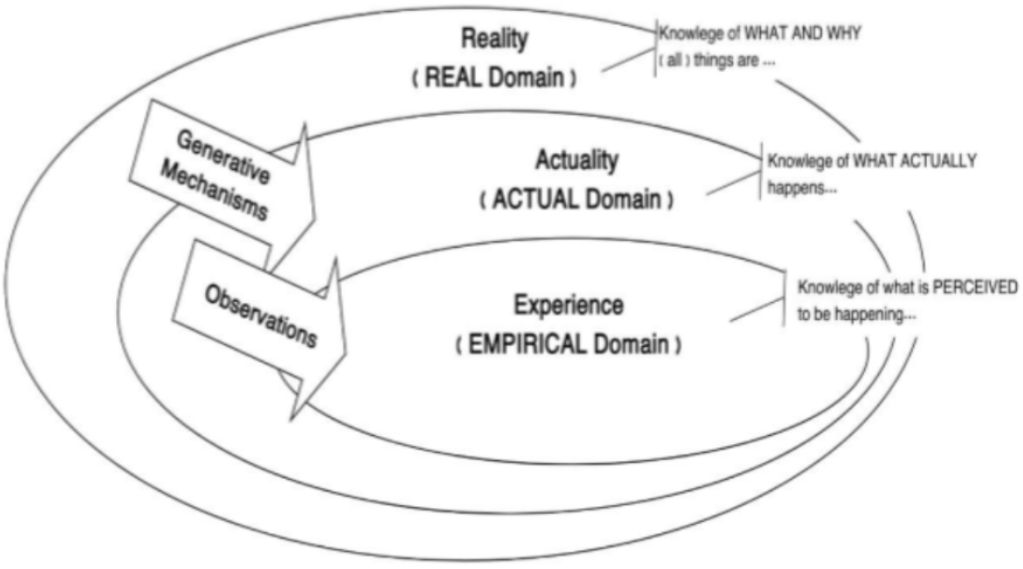

Figure 4.3: Critical Realism Concept Diagram

(Source: Bhaskar, 1978, p.166)

The domains are: first, the *Real Domain*, which consists of the processes that produce events. Generative mechanisms or causal powers exist independently with a tendency to produce patterns of observable events under contingent conditions. Second is the *Actual Domain*, in which patterns

of events occur, whether they are observed or not. Finally, there is the *Empirical Domain*, in which experiences can be obtained by direct observation (Archer et al., 2013; Bhaskar, 2013).

As such, critical realism distinguishes between the 'real' world and the 'observable' world. According to critical realism, realist observation entails independence from human perceptions, theories, and paradigms. As we understand and know it, the world is constructed from our perspectives and experiences through the 'observable' (Archer et al., 2013). Thus, according to critical realism, unobservable structures cause observable events, and the social world can be understood solely if people understand the structures that generate events (Bhaskar, 2013). For critical realists, the means to determine the reality of a social phenomenon is through the triangulation of cognition processes. Indeed, "a perception for realists is a window on to reality from which a picture of reality can be triangulated with other perceptions" (Sobh and Perry, 2006, p. 1199).

In the first instance, this thesis aims to explore the formation and evolution of high tech incubated entrepreneurial teams in technology incubators. Accordingly, the researcher attempts to explore the technology incubator's role (involvement) in forming and evolving high tech incubated entrepreneurial teams as one of its prime micro-processes of new tech firm creation. Inherent in this aim, critical realism is the appropriate philosophical tenet for this research, and justifications for this will be explained below.

The thesis focuses on the following key research questions:

(R1) How does the composition and structure of entrepreneurial teams evolve over the incubation period?

(R2) What role does the incubator play in influencing the evolution and dynamics of entrepreneurial teams?

(R3) How do social interaction processes influence the evolution of entrepreneurial teams during the incubation period?

(R4) What role does the incubator play in the social interaction processes in entrepreneurial teams?

This study explores the formation and evolution dynamics of the Entrepreneurial Team (ET) during incubation and how the technology business incubator is involved. These formation and evolution dynamics occur over time: time is required for entrepreneurial teams to form and evolve and similarly, incubatees may progress over time through different stages. The incubator role stems from considering incubated tech entrepreneurial team building as one of its prime micro-processes to create the new tech firm. This statement clarifies the importance of understanding the complexities associated with these team formation and evolution processes and the incubator's involvement. In principle, the technology incubation literature recognises the complexity of the micro incubator processes associated with the new tech firm creation (Mian et al., 2016). Such complexity stems

from the multiplicity and different aspects of such creation and the heterogeneity of these incubated firms (Shepherd et al., 20121).

Similarly, the entrepreneurial team literature recognises the same complexity associated with the formation and evolution of teams (Clarysse and Moray, 2004). Such complexity stems from the depth of the associated changes and events and the entrepreneurial teams' heterogeneity (Ben-Hafaïedh and Dridi, 2010). The features of critical realism fit well with the ontology of complexity that recognises the synergistic nature of context and mechanisms where the addition of multiple elements results in more than the sum of the parts involved (Blundel, 2007; Hu, 2018). This understanding is aligned with the complexities associated with technology incubation and the processes of building entrepreneurial teams, as well as the complexities associated with the formation and evolution dynamics of incubated entrepreneurial teams. A critical realist approach will therefore help to address the research questions about how and why interventions and incubators work with the complexities of the tech incubated entrepreneurial team formation and evolution. It is particularly useful for understanding how and why things happen, as well as unpacking the influence of the TBI as a context on the ET's formation and evolution during the incubation process.

A primary objective of this critical realism-based research is to provide clear, concise, and empirically supported statements about causation, precisely how and why a phenomenon occurred. The causality can be ascribed "if and only if it is the case that some event E would not have occurred, under the conditions that prevailed but for (the operation of) X" (Bhaskar 1998, p. 101). Under critical realism, a causal explanation concerning a designated phenomenon is inferred by explicitly identifying how structural entities and contextual conditions interact to generate a given set of events. This proposes that events are generated through the interaction of specific mechanisms endowed with causal powers. These causal powers may or may not be triggered and may or may not be countervailed (Bhaskar, 2013). In other words, such events happen when the causal mechanisms of the objects and structures are activated. One of the key features of critical realism is that explanation involves penetrating behind the surface of reality to access the domain of reality and identify those structures and mechanisms and how they act (Sayer, 2004).

This thesis's adoption of critical realism (CR) responds to recent calls for improved theorising and the creation of technology incubation theories that are micro-processes oriented (Mian et al., 2016). Research of technology incubators relating to the building of high-tech incubated teams indicates that entrepreneurs begin the process of assembling the entrepreneurial team (McAdam and McAdam, 2008). Based on this, within micro incubation processes, technology incubators play an active role in forming the entrepreneurial team by appointing surrogate entrepreneurs to improve the formation of the entrepreneurial team (Lundqvist, 2014). In this regard, there have been calls for more rigorous methodologies and in-depth levels of discovery to identify the mechanisms that connect chains of indeterminate events and complex interactions (McAdam and McAdam, 2008). In doing so, this allows researchers to develop and support in-depth causal explanations for the outcomes of specific social phenomena inside the incubator, such as building incubated

entrepreneurial teams and interacting with the incubator and its staff. The research design based on CR enables the conducting of empirical studies and provides comprehensive causal explanations such as complex social events (Hu, 2018). Providing causal explanations for social phenomena within a technology incubator is closely related to perceiving the changing circumstances, dynamics, and conditions (Sayer, 2000), in addition to social, organisational, and environmental factors, which may play a causal role in their occurrence (Outhwaite, 1990; Christie et al., 2000).

The formation and evolution of entrepreneurial teams are a dynamic process, intertwined and involving various influences that interact to form team outputs and firm performance (Forbes et al., 2006). As such, this CR-based research concentrates on unpacking the interactions and components within this reality to demonstrate the occurrence of a given set of events related to entrepreneurial team formation and development within the technology incubator (Bhaskar, 2013). In this regard, capturing events related to either incubation or the development of entrepreneurial teams implies recognising the element of time and change over time. This calls for appropriate research design, such as longitudinal studies—in addition to focusing on the sample size and different contexts aimed at observing the empirical domain to discover a "mixture of theoretical reasoning and experimentation" (Outhwaite, 1990, p. 332). In other words, knowledge of the real world, by naming and describing the generative mechanisms that operate and result in the events may be observed, which reflects the critical realism approach. A considerable amount of work conducted on the entrepreneurial team tends toward realism in establishing those enduring traits at the intrapersonal level (or impersonal/compositional) which may be found as static truths about team outcomes (Klotz et al., 2014).

According to Alvarez et al. (2014) critical realism applies to entrepreneurship research when researchers ask questions from a deep level of discovery. This entails moving away from positivism which has traditionally been the dominant approach in the field of entrepreneurship (Anderson and Starnawska, 2008; Alvarez et al., 2014). In addition, there are several reasons why the critical realism paradigm might provide a suitable vehicle for entrepreneurship research, with specific reference to qualitative approaches. First, critical realism can help to revive a longstanding realist tradition in entrepreneurship research. Second, critical realism can promote the much-needed contextualisation of entrepreneurial phenomena in empirical research. Third, critical realism can facilitate greater theoretical integration between disciplines and across multiple levels of analysis. Fourth, critical realism can enhance the explanatory potential of existing qualitative research techniques, including the case study approach. Critical realism is fundamentally well suited as a companion to case study research as it justifies the study of any situation. This is regardless of the number of research units involved, but only if the process involves thoughtful, in-depth research to understand why things are as they are (Easton, 2010). Fifth, critical realism has the potential to contribute more 'useful' knowledge than rival paradigms (Blundel, 2007).

4.3 Defining the Values and Logic of Qualitative Research

Once the paradigm is considered, the researcher must choose a methodological approach, evaluating quantitative, qualitative, or mixed methods approaches. Quantitative studies allow researchers to study differences in individuals' perceptions, develop repeatable measures of a phenomenon, and gain insight into relationships of interest, hence the ability to generalise the results (Heale and Twycross, 2015). In technology incubation literature, questionnaires are the most common quantitative data collection method. They are used to focus on specific topics such as incubators' success, outcomes, and performance (Mian et al., 2016). Based on that, much of the incubation literature is described as fragmented, anecdotal, and atheoretical (Hackett and Dilts, 2004a). These complexities, coupled with the lack of systematic longitudinal research, make the development of generalisable theory challenging (Mian et al., 2016). However, Phan et al. (2005) notes that generalisable theory may not be possible due to the idiosyncrasies of incubators concerning geographic, political, social, and economic systems. Quantitative studies are challenged by their inability to provide an in-depth understanding of the elements and the analysed processes due to the taxonomy's reductive nature (Merriam and Grenier, 2019).

In business incubation research, qualitative studies are sometimes criticised for their simplicity, reliance on descriptive accounts, fragmentation and lack of solid conceptual grounding (Theodorakopoulos al., 2014). In technology incubation research, despite the significant presence of qualitative studies, there are limited efforts regarding how the incubatee develops within the incubation environment (Mian et al., 2016). Qualitative research to date covers a limited number of themes such as value-added, management, and assessment (Hillemane et al., 2019). These qualitative frameworks primarily rely on interview data for comparative evaluations of several incubator cases (Hausberg and Korreck, 2020).

Qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific settings, such as "real-world setting where the researcher does not attempt to manipulate the phenomenon of interest" (Patton, 1999, p. 39). Qualitative research is well suited for description, interpretation, and explanation (Patton, 2005), which means "any research that produces findings not arrived at employing statistical procedures or other means of quantification" (Corbin and Strauss, 1990, p. 17). In qualitative research, the researcher builds a complex, holistic picture, analyses words, provides reports and detailed views of informants, all conducted in a natural setting (Creswell and Poth, 2016).

Denzin and Lincoln (2008, p.4) define qualitative research as:

"Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meaning people bring to them."

Therefore, qualitative research is concerned with aspects of reality that cannot be quantified, concentrating on understanding and explaining the dynamics of social relations (Silverman, 2016). Maxwell (2008) advocates that qualitative research works with the universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the operationalisation of variables. Despite this, it has been claimed that quantitative researchers attempt to disassociate themselves as much as possible from the research process (Winter, 2000). Nevertheless, qualitative researchers have come to embrace their role and involvement within the research. Patton (2005) supports the notion of the researcher's immersion and involvement in the research by discussing that the real world is subject to change. Therefore, a qualitative researcher should be present to record an event after and before the change occurs. However, qualitative studies do not represent a uniform perspective, as different qualitative techniques and approaches may be applicable (Wigren, 2007). Qualitative research may encounter challenges where data collection can take a long and intense time, and analysis and interpretation can be complicated (Polkinghorne, 2005). Moreover, the progress and endpoint of qualitative research can be challenging to control in addition to applying fundamental concepts of validity, reliability, and generalisability (Morgan and Smircich, 1980).

The consideration of qualitative research as a social encounter is influenced mainly by the characteristics of the individuals involved, which affects conclusions derived (Hancock et al., 2001). Hence, it is essential to provide the reader with evidence as to why they should trust this piece of research. This corresponds to the question, “how can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to?” (Lincoln and Guba, 1994, p. 290). Within the realm of qualitative research, validity and reliability are two fundamental factors which any qualitative researcher should be concerned with while designing a study, analysing results and judging the quality of the study (Brink, 1993; Patton, 1999). Solidifying the validity and reliability entails having clear and explicit aims, methods, and findings. Consequentially, this clarity associated with the research elements will facilitate its interpretation and repetition by others (Golafshani, 2003).

In this study, the researcher chose a methodology that enables the disclosure of results, or the phenomenon studied in the appropriate context for it to be valid. This implies that due consideration was given to cultural and contextual variables. In relation to sampling, the purposeful sampling technique was deemed appropriate, which indicates a precise aim or framework, and that the ongoing data collection process moulds theoretical sampling besides theory in evolution (Palinkas et al., 2015). The researcher adopted several methods to enhance validity to extract data and analyse it, including first-tier triangulation (of the researcher) and second tier triangulation of resources and theories (Finfgeld-Connett, 2010). Furthermore, a well-documented audit trail of materials and processes (Rodgers and Cowles, 1993; Carcary, 2009); multidimensional analysis as a concept- or case-orientated (Miles and Huberman, 1994); and respondent verification (George and Apter, 2004) were all utilised.

The essence of reliability for qualitative research lies with consistency (Carcary, 2009; Grossoehme, 2014). Accordingly, a margin of variability for results is tolerated in qualitative research in that epistemological logistics consistently yield ontologically similar data but may differ in richness and ambience within similar dimensions.

Silverman and Marvasti (2008) suggested five approaches in enhancing the reliability of process and results: constant data comparison, refutational analysis, comprehensive data use, including deviant cases, and tables. In this research, as data were extracted from the original sources, the researcher focused on verifying the accuracy concerning form and context with constant comparison, either alone or with the participants (a form of triangulation). Also, the researcher has concentrated on the scope and analysis of data included to be comprehensive and inclusive (Patton, 1999). Accordingly, adopting the Popperian dictum of falsifiability as the essence of truth and science, involving refuting the qualitative data and analyses was performed to assess reliability (Leung, 2015).

Some qualitative researchers have argued that the term validity does not fit with the nature of qualitative research. At the same time, they have emphasised the need for a type of measurement or validity that qualifies their research. Hence, many researchers have developed their own concepts of validity and have often adopted or generated further appropriate terms, such as quality, rigour and trustworthiness (Lincoln and Guba, 1985; Golafshani, 2003). The current research has adopted five strategies proposed by Lincoln and Guba: credibility, generalisability, dependability, confirmability and reflexivity (Guba and Lincoln, 1994). In the first construct, the credibility of research states that the research must be 'credible to the constructors of the original multilabel realities' (Guba and Lincoln, 1994, p. 296). Relying on that, the establishment of this research's credibility was conducted through identifying and describing the subject and context matter under study (Patton, 1999). The second construct is transferability and generalisability. To strengthen the transferability of this research, the researcher can refer to the theoretical parameters. Based on this, one judges the extent to which results in one study can be generalised to another according to a similar theoretical model. Additionally, the close similarity model, where one study can be generalised to another, is judged by the similarities between time, place, people, and other social contexts (Gobo, 2004; Sinkovics et al., 2008).

One way in which generalisability can be enhanced in qualitative research is triangulation. Qualitative research often uses more than one approach to researching a question, aiming to increase confidence in the findings through the confirmation of a proposition using two or more independent measures (Heale and Forbes, 2013). Combining findings from two or other rigorous approaches provides an additional, comprehensive picture of the results than either approach could do alone (Tashakkori and Teddlie, 2003). Essentially, triangulation is associated with the methods of research and design. However, there are various other variations of the term. Triangulation may use multiple data sources, theories, methods or investigators within the study of a single phenomenon (Graham, 2005).

The third construct, dependability, allows for changing conditions in the phenomena under study besides taking account of changes in design that occur as a result of a deeper understanding of the research area (Golafshani, 2003). The fourth construct is confirmability, the last criterion of trustworthiness which a qualitative researcher must establish. This criterion has to do with confidence that the research study's findings are based on the participants' narratives and words rather than potential researcher biases. Confirmability is there to verify that the findings are shaped by participants more than by a qualitative researcher (Belotto, 2018). A couple of techniques can be used to establish the confirmability of the research study's findings, including an audit trail and reflexivity. The audit trail is the technique used to establish confirmability in this research whereby the researcher detailed the data collection, data analysis, and interpretation of the data. In so doing, recorded what topics were unique and exciting during the data collection, wrote down main thoughts about coding, provided a rationale for merging codes, and explained the themes (Houghton et al., 2013). The fifth and last construct is reflexivity, reflexivity allows researchers to acknowledge the changes that occur in themselves because of the research process. Furthermore, how these changes affect the research process (Palaganas et al., 2017).

4.4 Research Design and Strategy

4.4.1 Research design

The research design acts as a framework or blueprint for conducting the research study, specifying the planned methods and procedures for collecting and analysing information (Maxwell, 2008). Research design selection depends on the purpose of research, the control an agent has over real behavioural situations and the attention on contemporary rather than historical phenomena (Yin, 2003). Hackett and Dilts (2004a) and Phan et al. (2005) urge business incubation scholars to pay more attention to the research design in terms of theoretical foundations, time horizons, and structured sampling. In this respect, Löfsten and Lindelöf (2005) state that structured sampling in technology incubation research is needed in relation to the heterogeneity of New Technology Based Firms (NTBFs) and thus provides additional comparison possibilities. This thesis follows a descriptive research strategy to describe and examine incubated entrepreneurial teams' formation and evolution processes within a technology business incubator. A descriptive research design describes the situation and population inside technology incubation, (i.e., potential relationships, causes, effects and dynamic processes, (Crano et al., 2014), which is the most adopted in technology incubation research to open the "black box" (McAdam and McAdam, 2008; McAdam et al., 2006; Marlow and McAdam, 2011). An inductive approach is typically utilised to understand the research context which implies a less rigid research methodology – generally qualitative, whereby the researcher is part of the process, and a small number of participants or respondents are sampled (Becker et al., 2002). Moreover, less concern is paid to generalising and cause-effect links between variables (Lewis et al., 2003).

4.4.2 Defining the Values and Logic of Conducting a Case Study

Guided by these concepts from critical realism, it is possible to apply research methods that acknowledge, seek and explore the real-world complexities of the formation and evolution of the tech incubated ET in incubation as one of the TBI prime micro-processes of new firm creation. While critical realism can accommodate a variety of methodological choices, a multiple case study approach has been chosen for the following reasons. First, a multiple case study approach is best suited for critical realist studies seeking to develop causal explanations of entrepreneurship complex events (Hu, 2018).

Second, a critical realism case approach is particularly well suited to relatively clearly bounded but complex phenomena. For example, social communications and related dynamics within specific contexts are represented in this research in the formation and evolution of the incubated tech entrepreneurial team within the context of the technology incubator (Easton, 2010). This implies that the phenomena' boundaries, for example (contexts), must be determined, although it is not uncommon for those boundaries to change during the research. Adopting a CR stance, which entails determining causality, may require that the researcher moves beyond the initial boundary or narrows the boundary because the causal mechanisms are more narrowly focused than previously thought (Smith and Elger, 2014).

Third, the nature of the research questions in the form of "what caused the events associated with the phenomenon to occur", align with the critical realism case strategy (Easton, 2010, p. 123). Hence, to understand the social phenomenon in this research, the researcher recorded and analysed the associated events that occur because of the actor's roleplaying (Easton, 2010). The next and crucial task was identifying the entities/objects that characterise the phenomena being studied. Sayer points out that this process is usually given less attention than it requires - "many rests on the nature of our abstractions, that is, our conceptions of particular one-sided components of the concrete object; if they divide what is indivisible, or if they conflate what different and separable components are, then problems are likely to result" (Sayer, 2004, p.19).

The fourth reason for adopting a multiple case study approach lies in its appropriateness for exploratory formative research, (Gerring, 2004). Adopting a multiple case study facilitates building an integrated and prosperous picture through the data generated using multiple methods, including interviews, observations, focus groups, and discussions. Also, a multiple case study approach offers verifiable data from direct observations of the entity involved (Seawright and Gerring, 2008). These observations provide, in turn, information about the path taken, which led to specific results being generated. Consequently, those observations make it possible for others, in similar circumstances, to replicate the results discovered by the case study method. Additionally, in-depth examining and monitoring of the participating teams' formation and evolution paths in this research will generate additional credibility (Gerring, 2004).

4.4.3 Justifying the Use of the Case Multiple Study Strategy

"The case study method "explores a real - life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information… and reports a case description and case themes" (Creswell and Poth, 2016, p. 97).

In the light of adopting a multiple case study approach, an exploratory multiple case strategy is used, as this research focuses on achieving insights based on "how" and "what" type questions (Yin, 1994; Eisenhardt, 1989). This research recognises that the research questions are related to issues, which are complex and dynamic, consisting of a wide range of influences, which interact; thus, forming the realities of the entrepreneurial firm, the high tech incubated entrepreneurial team and the technology incubator. Furthermore, this research recognises the inherent heterogeneity regarding entrepreneurial teams (Dufays and Huybrechts, 2016). Consequentially, studying multiple cases helps to understand (compare) the differences and the similarities between the cases (Baxter and Jack, 2008; Stake, 2005). Moreover, multiple cases enable data analysis both within each situation and across situations (Yin, 2003). In other words, multiple cases permit a replication logic in which cases are treated as experiments, with each serving to confirm or disconfirm inferences drawn from the others (Yin, 1994). This process yields a further robust, generalisable theory than single cases (Eisenhardt and Graebner, 2007). This research attempts to develop a theory about building incubated entrepreneurial teams within the incubation environments as one of the key micro incubation processes. Multiple case studies create a more convincing theory (Dyer and Wilkins, 1991; Eisenhardt and Graebner, 2007) and also allow for broader research questions and theoretical evolution (Eisenhardt and Graebner, 2007).

4.4.4 Using Longitudinal Research

In light of this thesis's research questions, a longitudinal research design was deemed appropriate. As the literature has highlighted, entrepreneurial teams are dynamic and in states of constant change. Using longitudinal research instead of a cross-sectional study facilitates an illustration of dynamics (both team and incubator) over time and it is the only way to determine how ETs developed and addressed social issues and changes within their teams. Longitudinal research provides unique insights that might not be possible any other way; this method allows for the exploration of changes over time (I.e., changing founding team dynamics). The technology incubation context arguably provides an ideal setting to observe entrepreneurial teams' formation and early development and in so doing provide insights into the technology incubator context (Lazar et al., 2020; Phan et al., 2005). As such, longitudinal research is considered appropriate in technology incubation research given the inherent heterogeneity in incubatees and the incubation processes. This design makes it possible to study total and partial changes that can occur in this context (Mian et al.,

2016) and the monitoring of the chronological order of events. Longitudinal research is considered a novel design in the technology incubation micro process, which has been to date dominated by cross-sectional studies (Mian et al., 2016; McAdam and McAdam, 2008). Additionally, longitudinal research enables the development of theories that address the complexity of technology incubators (Ballinger, 2004; Mian et al., 2016).

Aligning with the critical realism position taken by this research, a longitudinal perspective was deemed the most appropriate. The appropriateness of longitudinal design with the critical realism stance is based on the following. First, longitudinal studies can discover causal relationships, which is consistent with taking the position of critical realism (Zapf et al., 1996). On the other hand, a longitudinal approach corresponds with critical realism regarding facilitating the main elements of a critical realism position, which is the so-called reproduction of the cognitive process. This means that critical realists collect more data until epistemic closure is reached, which identifies the mechanisms which explains why certain events occur (Archer et al., 2013).

The use of the longitudinal approach in this research to capture the involvement and role of the technology incubator in the formation and development of high-tech incubated teams during the incubation phase requires:

- Constructing a rich picture of how particular dynamics and processes of incubated entrepreneurial teams may change at different points in the incubation journey, in addition to exploring some of the reasons as to why these developmental shifts take place (Vanaelst et al., 2006; Clarysse and Moray, 2004).
- Tracking the participating teams from the beginning of their incubation journey to graduation to ascertain how a distinct environment or context (technology incubator) influences the formation and development process (Klotz et al., 2014).
- Given that this longitudinal study took place over a year (twelve months; between January 2019 and January 2020), the data can be utilised to establish a sequence of events, as this period is sufficient to allow longitudinal patterns to emerge (Menard, 2002). Hence, providing accurate, detailed data to emerge regarding the formation and development process of high tech incubated entrepreneurial teams within the technology incubator (Ployhart and Vandenberg, 2010). It is anticipated that this longitudinal approach, combined with a qualitative methodology, drawing upon interviewing, non-participant observations, focus groups, and informal discussion with a range of stakeholders associated with the technology incubator, will realise a rich data set.

4.5 The Context of Research

Context is important in entrepreneurship research (Welter, 2011; Welter et al., 2019). The twelve case studies included in this research all had incubator residency in BADIR Incubator for Technology and Communication in Saudi Arabia. BADIR Riyadh Incubator is one of the technology incubators within the BADIR Program for Technology Incubators and Accelerators established to

support technology start-ups in Saudi Arabia, it was launched as part of Vision 2030. BADIR Riyadh Incubator has launched the most significant number of new firms since its inception compared to its counterparts (Badir Annual Report, 2017). It works intensively alongside the incubated teams during the incubation period. In the admission stage, one of its primary criteria is the extent to which the applicant (single or team) speaks about the business and the team with transparency, clarity, and without reservation. The incubator assumes that this will facilitate cooperation with BADIR advisor and willingness to accept their suggestions in developing both the business and the team (Badir Annual Report, 2017). Hence, this engagement between the incubator and incubatees allows for tracking the teams' development within the incubation program over time and the incubator's role in this regard.

4.5.1 The Saudi tech ecosystem

Saudi Arabia is swiftly establishing itself as a vigorous hub for digital entrepreneurship, with its start-up landscape advancing rapidly and significantly. The nation is committed to nurturing the tech sector in alignment with its Vision 2030 agenda, which endeavours to transition the economy from oil reliance, generate employment opportunities, and draw in high-skilled professionals to the kingdom. Saudi Vision 2030 is a strategic framework for transforming to a knowledge economy, diversifying sources of income, and reducing Saudi Arabia's dependence on oil. According to Saudi Vision 2030, this diversification of the economy depends mainly on the development of public services sectors such as health, education, infrastructure, entertainment and tourism and achieving critical goals related to enhancing the economy and investment in non-oil trade activities (Vision 2030, n.d.(b)). The 2030 Vision was first announced on the 25th of April in 2016 by Crown Prince Mohammed bin Salman. Accordingly, the Council of Economic and Development Affairs (CEDA) tasked the Council of Ministers to define and draw a comprehensive map to implement the 2030 Vision (Vision 2030, n.d.(c)). Subsequently, the National Transformation Program was designed and launched across 24 government agencies. The program entails three consecutive phases, each taking five years to complete in 2030 (Vision 2030, n.d.(d)). One major structural reform targeted by Saudi Arabia is its transformation into a diversified and knowledge-based economy that supports entrepreneurship, innovation, and the ease of doing business (Vision 2030, n.d.(e)). Vision 2030 positions the SME sector as one of the most important engines of economic growth for Saudi Arabia. As such, they are increasing the productivity of these enterprises with a targeted contribution to the nation's GDP from 20% in 2019 to 35% by 2030 (Monsha'at, 2022a).

In implementing the strategic plan of enabling the SME sector, Monsha'at has launched diverse programs to translate Vision 2030 into the SME sector, which involves supporting innovation, facilitating business processes, enabling firm growth, developing entrepreneurial capacity, and creating suitable employment opportunities for citizens across the Kingdom (Monsha'at, 2022b). As such, entrepreneurship is being supported through improved regulations for the SME sector, more accessible financing, and more opportunities for international partnerships for

local firms. Moreover, constructing environments that would support entrepreneurs and protect them from failure and help them face “threshold challenges” such as incubators and accelerators, including BADIR.

In recent years, the country has witnessed an influx of venture capital injections. During the recent LEAP 2023 event in Riyadh, as reported by Arab News, nine funds amassing $2.4 billion were unveiled to propel start-up expansion; furthermore, in 2021 and 2022, venture capital investments in Saudi-based start-ups soared by 72%, accumulating $987 million across 144 transactions, as highlighted in the Harvard Business Review.

Additionally, Saudi Arabia boasts a youthful, tech-inclined populace with a significant inclination towards digital solutions, rendering it appealing to investors. The GEM report revealed that 90% of surveyed individuals affirmed the ease of initiating a business in Saudi Arabia, ranking the nation at the pinnacle among economies. Moreover, as per the GEM report, 80% of respondents identified opportunities to launch a business owing to the alterations induced by the pandemic.

Moreover, Saudi Arabia is evolving into a nucleus for female entrepreneurs. As per Arab News, in 2021, a total of 139,754 new commercial permits were granted to women, positioning it as a forefront player in fostering female tech entrepreneurship. Moreover, Saudi Arabia serves as an educational haven for females pursuing STEM, with Riyadh hosting the world's largest women's university.

4.5.2 BADIR Technology Incubators and Accelerators Program

The BADIR program was created in 2007 by King Abdulaziz City for Science and Technology as one of its dedicated programs to develop science, technology and innovation in Saudi Arabia. (Khorsheed et al., 2014). With the announcement of Vision 2030, King Abdulaziz City dedicated the BADIR program to technology incubation, thereby opening multiple branches (Badir, 2020). The BADIR program is a non-profit organisation, one of the leading national and innovative environments in the field of supporting the establishment and growth of tech start-ups in Saudi Arabia. BADIR focuses on promoting the concept of technology entrepreneurship and converting technological projects into successful business opportunities. Besides supporting tech start-ups, BADIR also focuses on developing the technology incubator industry in Saudi Arabia. Since the program was launched, it has created several business incubators in seven cities throughout the Kingdom. Such incubators, in turn, seek to support entrepreneurs and stabilise a fertile breeding ground for creating tech start-ups by relying on the principle of risk minimisation and building companies capable of achieving success and survival (Badir, 2020).

Executing its mission, BADIR operates as an autonomous entity within the Technology Development Center (TDC), possessing its own governance and management structure (Khorsheed et al., 2014). This organisational setup facilitates funding acquisition, managerial autonomy, streamlined

contractual procedures, and minimal political intrusion. Moreover, BADIR is bifurcated into two divisions: the Management branch (non-profit) and the Venture Fund (for-profit), enabling a collaborative framework for expert advice and financial support. The Management branch is committed to offering strategic guidance drawn from a consortium of experienced leaders from both private and public sectors, whose insights are imperative for the success of high-tech BIs. The incubation process is overseen by a supervisory board chaired by the KACST Vice President for Research Institutes, with members representing private sector, technology industries, financial institutions, and governmental bodies. These board members, chosen based on their expertise, are there to steer strategic direction, assess the program's performance, approve significant investments and projects, and facilitate access to broader networks and expertise.

The BADIR Program includes 10 incubators and 8 accelerators in seven different cities in Saudi Arabia (Wamda, 2017b). The BADIR Incubator for Technology and Communication, which was selected for this research, was the first to be established. BADIR Riyadh Incubator, which was launched in 2008, aims at enhancing the growth of enterprises of a technical nature. Over a span of 10 years, BADIR-incubated technology start-ups raised $136 million, indicating a positive performance trajectory (Zawya, 2020). The technology incubator was chosen because of its high budget, large number of participants and because of the diverse range of its incubated firms that fall under the umbrella term of technology start-ups thereby resulting in a more diverse sample and a wider range of meaningful results. Firms embedded into the incubator deal with computer and telecommunication technologies, the infrastructure of IT and telecommunications, software, solutions, multimedia, online gaming, online portals, intelligent mobile phone applications, and advanced manufacturing technology for innovated products through consultations of design, 3-D design, and prototype development (Saudi Gazette, 2020). In addition, the incubator, located in Riyadh, seeks to assist entrepreneurs in passing the first stages of establishment and growth, which are classified as the most challenging stages during the life of any business and also the stage that is of most interest for this study (Khan, 2013). In addition, it motivates innovation and initiative in technology fields. It finds investment opportunities in this vital sector, encourages the development of technological entrepreneurship in the Kingdom and contributes to creating new job opportunities (LinkedIn, n.d.).

In summary, the BADIR program is a critical component of Saudi Arabia's policy framework under Vision 2030, designed to support the growth of the tech sector and contribute to the transformation of the economy. It provides a supportive environment for tech start-ups, aligns with the national goals of economic diversification, and fosters a culture of innovation and entrepreneurship.

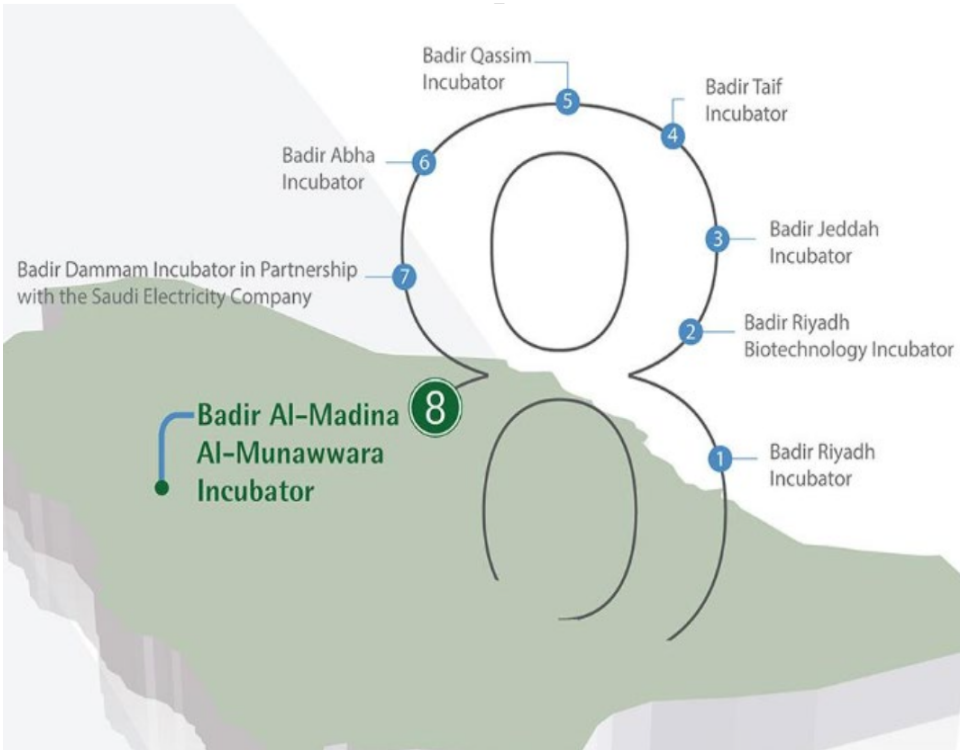

Figure 4.4: Distribution of the BADIR Program Technology Incubators in Saudi Arabia (Source: Badir, 2020)

The TBI provides advice, consulting services, mentoring and practical training for entrepreneurs. In addition, it provides an environment and logistical services, such as: providing offices for entrepreneurs, accounting, development, and finance consultations, along with other consulting and financial services, all of which transfer ideas to promising technological projects and minimise risks accompanying the establishment of start-up companies (Aloulu, 2021).

BADIR employs a tri-level service model to handle persistent demand while amplifying reach, adaptability, and effectiveness. This model, depicted in Figure 4.5, allows numerous applicants to access the resources within the BADIR program, focusing on the most promising applicants and tenants. The stages are awareness of technology and entrepreneurial opportunities; pre-incubation; and incubation.

In the first stage, aspiring entrepreneurs partake in workshops and seminars, facilitated by third-party organisations, to refine their ideas and bolster business venture commitment. The second stage offers more workshops and individual guidance to ascertain the commercial potential of new ideas. Successful individuals from the first stage receive assistance in idea evaluation, initial market research, and preliminary business planning, targeting a broad audience including students, researchers, and professionals from various sectors for training. This stage also enables entrepreneurs to enhance their initial applications for re-evaluation. Similar to the first stage, external organisations conduct pre-incubation workshops in the second stage, allowing BADIR to concentrate its resources on personalised assistance and BI. BADIR's leadership meticulously selects the candidates

progressing to the third stage. The final stage is geared towards establishing the start-up businesses, with two sub-stages. The first sub-stage aids in developing business models or plans, preparing them for financial accessibility through intensive group or individual sessions. The second sub-stage offers intensive individual assistance, providing access to additional resources and networking opportunities, facilitating business initiation and growth. Typically, incubation time is 3–4 years, but the time depends on each individual case. In the final year, BADIR prepares the incubated company for graduation.

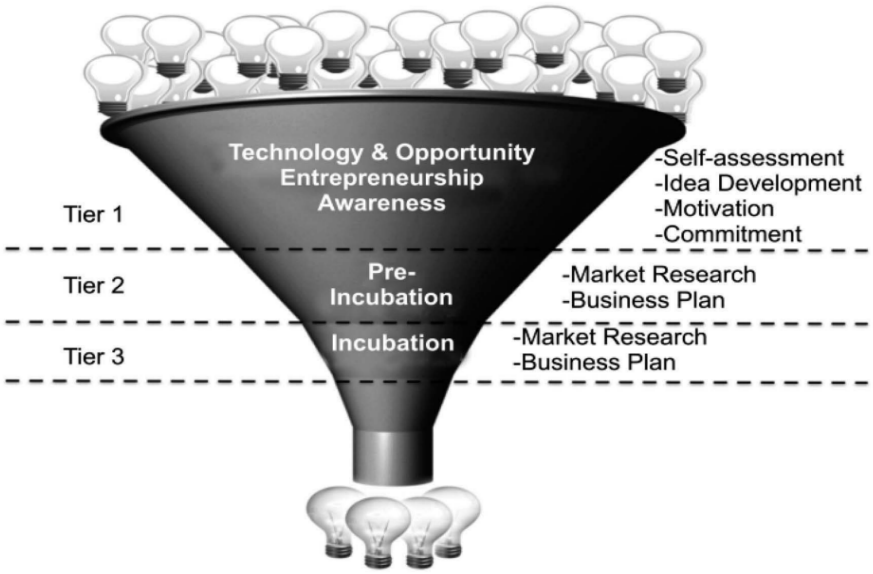

Figure 4.5: BADIR Three-Tier Service Model

(Source: Khorsheed et al., 2014).

Nawaf Al Sahhaf, the Chief Executive Officer of the Badir Program for Technology Incubators, mentioned that a thorough evaluation of participants has been conducted and finalists have been chosen based on certain criteria. The primary factors include the advancement of the companies' ideas and products, their prospects for future development and expansion, their competitive standing, and the extent to which their innovations align with market demands. He also observed that the substantial volume of applications received by the Accelerator underscores the vital necessity of such initiatives.

Indeed, to be accepted onto the BADIR Riyadh Incubator program, the applicant must fulfil a set of conditions. First, the applicant must have passed the idea stage, where a prototype of the technological product must be presented to the admission committee of the incubator (Chase and Webb, 2018). Second, the applicant (team or single) must have sufficient basic knowledge and experience of the firm. Thus, providing sufficient information about the firm from technical,

marketing, and financial point of views. Third, the business has identified an opportunity in the target market and a competitive advantage for the firm, that has growth potential and adds economic value. Fourth, upon obtaining conditional initial acceptance, the applicant (single or team) is required to attend the admission committee's meeting, present a pitch, and then pass a selection interview (Chase and Webb, 2018). When the applicant gets accepted and takes up tenancy in the incubator as an incubatee, they are then expected to progress along the three stages of incubation (See Figure 4.6).

Figure 4.6. The Stages of Incubatees Developing within the BADIR Riyadh Incubator
(Source: Researcher's own)

BADIR Riyadh presents a distinctive environment where prime-micro processes related to the formation and evolution of entrepreneurial teams during incubation are prevalent. This makes it a fertile ground for investigating the overlooked aspects in incubation literature concerning ET dynamics during the incubation phase.

Moreover, being a Technology Business Incubator, BADIR Riyadh aligns with the research's focus on technology-based new firms, providing a relevant setting to explore the dynamics of entrepreneurial teams within the tech sector. The BADIR Incubator for Technology and Communication was chosen because of the diverse range of its incubated firms that fall under the umbrella term of technology start-ups. This diversity results in a more diverse sample and a wider range of meaningful results.

Over a span of 10 years, BADIR-incubated technology start-ups indicate a positive performance trajectory. This success rate suggests that the program is effective in fostering technology entrepreneurship, making it an ideal case study for the research. Lastly, the availability of data through interviews, focus groups, and observations is crucial for the research. BADIR Riyadh provides a platform where such data can be collected over time from various stakeholders including entrepreneurial team members, incubator advisors, and incubator management.

4.6 Research Process and Data Collection

4.6.1 Ethical Compliance

The researcher gained approval from DCU Research Ethics Committee (REC) before the empirical research commenced. According to Neuman and Wiegand (2000), data from other sources

is often confidential and so brings with it legal and ethical issues. Two ethical reviews were approved by both DCU and BADIR Riyadh Incubator, (shown in Appendix A). The two ethical reviews required the procedures to be set forth, including the necessity to adhere to DCU's policy on conflicts of interest, the law on good research practice, and any other condition set by the Research Ethics Committee. Additionally, it was necessary to identify all the risks related to the research that may arise during the conduct of this research, as well as acknowledging a commitment to the rights of the participants. The two ethical reviews stressed the need for the researcher to possess the qualifications, experience, and appropriate facilities to conduct the research and the ability to be able to deal with any emergencies related to the research that may arise.

4.6.2 The Research Participants

In relation to the selection of research participants, two main elements are discussed. First, the type of sampling strategy used and second, the selection of the research participants according to the selected targeting strategy.

4.6.2.1 Purposive Sampling

There are two significant types of sampling, probability and non-probability sampling, which are further divided into sub-types. Probability sampling includes simple random sampling, stratified random sampling, systemic sampling, cluster sampling, and multi-stage sampling (Etikan et al., 2016). A non-probability sampling includes purposive sampling, convenience sampling, snowball sampling, and quota sampling. Selecting the sample or participants of this research relied on purposive targeting (Suen et al., 2014). A purposive sample is a non-probability sample that is selected based on the characteristics of a population and the study's objective. In process focused and theory-building research, this requirement favours non-probability sampling (Siggelkow, 2007).

4.6.2.2 Participants Selection

a. Participating Incubatees

Six months before data collection began, the researcher meticulously communicated the research procedures to the incubator management, detailing the ethical considerations as per DCU research ethics, the types of data to be collected, and the methods of data collection. The researcher outlined the longitudinal nature of the study, emphasising the need for repeated engagement with the incubatees over the study's duration.

To facilitate access, the researcher obtained formal authorisation from the incubator management, which involved a thorough review of the research proposal and an agreement on the terms of engagement with the incubatees. This process ensured that the management was fully aware of the study's scope and the researcher's requirements.

The longitudinal study was designed to involve multiple interactions with the incubatees. The researcher communicated to the incubator management that the study would require the incubatees to participate in several data collection sessions, which would include interviews, surveys, and potentially observations, over a period that was to be determined. The expectations were that the incubatees would engage in these activities at least bi-monthly, with each session lasting approximately one to one hour and twenty minutes, over the course of the study.

The incubatees were informed that their participation would involve a commitment to this schedule and that their insights and experiences would contribute significantly to the understanding of the incubation process. The researcher assured the incubatees and the incubator management that all data would be handled with strict confidentiality and that the rights and privacy of the participants would be rigorously protected throughout the research.

Given that 70% of those accepted for incubation typically withdraw from the first stage, it was agreed with the incubator management and advisors that the teams participating in the research would be drawn from the second stage of incubation. Of the total of 66 incubated firms in the second stage, 15 incubated firms initially indicated their willingness to participate in this research. Of the 15, 12 participated from the start to the end of this study's longitudinal time frame. The sample therefore consists of 12 firms, constituting approximately 18% of the total number of incubated firms. The sampling criteria were as follows:

- The participant criteria for the study necessitated the inclusion of both established teams and individual incubatees. The rationale for incorporating solo founders, despite the focus on team dynamics, stemmed from the incubator management's advisement regarding the imperative for these individuals to form teams. The inclusion of these four single-founder firms was strategic, as it provided a unique opportunity to observe the incubator's role, if any, in facilitating team formation. This approach allowed the research to explore the efficacy of the incubator's efforts in assisting solo entrepreneurs to transition into team-based ventures, thereby offering a comprehensive view of the incubator's influence on team dynamics from inception.
- The participants had to be in the second stage of the BADIR incubation program. They are the ones that the incubator has made sure of their seriousness. According to the incubator’s management, 70% of those enrolled in the first stage do not complete the two following stages of the program.

Accordingly, the participants characteristics included in this research are detailed in Table 4.1. More detailed information on the participating teams and their members in terms of their demographics (age, sex, study specialisation, work/business experience) can additionally be found in Appendix E.

In developing the methodology for this study, special attention was given to the gender composition of the entrepreneurial teams within the incubator. This was particularly pertinent given the socio-cultural context of Saudi Arabia, where women's participation in business is an evolving

phenomenon, underscored by the objectives of Vision 2030. The researcher systematically recorded the gender of team members, enabling us to analyse the dynamics of cooperation and visibility enhancement specifically for women-led and mixed-gender teams. These insights were critical in understanding the unique conditions that support talented female leaders and entrepreneurship under the Vision 2030 framework.

No	**Research's participating incubatees (cases) (Pseudonyms)**	**Number of members**	**The age of the business before entering the incubator**	**Duration of stay in the incubator when the research begins**	**Signing partnership agreements that are not officially documented**
1	Al Jawhara Case	2	7 months	3 months	
2	Al Batoul Case	1	6 months	5 months	
3	Alanod Case	1	6 months	3 months	
4	Warda Case	1	9 months	2 months	
5	Mubarak Case*	2	7 months	4 months	
6	Thabet Case	2	6 months	4 months	x
7	Sumoud Case	4	10 months	2 months	x
8	Ryan Case	3	4 months	4 months	x
9	Faisal Case	3	5 months	5 months	
10	Yamen Case	2	8 months	2 months	
11	Omar Case	3	5 months	4 months	
12	Aseel Case	2	5 months	4 months	
13	Hamad Case	2	6 months	4 months	x
14	Ajeed Case	1	2 months	4 months	x
15	Fahd Case	2	2 months	4 months	x

Table 4.1: The Characteristics of Participating Incubatees

*Initiated with four members; following the departure of three, the individual who is now CEO stepped in to reassemble the team and recruited a co-founder, bringing the current total to two members. (Source: Researcher's own)

In Saudi Arabia, initiating a business necessitates the establishment of a commercial register under the name of a single individual. Research indicates that all examined businesses were registered to one team member. It is common for teams, advised by their incubator at the onset of incubation, to consent to a partnership agreement that encompasses all terms, although initially, these are not legally recorded in court. Such agreements typically become formally documented and may be substantially

revised once investors get involved. The accompanying table details which teams had signed partnership agreements upon entering the incubator.

In preparation for the study, the researcher proactively participated in the incubator's internal online activities, such as workshops, which facilitated introductions and fostered dialogue with the teams and developers. This engagement allowed the researcher to discuss with the incubator management and developers the evolution of entrepreneurial teams and relevant literature on the topic. The researcher initiated conversations with the teams about their ventures, focusing on industry dynamics, competitive landscapes, customer interactions, and the challenges faced. Recognising the sensitivity of discussing internal team dynamics, the researcher was aware of the necessity to establish a rapport based on trust, which would encourage the teams to later disclose internal, particularly social, issues. As time progressed, it became evident that the incubator management, business developers, and the entrepreneurial teams were receptive to the researcher's communications and were willing to share information freely.

Upon the researcher's arrival in Riyadh, their prior engagement from Dublin had established them as a familiar and welcome presence within the incubator community. The researcher took the opportunity to formalise their acquaintance with the entrepreneurial teams through sit-down sessions, during which all necessary documents pertaining to research ethics were shared and signed.

The researcher's initial two days in Riyadh were dedicated to acclimating to the incubator environment, arranging and confirming interview schedules. This immersion was crucial for the researcher to familiarise themselves with the incubator and the milieu encompassing the entrepreneurial teams. This comprehensive approach ensured that the research procedures were clearly communicated and understood by all parties involved. The access granted to the researcher was based on a foundation of trust and mutual understanding, which was built over months of consistent communication. The longitudinal study was thus designed with a clear expectation of engagement frequency and duration, ensuring that the incubatees were well-informed and agreeable to the study's requirements.

b. Participating Incubator Advisors

Included in the participants in this research are the incubator advisors responsible for monitoring and following up the included cases progress. There are seven in total (as shown in Table 4.2), four for the second stage and three other advisors for the third stage. The second stage advisors are more specialised in marketing matters and product development. The advisors of the third stage are more specialised in fund-raising and/or getting the incubatees ready for investment, thereby attracting and linking incubatees with the venture capital (VCs) and business angel networks. The researcher interviewed, observed, and discussed informally with both participating incubatees (team

and solos) and advisors to map a complete picture of the formation and development (building) of incubated high-tech entrepreneurial teams within the technology incubator. Each data collection method is discussed below.

Research's participating advisors (pseudonyms)	**The stage at which the advisor works**	**The duration of the advisor's work in the incubator**	**The type of field the advisor works in**
Advisor 1	Second	3 years	Organisational development
Advisor 2	Second	2 years	Marketing
Advisor 3	Second	5 years	Product development
Advisor 4	Second	8 months	Strategic management
Advisor 5	Third	1 years	Angel investors
Advisor 6	Third	3 years	Strategic management
Advisor 7	Third	4 years	Angel investors

Table 4.2: The Characteristics of the Participating Incubator Advisors
(Source: Researcher's own)

4.7 Data Collection

After identifying the participants in the research, this section provides the strategies and data collection method used for this research across three rounds of data collection and includes the following aspects:

- Designing of interviews schedules
- Pilot interviews
- Semi-structured interviews
- Focus groups
- Non-participant observation
- Informal discussion

Relying on a single method can introduce bias. Triangulation through multiple methods mitigates this risk, as each method has its own biases which are balanced out by the others.

Semi-Structured Interviews provide in-depth, individual perspectives. They allow for flexibility in questioning, enabling the researcher to explore specific topics in detail while also adapting to the flow of conversation. This method is particularly effective for understanding personal experiences, opinions, and motivations. In contrast to the individual focus of semi-structured interviews, focus groups capture the dynamics of group discussions. They reveal how ideas and opinions are formed and influenced within a group setting. This method is valuable for exploring consensus, diversity of views, and social dynamics. While interviews and focus groups rely on self-reported data, non-participant observation offers an objective lens. It allows researchers to observe behaviours and interactions in real-time, providing insights into how people actually behave in certain environments or situations, rather than how they report they behave. Lastly, Informal Discussions are more casual and can occur spontaneously, providing a relaxed environment where participants might share insights they would not in more formal settings. This method is particularly useful for building rapport, gaining trust, and uncovering deeper, perhaps unanticipated insights.

Together, these methods offer a multi-faceted view of the research topic. While interviews provide depth, focus groups add breadth. Observations offer a reality check against what is reported in interviews and focus groups. Moreover, using multiple methods allows for cross-verification of data. What is observed can be compared with what is reported in interviews and focus groups. Furthermore, each method illuminates different aspects of the research question. For example, individual interviews might reveal personal experiences, while group dynamics emerge in focus groups, and observed behaviours are captured in non-participant observations.

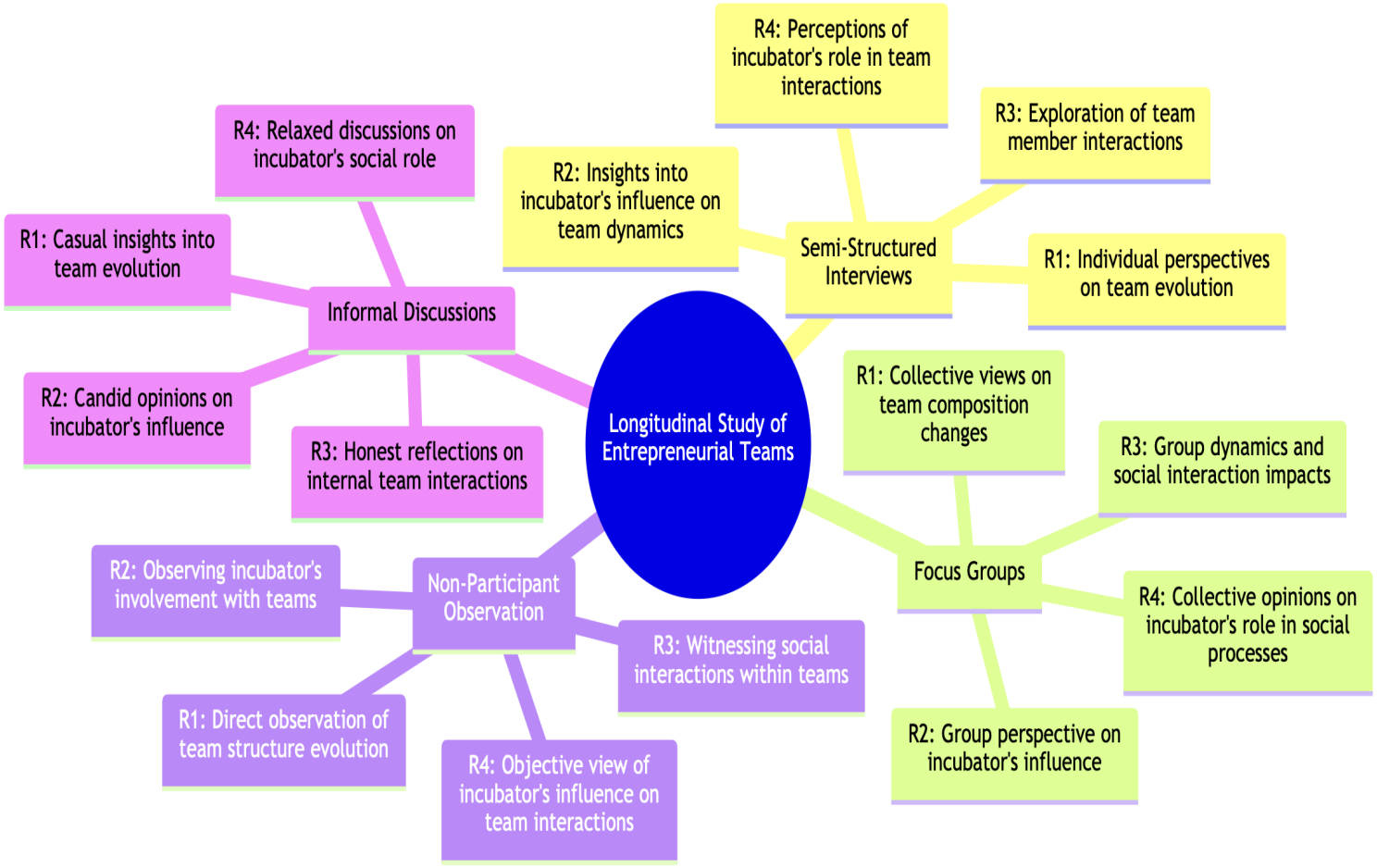

Figure 4.7.: Longitudinal Study of Entrepreneurial Teams

(Source: Researcher's own)

4.7.1 Designing of Interview Schedules

The main aim was to enhance the quality of the data by using open-ended questions. In so doing, the researcher allows the participants to talk freely and openly. The research consisted of a series of semi-structured interviews describing the incubatees' formation and evolution of their team within the context of the technology incubator across three data collection points. This in turn, enabled the capturing of the incubator's involvement (interventions) and its role in these dynamics. Each of the three stages of data collection entailed designing distinct semi-structured interviews as each stage had different objectives (Table 4.3). As such, the nature of each stage of data collection is reflected in the nature of the interview questions' design (the interview schedule is included in Appendix B).

Therefore, the interview series was strategically crafted to align with the distinct objectives of each phase. The initial set of interviews laid the foundation by collecting vital participant information, fostering a trust-based rapport, and understanding both the firm's history and the personal attributes of the participants. The questions sought personal introductions, backgrounds, the business's history before and during incubation, team formation and dynamics, task distribution, equity arrangements, and the incubator's influence on team evolution.

In the second series, the inquiries were sharpened to complete the narrative initiated previously, emphasising the transformations and progress since the inaugural interview.

The final series continued this trajectory, aiming to capture the growth and scaling stages, including international expansion and the incubatees' readiness for post-incubation success, with a focus on the founding team's response to these shifts and the incubator's contributory role. This comprehensive approach was reflected in queries about team updates, incubator involvement, and eliciting feedback on a provided summary diagram, culminating in a gesture of appreciation for the year-long engagement.

Factors influencing the formulation of interview questions across the three rounds	The first round of data collection	The second round of data collection	The third round of data collection
The nature of questions based on the round's purpose	Foundational	Follow-up and clarification - more concentrated and specific	Follow-up and clarification - directed towards specific issues
The way the interview questions keep pace with the nature of the round	The questions in this stage addressed the basic information about the participating incubatees and advisors, besides the incubator as a context.	The questions in this stage addressed the developments and changes of the tech incubated team since the first round.	The questions in this stage focused on specific issues related to the impact of growth and expansion on the tech incubated teams and preparation for graduation from the incubator.
Key themes of each interview round	This round focused on getting to know the team members and their backgrounds, the history of the business and its stage at the time, the dynamics within the founding team, their roles, task distribution, equity shares agreement, the decision to join the incubator, the changes experienced during the incubation, and the role of the incubator in team development and social processes within the team.	The second interview revisited the team's early days through a summarising diagram and sought comments on it. It then delved into the current state of the team, the changes and developments since the last interview, and the incubator's involvement in these processes.	Similar to the second, this interview used a diagram to summarise the team's journey and asked for comments. It further explored the current team dynamics, the changes since the last meeting, and the incubator's role. The session concluded with a note of gratitude for the three meetings over the year and an opportunity for additional comments from the interviewee.

Table 4.3: The Factors Influencing the Formulation of Interview Questions Across the Three Data Collection Points

(Source: Researcher's own

4.7.2 Pilot Interview

After designing the interview schedule and before each round of data collection, the interview questions were piloted. An initial pilot interview for the first round was conducted after the final interview questions were drafted, checked by PhD supervisors, and approved by DCU's Research Ethics Committee (REC). This pilot interview was conducted with one of the twelve cases. The interviews were conducted using Zoom (video call) before the Riyadh trip. The primary purpose of using a pilot interview in this research was to refine the interview questions, figure out what ways were best for pursuing the questions, achieve eligibility, and estimate how much time and resources would be necessary to complete the subsequent rounds (Rowley, 2012; Roulston and Choi, 2018).

The pilot interviews conducted from Ireland before the Riyadh trip using Zoom led the researcher to three essential conclusions:

1. The questions themselves did not change, but some questions relating to sensitive issues for the team, such as conflict, leadership, and assignment of tasks, needed redrafting. The researcher decided instead of asking, "could you tell me how your team deals with disagreement?" to a more acceptable format such as "usually most teams go through stages of disagreement and many debates before agreement is achieved, in relation to your team's experience, can you reflect this?
2. The researcher must build trust and develop empathy with participants while simultaneously avoiding over-empathising with participants.
3. The time taken was approximately 120 minutes for each interview.

Upon reaching Riyadh for the first round of data collection, two face-to-face pilot interviews were conducted with one of the incubator advisors and one of the team founders. The purpose of these interviews was to ensure that the previous conclusions resulting from the first online pilot interview were correct and could be applied to face-to-face interviews.

4.7.3 Semi-Structured Interviews

The four different methods used to collect data across all three rounds are now discussed. Table 4.4 illustrates each method (semi-structured interviews – focus groups- informal discussions- non-participant observations) and the purpose of each (i.e., the role of each method in the data collection).

Semi-structured interviews fall between a structured interview and an unstructured interview (Brinkmann, 2014). Semi-structured interviews were selected in this research as the means of data collection because of two primary considerations. First, they are well suited for exploring the perceptions and opinions of respondents regarding complex and sometimes sensitive issues and enable probing for more information and clarification of answers (Knox and Burkard, 2009). Second, they are well suited for dealing with the sample group's various professional, educational, and

personal data heterogeneity (Rowley, 2012). The questions were formulated according to three factors: the first factor is the availability of previous knowledge in the literature on technology incubation and entrepreneurial teams. The second factor concerned the researcher's insight into the knowledge (Guba and Lincoln, 1994). As such, the researcher builds key questions that relate to the team's story from the beginning; then the decision to join the incubator; after that, how the team's story evolved within the context of the technology incubator, with significant attention given to the involvement and role of the incubator in this story. A pre-prepared interview guide was used in the three rounds of data collection; this guide aimed to ensure the interview retained focus besides enabling them to be completed in the required frame (Kallio et al., 2016). The interview guide offered a map for the researcher to follow. As such, the guide helped the researcher over the three rounds of data collection to keep questions clear by using unambiguous language. This method also helped the interviewees to understand the questions thoroughly. Thus, the primary purpose of delivering clear questions lies in enabling transparent data collection (March and Shapira,1987).

The third factor according to which the questions were formulated by applying CR realism to the participants' interviewing, the approach to an interview is the 'teacher–learner' style. This approach refers to the interviewee being cast as the expert or 'teacher'. In contrast, the interviewer is the learner, which allows asking questions to progressively refine, deepen, and re-formulate their understandings of how the ET form and evolve during incubation in the context of the TBI and why and how interventions of TBI regarding their teams' issues are effective. The researcher, consequently, can develop different theories (scenarios) about how and why the intervention (involvement of the TBI during the team formation and evolution) might work and present these to the interviewee (See the interview schedule; Appendix B). This often occurs through a series of 'why' questions related to the interviewee's experience. The interviewee is asked to comment on the researcher's developed theory and scenarios based on their own real-world experience and teach the interviewer about their own theories and stories about the subject. This is a very different approach to other interview studies (e.g., grounded theory) as the interviewer is very open about their own ideas and seeks to learn from the participant's experience.

Open questions were used for the data collection given that the nature of the research was interested in the how's and whys, such as "tell me about" and "give me an example". These sorts of questions can provide the researcher with a good deal of information about the formation and evolution dynamics processes of incubated entrepreneurial teams and the incubator's role in this regard. There were also some specific questions (see interview schedule in Appendix A) such as "what do you think about" and "how you do that (relating to the team)" and some probing questions, when appropriate as probing questions help to explore deeper meanings (DeMarrais, 2004).

Method	The method nature in the research	Its role in data collection Its importance in data collection
Semi-structured interviews	This method consisted of a dialogue between the researcher and participants, guided by a flexible interview protocol and supplemented by follow-up questions, probes and comments.	This method allows the researcher to collect open-ended data, to explore participants' thoughts, feelings and beliefs about tech incubated team formation and development within the incubator and the role of the incubator in this regard. Moreover, delving deeply into related personal and sometimes sensitive issues.
Focus Group	This method consisted of asking the participants questions in an interactive setting (e.g., the meeting rooms of incubator). Participants were encouraged to discuss their thoughts freely with other participants. This type of open and free discussion generated ideas and a wealth of information for the researcher.	This method contributes to obtaining information that the participants may not readily depart with in the interviews. Focus groups facilitates information flows in the form of discussion. This approach allowed for an in-depth discussion of the incubator's actual potential and contribution to building the incubated entrepreneurial team and to the role of the incubator in this regard.
Non-participant observation	Non-participant observation in this research involved observing the participants without actively participating. This option was used to understand the research issues by entering the community of the participants involved in the research while staying separate from the activities being observed. This typically happened during the participants' usual activities	This method mainly assists the researcher in observing the social issues that take place in the incubated teams involved in the research. Such social issues are the social interaction that takes place between the participants during events related to the incubation and development of the incubatees, especially team building. In addition to observing the impact of demographic and non-demographic factors on the team's operations during their daily activities in the incubator.

	within the incubator, such as meetings with advisors, or team members to discuss project matters.	
Informal discussions	The informal discussions captured in this research indicates no set rules or wording, i.e., free and frank exchange of information between the researcher and the research participants.	This method (informal discussions) helped the researcher to enhance transparency and to improve communication with the participants, thus encouraging the participants to share information that is difficult to discuss in the context of interviews or focus groups. Such issues were related to conflict, and dealing with it, thereby transforming into cohesion. Additionally, issues related to shared cognition were all discussed.

Table 4.4: The Nature of Using Research Methods and their Role in Data Collection

4.7.5 Focus Groups

A focus group is "a group comprised of individuals with certain characteristics who focus discussions on a given issue or topic" (Anderson, 1998, p.241). A focus group usually consists of a small group of people, usually between six and nine in number, who are brought together by the researcher (as a trained moderator) to explore attitudes and perceptions, feelings, and ideas about a particular topic (Denscombe, 2014). As such, the focus groups allow researchers to study people in a more natural conversation pattern than typically occurs in a one-to-one interview (Morgan and Spanish, 1984). Another advantage is that focus groups can be used as an occasion for participants to learn from each other as they exchange ideas and build views. Hence the participants could experience the research as an enriching encounter. This counteracts the extractive nature of research which seeks to "mine" participants for data (with no benefit for them) as criticised by various scholars (Romm, 2014).
In summary, focus groups in this study served as a crucial method for gathering collective insights and understanding group dynamics, which were integral to addressing the research questions, especially in the context of a longitudinal study. The information from focus groups complemented the data from other methods, contributing to a holistic understanding of the entrepreneurial teams' evolution, the role of the incubator, and the social interaction processes within the incubator environment.

4.7.6 Non-Participant Observation

Non-participant observation entails observing participants without actively participating (Cooper et al., 2004). This option is used in this research to understand a team phenomenon by entering the teams' communities or their social systems (represented by the incubator environment). At the same time, the researcher stayed separate from the activities being observed (Saunders et al., 2009b). Non-participant observation is often employed in tangent with other data collection methods. It can offer a more "nuanced and dynamic" appreciation of situations that cannot be as easily captured through other methods. (Liu and Maitlis, 2010, p. 4). The process of observation in this research follows a three-stage funnel:

- beginning with descriptive observation, in which the researcher carries out broad scope observation to get an overview of the setting.
- moving to focused observation, in which the researcher starts to pay attention to a narrower portion of the activities of most interest.
- then selected observation, in which the researcher investigates relations among the elements selected as being of greatest interest (Spradley, 2016).

The observation ends when theoretical saturation is reached, and further observation add little to the researcher's understanding (Liu and Maitlis, 2010).

4.7.7 Informal discussion

Informal discussion (informal interviews) can help build a rapport with respondents, thereby acquiring their trust and understanding of the purpose of the research. Informal discussions foster 'low pressure' interactions and allow respondents (participants) to speak more freely and openly. In addition to semistructured interviews, the researcher conducted informal discussions, talking with incubatees, consultants, and advisors in the incubator informally, without using a guide and without scheduling formal meetings and in undesignated places. These informal discussions often occurred in the canteen and the open planned areas of the incubator (Moeller et al., 1980). The researcher kept research memos from the research context, detailing all interactions, interviews and observations. These informal interviews and non-participant observation contributed to an understanding of the context and team development within the incubator environment (Christensen, 1980).

4.8 Data Collection Rounds

Data were collected from the BADIR Riyadh incubator over 12 months and included three rounds of data collection at three different data collection points (See Figure 4.8). Table 4.5 shows the total number of interviews, focus group, informal discussions, and non-participant observations conducted by the researcher during each round and over the three rounds with the participants, whether incubatees or advisors. Through the entry permit obtained from the BADIR head of program management, the researcher had the opportunity to spend a month in each round. Therefore, the researcher spent the entire period full-time inside the incubator in each round.

Data collection method	**The first round of data collection**	**The second round of data collection**	**The third round of data collection**	**Total**
Interviews	35	31	32	98
Focus Group	3	2	3	8
Informal Discussion	5	3	2	10
Non-Participant observation	2	1	1	4

Table 4.5: The Volume of Data Collection Per Method during the Data Collection

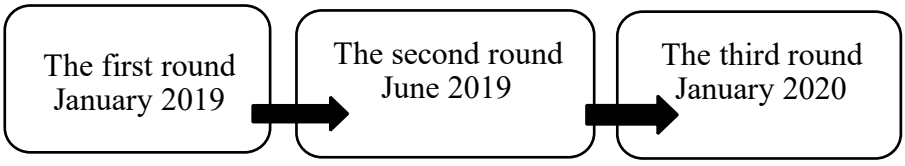

Figure 4.8: The Rounds of Data Collection at Three Different Data Collection Points

(Source: Researcher's own)

4.8.1 The First Round of Data Collection

The first round of data collection was in January 2019. As mentioned earlier, this round was foundational for the subsequent rounds, which had implications for the nature of the questions asked and the interaction with the participants. Moreover, as a foundational round, the first round required intensive efforts by the researcher, with such efforts associated with understanding the context of research, (i.e., the technology incubator). The key challenges associated with this round of data collection are detailed in Table 4.6)

The researcher conducted the main interviews with the participating incubatees, either teams or solo entrepreneur. Additionally, the researcher conducted interviews with the incubator advisors who worked with and regularly monitored the participating incubatees in the second stage of the incubation program of BADIR. The main interviews were organised with the participants via phone/email. This was usually scheduled a week or two in advance. Telephone contact made it relatively easy to communicate with the participants, who agreed to be interviewed in their offices or meeting rooms in the incubator. Participants (incubatees and advisors) were provided with a copy of the consent form, which they signed. They were also assured that the interview was being conducted according to DCU's Research Ethics Committee (REC) guidelines and that the interviews would be confidential. This round included in total 35 interviews with the participants, whether incubatees or advisors (as Table shown
4.5). 33 of the 35 of these interviews were with the incubating participants, while 3 were with the participating advisors who supervising the incubating participants in their stage. The duration of these interviews ranged between 60 and 80 minutes and took place in offices or meeting rooms.

In addition to the interviews, the researcher conducted three focus groups: two focus groups with participating incubatees and one with participating advisors. These focus groups provided a unique opportunity for the discussion of key issues. Such key issues included the extent to which the participating incubatees accepted the incubator's intervention or role in their issues and an explanation of what and how this intervention, role, or engagement occurred. Focus group sessions typically spanned between 45 minutes to an hour, though there was an instance where the discussion continued for a full two hours. These sessions were conducted in the incubator's meeting rooms.

During the initial round of data collection, it was observed that focus groups served as a more conducive setting for discussions that participants were hesitant to engage in during one-on-one interviews. The hypothesis was that a collective discussion might encourage team members to share information more openly, especially when it came to sensitive subjects.

This method proved particularly useful for family entrepreneurial teams like Al Jawhara and Thabet. Thabet's team treated the distribution of roles, family considerations, and equity shares as negotiable, in contrast to Al Jawhara's team, which saw these issues as non-negotiable. A focus group was organised for these teams to discuss these topics openly. The incubator's advisors were

also invited to participate in the session. The focus group enabled both teams to engage in transparent discussions about the management roles within family entrepreneurial teams and the solutions they had found for resolving issues related to equity shares. The exchange of legal solutions and experiences during the group discussion provided additional insights that were not revealed in the interviews. The incubator's advisors added value to the discussion by offering advice based on the teams' dynamics and their own professional experiences. They also shared their knowledge on governance and control in family businesses, thus contributing to a deeper understanding of the unique challenges faced by family-run teams within the incubator.

Moreover, throughout the interview process, it was observed that several entrepreneurial teams (ETs) hesitated to discuss issues that arose when team members' personalities did not align or when an individual was deemed unsuitable for a designated role. Such misalignments had the potential to precipitate changes in team composition. While the teams led by Faisal and Mubarak were forthcoming in addressing these concerns, Omar’s team exhibited a reluctance to engage in such discussions.

However, the implementation of a second focus group facilitated a more open dialogue among the teams, which proved instrumental in revealing that certain impediments to restructuring decisions could stem from personal relationships, such as the profound and enduring friendships observed within Omar’s team. The involvement of the incubator’s advisors in this focus group contributed significantly, as they offered both advice and shared their professional experiences. This exchange prompted Omar’s team to articulate concerns they had previously withheld, leading to a richer understanding of their internal team dynamics and the realisation that open communication could enhance their collective development within the incubator environment.

In the third focus group, Mubarak's team expressed concerns regarding the perceived inadequacies in the incubator's support concerning leadership roles within their team. In response to these concerns, I convened a focus group discussion that also included Ryan's team, who held a dissenting view on the incubator's role. The juxtaposition of these perspectives during the focus group session facilitated a robust exchange of experiences. Incubator advisors were present during this dialogue, which led to Mubarak’s team articulating a series of recommendations to enhance the incubator's involvement. One significant proposition from Mubarak’s team was the incorporation of guest lectures by prominent figures from successful technology ventures, which would provide additional guidance and inspiration to the incubatees.

The researcher also conducted informal discussions with participating incubatees and advisors in the incubator’s open areas and canteen, which enriched the collected data. Conversations during informal discussions were shorter, ranging from 10 minutes to 30 minutes. These took place in more relaxed venues within the incubator, such as the prayer hall, the cantina, and other open areas.

Informal discussions revealed that participants were more inclined to discuss certain topics candidly when not being recorded and in a more casual setting. This was particularly true for conversations about personal perspectives and experiences.

For example, when discussing the incubator's role in recruiting new team members, Al Batoul TM1 was reserved during formal interviews, providing only general comments. However, in a more relaxed setting, Al Batoul TM1 was forthcoming about her reservations regarding the incubator's methods, indicating potential disagreements with their approach.

Additionally, it was observed that many teams were hesitant to discuss the nuances of their internal interactions during structured interviews. Through informal discussions with members from the teams Sumoud, Mubarak, Ryan, and Omar, insights were gained about how these interactions could potentially influence the future structure of the team. These conversations allowed for a more nuanced understanding of team dynamics and the various factors influencing team cohesion and strategy.

Likewise, the researcher conducted four non-participating observations. Those observations were conducted during the courses provided by the incubator and by attending some meetings of the participants with their advisors. Observations of non-participants were made discreetly, carried out in the incubator's offices and specialised function rooms dedicated to this purpose. Non-participant observation affords the researcher the opportunity to directly witness events and behaviours, enabling objective judgments and the study of non-verbal communication. This method allows researchers to remain detached and less prone to emotional bias, potentially resulting in more objective data collection. Moreover, it facilitates the researcher's inconspicuous presence, encouraging natural behaviour among subjects.

For instance, during observations, it was noted that Al Jawhara TM1's performance in her role was influenced by familial dynamics, particularly the presence of her father. This non-participant observation during an operational meeting revealed that Al Jawhara TM2, her father, did not exercise the power and authority his role entailed, due to family considerations. In another case, observation provided insight into the incubator's discussions with Al Batoul TM1 about team formation and the processes involved. Attending these meetings as an observer allowed for a clearer understanding of the incubator's role in team dynamics.

Additionally, the Sumoud team's efforts to establish effective internal communication were observed. The team's meetings and their discussions with other incubated teams provided a view of how the incubator facilitates knowledge sharing among teams, using its internal resources to foster community and collaboration within the entrepreneurial ecosystem.

Therefore, the researcher reduced the potential for retrospective bias by matching interviews and focus groups data with the non-participant observation and informal discussion data.

4.8.2 The Second Round of Data Collection

After six months, the second round was conducted in June 2019, whereby the researcher used the same methods to collect data as in the first round. The researcher found that the second round different from the first round in that the participants were more willing to share more details with greater transparency. The participants in the second round narrated all changes that had occurred since the first round. The purpose of the second round was reflected in the nature of the questions, as they were focused on issues of evolution, change, and team building. As such, the participants shared information relating to their teams and their contact with the incubator. The researcher spent a considerable amount of time inside the incubator during the second round. However, this round also coincided with a set of challenges (as mentioned in Table 4.6).

In this round, three case studies withdrew (one solo entrepreneur and two teams) from the sample because they left the incubator and thus could not participate in this research (as per sampling criteria). According to their pseudonym's names in this research, they are (Fahd and Hamad teams in addition to the solo entrepreneur Areej; Table: 4.1). This round comprised 31 interviews in total: 27 with the participating incubatees and 4 with the participating advisors. The majority present from the first round, in addition to the newly joined members. The duration of the second-round interviews was shorter than the first round and averaged fifty-five minutes. The researcher also used this round to ask the participants for their views on the accuracy of the first-round interpretations, thus validating the data (Morse, 1991). This was through some diagrams provided by the researcher that explain the scenarios extracted from the first round (See Appendix C). This round also consisted of two focus groups, three informal discussions and one non-participation observation (Table 4.5). Focus groups were condensed to 50 minutes, informal discussions to 15 minutes, and non-participant observations to 20 minutes.

The second rounds of data collection acted as a continuation and deep dive into the themes identified in the initial round, particularly focusing on the development of team composition and the social processes within teams. The methodology in the second round included encouraging team members to visually map out the progress and changes in team dynamics that had been deduced from the first round. This collaborative sketching of the team's evolution, which was included in the appendices, offered a more engaging way for interviewees to communicate their experiences and developments.

The focus groups in the second round were targeted to extract deeper insights on specific issues that surfaced during interviews. For instance, the topic of bolstering women in leadership roles was explored with Al Jawhara and Warda teams. A focus group brought together women leaders from these teams along with incubator management to discuss the empowerment of women leaders, examining the mechanisms, objectives, and challenges involved.

Additionally, there was an extensive dialogue regarding the professionalisation of roles within teams and the incubator's contribution to this transformation. A focus group was convened to

explore this further, with attendance from team members, incubator management, and advisors. This session was especially focused on generating actionable recommendations based on the discussions.

In the second round, informal discussions were instrumental in addressing changes in team structures, such as the dynamics of splitting teams, departing members, and the integration of new individuals. It was recognised that these sensitive topics were often not addressed with full candour during formal interviews. However, casual settings like the canteen, prayer hall, and open areas of the incubator provided a backdrop where these issues could be discussed more openly. Teams like Thabet, Mubarak, Yamen, and Omar highlighted the significance of constructive conflict within the team context, acknowledging it as an inherent part of everyday interactions. Yamen's team, recognising the value of transparency in research, granted permission for non-participant observation during various intervals of a typical workday, thus offering a direct view into the team's operational dynamics.

4.8.3 The Third Round of Data Collection

Six months after the second round, the third round was conducted, in January 2020. This final round resembled the second round in terms of the data collection methods. A total of 32 interviews: 29 of them were with the participating incubatees, while three of them were with the participating advisors. This is in addition to three focus groups and one informal discussion. The researcher had the opportunity to include additional one non-participant observational instances, such as forums held by the Small and Medium Enterprises Authority in Saudi Arabia. At this stage in the research, the researcher had obtained the trust and had built the effective relationships necessary to collect all the required data. However, the researcher was met with a single challenge represented by the independence of some of the participating incubatees from the incubator regarding consultations and intervention. Therefore, the researcher occasionally had to meet them outside the incubator.

The first focus group examined leadership transitions within entrepreneurial teams, exploring the causes and consequences, and considering potential solutions. The second group discussed the interpersonal dynamics of team members and how stronger relationships between some could impact the team's overall structure. The third group tackled the challenges and implications of members leaving and new members joining the teams. The informal discussion round also emphasised the influence of rapid organisational growth on team formation and the social dynamics within the teams, as well as the incubator's overall role during the incubation process concerning team structure and social interactions.

Additionally, for non-participant observation, the Warda and Al Jawhara teams facilitated the researcher's attendance at a meeting with the CEOs of two tech ventures that had successfully graduated from the incubator. This engagement was part of the incubator's initiative to support the role of female leaders within its entrepreneurial community.

4.8.4 Audio Recordings and Transcriptions

For each round, all interviews and focus groups were digitally recorded with the participants' permission. This gave the researcher an opportunity to capture the information with a high level of accuracy. Also, the researcher took notes during non-participation observations and informal discussions. All recordings were in Arabic, with some expressions spoken by the participants in English. After each round, the researcher transcribed the recordings in Arabic and then translated them into English and reviewed them again with the recordings. The researcher took these precise measures to reduce the incidence of errors in the transcriptions, to reduce ambiguity and confusion, and thus ensure the integrity of the data.

4.9 Data Analysis

Once the initial data was obtained after each round of data collection from the semi-structured interviews, focus groups, and transcribed, the data analysis began. This section illustrates the approach used to analyse the data collected. To achieve this objective, the researcher began with an in-depth analysis of each case through the lens of the research questions:

Round of data collection	Nature of this round	Key challenges
1	This round is considered foundational in terms of getting background information on which the subsequent rounds are built.	1- Initially participants were slow to divulge information, however as confidence grew (revolving around ensuring the confidentiality of the data) the participants were more willing to engage in more open discussions.
2	The nature of this round is more focused, the researcher in this round no longer addresses general information but rather focuses on the development issues of the teams and what has happened since the first round.	This round was accompanied by a set of challenges revolving around: 1- The withdrawal of two teams Fahd and Aseel in addition to the solo entrepreneur Areej (Table 4.1). 2- As a result of the development and building of some participants' teams, some members had withdrawn, and it is one of the sensitive issues that was not deemed desirable to discuss. 3- As a result of building some teams, new members joined, which necessitated studying these new members in depth and from scratch, which took up additional time. 4- As a result of moving some of the participating incubatees to the third stage of the incubation program in the incubator, this resulted in the inclusion of new advisors in the sample which required them to be studied in depth besides implementing previous procedures to build effective relationships and trust.
3	The nature of this round differs from the previous rounds in terms of directing the participants to specific issues.	The only challenge that the researcher encountered in this round was related to the fact that some of the participating incubatees had started to become more independent of the incubator (not physically), but in terms of the incubator's intervention. As a result, the information provided by the participating advisors in this round was less detailed compared to the previous one.

Table 4.6: The Nature of the Data Collection Rounds and Associated Challenges

4.9.1 Analytical Strategy for this Research Using the Constant Comparative Method

Data analysis for this thesis followed Maykut and Morehouse (2002) 'Constant Comparative Method'. The constant comparative method is concerned with reconstructing data into a "recognisable reality" along with the researcher's own interpretations (Corbin and Strauss, 1990, p.22). To achieve this, responses are not grouped according to pre-defined categories or schematics; rather the first stage in the process is to gather salient categories and relationships between categories as they emerge from the data itself, through a process of inductive reasoning. The method offers the researcher a process that allows the interrogation of participants' own words in a manner that facilitates the structured explanation of social situations. Following analysis and interpretation of data, categories are labelled using propositional statements which are statements designed to capture the essence of the category they represent, using the language of the participants themselves. This unique approach of using propositional statements in the language of the participants stays most true to the action research ethos of allowing the voices of participants to come through the data. As Maykut and Morehouse (1994) indicate: "words are how most people come to understand their situations; we create our world with words; we explain ourselves with words; we defend and hide ourselves with words" (p. 427). Thus, in qualitative data analysis and presentation: "the task of the researcher is to find patterns within those words and to present those patterns for others to inspect while at the same time staying as close to the construction of the world as the participants originally experienced it" (p. 18).

4.9.2 Characteristics / Defining Features of Qualitative Research

This qualitative research is based on a critical realism position which is a holistic approach that acknowledges that "the world is constituted by the objects of actual (and, sometimes, possible) experiences" (Bhaskar,1998, p. 6). Interestingly, part of Bhaskar's thought for contexts within which human experiences occur are thus concerned with learning from instances or cases, meaning understanding of human and social action as "open." Furthermore, critical realism necessitates a reflective examination of the complexities of interactions (Bhaskar, 1998). Qualitative research seeks to access the inner world of perception and meaning making to understand, explain, describe, and social processes from the perspective of study participants (Fossey et al., 2002). As such, this approach does not commence with a prior hypothesis to be tested and proved.

Nevertheless, it commences with a focus of inquiry that takes the researcher on a voyage of discovery (Silverman, 2020). This takes an inductive approach to data analysis. Research outcomes are not broad generalisations, yet contextual findings. Qualitative researchers tend to speak of 'transferability' (from context to context) rather than generalisability (Silverman, 2020).

4.9.3 Constant Comparative Method: Overview of Process

The nature of qualitative research dictates that during data collection, open questions are asked to the participants, who are given the opportunity to express their experiences and what they feel frankly and spontaneously (Morgan, 1996). This format, enables the researcher to analyse the data while identifying interactions among boundary decisions and to find connections among emerging categories, leading to the specific patterns of decisions that emerge from the data. Furthermore, it facilitates cross-case analysis (Hammel et al., 2008), whereby the insights that emerge from each case are compared with those from other cases to identify consistent patterns and themes, using inductive reasoning (Eisenhardt and Graebner, 2007). Categories undergo definition and content changes as units and incidents are compared and categorised to understand the categories' properties. The relationships between categories are refined and developed throughout the analytical process. According to Taylor and Bogdan (1984), "in the constant comparative method the researcher simultaneously codes and analyses data in order to develop concepts; by continually comparing specific incidents in the data, the researcher refines these concepts, identifies their properties, explores their relationships to one another, and integrates them into a coherent explanatory model" (p126). The constant comparative method allows the researcher to access and analyse these articulated perspectives (Boeije, 2002).

4.9.4 Using Qualitative Data Analysis Software

To give clarity to the coding and analytical processes, Qualitative Data Analysis Software Nvivo 12 was used (See Appendix E: an example of the coding process). NVivo 12 was used to document and manage the coding (i.e., a document and coding management system). Discussions of computer-assisted qualitative data analysis software (C D) in social science research studies are still few and isolated (Kikooma, 2010). However, it is stressed that using qualitative data analysis software does not mean that the researcher yields the hermeneutic task to the logic of the computer (Woods et al., 2016). Conversely, the computer is used as a tool for efficiency and not as a tool that in and of itself conducts analysis and draws conclusions (Talanquer, 2014). Fielding et al. (1998) notes that qualitative researchers "want tools which support analysis but leave the analyst firmly in charge" (p167). Importantly such software also serves as a tool for transparency. There is a perception that the qualitative research process is not always presented in a way that is transparent (Bringer et al., 2004) or rigorous (Richards, 2002) as compared to its quantitative analysis counterpart. To overcome this perception, qualitative scholars demand an explicit inclusion of a 'transparency' mechanism attached to all research processes as an integral aspect of quality (Lune and Berg, 2017). For instance, as Bringer et al. (2004) argue, NVivo screen captures can be used to maximise transparency when communicating research findings. They can also be a way to demonstrate the consistent use of software, thus allowing others to evaluate the research accurately. Moreover, it is a technique that captures the research process as it unfolds within NVivo and ensures the appropriate data is used, the inquiry is thorough, and the best possible outcome is achieved.

Hence, it is argued that the production of an audit trail is the key most essential criteria on which the trustworthiness and plausibility of a study can be established (Morse et al., 2022).

4.9.5 Data Analysis Stages and Process

As detailed in Figure 4.9, the analysis was dependent on nine discrete cycles under four general headings defined by Maykut and Morehouse (1994). These cycles involve three separate cycles of coding: two cycles of managing codes; one for initial categorisation of open codes and one for data reduction through consolidating codes into a more abstract theoretical framework, and three, which uses writing as a tool to prompt deeper thinking of the data (Bazeley, 2009) leading to findings from which conclusions may be drawn. Some of the managing coding cycles also involve additional coding. Maykut and Morehouse (1994) illustrate this process in the following way: The expansive process of categorising data is analogous to fully pull apart the folds of the accordion, which is necessary for the eventual harmonic synthesis to occur. Like an accordionist, the researcher methodically pulls apart the meaning contained in the data, enabling him or her to eventually reconstruct the important melodies contained in the phenomenon being studied. (p. 138)

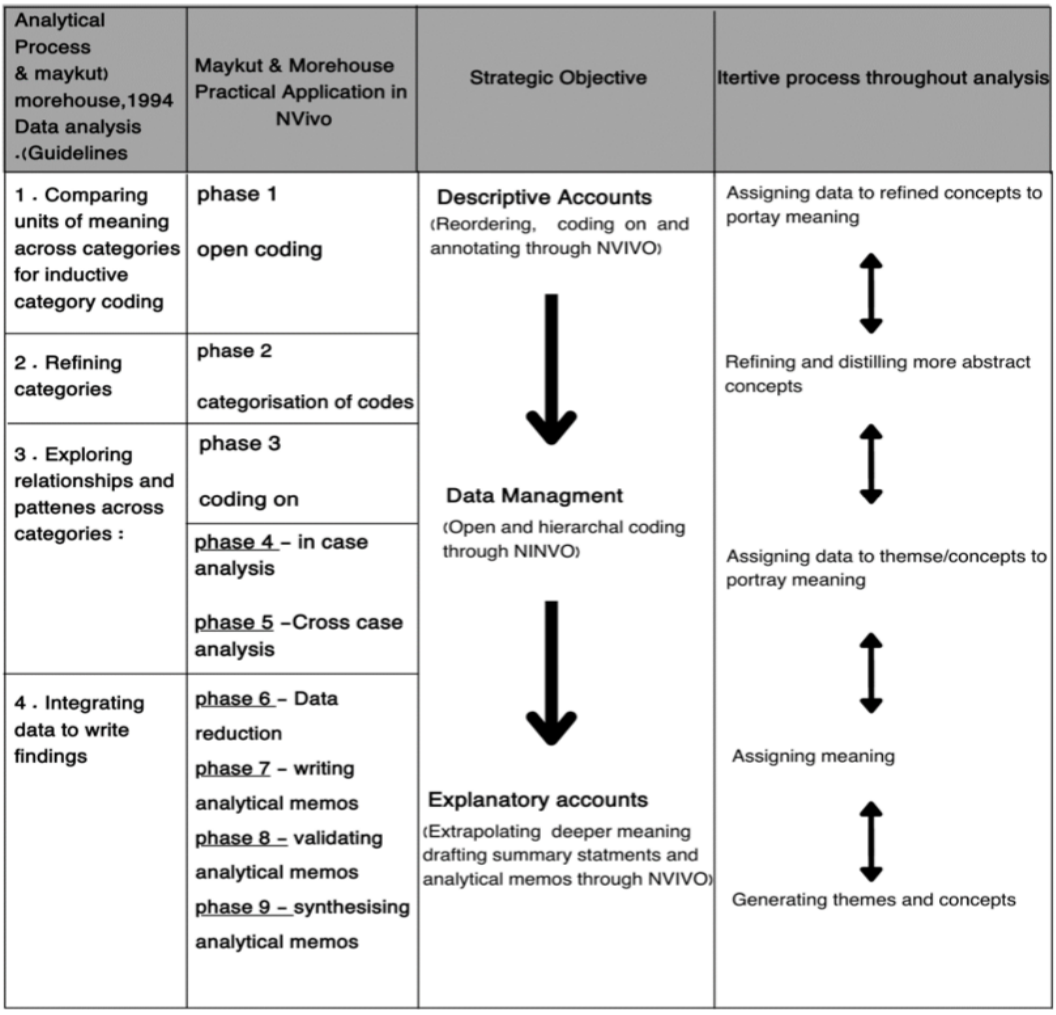

Figure 4.10: Analytical Hierarchy to Data Analysis

(Source: Adapted from Maykut and Morehouse, 1994, p.18)

Phase 1 – Open Coding involved participant-driven descriptive 'open coding' or deconstruction of the data from its original chronology. This was undertaken by coding participants' interviews to initial codes labelled and defined and grouped or clustered under cases.

Phase 2 – Categorisation of Codes the initial codes identified in phase 1, were reorganised, re-labelled, aligned, distilled, merged, and clustered under broader categories of codes. This was to reconstruct the data into a framework of codes that makes sense in terms of furthering the analysis and is relative to the study's focus of inquiry. **Phase 3 – Coding** qualitative codes for 'coding on' was identified the restructured codes into sub-categories to fully understand the meanings embedded in these categories. This phase was more interpretive, and researcher led as it sought to develop themes embedded in the data.

Phase 4 – In-case analyses – this was undertaken by analysing all emergent themes and sub-themes as developed in previous phases according to each case in the 'network' to initially examine and report on a case-by-case basis.

Phase 5 – Cross case analysis – involved a comparative analysis of all emergent themes and sub-themes as developed in previous phases considering all cases in the 'network' to report on similarities and differences between cases.

Phase 6 – Data Reduction – involved consolidating codes from previous coding cycles into a more abstract, philosophical, literature-based and researcher-led conceptual framework or map of themes and their relationships to each other for reporting purposes (Buzan, 1993).

Phase 7 – **Writing analytical memos** against the higher-level codes to accurately summarise the content of each category and its codes and propose empirical findings against such categories (Richards, 2005). These memos consider five key areas:

1. The content of the cluster of codes on which it was reporting.
2. The patterns were relevant (levels of coding, for example, although this could be used to identify exceptional cases as well as shared experiences)
3. Consideration of background information recorded against participants and considering any patterns concerning participants' profiles.
4. Situating the code(s) in the storyboard –meaning considering the relatedness of codes to each other and drawing and describing inferences, and their importance to addressing the research question and sequencing disparate codes and clusters of codes into a story or narrative, which was structured and can be expressed in the form of a coherent and cohesive chapter.
5. Consideration of primary sources in the context of relationships with the literature besides identifying gaps in the literature to facilitate a discussion of the study's findings.

Phase 8 – **Validating analytical memos** involved testing, validating, and revising analytical memos to self-audit proposed findings by seeking evidence in the data beyond textual quotes to support the stated findings and expanding on deeper meanings embedded

in the data. This process involved interrogating data and considering elements beyond the category, drawing on relationships across and between categories and cross tabulating with demographics, observations, and literature. This phase resulted in evidence-based findings as each finding must be validated by being rooted in the data itself and relied on the creation of reports from the data to substantiate findings.

Phase 9 – involved synthesising the analytical memos into a coherent, cohesive, and well-supported set of findings.

4.10 Chapter Summary

This chapter explains the philosophical underpinnings and the methodological stance taken by this research to address the two main research questions. It also outlines the study sample and discusses several methodological considerations of the data collection and research design. A multiple case study based, qualitative research strategy was selected, studying high tech entrepreneurial team building in the technology incubator as one of its prime micro-processes. A longitudinal research design was used, conducting three rounds of data collection at three different data collection points over 12 months. The chapter concludes with an explanation of the data analysis protocol adopted.

Chapter 5: Cross-Case Analysis, Findings and Discussion

5.1 Overview of the Structure of the Findings and Discussion Section (Chapter 5-6)

To provide the most comprehensive answers to this study's research questions, the analysis and discussion section has been organised into two distinct chapters. First, Chapter 5 is designed to address research questions 1 and 2. It focuses on three key themes related to entrepreneurial team formation: the Initial Creation/Formation of Entrepreneurial Teams (Theme 1), Membership Changes within Entrepreneurial Teams (Theme 2), and Identifying Faultlines within Entrepreneurial Teams (Theme 3). This chapter is followed by a discussion of these themes, structured in two parts: the formation of entrepreneurial teams and the role of the incubator in entrepreneurial team formation processes.

This is followed by Chapter 6, which mainly focuses on research questions 3 and 4 by looking at three social interaction processes identified in the literature review that have the most substantial impact on entrepreneurial team evolution: the initial allocation and professionalisation of roles, leadership transitions, and conflicts within teams. Following this analysis, the chapter engages in a discussion of the findings regarding the internal social challenges that entrepreneurial teams encountered during the incubation period and how specific social processes, as well as the role of the incubator in them, influenced their formation and evolution.

It is important to note that since all research questions are closely aligned and mainly focus on the evolution and development of ETs during the incubation period, sections and findings overlap at times.

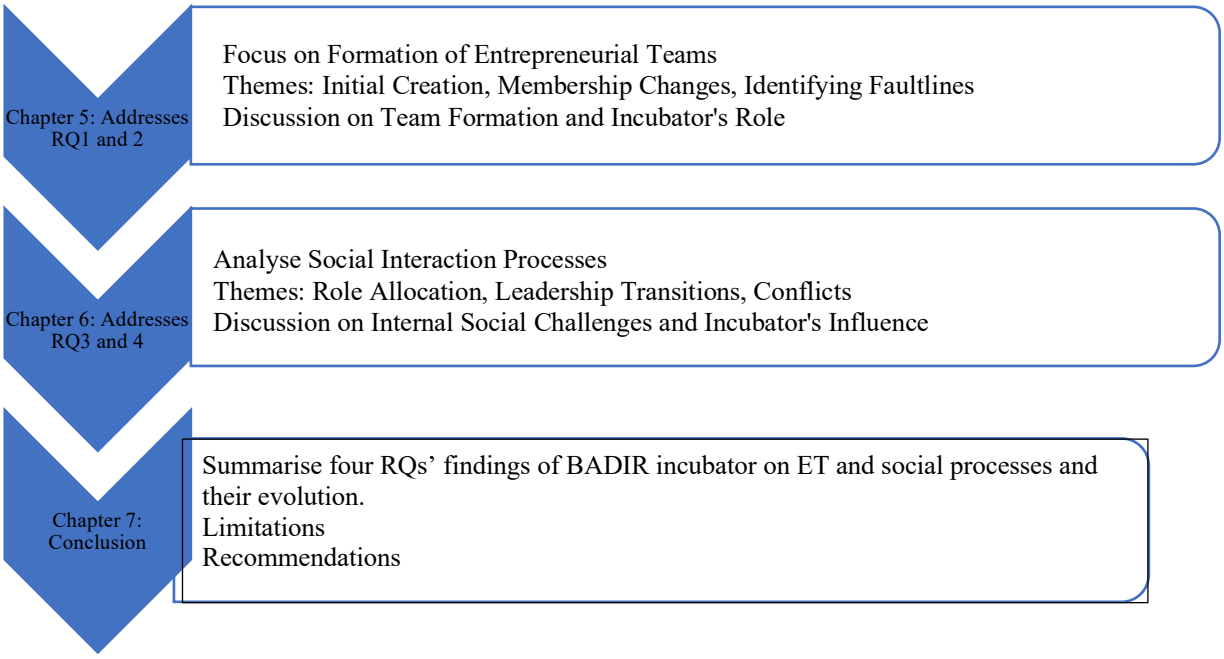

Figure 5.1.: Overview of the Structure of the Findings and Discussion Section

(Source: Researcher's Own)

5.2 Cross-Analysis' Findings of the ET's Formation

This chapter presents the findings of first two research questions:

(R1) How does the composition and structure of entrepreneurial teams evolve over the incubation period?

(R2) What role does the incubator play in influencing the evolution and dynamics of entrepreneurial teams?

The cross-analysis studies the twelve entrepreneurial teams under three themes relating to ET formation: Initial Creation/Formation of ET (Theme 1); ET Membership Changes (Theme 2); and Faultlines in ETs (Theme 3). This is followed by a discussion of the three themes, divided into the general entrepreneurial team formation and the role of the incubator in ET formation processes.

Three formation dynamics appeared in twelve teams under investigation (Table 6.1). The new formation/creation of the team appeared in Ryan team. The ET membership changes appeared in seven cases, including the team members exit and addition. The faultlines in ETs appeared in two cases.

1st order codes	2nd order codes	Aggregate theoretical dimensions	Cases
- Group with an idea - The ET at the idea stage - Seeking to seize the opportunity	The origin of the ET	**1st Initial Creation/Formation of ET**	Ryan
- Acceptance/realisation of the need to create a team - The model of the ET's initial/new creation process - Transforming the team into an entrepreneurial team – pursuing an opportunity	Creating the ET		
- Unhealthy conflict over interests as an antecedent of members' departure (1) - The amicable exit routes of members (2) - Member's personal circumstances as an antecedent of members' departure (1) - Unhealthy affective/interpersonal conflict over relationship and personalities as an antecedent of members' departure (1) - Gradual escalation of conflict leading to the alienation of the members (1)	Departure of entrepreneurial team members	**2nd ET Membership Change**	Mubarak Yamen Al Jawhara Al Batoul Warda Aseel Alanod
- Speed up the procedures of re-formation (2) (With the presence of investors and the lack of competencies) - Team re-formation process (2) - Positive effect and feeling at the team level after member's departure (1) (Harmony, consistency, and convergence around a common vision)	The consequences of members' departure		
Mobilising resources, a motivator for adding a new member (4) - Retaining control, a motivator for adding a new member (1) - Responding to external stakeholders' needs (VC) as a motivator for adding a new member (2) - Looking forward to social participation as a motivator for adding a new member (2) - A structured and formal process for adding a new member (2) - A categorical refusal of co-founding (3) - Shifting to complete acceptance of adding a new member, driven by multiple motivators (3) - Structured and formal process for adding a new member (4)	New members' addition		
- Dormant Faultline based on multilabel demographic attributes (1) - Dormant Faultline based on a combination of demographic and multilabel non-demographic attributes (1) - Dormant Faultline based on a combination of demographic and non-demographic attributes (1)	Dormant Faultline	**3rd Faultlines in ETs**	Omar Faisal
- Faultline activation by the trigger: status and commitment to firm (1) - Faultline activation by the trigger: restructuring of roles in response to the investor (1)	Triggers of Faultline activation		
- Faultline activation by the trigger: adopting a new approach to work (1)	Activated team faultlines		

- The nature of the sub-team's work: residence in countries of expansion and development of tech products (1) - The nature of the sub-team's work: focusing on welcoming the change (1) - The nature of the sub-team: developing new products based on their technological background) (1)			
- Positive feeling at the team level based on feelings of satisfaction (2) - Improving the quality of decisions (1) - Improving team performance: productivity (1) - Positive feeling at the main team level based on feelings of fairness (1) - Positive feeling at the main team level based on achieving harmony (1)	The positive impact of the subteam's emergence		

Table 5.1: Coding of the first research question

(Source: Researcher's Own)

1st order codes	2nd order codes	Aggregate theoretical dimensions	Cases
- Granting conditional incubation acceptance with team building bootcamp attendance - Pre-contract meeting to clarify all aspects of the partnership - Ensure all the signed legal procedures and contracts are in order - Authorising the incubator to complete all official governmental procedures	The advisory role of the incubator to create the new team	**1st TBI's role in the Initial Creation/Formation of ET**	Ryan
- The incubator's attempts to retain the ET before disbanding (1) - Moral/emotional support for the first founders when disbanding their teams (2) - Delegating the incubator to complete all official and legal procedures on behalf of the team during ET's disbanding (2) - Utilising the social networks of the incubator during the team re-formation process (2) - Utilising the embedded knowledge of the incubator during the team reformation process (2) - Delegating the incubator to complete all official and legal procedures on behalf of the team during re-formation of the team/new members' joining (2)	TBI's role in the consequences of the members' departure	**2nd TBI's Role in ET Membership Change**	Mubarak Yamen Al Jawhara Al Batoul Warda Aseel Alanod
- Founder's acquiring/ absorbing the guidance to add a new member (intensive mentorship) (6) - Advisors urging the founders to strengthen networks to find a member (3) - Delegating the incubator to complete all official and legal procedures on behalf of the team (7) - The advisors chairing pre-joining meetings and negotiations with the new member (1) - The incubator's admission committee's role in identifying vacant roles and required competencies (4) - The advisors' involvement with the founder in the search for a new member (1) - Solo founder's acceptance of co-founding by absorbing incubator's training knowledge (1) - Solo founder's acceptance of co-founding by feeling of reassurance because the procedures will be under the supervision of the incubator (3) - Solo founder's acceptance of co-founding by absorbing peer experiences (through interactions) (3) - Solo founder's acceptance of co-founding by absorbing incubator's training knowledge (2) - Utilising the events held by the incubator to find potential new members (2) - Upholding the incubator's advice for the specifications set by the team for the new member) (1) - Ongoing advisors' urging the founder to add a member during mentorship meetings (1)	TBI's role in new members' addition		

- Empowering female talent as a sub-team (1) - Incubator-paid professional consultations: focusing on the need to maintain healthy communication at the main team level (1) - Incubator advisor's involvement in pre-sub-team emergence settlements (1) - Encouragement of the team by the incubator's advisors to keep cooperation at the main team level (1)	TBI's procedures for the emergence of the sub-team	**3rd The TBI's Role in the Sub Team's Emergence**	Omar Faisal

Table 5.2: Coding of the second research question

(Source: Researcher's Own)

5.2.1 Theme 1: Initial Creation/Formation of ET

Cooney (2005) refers to the team's initial creation as a meeting of team members to start their firm together. Lazar et al. (2020) emphasise that the initial creation of the entrepreneurial team is related to the meeting of the members at the early stage, associated with the sparking of the idea and the creation of the minimum viable product (MVP) and prototypes of the products. The change of membership is a part of the later team formation dynamics (Patzelt et al., 2021). Of the 12 cases, team initial creation occurred during the period of incubation in just one instance – Ryan is the only team created during incubation. For the other cases, instances of the joining and departure of members entrepreneurial are captured in theme 2: Membership Changes.

5.2.1.1 The Origin of ET

The interview data suggests that the most appropriate characterisation of the initial Ryan team, consisting of Ryan TM1 and Ryan TM2, was a group with an idea. The idea resulted from a long-term friendship with an entrepreneurial intention that led to many discussions about firms and the market.

"We had created the idea together; it was not momentary. It is the result of a continuous lifestyle of us as friends. Our whole life is discussions, thinking, analysis… It has always been our intention to start a business." [Ryan TM2, captured by the first round of data collection].

After creating the initial idea, the incipient founding team of Ryan sought to take steps in the ideation stage. Engaging in these details led the Ryan team to realise their own inadequacy, which led them to the incubator.

"We had a brainstorming session. For example, we tried to answer questions: Are we solving a problem? Who exactly? We had tried to discuss the idea with those around us… We felt very helpless about, for example, studying the market. I undoubtedly told my friend (Ryan TM2) we need a guide... The incubator immediately came to our minds because we were attending some entrepreneurial events and were hearing about them." [Ryan TM1, captured by the first round of data collection]

5.2.1.2 Creating the ET

Following the admission phase and interview with the incubator's admission committee, the idea developed from merely an idea to a clear roadmap of how to seize the opportunity.

"One of the unforgettable moments of my life. The committee discussed with us for two hours professionally in deep detail. They drew a road map for us to move the idea to another place… They

encouraged us and said it is a good opportunity but needed clear goals and a plan of action." [Ryan TM2, captured by the first round of data collection].

The first step in the roadmap towards seising the opportunity was to create a minimum viable product (MVP). This required technological competencies, which led Ryan's initial founding team to be convinced of the need to form a team by adding a Chief Technology Officer (CTO).

"We realised that we really needed a technological arm, and, without it, it would be impossible to do anything. We do not have sufficient financial resources to employ talents in this field... Yes, we realised that the only solution was the presence of a new member as the CTO." [Ryan TM1, captured by the first round of data collection].

After the Ryan team was convinced of the necessity to create a team, the group, consisting of Ryan TM1 and TM2, engaged in a structured process. The data from the interviews describes the processes involved in initial creation/formation of the team. The processes seemed structured, and this is the result of the influences the incubator management and advisors. The incubator's role revolves around creating for the founders a logic for adding a member. While Ryan TM1 and TM2 were united under the logic of "let us be a team and start our business", the addition of the new member, Ryan TM3, required the acceptance of the logic that exploiting the firm opportunity required specific skills within the ET.

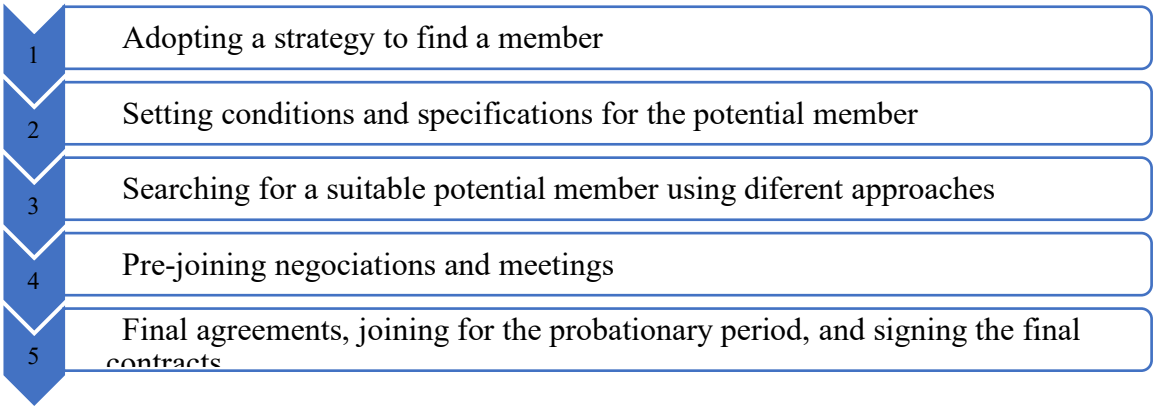

Figure 5.2.: The Initial Creation/Formation of ET

(Source: Researcher's Own)

The first action in the team creation process was to build a specific strategy to find the new member. While the primary goal of Ryan TM1 and TM2 was to find a technological member with professional competencies, they had concerns about who they could trust. As such the ET's strategy can be described as a hybrid strategy, combining two search strategies: resource-seeking and interpersonal attraction strategies (Lazar et al., 2020).

"Yes, it was a conditional decision. In addition to being a competent person, we must know and trust him... We need to work with someone we can get along and agree with." [Ryan TM2, captured by the first round of data collection].

The Ryan team's second action was to draw up the criteria for selecting a new member:

"We drew up a list of the qualifications for who will hold the position… He must be a professional programmer, good follower of tech trends..." [Ryan TM1, captured by the first round of data collection].

After the Ryan founding team determined the selection criteria, they began an extensive search. Consequently, they selected a close old friend who has experience and competencies as a professional computer programmer (Ryan TM3).

"We searched extensively around us... Finally, we decided on Ryan TM3 because he is the most qualified... Importantly, he is an old friend who has shared many experiences with us; he studied with us in the United States." [Ryan TM1, captured by the first round of data collection].

After Ryan TM3 was selected to be the CTO, the next step was on-boarding, which included pre-joining discussions and negotiations.

"Yes, we met a lot to agree on all the details before we formally and finally signed the contracts." [Ryan TM2, captured by the first round of data collection].

These interviews and discussions preceding the joining phase had a role in the final agreements for Ryan TM3 joining. Therefore, the fifth and final action was drafting agreements and Ryan TM3's formal entry into the business.

"We made contracts, signed them in here in the incubator, and our journey began." [Ryan TM2, captured by the first round of data collection].

5.2.1.3 The Incubator Role in Initial Creation/Formation of ET

The incubator played a prominent role in the initial creation/formation of the Ryan entrepreneurial team. The data from the interviews, focus groups and informal discussions captures the role of the incubator. This is summarised in five dimensions. Overall, the incubator provided formality and structure to the process.

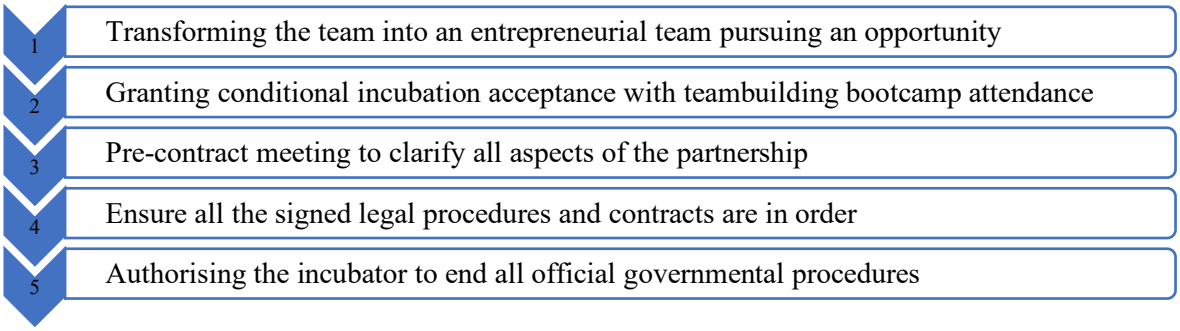

Figure 5.3.: The incubator role in initial creation/formation of ET
(Source: Researcher's Own)

The incubator's admission committee played a prominent role in turning the Ryan group into an entrepreneurial team pursuing the opportunity. They convinced Ryan TM1 and TM2 that creating an effective team and firm depended on filling gaps in the ET. In this case the gap related the technological aspect of the firm and specifically the need to add a CTO.

"During the discussion with the admissions committee, they said although the idea is good, it is not everything. The real challenge is in executing and seising the opportunity correctly... They concentrated on team formation by adding a CTO... We were good listeners... We were convinced, of course, all the feedback made sense." [Ryan TM1, captured by the first round of data collection].

"One of the committee members drew on the board a graph of a team with clear roles that build you a real entity... and so on." [Ryan TM2, captured by the first round of data collection].

After the acceptance committee succeeded in persuading Ryan TM1 and TM2 to pursue the firm opportunity, they began giving the methods/means and a roadmap for the ET to move forward. The first of these was attending the training camp/boot camp for building the entrepreneurial team.

"They gave us a conditional acceptance to be an incubatee here by attending their training event in the boot camp on building the entrepreneurial team. They were very persistent about it, and we were excited because it was definitely a good opportunity for us to learn." [Ryan TM1, captured by the first round of data collection].

The data shows that the Ryan team completed the boot camp on building the entrepreneurial team with a decision to form an ET and with the conviction and knowledge to form a team.

"At the end of the camp, Ryan TM1 and I were constantly discussing who would be our member in this position. We decided to start searching... We came back here to start the incubation program with Ryan TM3." [Ryan TM2, captured by the first round of data collection].

After offering Ryan TM3 the co-founder position and commencing pre-joining negotiations and discussions, it was time to clarify all matters related to the co-founding. It appeared that Ryan TM3 felt that the presence of the incubator in this regard would provide trust in the procedures.

"They (Ryan TM1 and Ryan TM2) had told me that they had a conditional admission to the incubator... The presence of the incubator in these procedures made me feel reassured... During the final agreement, I asked my partners to arrange a meeting with the incubator to explain to us all aspects… We came here (the incubator) and met Advisor 3. He explained everything to us. I was happy with this; such consultations with an incubator are high cost." [Ryan TM3, captured by the first round of data collection].

Finally, when it was time to finalise the official procedures, the Ryan team came to the incubator to utilise the legal services/department of the incubator.

"We completed all the legal procedures here with the legal department ... They told us they could finish all the governmental and official procedures on our behalf, so we delegated to them... They also paid the company's establishment fees two years in advance, which is great." [Ryan TM2, captured by the first round of data collection].

5.2.2 Theme 2: ET Member Changes

Findings from this study are also in line with previous research on entrepreneurial teams showing that team compositions are constantly evolving and changing. The data analysis of interviews and informal discussions shows two entrepreneurial teams, Mubarak and Yamen, experienced the departure of some of their founding team members. In addition, seven of the entrepreneurial teams in this study, Omar, Aseel, Yamen, Al Jawhara, Al Batoul, Alanod, and Warda, added new members to their teams during the incubation phase. Data from the interviews and focus groups documents the dynamics concerning the departure or addition of members, in addition to the role of the incubator in both of these processes.

5.2.2.1 Departure/Exit of Entrepreneurial Team Members

Previous research on entrepreneurial team members' exits affirms that the departure of members is the result of antecedents on of the three levels: the individual, the team, or the organisation (Gregori and Parastuty, 2021). The data from the interviews and informal discussions indicates that the antecedents (causes) that led to the departure/exit of the members from the Yamen and Mubarak teams were conflict (Mubarak case) or personal circumstances (Yamen case).

In the Mubarak team, which initially consisted of five members at the beginning of their incubation period, a conflict of interests led to the exit/departure of four members (Mubarak TM2, TM3, TM4, TM5). The conflict in the Mubarak team, between Mubarak TM1 and the other four members, stemmed originally from heterogeneity in commitment, productivity, and lack of agreement on strategic directions.

"So, we started; the matter was not as easy as imagined. They all were part-timers, and I am the only one here, full time ... The investor came quickly through the incubator with the first client. The work began; everything became clear. I was working 24 hours while my partners only worked 2 hours per day... the work fitness was not equal; I mean the productivity... Our conflicts and quarrels intensified; we could not tolerate each other. They decided to leave, and I stayed. That was after I explained to them our vision and our direction." [Mubarak TM1, captured by the first round of data collection].

Data from interviews, informal discussions and focus groups on the Yamen team identified the exit

of two members at two different time periods (captured during the first and third rounds of data collection). The first exit of a team member was of Yamen TM2, who was one of the initial founding members of a team consisting of just two members (Yamen TM1 and Yamen TM2). Yamen TM2 left due to personal reasons: he preferred the security of other available job opportunities.

"At the beginning of incubation... Yamen TM2 told me he did not want to continue working in a start-up. Here (in the incubator), he realised the matter's seriousness. He wanted a job that would give him job security... His initial joining was a temporary solution to his unemployment." [Yamen TM1, captured by the first round of data collection].

Later, after Yamen TM1 reformed the team, the team experienced affective conflict about equity stakes that was characterised by interpersonal conflicts (relationships/personality clashes) between Yamen TM3 and TM4. This led to Yamen TM4's departure (captured by the third round of data collection).

"As soon as we started, he had a fierce debate about raising his equity stake, and because it was not acceptable, I got angry; hence, our endless conflicts began." [Yamen TM3, captured by the third round of data collection].

"He (Yamen TM4) started complaining that (Yamen TM3) is bossy; loves to interfere and control every detail. He told me that he did not feel comfortable with Yamen TM3… I justified to him that we are perfectionists... Anyway, the conflicts between them were beginning to float up." [Yamen TM1, captured by the third round of data collection].

The data from informal discussions also captures that the crystallising and escalation of these conflicts over time led to significant repercussions for the team. This is represented in the members' alienation from one another, which eventually led to Yamen 'M4's withdrawal.

"He (Yamen TM4) was showing his resentment continuously. After three weeks, I was persuaded that we could not work together… One day, we were in a discussion, our manner changed towards an unacceptable direction. A week after that conflict, he (Yamen TM4) sent an email asking us to break up the partnership." [Yamen TM3, captured by the third round of data collection].

When it was time to depart, the interviews and informal discussions data show the exit route in Yamen and Mubarak. It was evident that both teams concentrated on a peaceful exit of the members so that their exit was amicable. This was because the teams were careful to protect their reputation in the incubator and the Saudi entrepreneurial community:

"We tried to end this peacefully and with minimal losses. We are in a small tech entrepreneurial community in Saudi Arabia. Indeed, our real assets are our reputation, which would be affected by the spread of some negative news. So, we were careful… He requested all his dues and received them." [Yamen TM3, captured by the third round of data collection].

5.2.2.2 The Consequences of Entrepreneurial Team Members Exit

Following the members' departure, data from the interviews, focus groups and the informal discussions documents the consequences of departure in both teams. Consequences of founder ET member exits included attempts in both teams of the first founders, Mubarak TM1 and Yamen TM1, to re-form the teams, and in the Yamen case, a positive team spirit was again evident in the Yamen team after 'M4's departure. Where the exit of a founding team member occurred early in the firm's period of incubation, the data suggests that there was a sense that it was important that the teams reformed quickly. This urgency was due to the presence of investors and due to the need to resolve the loss of specific competencies within the team:

"…I promised the investor that I would build the team again ASAP." [Mubarak TM1, captured by the first round of data collection].

"When Yamen TM2 left, we were in a difficult phase; we just started to say to the market, "We are here". His withdrawal was a dilemma, but I did not force him to stay … I focused on finding an efficient alternative quickly." [Yamen TM1, captured by the first round of data collection].

A second consequence of a co-founder exit was the re-emergence of a positive team spirit. This was evident in the Yamen team after the departure of Yamen TM4. This was demonstrated by the harmony, consistency, and convergence around a shared vision, as Yamen TM4 had seemed far from the team's vision and direction:

"Perhaps Yamen TM4's departure allowed us to re-evaluate everything... We are now more in tune and consistent... We quickly have got around a new common vision." [Yamen TM3, captured by the third round of data collection].

The actions seemed structured and formalised, with the incubator playing a major role. This more structured approach to team re-formation contrast with how these team were initially formed. In both cases, Mubarak and Yamen, the teams' initial creation was less structured – the creation of the Mubarak team was based on "let us be a team and start our firm"; while for the Yamen team, the founder, Yamen TM1, searched for a co-founder who was known and trusted, regardless of his skills and competency. In contrast, when re-forming the team, following a co-founder exit, the founders, Mubarak TM1 and Yamen TM1 insisted on reforming their teams deliberately, seeking to achieve a founder-market fit.

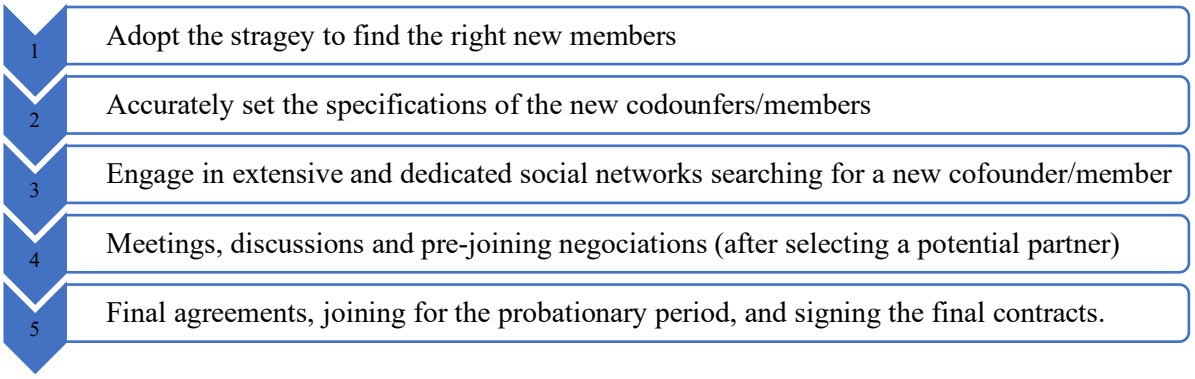

Figure 5.4.: The Entrepreneurial Team Re-Formation Process

(Source: Researcher's Own)

New members' specifications were then carefully profiled to ensure successful team re-formation and a sustainable team. This was based on determining the functional positions accurately. Hence, there was an intensive search by the first founders Mubarak TM1 and Yamen TM1 for new potential new members compatible with the previously set conditions by engaging in intense social networking.

"From my disappointment last time, I pledged myself that I will not work with part-timers anymore... I was very strict this time… That experience also taught me the speciality of the partner who is supposed to join; I need a financial professional to raise funds." [Mubarak TM1, captured by the first round of data collection].

"I started creating relations here (in the incubator) and talked to all the incubatees. Fortunately, I spoke with Mubarak TM1, he had gone through the same experience, and he presented me with the perfect guide." [Yamen TM1, captured by the first round of data collection].

After searching and finding a potential new member, it was time for the pre-joining meetings and negotiations. In addition to delving into work details, the founders appeared to focus on eliminating any sources of future disagreements.

"… My friends let me down last time; I had to be cautious. We had eight interviews lasting for three hours, and I had examined Mubarak TM6 in all respects on a personal and professional level. Most importantly, will he leave his full-time job as a lecturer to join me; he also made a complete plan to raise funding." [Mubarak TM1, captured by the first round of data collection].

"I was examining carefully if there was anything that would make us quarrel later…" [Yamen TM1, captured by the first round of data collection].

Finally, the final agreements were established, and then the addition (joining) procedures, including the signing of contracts and the imposition of a probationary period.

"After these meetings, we agreed that there would be three months' probationary period… We had to live together before finally committing. We signed the temporary contracts and got to work." [Yamen TM1, captured by the first round of data collection].

5.2.2.3 The TBI in ETs' Members' Exit Consequences

In both cases (Yamen and Mubarak), the incubator management and advisors intervened with the teams during the period of possible co-founder exits and then during the ET re-formation. Before the Mubarak team was dissolved, the founders had endeavoured to preserve the team and the incubator's management and advisors were involved in attempts to maintain the ET team. These efforts were unsuccessful.

"Yes, they (the incubator's management and advisors) had tried hard to convince us to stay as one team. They talked to us collectively and individually… They concentrated on our business, and the team had a promising future. They reminded us that investors may not be happy about this… This did not work; they (members) insisted on leaving..." [Mubarak TM1, captured by the first round of data collection].

"True, we had tried to fix the matter, but to no avail... Our role is to preserve teams and firms to survive and succeed." [Advisor 1, from the focus group, captured by the first round of data collection].

When the members insisted on exit, it was a difficult time. The incubator's management and advisors provided moral/emotional support to the first founders and completed all legal formalities on behalf of the teams.

"They supported me morally; I felt frustrated and upset after my partners left... They encouraged me to build my team again, avoiding my previous mistakes with my last team." [Mubarak TM1, captured by the first round of data collection].

"I authorised the incubator to complete all legal procedures." [Yamen TM1, captured by the first round of data collection].

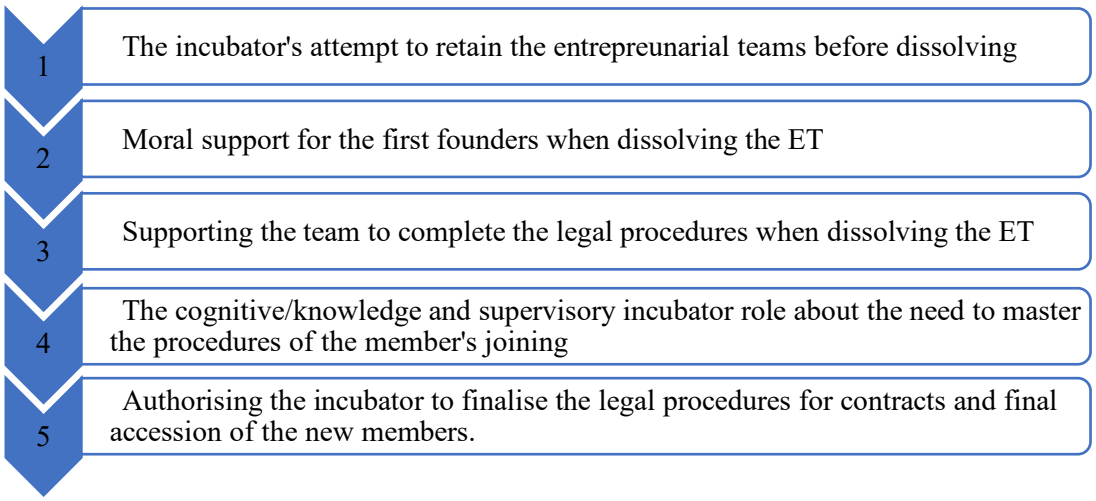

Figure 5.5.: The Incubator Role during ET's Re-Formation

(Source: Researcher's Own)

As seen in Figure 6.4, when the first founders, Mubarak TM1 and Yamen TM, began reforming their teams, they accessed the networks developed within the incubator (an intangible incubator resource). Yamen TM1 took advantage of the social networks in the incubator to find a new member, Yamen TM3. Interestingly, Yamen TM1 found the new member through his network with Mubarak TM1, who shared the successful experience of re-forming his team.

"I was striving to build good connections with the incubatees here... So, I met Mubarak TM1… I strengthened my relationship very much with him, and he has helped me a lot. He shared with me in high transparency his experience of disbanding his team and reforming... He told me in many discussions about his friend who had just returned from the United States and had excellent experience. He worked for a start-up in Silicon Valley and offered to introduce me to him." [Yamen TM1, captured by the first round of data collection].

Finding a potential new member was followed by pre-joining meetings that included detailed negotiations and discussions, which the founders preferred to do independently of the incubator. The role of the incubator here seemed to be represented in the knowledge and advice that the founder Yamen TM1 had absorbed on the necessity of the provisions of these procedures.

"All the advisors and incubatees here were concentrating on the importance of the probationary period... I was also keen on it, and I strived for a sustained team this time." [Yamen TM1, captured by the first round of data collection].

With the final agreement, all the legal and official formalities of both teams were delegated to the incubator.

"Everything was done here in the incubator, the incubator drafted contracts, and we signed here and then and authorised the incubator to finish the official procedures ... The incubator paid us the company fees for the next two years." [Mubarak TM1, captured by the first round of data collection].

5.2.2.4 Addition of New Members to ETs

As previous research by Lazar at al. (2020) has shown, entrepreneurial team composition is constantly changing, and members are not only often added during the initial formation of ETs but also at later phases such as during the launch and selling of products. This data confirms the constantly evolving nature of entrepreneurial teams, as in seven different cases (Omar, Aseel, Yamen, Al Jawhara, Al Batoul, Alanod, and Warda) new members were added to teams, often at different stages for different reasons.

Three of these seven, Al Batoul TM1, Alanod TM1, and Warda TM1, were solo incubatees who initially categorically rejected the addition of new members in the admission phase (evidenced in the first round of data collection). Later, these founders accepted the need for new skills and resources and added new members (captured by the second and third rounds of data collection). Data

from interviews, informal discussions, and the non-participant observations explain the rationale behind the rejection and then the conversion to acceptance. The data reveals three reasons for their initial refusal: retaining total equity stake; fear of the risks of partners and partnership; and belief in individual heroism:

"I do not want to share the equity with anyone; I've paid everything. I started lonely from scratch and came a long way." [Al Batoul TM1, captured by the first round of data collection].

"I want the whole cake for me, and I have a phobia of partners and teams. I have had two unsuccessful experiences… I never want to repeat them, I am not ready." [Alanod TM1, captured by the first round of data collection].

"I succeeded in my previous start-up without a team; I fought all the battles alone... I will succeed this time, alone too." [Warda TM1, captured by the first round of data collection].

These individual founders accepted the necessity of adding new members for three reasons: overcoming liabilities, retaining control, and mobilising resources. These reasons seemed to reflect the stage of growth and the accompanying challenges.

"I have faced obstacles like big waves with growth... I was about to surrender… I had no options available except to add the members… The competitors were surrounding me and tightening the noose around me. I was looking for someone to drive the boat with me to safety." [Al Batoul TM1, captured by the third round of data collection].

However, these reasons for adding members were not limited to these three founders who started without a team, they were also reasons for the addition of members in the other cases. These other cases also highlighted additional reasons for adding team members as: responding to external stakeholders' needs and looking forward to social participation.

"Naturally, with growth progress, the need for new competencies and filling gaps appears, especially in sising opportunities. As a start-up, it is not only money that makes us add members, but because we want someone to fight with us to survive and succeed. Only a member will do this, I am sure." [Al Jawhara TM1, captured by the second round of data collection].

"In all my recent negotiations with investors, they asked me about the team. Of course, they see that I have a deficiency." [Aseel TM1, captured by the second round of data collection].

As a result of these motives for adding a team member, the process of adding members began. Six of the seven cases (Yamen, Al Jawhara, Al Batoul, Alanod, Omar, and Warda) that added a member during the incubation phase followed a formal and structured approach. Although procedures presented below appears structured and elaborated, in reality, it is based on logic, rather than complex procedures. The role of the incubator revolves around the formulation of these sequential procedures in the form of a guide. Such guidance is derived from the experiences of previous incubatees in building their teams. The procedures simply depended on answering such questions as, "Whom do

we need? Why do we need this person? What does the person who will fill this vacancy look like? How do we find this person? If we find them, how can a person be persuaded to join? What are the legal procedures involved in joining?"

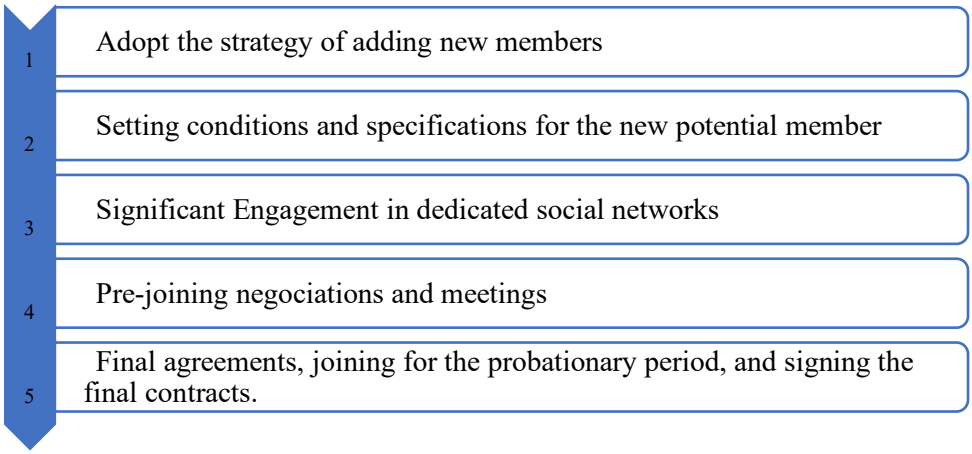

Figure 5.6.: The New Members Addition Process

(Source: Researcher's Own)

The first action in adding new members was to identify a strategy for identifying and selecting a new member – either a focus on resource-seeking or a focus on interpersonal fit. Al Jawhara, Yamen, and Warda adopted a resource-seeking strategy. This necessitated prioritising filling the gaps in competencies and resources at critical stages of growth. In contrast, Alanod, Al Batoul and Omar adopted a hybrid strategy of simultaneously combining a resource-seeking strategy with an interpersonal attraction strategy to ensure interpersonal fit. In light of the defined strategy, specifications were drawn up for the new members/members.

"It was important to be an exceptional talent." [Al Jawhara TM1, captured by the third round of data collection].

"All our financial matters are messed up; a co-founder who is not close to us will ask a thousand questions... While the close friend trusts us, he will not check much... We were also concentrating on being with a distinct business mentality." [Omar TM2, captured by the first round of data collection].

"After what I went through, I wanted to feel safe… I was keen to match our personalities and minds." [Alanod TM1, captured by the third round of data collection].

For ensuring the success of adding the new members, the founders got involved in social networks to search for members based on the specifications that they had set out.

"Oh, no room for ad firm… We immersed ourselves in wide social networks… Only the right person was supposed to attend. Successful social networks were the only way that could get us this right person." [Al Jawhara TM1, captured by the third round of data collection].

After selecting the members, the cases were involved in pre-joining meeting.

"Many meetings and negotiations, we delved into all the details, even the brand's font… I did my best to understand her well. How does she decide… and how does she react? Before that, how did the firm proceed from A to Z? This took months; it was not an easy matter…" [Al Batoul TM2, captured by the third round of data collection].

The last action appeared after these steps, which is the final agreement, the signing of contracts, and the start of the probationary period.

"We had reached a satisfactory agreement, we shook hands, we signed, and I said to Al Jawhara TM3, 'welcome to your company', this was the beginning of the probationary period." [Al Jawhara TM1, captured by the third round of data collection].

5.2.2.5 The Role of the TBI in the Addition of New Members

It was evident that the incubator made efforts with the first solo founders, Al Batoul, Alanod, Aseel and Warda, via the admission committee at the admission phase. The admission committee's perception of the firm's milestones identified the gaps and suggested filling them with the required competencies via members. The three solo founders Al Batoul, Alanod, and Warda initially rejected these proposals.

"They (the admission committee) delved into all the details, asking about the challenges… I honestly shared what I suffered in a field completely dominated by men. They literally do not accept females. Also, I told them I needed their help drawing the strategic direction because I am too weak in this… So, they suggested a man to be a professional strategist to be the CEO and best presenter of the firm in an area dominated by culture, customs, and traditions that do not accept women; in a field reserved for men... I did not accept that." [Al Batoul TM1, captured by the first round of data collection].

During the incubation phase and as the firm progressed through stages of growth, the idea of adding members became more attractive to the solo founders (captured by the second and the third round of data collections). Data from interviews, focus groups and non-participant observations shows multiple factors in the incubator played a major role in this change in perspective. First, the incubator's advisors constantly suggested adding members during mentorship sessions. Second, interactions with other incubatees who had similar experiences through the incubator's social networks played a role. Third, the ETs were exposed to consultants, training, coaching and the online resources on the incubator website that suggested ETs are part of the 'success formula' for NTBFs. Fourth, the founders developed a sense that the incubator's involvement in adding members would ensure success.

"Of course, all my convictions have changed after incubation, and I have accumulated experiences to make my business a success... Yes, I decided to transfer the operation manager [role] to a member with full conviction... Every time I met the advisors here, they examined the situation

and asserted that I must have a partner... Literally, everything was saying I needed a partner." [Alanod TM1, captured by the third round of data collection].

"Yes, I felt brave enough when I made this decision, and I overcame all my fear because I was reassured that the incubator was by my side… I heard a lot here from the incubatees about the importance of teams and their experience. Further, I have learned that it is a basis for success in courses and with consultants." [Al Batoul TM1, captured by the third round of data collection].

Overall, it was evident in the six cases, Omar, Al Jawhara, Al Batoul, Alanod, Yamen, and Warda, that by following the guidance of the incubator on how to add members, the process within the ETS was more formal and structured. This guidance was considered part of the acquired knowledge included in the incubation programs or through interaction with the incubatees and the incubator staff.

"Two things in the incubator have a guide that everyone exchanges here. The guide for adding members and team building, and the guide for attracting investments and entering investment rounds… It is a guide you can hear from incubatees, management, advisors, consultants, and even the website's resources. It is a conclusion of experiences and stories." [Yamen TM3, captured by the third round of data collection].

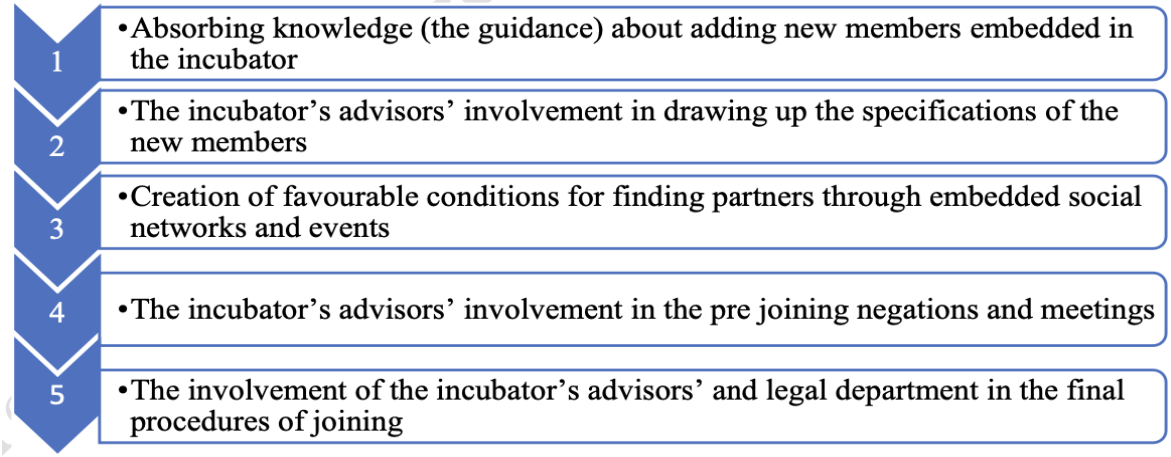

Figure 5.7.: The Role of the TBI during the Members' Addition Process

(Source: Researcher's Own)

The first stage of adding new members concerns setting conditions and specifications for the new members. The incubator advisors involved themselves extensively in this with Al Batoul TM1.

"Advisor 1, Advisor 4, and I have discussed this step continuously. I was so afraid of this decision, and I was looking forward to unlimited support and assistance... We have written in detail what skills, experience, qualifications the member must have to build my team correctly... We wrote together about how the partner would commit to what his contributions are supposed to be... We outlined the partnership agreement… I am happy with this." [Al Batoul TM1, captured by the third round of data collection].

In the Omar team, the incubator's advisors upheld the specifications set by the team for the new member.

"Simply, they agreed with what we planned. They said it is in our best interest to find a close person because our financial matters are not attractive." [Omar TM2, captured by the third round of data collection].

In the second stage of adding new members, the search by the founders and the incubator for potential members, the incubator's advisors' involvement was evident. The advisors encouraged the founders, Al Jawhara TM1, Al Batoul TM1, and Warda TM1, to strengthen their networking.

"As they did with me in my previous incubated firm... They encouraged me to meet people interested in the same field by registering for peer-to-peer and online training courses... Attending entrepreneurial events and paying for all tickets... They introduced me to entrepreneurs working in the same direction." [Warda TM1, captured by the third round of data collection].

Interestingly, the incubator's advisors began searching for potential new members of Al Batoul TM1 through their own networks.

"Advisor 3 and Advisor 5 posted the vacancy through their social media platforms and own networks to reach potential partners for me." [Al Batoul TM1, captured by the third round of data collection].

Moreover, to find potential new members, the founders utilised events held by the incubator, such as job fairs, seminars and workshops and open discussions available to all interested outside the incubator and graduates.

"I am lucky to be an incubatee here; when I decided to attract someone to join me seriously, there were several options. They provided me with CVs, and I attended job fairs here … I attended the incubator's meetings of those wishing to be co-founders in the incubated firms... I attended XX and XX (names of entrepreneurial events) paid by the incubator." [Alanod TM1, captured by the third round of data collection].

"I met all the successful alumni here at the incubator. I was looking for a new member during these networks." [Yamen TM3, captured by the third round of data collection].

Besides regular trainings and workshops organised by the incubator, there was a course dedicated to finding the right member.

"By following up on emails from the incubator... I registered in XX course about building teams... I learned a lot, of course, especially how to choose the right partner." [Warda TM1, captured by the third round of data collection].

During the third stage of adding new members, the incubator advisors presided over the pre-joining meetings and negotiations with Al Batoul TM1 to ensure that Al Batoul TM2 was the right member.

"Al Batoul TM2 and I met the incubator advisors Advisor 1, Advisor 2, and Advisor 3 to ensure that Al Batoul TM2 is the ideal person before taking the final decision… The meeting lasted a long time, while Advisor 3 was very impressed with Al Batoul TM2; and found him the ideal person, he was worried about his young age. On the other hand, Advisor 2 was an optimist based on his current successful company, and I insisted on his joining because I was convinced of him...The advisors evaluated Al Batoul TM2's share for what he is supposed to pay, so he paid for 30%." [Al Batoul TM1, captured by the third round of data collection].

At this stage, the role of the incubator in Alanod revolved around explaining the consequences, rights, and duties of the member.

"We both met the Advisor 2 to explain all aspects because our knowledge in this matter was zero." [Alanod TM2, captured by the third round of data collection].

In the last stage, the prominent role of the incubator was in completing all official and legal procedures for all seven cases that added new members during the incubation phase.

"I authorised the incubator to complete all official and legal procedures." [Aseel TM1, captured by the second round of data collection].

5.2.3 Theme 3: Faultlines in ETs

Among the twelve teams under investigation, three entrepreneurial teams, Omar, Faisal, and Al Jawhara experienced Faultline activation.

5.2.3.1 Activated Team Faultlines

Data from the interviews and informal discussions indicated that the dormant faultlines in the Omar team were around the combination of demographic and non-demographic attributes between Omar TM1 and TM2. The demographic attributes indicate information-based attributes, including functional backgrounds and work experience, and non-demographic attributes indicate the status, including physical distance (work location) and commitment.

"They are both close to me, but honestly, Omar TM1 is closer because we are full-time here, always in one place; Omar TM3 has a full-time job... He (Omar TM3) has a long experience while we (Omar TM1 and Omat TM) do not have much experience; we always strive to learn together, so we have a common language… We are both from a tech background." [Omar TM2, captured by the first round of data collection].

In the Faisal team, the dormant faultlines were around a combination of demographic and multiple non-demographic attributes between Faisal TM1 and TM2. The demographic attributes indicate information-based differences, including functional backgrounds and work experience. Non-

demographic attributes indicate the status, including physical distance (work location) and commitment besides personalities of those two members.

"Faisal TM2 and I, maybe our personalities are very similar; we are a strange mix; we are strict, hasty, and ambitious, sometimes without logic. Faisal TM3 is the exact opposite; he is cautious and sober. Faisal and I went through an internship experience together." [Faisal TM1, captured by the first round of data collection].

In the Al Jawhara team, the dormant faultlines were around multiple demographic attributes between Al Jawhara TM1 and TM2. The demographic attributes indicate age and gender.

"Because we are girls of the same age, she understands what I want immediately. We have a great common language. This, of course, has addressed what I was missing with my father (Al Jawhara TM2)." [Al Jawhara TM1, captured by the second round of data collection].

It was evident that these potential faultlines remained dormant until they were activated by various triggers, as explained by the Faultline theory of Lau and Murnighan (1998). The triggers responsible for activating the faultlines belong to the phases of growth, and related implications for the ET and firm, most notably the presence of Venture Capital (VC). All the potential faultlines remained dormant in the Omar team until they were triggered by activation triggers: the presence of VC and entering new foreign markets. These resulted in activating relevant faultlines between Omar TM1 and Omar TM2. This included their full commitment to the firm, intensifying technical work, and the necessity of being present in the expansion countries.

"We expanded into the Egyptian and the Jordanian markets, which necessitated us to develop new products, so Omar TM1 and I stayed in Egypt and Jordan for 40 days... We had worked hard on creating our IT teams there... When we returned, this became our preoccupation. From here, Omar TM1 and I started working more without Omar TM3… Omar TM3 does not work with us in XX (the business name) full time; the IT matters are not his field." [Omar TM2, captured by the second round of data collection].

The dormant faultlines between Faisal TM1 and Faisal TM2 were activated in the Faisal team. Practically, obtaining an investment round and the involvement of investors in the details of the team's structuring led the entrepreneurial team to reconsider different aspects. Those aspects included commitment, the required competencies, and the extent of harmony within the ET.

"With this latest investment round, the VC rung the bells about everything... everything has been scrutinised, our roles, our commitment, and our equity stakes distribution thus. We were not all full time, just me and Faisal TM2... This was a good opportunity to rearrange our affairs internally. I was starting to really feel that it was unfair that the roles are unequal, and the equity was completely equal... They urged us to solve this... We had discussed the matter as a team... Finally, we settled the matter... To be honest, it lit the fuse for a heated discussion… We agreed that the roles and

commitment would remain the same, but Faisal TM3's equity would be reduced... Yes, we are indeed like a sub-team; Faisal TM3 only engages with us remotely on clear tasks and certainly attends meetings." [Faisal TM1, captured by the second round of data collection].

In the Al Jawhara team, the team's entry into a new phase of growth and seising opportunities led to them adopting a new approach that two members, TM1 and TM3, were able to work with. This led to the activation of relevant dormant faultlines between TM1 and TM3

"I originally added Al Jawhara TM3 for the sake of expansion, and my father (Al Jawhara TM2) really does not fit the way of working that XX (the business name) requires for growth and expansion... Since Al Jawhara TM3 joined, we have been working separately and continuously. Al Jawhara TM2 focuses on only limited matters related to content." [Al Jawhara TM1, captured by the third round of data collection].

After the dormant faultlines in the three ETs, Omar, Faisal, and Al Jawhara, were activated by triggers, sub-teams appeared within the main teams. The data shows the nature of the work of these sub-teams. In the Omar team, the sub-team, TM1 and TM2, appeared committed to the presence of the firm in the new foreign markets with full-time commitment, focusing on developing new products based on their technological background.

"Indeed, recently, Omar TM2 and I have been working as if we were a team that all the work now depends mainly on... Omar TM3 reviews with us what is needed twice a month… We are most of the time in Egypt and Jordan for the sake of technology...We are happy and satisfied with this." [Omar TM1, captured by the third round of data collection].

Likewise, in the Faisal team, the sub-team consisted of TM1 and TM2, who appeared fully committed, and had high personality compatibility.

"Yes, Faisal TM1 and I work full time. We are trying to adapt to the stage, which all seem challenging. We get along quickly; it seems because our personalities get along." [Faisal TM2, captured by the third round of data collection].

Similarly, the Al Jawhara sub team consisted of TM1 and TM3 who worked intensively on the new approach and welcomed the change.

"I am happy with what Al Jawhara TM3 and I are doing now. Everything is going smoothly. We agree on a professional, modern way of working and align with our plan for the next five years." [Al Jawhara TM1, captured by the third round of data collection].

5.2.3.2 The Positive Impact of Sub-teams in Entrepreneurial Teams

After the emergence of sub-teams in the three entrepreneurial teams, Omar, Faisal, and Al Jawhara, the data provides evidence of the positive impact of these sub-teams. Aligning with? It was evident that creating sub-teams within the main teams was a fundamental solution to the conflicts that emerged. In the Faisal team, the presence of the VC, who questioned the distribution of members' equity stakes and the extent of commitment, had created conflict within the team. The sub-team emergence was considered a team restructuring and a solution to bridge all the causes of this conflict. As a result, according to the team's narrative, feelings of satisfaction and fairness prevailed in the team, thus achieving harmony within the ET.

"Based on our friendship, Faisal TM1 and I used to do literally everything. Faisal TM3 is committed to his main job and, of course will not leave it... I suggested that we rearrange everything to get the investment to achieve our goals... It was not easy; we were annoyed at first, argued, and then agreed... Then we felt very comfortable because we felt that it was fair. I felt like we became more in tune because we no longer had any negative feelings." [Faisal TM2, captured by the third round of data collection].

Similarly, the presence of a sub-team led to an increased feeling of harmony at the main team level in the Al Jawhara team. This resulted from disagreements that Al Jawhara 'M3's presence resolved regarding the new work approach.

"... we have reached a harmony that my dad (Al Jawhara TM1) and I would not have reached in terms of work if it had not been for AL Jawhara TM3's joining. When Al Jawhara TM3 joined, I got busy with her, so my conflicts with my dad (Al Jawhara TM2) faded because I found someone who understood me and worked with me as it should be. This made us all feel so in tune." [Al Jawhara TM1, captured by the third round of data collection].

Another finding from the Al Jawhara sub-team emergence was its role as a generator of high-quality decisions, based on the exchange of valuable information.

"I finally found someone who shares everything with me; her conclusions, her thinking, the valuable information she reaches after tough research and analysis... The exchange of this rich information certainly made us make healthy decisions." [Al Jawhara TM1, captured by the third round of data collection].

In the Omar team, a new phase of growth and its exceptional nature necessitated the presence of a sub-team that was fully committed to the incubated firm, and who can be residence in the countries in which the products are developed. According to the data, this reflected positively on the business, translated through performance indicators and productivity.

"The new stage, its unique nature of work, required this change... It was not a choice but an inevitable turn... All our performance indicators indicate that we are on the right path." [Omar TM2, captured by the third round of data collection].

5.2.3.3 The Role of the TBI in Sub-team Emergence

After the dormant faultlines were activated, leading to the emergence of sub-teams, the role of the incubator appeared different in each case. In the Omar team, paid consultation by the incubator with a professional organisationdevelopment specialist emphasised to the team the need to adhere to adequate, healthy, and continual communication at the level of the main team.

"XX (an expert in organisational development listed in the list of professional incubator consultants paid online consultations by the hour) urged us that we all communicate continuously, especially with Omar TM3... Also, he stressed keeping him informed..." [Omar TM2, captured by the third round of data collection].

In the Faisal team, the role of one incubator advisor (Advisor 4), who was close to the team, was evident. His role included involvement in the team's discussions and negotiations for the change in equity stake and helping in restructuring the team.

"Advisor 4, because he is very close to our team, he convinced Faisal TM3 with us to restructure our team without having a conflict or dismissal." [Faisal TM2, captured by the second round of data collection].

Simultaneously, the data shows another prominent role for Advisor 4, which centred around urging the team to ensure cooperation at the level of the main team.

"Advisor 4 is well aware of our need for innovation, and he is also aware of Faisal TM3's intelligence, skills, and creativity, no doubt. So, he urged us to keep the cooperation; Faisal TM3 must contribute and integrate with us correctly." [Faisal TM1, captured by the second round of data collection].

In the Al Jawhara team, the role of the incubator was prominent in supporting the sub-team, following the 2030 Vision through supporting female talent: this manifested in four ways. First, the incubator supported the sub-team to attend entrepreneurial forums, speaking and sharing their experiences:

"XX (the incubator manager) encouraged us to be speakers in several events paid by the incubator… We travelled with her to the Arab Entrepreneur Forum. There we shared our experience... we feel this is our responsibility as Saudi women to encourage the empowerment of our peers..." [Al Jawhara TM3, captured by the third round of data collection].

Second, the incubator endeavoured to strengthen the networks of the sub-team by connecting them with influential names in the Saudi tech entrepreneurship community:

"Yes, the incubator manager strengthened relations between Al Jawhara TM3 and I recently outside the incubator ... Introduced us to the influential names such as XX and XX; tech entrepreneurs now role models in Saudi Arabia." [Al Jawhara TM1, captured by the second round of data collection].

Third, the incubator persuaded Al Jawhara TM2 to support the sub-team and empower it according to the incubator's vision and Saudi Arabia Vision 2030:

"XX (the incubator manager) urged me to give these young women the opportunity to prove that they are capable. I do not mind... I am proud of them... I must trust them, as everyone trusts them. All our statistics in XX (the business name) points that they deserve to be empowered." [Al Jawhara TM2, captured by the third round of data collection].

And, fourthly, the incubator stressed the necessity of improving the self-perception of the sub team by enhancing emotional and cognitive integration:

"At some point, I was afraid our new sub-team would hurt my father, who is my partner at the same time (Al Jawhara TM2). I mean, emotionally, I was worried he would feel useless or excluded. When I shared this with the incubator manager, she advised me that we should always adhere to the fact that we have good personal relationships and must maintain them..." [Al Jawhara TM1, captured by the third round of data collection].

5.2.4 Summary of Findings on ET Formation

In summary, the cross-case analysis of the formation phase of the entrepreneurial teams suggest that ETs are unstable, changing entities. The ETs in the cases experienced significant changes in formation, which are represented by three formation dynamics: the initial creation/formation n of the entrepreneurial team, the changes in membership, and the activation of faultlines leading to the emergence of sub-teams within the main teams. The TBI played an influential role across team formation in the cases, shaping the process of entrepreneurial team formation during the period of incubation in different ways. The role of the incubator can be described in terms of five important contexts. First, as an 'advisory' context, with for example the admissions committee intervening in the initial/formation creation of the ET, the incubator advisors influencing the changes of ET membership, both addition and exit of members, and the emergence of sub-teams. Second, as a 'social' context, with ETs exploiting incubators social networks during formation dynamics associated with their membership change. Third, as a 'knowledge' context, with, for example, the ETs benefiting from the guidance of the incubator in how to create the teams, how to add new members, and how to re-form teams after co-founder exit. Fourth, as a 'mediatory' context, with, for example, the TBI mediating between the ETs and the VCs, which led to significant changes in ET formation. Fifth, as a 'administrative' context, with the TBI playing a significant role in the completion of official procedures of formation.

5.3 Discussion of Q1: How ET Forms During Incubation

5.3.1 The Initial Creation of ET during the Incubation

Literature on how outsiders, mediators and incubating environments can play a role in creating and changing entrepreneurial teams is scarce (Patzelt et al., 2021) and this study aims to specifically examine the role that incubators had in the change of Saudi Arabian entrepreneurial teams.

The evidence from this study suggests that an incubator can influence how groups become entrepreneurial teams. In this study, one case study with its origins in a group formed during the incubation period. Ryan TM1 and Ryan TM2 formed a team based on their established friendship, which began in childhood. This beginning was a "let us be a team to start our business", with the team formation preceding the recognition of the firm. As shown in the case analysis, the incubator played an important role in mediating how this group became an ET and how this ET added members. The group Ryan consisting of TM1 and TM2 became an entrepreneurial team seeking to exploit an opportunity through a process that was mediated by the incubator management. How this process occurred in this specific case was through outlining a road map for exploiting the opportunity, the first step of which was to fill any deficit in resources. It became clear that the ET did not have the competency to handle the technological aspects of the business. A third member was added as CTO. Figure 6.1 describes the prominent role of the incubator in creating the team. It is evident that the incubator's presence contributed to the creation of the entrepreneurial team and that this followed a structured process.

5.3.2 ET Membership Changes during Incubation

5.3.2.1 ET Members' Departure and the Consequences

While the addition of members plays a major role in the success of a growing entrepreneurial business, the departure of members can also have a significant impact that, at times, receives limited attention (Gregori and Parastuty, 2021).

In this study, both businesses that experienced departures cited personal reasons and conflict as deciding factors for members' departures. This research highlights a new type of conflict that led to the members' departure: a conflict over interests and strategic direction. The case data also describe the team's social and psychological status before a member's exit triggered by conflict. The conflict led to the dissolution of the members' trust in each other, creating a hostile and tense atmosphere and consequently their reluctance to cooperate, interact with each other or remain within the team. As such, the study addresses a question posed by Ucbasaran et al. (2003), about what the team is going through, especially the feelings that prevail before the members leave permanently.

The findings also provide evidence of an amicable route of exit by members. The reason the exit was amicable was the concern about the team's reputation in the tech entrepreneurship environment and in the incubator. A negative impact on their reputation might result in stakeholders'

not cooperating with the ET. Thus, this research reveals a reason for choosing a particular route for ET members' departure.

A further question of importance in the ET literature is what are the consequences of members leaving the entrepreneurial team? Guenther et al. (2016) argue that evidence on the consequences of members' exit in the entrepreneurial team literature is inconclusive, and the effects may be both positive and negative. Consequences of founder exit may be for the exiting individual, the ET, and the firm. At the team level, affective conflict resulting from relationship clashes negatively affect team cohesion by impeding entrepreneurial members' social exchange behaviour. When there is a high level of relationship conflict, the quality of and opportunities for social exchange are undermined, so team cohesion is negatively affected (Chen et al., 2017). Regarding the consequences associated with the individual, Breugst et al. (2015) provide an example of how an individual isolated himself from the remaining team, the enterprise, and his wider social environment.

This research captures the consequences of members' departure at two levels: the founders' level and the team level. The study captures the scenario that the first founders underwent to re-form the team, as well as the positive consequences that the team experienced. The positive consequence to internal team dynamics resulted from the consistency of opinions among the remaining members and them rallying around one vision after the departure of a member who held contrary beliefs and opinions to the team.

5.3.2.2 Addition of New Members to the ET

In this study, the challenges that related to the growth of the firms led the founders, both solo and teams, to add new members, which is consistent with the reasons identified in previous research, including adding members to assist them overcome obstacles, filling gaps and missing competencies, building the internal human capital to seize recognised opportunities (Clarysse and Moray, 2004; Discua Cruz et al., 2013; Klotz et al., 2014). The findings do suggest a motive for adding a new co-founder that is distinct from those already identified in the extant literature – the need for social participation. This study includes instances of firms characterised by solo founders, who are started in a context where team founding was strongly advocated (the TBI management and advisors suggested that these cases start as an ET). While the previous literature focused on the formation of the entrepreneurial team regarding the reasons motivating the founding individuals or groups to form the entrepreneurial teams (Lazar et al., 2020), studying why solo entrepreneurs reject the ET approach is novel. The analysis suggests that the rejection of an ET approach in this context revolved around psychological reasons related to the fear of co-founding risks, financial reasons that suggest preserving the entire equity, and the belief in individual heroism.

How are new members added to ETs? The cases in this study build on prior research in a number of ways. First, the members' selection was either searching for the right competencies to fill a resource deficit (search based on resource-seeking) or a hybrid approach. The hybrid approach combines rationality and psychology by adding the member who will compensate for resource

shortfalls while also considering the interpersonal fit. Second, while founders relied on their social networks to find the right members, this research highlights how the founders were characterised by constant efforts to develop their networks as a reliable source of members. Third, the founders were involved in a series of decisions related to choosing the best among potential members and starting negotiations. While these processes for adding members appear fragmented in the previous literature, this research advances the literature by "modelling" a series of interrelated, successive and structured processes. While each process has been considered in isolation in the previous literature, so that earlier studies dealt with only one process without considering the interaction among the processes, the longitudinal nature of this research allowed for the analysis of ET formation dynamics in an integrated way.

5.3.3 Activation of Faultlines and Emergence of Sub-teams

This study focused on activated faultlines that differ from those found in the previous ET literature, in that they are compound faultlines. They are based on a combination of demographic, non-demographic and multi-non-demographic attributes. In this study, the growth stage and its related repercussions, most notably the presence of venture capital (VC), were responsible for activating the faultlines. That led to ETs adopting a new approach to work, the necessity of restructuring roles, and committing full-time to the firm, which trigged dormant faultlines in the cases in this study. This research highlights three triggers. The first trigger, the necessity of adopting a new approach to work, activates the dormant faultlines around the new generation that is receptive to openness and development. The second trigger, the necessity of restructuring the members' roles, activates the dormant faultlines around functional backgrounds and personality compatibility. The third trigger, the necessity of full-time commitment to the firm, activates the dormant faultlines about the status of the members concerning their commitment to the firm (full-time or part-time). While the first trigger is consistent with prior studies, the additional two triggers are not evident in extant literature.

With respect to the impact of faultlines, the positive impact of faultlines identified in this research is consistent with what is found in the literature on faultlines in the entrepreneurial team regarding performance indicators. Positive performance indicators indicate high productivity and high-quality decision-making. However, this research identifies that the positive impact of faultlines on the team's psychological state. After the sub-teams appeared, the ETs seemed more harmonious, satisfied, and had a stronger sense of justice.

In summary, faultlines that are activated based on compound attributes have a stronger effect, represented in the strength of the sub-teams that emerge (Zhang and Liu, 2019). Accordingly, this research advances the literature on faultlines in entrepreneurial teams by highlighting this type of compound faultlines and by highlighting a new type of attribute on which the faultlines depend – the status of members regarding their full and part-time commitment to the firm.

5.4 Discussion of Q2: the Role the Incubator Plays in ET Formation

Although business incubators are one of the main contexts that support the emergence of new firms and thus the formation of teams, ET formation in this context is not yet adequately researched (Ensley and Hmieleskib, 2005; Phan et al., 2005; Mian et al., 2016). The incubator context is a valuable lens for expanding the scope of research on ETs (Diakanastasi et al., 2018). From the perspective of the incubator as a context, the incubator must play a role in addressing the incubatees' potential as actors and members of ETs, as well as recognising critical team dynamics and basing their choice on moving to sustainable new firm creation.

By focussing on the incubator's prominent "multifaceted" role as a "multifaceted" context in shaping the formation of the entrepreneurial team during the incubation this research advances the literature on ETs. Three main ET formation dynamics emerged in this research: (i) the initial creation/formation of ET, (ii) membership changes, and (iii) faultlines in ETs: sub-team emergence after faultlines were activated. Through these formation dynamics, the role of the incubator emerged as a context with multifaceted roles that influences the ET. The incubator emerged as "a "multifaceted" context reflecting the various resources of the TBI that impacted on ET team formation.

During the initial creation/formation of the ETs in the incubator, the incubator emerged as a distinct "advisory ", "knowledge", and "administrative" context. As an advisory context, the TBI admissions committee played a major role in convincing the initial founders of the necessity of creating the 'right' team required to exploit the firm idea. Additionally, there were meetings that preceded the final decision to create the team with the incubator's advisors to clarify all aspects of this procedure. As a knowledge context, the founders benefited from the knowledge embedded in the boot camp of the TBI about 'how to' create an effective entrepreneurial team. They also received guidance from the TBI admission committee on creating and forming a successful entrepreneurial team. As an administrative
context, the incubator, on behalf of the team, drew up the initial features of the official procedures. During the changes in membership of the cases, the incubator emerged as a distinct "advisory", "knowledge", "administrative", "social", and "mediatory" context. Hence, the findings of this study confirm that the incubator played a prominent role as a "multifaceted context" when teams disbanded, when teams reformed, and when teams added new members. When members decided to leave and ET, the incubator, as an "advisory" context, worked to keep the team together. When the members insisted on their departure, the incubator played a significant role as an "advisory" context through their support for the other founders – both moral and practical support on how to reform the teams. When founders decided to reform their teams, the incubator played a major role as a "social context" in that the TBI's networks facilitated the founders finding new members. These finding

align closely with those of Lundqvist (2014) showing that incubators often take a direct and hands-on approach when it comes to the entrepreneurial team composition.

The incubator enabled incubatees and their peers to exchange experiences about experiences (e.g., team disbanding and reforming). In addition, the incubator played a role as a "knowledge" context in providing these first founders with a guide on how to reform the ET. The incubator completed official procedures related to the disbanding and re-formation of the team ("administrative" context). The ETs
also utilised the incubator as a "mediatory" context, in that they benefited from the incubator's name to gain external communication that facilitated obtaining new members. In addition, the solo founders who initially refused to add members, the incubator's "multifaceted roles" combined to turn these refusals into acceptances.

5.5 Chapter Summary

This chapter presented the findings and discussion of the cross-analysis of the twelve entrepreneurial teams across three themes that pertain to ET formation. This includes a discussion of the three formation dynamics of ETs: initial ET formation/creation and the subsequent themes of formation process dynamics. These formation process dynamic themes include membership changes and faultlines in ETs. In the next chapter (Chapter 6), the focus is on the triggers that led ETs to choose to locate in the incubator and on how the relationship between the ETs and the incubator evolved overtime.

Chapter 6: Cross-Case Analysis, Findings and Discussion

6.1 Introduction

This chapter focuses on the social interaction processes within ETs during the BADIR incubation program and how this has affected the formation and development of teams. Based on the literature introduced in Chapter 3 three themes of ET evolution dynamics that were the focal point of the cross-case analysis of the twelve entrepreneurial teams: the initial allocation and professionalisation of roles; leadership transitions; and conflict in teams.

The research questions are:

(R3) How do social interaction processes influence the evolution of entrepreneurial teams during the incubation period?

(R4) What role does the incubator play in the social interaction processes in entrepreneurial teams?

6.2 Cross-Analysis' Findings: Social Interaction Processes in ETs

1st order codes	2nd order codes	Aggregate theoretical dimensions	Cases
- There were roles but without clear features (5) - There were no roles, only scattered tasks: the team preceded the idea (3) - The roles were in the process of taking shape: crystallisation: the team preceded the idea (5) - All roles were assigned to the solo founder (3) - Most tasks were handed over to freelancing by the solo founder (2) - Utilising the solo founders' original family human business resources (1)	The initial allocation of roles	**1st ET Role Allocation and Professionalisation**	Ryan Faisal Omar Thabet Al Jawhara Yamen Sumoud Mubarak
- Transition to well-defined and structured roles (positions) with related powers at the founding team (12) - Shifting the focus of the founding team from its roles to the roles of employees (3) - Imposing high responsibility and high accountability at the founding team level (5) - Attracting the right employees/talents (3) - Empowering the employees with their roles (2) - Shifting to well-defined and structured roles at the employee level (2) - Carefully mapping the organisational structure, defining the vacancies roles (4) - Adopting mechanisms with the existing employees to increase engagement (3) - Developing knowledge about management of human resources and organisational development (2)	Increased professionalisation		
- Taking over leadership for family reasons (1) - Sticking to leadership for fear of the hasty personality of the second member: realising of heterogeneity in personalities (composition) and its reflection on work (1) - Facing challenges has shown 'the capable leader': the saviour' (1) - Examining/testing each team member as a leader (1) - Leadership stability with the capable leader (3) - The founder's realisation of not having enough leadership skills: is not the capable leader (2) -Adding new member as a leader (2) -Handing over leadership to the new member (2)	Leadership transfer within ET	**2nd Leadership Transitions**	Al Jawhara Omar Aseel Alanod Ryan Sumoud Mubarak Yamen
- Adhering to shared leadership during the product development phase (3) - The emergence of informal leadership through shared leadership (2) - Shifting to hierarchical leadership because of the presence of the investor (2) - The founder stuck to hierarchical leadership as a precaution after disbanding the team (2) -Shifting to shared leadership as the basis for creating team integration (2)	Transitions of leadership style		

- Shifting to hierarchical leadership as part of formalisation (1)			
- The reason behind the leadership board turnover from the founding team - The essential components of successful leadership turnover	Leadership turnover		
- Conflict over task management: managing daily operation (3) - Heterogeneity of members' backgrounds as an origin of task conflict (4) - Conflict over decision-making and use of powers (6) - Heterogeneity of members' backgrounds and personalities is the origin of decision-making conflict (7) - Better quality of decisions as a benefit of the conflict (4) - Increasing innovation and creativity as a benefit of conflict (2) - Conflict over decision-making and use of powers (3) - Predicting potential issues early as a benefit of conflict (4) - Building commitment as a benefit of conflict (2) - Prompting the creation of multiple perspectives as a benefit of conflict (1) - Achieving team harmony and integration as a benefit of conflict (2)	'Healthy' team conflict	**3rd ET Conflict**	Mubarak Al Jawhara Ryan Omar Aseel Thabet Sumoud Yamen Faisal
- Low morale, lack of respect and trust: signs of unhealthy conflict that the teams recognised (2) - Unhealthy conflict stems from conflict of interests (2) - Departure of members as a result of the conflict of interests (2) - Unhealthy conflict stems from conflict of personalities (1) - Departure of members as a result of the conflict of personalities/affective issues (1)	'Unhealthy' team conflict		

Table 6.1: Coding of the third research question

(Source: Researcher's Own)

1st order codes	2nd order codes	Aggregate theoretical dimensions	Cases
- Appointing (identifying) vacant roles and required competencies by the admission committee (2) - Appointing (identifying) vacant roles and required competencies by the advisors (3) - The incubator's admission committee urging the founder to fill those roles by adding member (3) - The incubator's advisors urging the founder to fill those roles by adding member: during mentorship meetings (2) - The incubator's involvement in drawing the features of roles and related powers (2) - Warnings of overlapping roles as a source of conflict (1) - Attempts to resolve conflict resulting from overlapping roles (1) - The incubator's advisors' insistence on strictly defining the members' roles to attract investment: Role boundaries and responsibilities (1) - The incubator advisors' concentration on the necessity of keeping some flexibility: in the product development stage (2)	TBI's role in initial allocation of roles	**1st The Incubator Role in ET's Roles Allocation and Professionalisation**	Ryan Faisal Omar Thabet Al Jawhara Yamen Sumoud Mubarak
- At the level of the ET: absorbing knowledge about organisational structure from mentorship meetings (1) - At the level of the ET: utilising external professional consultants embedded in the incubator network (1) - At the level of the ET: emphasising the need to formally appoint positions (6) - At the employee level: getting employees through incubator job fairs and CV bank (2) - At the employee level: holding collaborative entrepreneurship practice-based solutions meetings with decision makers and stakeholders (Employment facilitation) (2) - At the employee level: staff development through the knowledge embedded in the incubator's training program (2) - At the employee level: contracting with an incubated firm about employee loyalty programs (1)	TBI's role in increased professionalisation		
- Urging by the incubator management to transfer leadership to a certain member (1) - Empowering the female CEO as a leader: complying with the TBI priorities in line with Vision 2030 (1) - Empowering the new CEO as a leader: linking with counterparts in the same position in incubated and graduated firms (1)	TBI's role in leadership transfer in ET	**2nd The Incubator Role in Leadership Transitions**	Al Jawhara Omar Aseel Alanod Ryan Sumoud, Mubarak Yamen

- Incubator advisors defining the role of leadership as vacant (1) -Urging the addition of the leader member through the incubator's advisors (Determining the specifications of the new leader member by the incubator's advisors (1) -Incubator advisors' involvement in the search for the new leader member (1)			
- Providing supportive knowledge of the adopted leadership style (2) - The investor imposed hierarchical leadership from the incubator network (2) - Support from the incubator advisors for the decision to change the style of leadership (1) -Finalising the legal procedures while formalising leadership (1)	TBI's role during transitions of leadership style		
- Specialised consultations from the incubator's consultants - Utilisation of the embedded social networks to gain required knowledge - Moral support for the entrepreneurial team	TBI's role in the entrepreneurial team's leadership turnover		
- Encouraging healthy conflict as a fundamental source of creativity and innovation - The incubator's effort' to maintain healthy conflict of decision making and not letting it turn negative (4) - The incubator's advisors efforts keeping task-related conflict healthy and not letting it turn negative (3) - Urging the team to build a culture of healthy conflict by the advisors (4)	TBI's role in 'healthy' team conflict	**3ed The Incubator Role in ET Conflict**	Mubarak Al Jawhara Ryan Omar Aseel Thabet Sumoud Yamen Faisal
- Precautionary measures before the conflict escalates - Attempts to resolve the dispute before the withdrawal of members (1)	TBI's role in 'unhealthy' team conflict		

Table 6.2: Coding of the fourth research question

(Source: Researcher's Own)

6.2.1 Theme 1: ET Role Allocation and Professionalisation

6.2.1.1 Initial Allocation of Roles

After the initial creation of an entrepreneurial team, the team must create a basis for cooperation within the team (Ben-Hafaïedh, 2017) and this includes the allocation of roles (Patzelt et al., 2021). In this study, the cases differed in regard to when task allocation occurred.

First, three entrepreneurial teams, Ryan, Faisal, and Omar, started as a team to create a business together and then sought an opportunity, based on "let us be a team and create our firm". There were no roles with prominent features but rather scattered tasks:

"… We simply asked each other, what can you do? Just do what you can do… Each of us did what we could do depending on availability." [Ryan TM1, captured by the first round of data collection].

Second, five entrepreneurial teams, Thabet, Al Jawhara, Yamen, Sumoud and Mubarak, who started with co-founders, realised the opportunity, based on "we know well what we want and let us do it". They formed the teams with an initial business model to work on to seize the business opportunity. Although there were roles in these entrepreneurial teams, they were still in the process of taking shape (crystallising), with ambiguous features, overlap, messiness/looseness, lack of clarity, high flexibility, and inequality the dominant traits.

"…I found myself with a pile of tasks, I was doing everything I could do, 70% of those tasks were not related to my major or my previous experience..." [Al Jawhara TM1, captured by the first round of data collection].

"Roles that I do; my dad (Al Jawhara TM2) does too. Everything about the roles in XX (the business name) is loose and ambiguous." [Al Jawhara TM1, captured by the first round of data collection].

Third, four entrepreneurial teams, Alanod, Al Batoul, Warda, and Aseel, who started with solo founders, realised the business opportunity, completed the procedures of the ideation stage, created an initial business model to work on seising the opportunity, launched to market and started actual operations. Multitasking was the most prominent characteristic of roles played by the solo founder. The solo founder took on most tasks and sought to limit hiring by handing over some tasks to freelancers (i.e., the idea, market launch, and operations, preceded the team formation).

"I do everything I can; I hired an employee to help me with the operation because it is complicated. The rest of the non-recurring tasks, hand them over to freelancers." [Alanod TM1, captured by the first round of data collection].

6.2.1.2 TBI's Role in the Initial Allocation of Roles

The data indicates that the incubator played different roles regarding the initial allocation of roles. In both the Omar and Ryan teams, the incubator admission committee identified gaps in the team at the admission phase via the admission committee. In these teams, there were no clear roles defined at this stage:

"They asked us frankly; both of you are technicians. Will you add a business mindset? They said, from this moment on, the existence of this person is essential." [Omar TM1, captured by the first round of data collection].

Later, the incubator got involved with the two teams to draw up the features of the team roles and associated responsibilities:

"It is time for structuring our roles guess... The incubator does not hesitate to support us in this regard." [Ryan TM2, captured by the first round of data collection].

Although the incubator's advisors attempted to draw the features and boundaries of the teams' members' roles at the beginning of the incubation phase, the incubator's advisors concentrated on the necessity of keeping some flexibility within the entrepreneurial teams of Sumoud and Yamen. These entrepreneurial teams were in the product creation stage, which both the team and the incubator advisors considered as requiring flexibility to ensure innovation:

"Of course, we keep some flexibility because we need to support each other... The incubator sees this as a source of creativity..." [Sumoud TM3, captured by the first round of data collection].

"...We do not seek to remove all flexibility; in the end, this will kill creativity. The start-up needs this flexibility." [Advisor 2, captured by the first round of data collection; from the focus group].

In contrast, in the Thabet team, the incubator advisors stressed the need to impose clear roles by setting boundaries of roles:

"...You cannot imagine how much of our work was messy. So, Advisors 4 and 5 strongly suggested a clear operation map, marked with everyone's role and details... The success in our business depends mainly on a successful operation... this is what we concluded from the advisors; successful customer experience = mastering the internal processes= commitment of each member to specific and clear roles." [Thabet TM2, captured by the first round of data collection].

Similarly, in the Faisal team, the incubator's advisors also insisted that roles, responsibilities and boundaries be strictly defined if they were to obtain investment from the incubator's network:

"...well, we positioned each of us in a specific role because the VC (by incubator) requires this. I am the operation director, Faisal TM1 and Faisal TM3, the strategic management and marketing director." [Faisal TM2, captured by the first round of data collection].

In the Al Jawhara team, the incubator's advisors cautioned against having overlapping tasks as it can be a source of conflict:

"I used to complain to them daily that we argued too much. They said that the reason was the overlap of roles. They advised us to separate the roles so not to become a source of greater conflicts." [Al Jawhara TM1, captured by the first round of data collection].

In the Thabet team, the incubator's advisors were involved in resolving conflicts resulting from overlapping roles:

"… I have always been mad at Thabet TM1's interference in my work... I asked Advisor 1 about this… she said that it is normal that some roles overlap in start-up companies, especially in the beginning... She supported me to attend the incubator's workshops to support my role. She also advised me to give my partner space to play his role as a leader." [Thabet TM2, captured by the second round of data collection].

"…we had internal problems resulting from Thabet TM2's absence and her total refusal to be involved in her work; I asked the advisor (Advisor 4) about the solution. He advised me that the employee working as Thabet TM2's assistant should be delegated to work correctly by Thabet TM2... He advised attending courses to support the delegated employee in her role." [Thabet TM1, captured by the second round of data collection].

The incubator advisors often suggested that new members be added for specific roles. For example:

"From day one, they have been drawing the shape of the missing roles, and who are supposed to fill them, but I admit it took me a long time to decide… They keep urging me to make a decision." [Alanod TM1, captured by the second round of data collection].

"Yes, they told me frankly, here is the deficiency and the person will be here must be 1, 2, 3 …" [Al Batoul TM1, captured by the second round of data collection].

6.2.1.3 Increased Professionalisation

As new ventures grow, a distinction can be made between three different stages: 'product market fit', 'working at scale', and 'diverse revenue streams' (Klepper, 1996). In the case data, there was evidence of professionalisation of roles during the 'product market fit' and 'working at scale' stages.

At the 'product market fit' stage, professionalisation of roles involved separating and defining roles (in the Omar, Ryan, Al Batoul, Alanod, Warda, and Aseel cases). For example:

"We have other worrisome challenges now to focus on, the competitors, the product and adapting it to the demand, reaching the customers... but we are paying attention definitely to our roles. I guess what matters most to us at this stage is that the roles are separated, and the positions are also clear because the financial matters depend on this." [Alanod TM1, captured by the third round of data collection].

At the third round of data collection, six of the cases were at the 'working at scale' stage (Mubarak, Thabet, Yamen, Sumoud, Faisal, and Al Jawhara). In these cases, there was a shift from flat (organic) structures to more complex structures. The adoption of more complex structures had implications for both founding team and the employees.

For the founding team, three aspects of this transformation to more complex structures were particularly prominent in the data. These were: first, a transition to well-defined and structured roles with appointed positions and titles (defined powers); second, a shift in focus of the founding entrepreneurial team from the roles of the team to focus more on employee roles; and third, the imposition of more responsibility and accountability within the founding team. For example:

"The roles and the tasks are drawn with high professionalism. I feel that everything is in its rightful place even though the pressure of challenges is growing..." [Al Jawhara TM1, captured by the third round of data collection].

"No, for our team, everything is fine. Our concern now is the employees; we have been swamped with their issues." [Mubarak TM6, captured by the third round of data collection].

"It is no longer the same; we are now establishing an entity in which every riyal is calculated... We have strengthened the concept of responsibility; every action now is thoughtful." [Faisal TM2, captured by the third round of data collection].

For the employees, three aspects of the transformation to more complex structures were evident. These were: first, the mapping of the organisational structure and the definition of roles; second, a focus on attracting the right employees/talents, empowering them, and then evaluating them; and third, the adoption of mechanisms with the existing employees to increase engagement, including the use of Employee Stock Ownership Plans (ESOPs). For example:

"We work hard to recruit talents based on our structure, especially in key positions, and follow up on their performance... The investment rounds that we obtained recently enabled us to hire middle managers, which made us move to another curve… Importantly, we decided to give the employees ESOP, which had a great effect." [Yamen TM1, captured by the third round of data collection].

"We are now observing from afar; we have gone beyond monitoring our roles as the founding team to employees now." [Faisal TM2, captured by the third round of data collection].

It was evident in some cases that the ETs sought to develop knowledge on aspects outlined above, including the management of human resources and organisational behaviour. This was in addition to the focus on issues related to employment, such as Saudisation and the reluctance of individuals to join Small and Medium Enterprises (SMEs). For example:

"Suddenly, we found ourselves dealing with more than 22 employees. We were keeping pace with development and adding employees quickly. All our reading, research, communication recently

with experts and advisors are about these issues." [Sumoud TM3, captured by the third round of data collection].

"We now face challenges related to Saudisation and competencies that completely refuse to join us as enterprises." [Yamen TM3, captured by the third round of data collection].

6.2.1.4 TBI's Role in Increased Professionalisation

The incubator advisors played an important role in the increased professionalisation of roles within the entrepreneurial teams. In the six entrepreneurial teams (Omar, Ryan, Al Batoul, Alanod, Warda, and Aseel) that were in the 'product market fit' stage of growth, the role of the incubator was an emphasis on the need for the ETs to formally identify roles and assign team members to these roles. For example:

"While dealing with us at this stage, they ask me every time about my position. They work with each of us according to his position" [Omar TM2, captured by the third round of data collection].

With respect to professionalisation of the entrepreneurial teams in the six entrepreneurial teams that were in 'scale-up growth' stage the incubator role revolved around four elements. First, the incubator management invited guest speakers to make presentations and hold seminars on the transition from new venture to an established organisation. These speakers included companies graduating from the incubator, founders of market-leading and influential tech firms, and experts. For example,

"I never forget XX's presentation (founder of a company graduating from the incubator) here about the most important tips from his experience to build a steadfast organisation." [Thabet TM1, captured by the third round of data collection].

"I attended two seminars by XX (expert in human resources) about team commitment to one goal and their roles... These speakers changed my thinking greatly and positively." [Al Jawhara TM1, captured by the third round of data collection].

Second, the incubator's advisors engaged with the entrepreneurial teams directly in terms of providing input into organisational structure improvement and delegation. For example:

"Of course, Advisor 5 had dedicated efforts in this regard. I am very much thankful for his support, advice, guidance, and presence with us to have an ideal structure." [Faisal TM2, captured by the third round of data collection].

"After all the structuring issues have been settled, they encouraged us to delegate, and we really did not master it." [Sumoud TM4, captured by the third round of data collection].

Third, the incubator provided the context for the entrepreneurial teams to exploit social networks within the incubator, which allowed them to obtain knowledge on organisational structure from their peers. For example:

"We have flaws in our structure; I always talk to XX (Incubated company founder) here. He has extensive knowledge in this regard. With time, he became like a consultant for us." [Thabet TM2, captured by the third round of data collection].

Fourth, some of the teams utilised incubator-paid consulting from consultants who were included in the incubator's network. For example:

"Sure, we benefited from the paid consultations. Transforming from simple structure, including three or four people a structure based on large numbers, is not easy... For example, they taught me these types of structures and how to set out a suitable structure." [Sumoud TM2, captured by the third round of data collection].

In the six entrepreneurial teams that were in 'scale-up growth' stage, the incubator also played a role in the professionalism of employees (as evident in the third round of data collection). The incubator's role revolved around four aspects. The first aspect refers to the incubator's assistance to the teams in finding suitable employees through arranging employment fairs in the incubator, in addition to providing the teams with CVs. For example:

"We attended recruitment fairs held here in the incubator and obtained CVs from the incubator… We hired three through the incubator." [Al Jawhara TM2, captured by the third round of data collection].

"We added a trainee in the sales department through the incubator, she is hard worker." [Thabet TM1, captured by the third round of data collection].

The second way that the incubator supported and influenced the ETs was in employee development opportunities in the incubation program. For example:

"All of our employees are registered on the incubator's mailing list... They get notifications for all training courses and events here. They attend for free, undoubtedly, they benefit." [Mubarak TM1, captured by the third round of data collection].

Third, the incubators enabled the teams to utilise social networks to create loyalty programs for employees through incubated companies that provided these services:

"XX (an incubated company) had developed an excellent loyalty program for our employees." [Yamen TM1, captured by the third round of data collection].

Fourth, joint meetings were held between the incubated entrepreneurial teams and decision makers in Saudi Arabia to discuss collaborative entrepreneurship practice-based solutions, aiming to create favourable conditions for these 'nascent' organisations.

"The Ministry of Labour obliges us to Saudisation; it harms us more than it does good to us... We discussed this with the incubator management a long time ago... She (the incubator manager)

arranged a meeting with a representative from the Ministry of Labour to discuss this matter here twice..." [Yamen TM3, captured by the third round of data collection].

6.2.2 Theme 2: Leadership Transitions

There was evidence of leadership transitions and related dynamics in eight teams (Al Jawhara, Omar, Aseel, Alanod, Ryan and Sumoud, Mubarak, and Yamen). Three forms of leadership transitions were identified: transfer of leadership within the ET team; a transition of leadership style; and board leadership turnover. The data captures the incubator's prominent role in each form of this leadership change.

6.2.2.1 Transfer of Leadership with the ET

There was a transfer of leadership within four teams (Al Jawhara, Omar, Al Batoul, and Aseel). This transfer of leadership occurred in three scenarios, each of which explains why the leading member relinquished leadership to another team member and why the other member was considered deserving of assuming the leadership role. These scenarios can be described as "a search for a capable leader.

The first scenario is evident in the Jawhara team. Al Jawhara TM2 took the leadership role initially (as evident in the second round of data collection). Positioning Al Jawhara TM2 as a leader was mainly constrained by family considerations as the team was a family entrepreneurial team and he is the father. Subsequently, Al Jawhara TM2 transferred leadership to Al Jawhara TM1, as he considered her to be a 'capable leader' (as evident in the third round of data collection). Al Jawhara TM2 had considered that his daughter's personality was not suited to a leadership role:

"Al Jawhara TM1 cannot be a leader. She is hasty, and that is risky." [Al Jawhara TM2, captured by the first round of data collection].

"My father (Al Jawhara) is the leader, and I cannot take the leadership away from him... Impossible." [Al Jawhara TM1, captured by the first round of data collection].

The decision to transfer leadership from father to daughter followed a period where the team faced severe challenges. During this time, Al Jawhara TM1 capabilities came to the fore.

"We went through alarming challenges… Every time Al Jawhara TM1 was the saviour… She was leading XX (the business name) wisely so that we could survive and succeed. So, I handed her much authority, she became the captain... My role has become confined to the content section." [Al Jawhara TM2, captured by the third round of data collection].

The second scenario of leadership transfer within the ET was evident in the Omar team. The team members agreed that each member would go through a leadership experience (a probationary period) and test their leadership skills. Based on this, the leader-member was evaluated, and if he was not

seen as successful, he relinquished the leadership to another member. As such, the leadership ultimately settled with Omar TM1, who was recognised by his counterparts in the team as the most deserving due to his leadership skills:

"We didn't know who a suitable leader could be. So, Omar TM3 suggested that we must try the leadership with each of us for three months and then measure results and achievements... Omar TM2 failed, so the leadership is mine now." [Omar TM1, captured by the third round of data collection].

The third scenario appeared in the Al Batoul and Aseel teams. Al Batoul TM1 and Aseel TM1 decided as single individual founders to relinquish leadership and form their teams by adding new members to be the leaders. This resulted from their recognition that they did not have sufficient leadership skills to be the 'capable leader':

"I am not a leader; I do not have the capabilities. The new partner had to be a leader." [Al Batoul TM1, captured by the second round of data collection].

"...I immediately handed over the leadership to Aseel TM2... I am convinced that adding Aseel TM2 was an absolute necessity for this and other reasons." [Aseel TM1, captured by the first round of data collection].

6.2.2.2 The Incubator's Role in Leadership Transfer within ETs

The incubator played an important role in the transfer of leadership roles within the ETs described above. In the Al Jawhara team, incubator management supported the transfer of leadership to Al Jawhara TM1. This was shaped by the goals and priorities of the incubator which are focussed on achieving the 2030 vision of empowering female talent and leaders. The incubator management supported Al Jawhara TM1 as the new leader by empowering her as a speaker and linking her with influential networks:

"The incubator management encouraged me to empower Al Jawhara TM1 as a successful leader. She has proven that; everyone in the incubator attests to this also... We all believe that it is time for women in Saudi Arabia... According to the vision (Saudi Vision 2030), the incubator supports empowering women leaders in this sector." [Al Jawhara TM2, captured by the third round of data collection].

"I am grateful for her support (the incubator manager). She supported me to be one of the field's prominent names. This is definitely giving us opportunities to expand." [Al Jawhara TM1, captured by the third round of data collection].

"Undoubtedly, we aim to strongly support women and empower them as successful leaders and entrepreneurs. This complies with the Vision 2030... Our incubator is ultimately part of the government incubation system." [Advisor 1, from focus group; captured by the third round of data collection].

Similarly, in the Omar team, the incubator advisors provided significant support for the new leader, Omar TM1, providing him with social networks through "Al Majles", a weekly event held in the incubator in a particular space, bringing together the CEOs of incubated companies and graduating companies. The incubator advisors also advised him make use of courses such as the 'intensive leadership' and 'CEO courses' available through the incubation program:

"From "Al Majles", I got exceptional relationships where the CEOs of companies meet here each Friday... Advisor 4, sent me through WhatsApp some courses and workshops for CEOs here (in the incubator)." [Omar TM1, captured by the third round of data collection].

In the Al Batoul team, the incubator advisors determined the gaps in the team, the most prominent being the leadership role. Therefore, the advisors identified the potential members' specifications and expertise and encouraged the individual founder, Al Batoul TM1, to add a new team member that could assume a leadership role. Moreover, they were actively involved in searching for this potential member in their own networks, aiming to fill the leadership role:

"Yes, we reached (Al Batoul TM1 and the incubator's advisors); I miss a real leader... Postponing him any longer can harm XX (the business name) ... they encouraged me. We agreed on how he should be… they posted this vacancy on their social media pages." [Al Batoul TM1, captured by the third round of data collection].

6.2.2.3 Transitions of Leadership Style

The case data illustrated another change in leadership, shifts in leadership styles and the factors leading to these shifts that was evident in five entrepreneurial teams (Ryan, Faisal, Sumoud, Mubarak, and Yamen). Such a shift refers to the transition from shared leadership to hierarchical leadership or the reverse, a shift from hierarchical leadership to shared leadership. The data illustrates the role of the incubator during the shifts in the leadership styles of the incubated entrepreneurial teams.

Hierarchical leadership suggests centralising the leadership functions within a single position (Harris, 2008). Conversely, shared leadership entails decentralising leadership functions across multiple individuals or groups (Carson et al., 2007; Pearce and Conger, 2003; Pearce and Wassenaar, 2015). Two entrepreneurial teams, Ryan and Faisal, were characterised by a shared leadership style during the product creation and development phases of venture creation This reflects the terms' focus on working as a unified entity to promote and sustain innovation during this phase of venture development. Later, both teams switched to a more hierarchical leadership style (leadership became the responsibility of Ryan TM1 and Faisal TM1). This was in part motivated by the expectation of the Venture Capital's (VC) that ventures should have a required a hierarchical leadership style, with one individual in the leadership role. For example:

"I am the CEO nominated by my team; all decisions are mine… The nature of the current stage and the VC dictated this… We have shared the leadership previously based on the nature of the phase. We were developing products together; teamwork is the only way to innovate." [Ryan TM1, captured by the third round of data collection].

In the Sumoud team, the adoption of a shared leadership style in the initial phases was motivated by the desire to achieve team integration and satisfaction levels and by the recognition of the need to recognise each member's contribution. Later, the team shifted towards a more hierarchical leadership style (leadership became the responsibility of Sumoud TM1, with him as the CEO). The main reason for this transformation in style was that the Sumoud team was the increase in the number of employees and the need to attract new talent, both of which necessitated the drawing up of an organisational structure and clearer definitions of roles.

"True, in the beginning, we needed to get along with each other and integrate, so we shared everything, even the pivotal decisions. Nowadays, the situation is different; the decisions are becoming more serious, the staff is growing every day, and we need only one leader. Duplication is a dilemma." [Sumoud TM1, captured by the third round of data collection].

"... We seek to keep pace with growth by attracting brilliant talents. © those talents arrive and find that our founding team is scattered or torn, they will never succeed... So, we had to arrange our affairs, and the leadership must be in the hands of one person only." [Sumoud TM3, captured by the third round of data collection].

The data suggests that in those cases with a shared leadership style, the concept of informal leadership emerged as an important dynamic within the ET. Informal leadership does not necessarily involve authority or power but instead, involves the leader influencing others on an interpersonal level through emotional support and motivation (Smart, 2010). Interestingly, those informal leaders (Al Jawhara TM1, Faisal TM1, and Sumoud TM1) later became CEOs when it was time to appoint a formal leader.

"Simply because he assembled the team and then struggled to compose it, and he is the one who studies situations rightly and then decide wisely... we cannot do that… He always motivates us." [Sumoud TM4, captured by the third round of data collection].

The transition from a hierarchical leadership style into a shared leadership style was evident in two entrepreneurial teams (Mubarak and Yamen), both of which were teams that disbanded and reformed. The founder's' insistence on retaining leadership after reforming their teams was a precautionary measure due to a previous unsuccessful team-building experience.

"The leadership must be mine. I know everything and know very well how to hold the reins and my partner just joined recently... Indeed, the experience of my previous team made me anxious." [Mubarak TM1, captured by the first round of data collection].

Later, the teams switched to a shared leadership style (’his was captured by the second round of data collection). This switch in leadership style reflected the terms' ambition to create a business based on participation and trust, which was important as they had team members operating in several geographical locations due to international expansion. This procedure seems to have come after the new members gained the trust of the founders.

“How if it is not shared? I stayed in Egypt for three months and in India for two months to establish our offices there. If everyone here did not share the decision and find solutions, we would have lost everything in Riyadh.” [Mubarak TM1, captured by the second round of data collection].

“Of course, I needed some space at first to feel trust with Yamen TM3.” [Mubarak TM1, captured by the second round of data collection].

6.2.2.4 The Incubator’ Role in the Leadership Style Transitions

The incubator played a role in the switch from a shared leadership style to a hierarchical leadership style. The role of the incubator took a number of forms. First, the VCs in the incubator network imposed the requirement for hierarchical leadership and a single leader in some cases (Ryan and Faisal teams):

“There is no room for discussion. Closing the last funding round with XX (VC from the incubator network) and forming a board of directors made us change. The first is that the leader is one person.” [Faisal TM2, captured by the third round of data collection].

Second, the incubator’s advisors provided support to teams. For example, in the Ryan team, the incubator advisors shared knowledge with the team.

“The incubator advisors have strongly supported us to be convincing to investors, which requires that the leader be one person who has full powers.” [Ryan TM3, captured by the third round of data collection].

The incubator management also played a role in that they helped draft all items/clauses of contracts related to key positions.

“... We just asked the incubator to formulate the politics of our work, including our positions as we agreed recently and the way of working in the partners’ agreement, and the equity and profit shares.” [Mubarak TM2, captured by the third round of data collection].

6.2.2.5 The Entrepreneurial Team’s Leadership Turnover

The data revealed another form of leadership change in one team (Thabet tea–) - the transfer of the leadership from the entrepreneurial founding team to a new CEO elected by the shareholders/investors (captured in the third round of data collection).

"The board of directors made several decisions through the majority of votes, including transferring leadership entirely to the elected board of directors. My wife (Thabet TM2) and I got a scholarship abroad to complete a PhD, so we cannot fully commit… We kept 65% of our equity stake." [Thabet TM1, captured by the third round of data collection].

In some cases, there was reference to the leadership's exit plans. There were a number of elements to these plans, including the need to maintain strategic focus and direction; the need to maintain internal conditions, particularly regarding staff; and communications with the new leader to facilitate © transition.

"We were at a serious juncture; we had to take firm measures to reduce costs and raise the capital... Correcting internal conditions related, for example, to the presence of employees who do not fit the stage and change… Meetings with the new CEO." [Thabet TM1 captured by the third round of data collection].

6.2.2.6 The Incubator's Role in ET's Leadership Turnover

The incubator's role in the cases when the leadership passed from the founding entrepreneurial team to a new CEO elected by the shareholders included multiple consultations from the incubator's financial consultants and moral/emotional support from one of the incubator's close advisors to the team (Thabet team):

"Yes... when it was time for final decisions, we were afraid and felt that we had to discuss the matter with experts. We arranged appointments with the financial consultants here (at the incubator) and took their advice." [Thabet TM1, captured by the third round of data collection].

"Oh, maybe we were looking for emotional support... Because we talk to Advisor 3 a lot. He supported us strongly. He shared other firms' stories that went through the same stages. They are now doing well, and this was reassuring." [Thabet TM2, captured by the third round of data collection].

6.2.3 Theme 3: ET Conflict

Conflict was an important aspect in the teams. Based on the entrepreneurial terms' perceptions of the effect of the conflict, nine teams (Mubarak, Al Jawhara, Ryan, Omar, Aseel, Thabet, Sumoud, Yamen, and Faisal) considered the conflict as 'healthy', while in contrast, two teams (Mubarak and Yamen) perceived the conflict to be 'unhealthy'. The incubator played a role in both forms of conflict and incubators were sometimes directly involved in conflicts themselves.

6.2.3.1 'Healthy' Team Conflict

The data captured healthy cognitive conflict, both task-based conflict and decision-making-based conflict. In four teams (Mubarak, Al Jawhara, Ryan, and Thabet) cognitive conflict based on the task

was evident mainly in daily internal operations. The origin of such conflict appeared to be the heterogeneity of members' backgrounds:

"Oh, the daily operations; because of it, every day we disagree countlessly... Honestly, our problem is always overlapping tasks that waste our time and effort… These disagreements are not negative; oh, the opposite, they have led us to organise our internal matters correctly during the last few months. I do not remember one day we stopped work because we disagreed." [Al Jawhara TM2, captured by the second round of data collection].

"Because each of us came from different background… For example, I manage tasks in meticulous detail the same way I deal with the Jira Software... Mubarak TM2 does not do this; he only outlines the tasks and how they should be done... Frankly, he says all roads lead to Rome." [Mubarak TM1, captured by the second round of data collection].

There was evidence of 'healthy' cognitive conflict over decision-making and use of powers/authority in seven teams (Thabet, Ryan, Sumoud, Mubarak, Yamen, Faisal, and Al Jawhara). The origin of this conflict appeared to be the heterogeneity of members' backgrounds and personality differences.

"Sometimes I want to cry, especially when we disagree about making quick and decisive decisions... it is a long and detailed process for us... These disagreements have a positive effect, as the quality of the decisions becomes high." [Thabet TM2, captured by the second round of data collection].

"Each of us has a personality and behaviour due to his culture, environment, education, and specialisation... With time and more challenges and problems that we went through together, it became clear how each of us behaves and how we can meet all these differences... Yeh, we have conflicts, but we deal with them positively as they have helped us comprehend each other and quickly harmonise." [Sumoud TM1, captured by the third round of data collection].

Based on the teams' narratives, 'healthy' cognitive conflict, task-related or decision-making related, had seven benefits. These benefits were: improving trust; creating multiple perspectives; increasing innovation and creativity; predicting potential issues early; building commitment; achieving team harmony and integration; and making better quality decisions. This is evident in the following:

"It made us more confident that together we can be a cohesive team, it enhanced trust." [Sumoud TM2, captured by the second round of data collection].

"No, quite the contrary, it made us understand each other more. We encourage each other... We appreciate each other's efforts, no matter what." [Ryan TM3, captured by the third round of data collection].

"We enter these loops continuously; we disagree, discuss a lot, then agree, which is what we consider healthy and raises innovation and creativity... The constant agreement is a negative thing; we prefer to be an effective team." [Yamen TM3, captured by the third round of data collection].

"Without these disagreements and discussions, we would not have predicted much and made early plans." [Al Jawhara TM2, captured by the second round of data collection].

"Today we are committed, harmonious, happy and act as one. That's because we've been through so much together. We argued a lot and didn't agree sometimes, but it's healthy." [Mubarak TM6, captured by the third round of data collection].

"These disagreements led us each time to reach successful decisions that developed our work and were not the opposite at all." [Thabet TM2, captured by the second round of data collection].

"No, quite the contrary, it made us understand each other more. We encourage each other... We appreciate each other's efforts, no matter what." [Faisal TM3, captured by the second round of data collection].

6.2.3.2 Incubator's Role - 'Healthy' Team Conflict

The incubator management played a role in helping teams manage what the teams perceived as 'healthy' conflict. The primary role of the incubator management in this regard was their involvement in helping teams to manage the conflict. This occurred through three separate mechanisms. First, the incubator's advisors encouraged and supported healthy conflict as it was perceived to be a fundamental source of creativity and innovation. This was evident in the Ryan team:

"They advised us during product development that it is okay to have different points of view because it is a source of creativity and innovation. Stagnation is useless." [Ryan TM2, captured by the second round of data collection, from the focus group].

Second, the incubator's advisors actively sought to encourage the teams to keep any conflict 'healthy' by supporting the right decisions after examining decisions with teams and supporting what they perceived to be the 'right' decisions. For example, in Al Jawhara, Ryan, and Thabet there was 'healthy' cognitive conflicts related to making fundamental decisions:

"I clarified to Advisor 1 that we prolong the discussion and disagreement... I shared some examples of what we have disagreed on lately. She advised me that these conflicts should not take a different turn, especially as my partner (Thabet TM1) gets angry quickly when discussing operation management... She (Advisor 1) supported some of my proposed solutions." [Thabet TM2, captured by the second round of data collection].

Two entrepreneurial teams, Faisal and Thabet, were characterised by 'healthy' cognitive conflicts related to tasks. The incubator's advisors' efforts focused on developing the internal organisational structure and setting clear boundaries for each member's role.

"Together (the team and Advisor 4), we have arranged the structure and meticulously clarified each employee's role and member... Advisor 4 always insists that confusion in the structure

would turn every positive disagreement now into storms later." [Faisal TM2, captured by the second round of data collection].

The third mechanism used by the incubator in the context of 'healthy' conflict was their role in building a 'healthy' conflict culture within teams. This was done by the incubator advisors sharing their experience concerning conflicts within teams at meetings with the ETs. In three teams, Sumoud, Ryan, and Yamen, the incubator's advisors encouraged the team members to debate ideas without judging their counterparts because their ideas may be different.

"Advisor 1 shared with us the stories about the health conflicts in the teams here; she asserted those conflicts are useful if you deal with them properly. They encouraged us to attend the team-related courses here in the meetings." [Thabet TM2, captured by the second round of data collection].

"For example, they advised me. Do not judge your partners and listen to them carefully. You are different, and you must understand this difference." [Sumoud TM2, captured by the second round of data collection].

The incubator advisors also encouraged the entrepreneurial teams such as Ryan and Thabet to develop their knowledge through the incubator program. For example, the programme suggested that utilising 'healthy' conflict to enhance the strength of a team can lead to a more harmonious team.

6.2.3.3 'Unhealthy' Team Conflict

Two teams were characterised by 'unhealthy' conflict Mubarak and Yamen). The data suggested four dimensions of 'unhealthy' conflict, whether it was affective conflict, relationships/interpersonal conflict or a conflict of interests. These were the indicators of unhealthy conflict, the origins/causes/sources of unhealthy conflict, internal attempts to resolve unhealthy conflict by ETs, and the consequence of unhealthy conflict..

The data revealed that resentment, low morale, constant disagreement, and lack of respect and trust were signs of unhealthy conflict that the teams recognised before the final consequences of the conflict were evident.

"The whole atmosphere turned negative, we were all upset and angry." [Yamen TM3, captured by the third round of data collection].

"Of course, our morale was low, I was not happy." [Mubarak TM1, captured by the first round of data collection].

"Literally we no longer agreed on anything, even if we wanted to agree, we would have deliberately disagreed." [Yamen TM3, captured by the third round of data collection].

"Respect and trust were going downhill until we got to zero and that were annoying to me." [Mubarak TM1, captured by the first round of data collection].

"Just like the construction, I felt like everything was starting to fall apart... There was no longer any trust; there's no more understanding. The voices were getting louder here, with no productivity, which was unacceptable. Their conflicts became public in the employees' spaces... The atmosphere was negative; I was afraid to lose everything." [Yamen TM1, captured by the third round of data collection].

The case data suggests two causes/sources of this unhealthy conflict: a clash of personalities and a conflict of interests. The conflict of interests associated with substantive issues in the Mubarak team revolved around strategic issues, including strategic decisions, commitment, and productivity:

"After that, we could no longer find room for agreement... Everything we had was going in the wrong direction. The vision, they were not satisfied with it... I was angry and resentful of productivity." [Mubarak TM1, captured by the first round of data collection].

A clash of personalities between Yamen TM3 and Yamen TM4 led to inconsistency, uneasiness and escalation of disagreements. This clash of personalities, perceived by team members, was the result of the heterogeneity in background, upbringing, and life experience.

"I tried to fit in with him (Yamen TM4), but my efforts were unsuccessful. He is a difficult person… We are not alike, nor do we have anything in common. His personality is different from ours; his actions; his view of matters." [Yamen TM3, captured by the third round of data collection].

"With the passage of time and our many conflicts had escalated until it became clear that was impossible to work together in the same place... Our personalities do not match, and they will not match, I am sure, even if we spend together light-years in the future... We could not agree on even the simplest matters... Sometimes I felt that he (Yamen TM4) was deliberately choosing everything that was the opposite of what I said and what I decided to prove that he was the best or just to be stubborn." [Yamen TM3, captured by the third round of data collection].

The data shows the consequences of the unhealthy conflict on the entrepreneurial teams was the withdrawal/exit/departure of members.

"They all decided to leave at once; I did not mind because we were at a dead-end." [Mubarak TM1, captured by the first round of data collection].

In the data there was evidence of internal attempts by the entrepreneurial teams to resolve the conflict before the departure of the members. For example, in the Yamen team's the first founder member (Yamen TM1) used the avoidance approach to encourage his counterparts (Yamen TM3 and Yamen TM4) to avoid the conflict, instead of compromising, accommodating, and collaborating.

"I had tried very hard to behave as professional people and get him (Yamen TM4) back to work... I was upset because he did not complete the three-month probationary period... After ten days of persuasion, he returned with conditions. When he came back from the first day, their behaviour

was aggressive. Their voices were loud... Yamen TM4 withdrew again. I became convinced that it was impossible–to complete with us. While he is professional and capable, our personalities and goals are different." [Yamen TM1, captured in the third round of data collection].

6.2.3.4 Incubator's Role - 'Unhealthy' Team Conflict

The data provides evidence of the incubator's role in preventing unhealthy conflict and of the procedures used to resolve unhealthy conflict. The incubator's preventive role was evident in the actions taken by the incubator's advisors when they first noticed signs of unhealthy conflict. For example, in two teams (Al Jawhara and Faisal) the incubator's advisors stressed the need to address official and financial legal issues through the incubator's dedicated departments when they noticed arguments were increasing among members about equity stakes. Such warnings about these issues were not the first from the incubator. The admissions committee stressed the importance of clarity on these issues during the admission phase, especially in the family entrepreneurial teams:

"I feel like I do not feel as excited about work as I used to be. Our discussions increased about unresolved ownership equities... The advisors who deal with us constantly know this well, so they urge us to submit all our papers to the financial and legal department here in the incubator to suggest solutions... This is neither a warning nor an initial urge from the incubator. The admission committee discussed this with us on the admission day because we are a father and daughter, and they said this is a serious matter... For example, if my father dies, all this will be inherited by the heirs, and my share will not be clear as a business partner and not a daughter." [Al Jawhara TM1, captured by the second round of data collection].

In the teams in the Thabet, Faisal, and Yemen cases, the incubator advisors stressed the need to draw up and develop an accurate organisational structure in anticipation of the emergence of any 'unhealthy' conflict. This was because arguments were increasing among members about the roles and granted powers/authorities:

"Lately, we have been exaggerating with phrases like, this is not your business; why didn't you do your work? Why are you interfering with my work? Advisor 3, because he is aware of what is happening, stressed the importance of clear structure and the separation of roles before the conflicts become real and out of control." [Thabet TM2, captured in the second round of data collection].

The preventive role of the incubator was also evident in their promotion of learning activity. The incubator advisors taught the leaders of three teams (Sumoud, Al Jawhara, and Ryan) to recognise 'unhealthy' conflict and arrest it early. Moreover, they emphasised how to recognise the difference between healthy and unhealthy conflict:

"Perhaps because we are very interested in achieving harmony and integration in our team, we were discussing with Advisor 1 and Advisor 2 their experiences and what they notice in the

entrepreneurial teams here... They shared with us the experiences of teams that did not avoid some conflicts in their beginnings... From here, it was essential to learn from them the type of conflicts that may exacerbate and affect negatively—Alternatively, those that are healthy for the quality of work and decisions." [Sumoud TM2, captured by the second round of data collection].

When the unhealthy conflict within both the Mubarak and Yamen teams became evident to the incubator advisors, the incubator advisors advocated measures to address the matter. For example, the incubator advisors made great efforts to resolve conflicts in the Mubarak team through attempts to bring the views of team members closer and by persuading members who had expressed a desire to withdraw to reconsider:

"Yes, before my partners (Mubarak TM2, TM3, TM4, and TM5) left, the advisors did their best to convince them not to leave. They tried to meet us and bring the views closer, but my friends completely refused and preferred to leave." [Mubarak TM1, captured by the first round of data collection].

6.2.3.5 Incubated Team Conflict with the Incubator

Conflict did not only emerge between teams, however, but also between teams and incubators. Conflict emerged between the Aseel team and the incubator for three reasons (the second and third rounds of data collections captured its escalation):

"It really is a conflict... We refused to deliver any new documents to the accounting department or even the legal department of the incubator... we refused to share any developments of our company. They criticise us for not constantly responding to them... They started sending us notifications to exclude us... for us, it is no longer important. The environment is no longer healthy for work because we are always in conflict with them." [Aseel TM2, captured by the third round of data collection].

The first reason was the lack of a common language between the team and the incubator team:

"I feel that they do not understand, hear, and discuss ... They are only keen on monitoring outcomes, that are incorrect or illogical from our point of view." [Aseel TM2, captured by the second round of data collection].

The second reason lies in the team's failure to adhere to the incubator's policy, which led to the incubator's annoyance:

"In business, there is no 1 + 1 = 2; in the incubator, they want all the work to be this way. For example, they demand us to activate the sources of income to comply with the conditions of their second stage. However, if we comply with this now, it will be a disaster ... they think that we have failed to adhere to their policy, but logically we are working in a way that fits our start-up ... they do not want to discuss it." [Aseel TM1, captured by the second round of data collection].

The third reason, which exacerbated this conflict between the incubator and the Aseel team, was the constant criticism of the incubated team towards the incubator and the way it operates:
"Yes, we constantly criticise them... We are not satisfied. This is a governmental incubator, and we feel like it should be of high quality... We have talked to them a lot about how they are working, but they are not responding." [Aseel TM1, captured by the third round of data collection].

6.2.4 Summary of Findings on ET Evolution

The case data show the professionalisation and organisationof the teams overtime were characterised by three prominent dynamics: initial allocation of and professionalisation of roles; leadership transitions; and within team conflict. The findings suggest that these evolutionary dynamics resulted from the attempts of the teams to create a common basis for cooperation while they formed. Regarding the initial allocation of roles, the findings show that role allocation differed between teams based on whether the teams formed before or after the recognition of the venture opportunity. The findings also suggest that the stages of growth, whether 'product market fit' or 'scale-up 'influenced how teams professionalised. In the cases three forms of leadership transition was evident: leadership transitions among members, transition of leadership styles, and leadership turnover. Conflict, both 'healthy' and 'unhealthy', emerged as a prominent evolutionary dynamic of the ET during the incubation period.

The multiple roles of the TBI as an influencer of the evolutionary dynamics of the ETs were prominent in the data. The TBI is a multifaceted context. As an ''advisory'' context, the incubator's intervention was high, represented by the involvement of the admission committee and the advisors regarding the allocation of the initial roles and the transition to professionalisation. As an ''advisory'' context also, the role of the TBI emerged in empowering 'capable' leaders in their roles, especially talented female leaders. With respect to team conflict, the advisors were an essential component of the advisory context of the incubator in that they in supported healthy conflict and preserving teams from moving into 'unhealthy' conflict. As a ''mediatory'' context, the role of the TBI emerged in linking entrepreneurial teams with decision-makers to explore collaborative solutions to employment issues. As a 'knowledge context', both teams and their staff absorbed the knowledge available through incubator training. Lastly, as a ''social'' context, the entrepreneurial teams utilised the social networks encapsulated in the incubator, during the processes of social interaction dynamics.

6.3 Discussion of How ET Forms During Incubation Related Social Interaction Processes

6.3.1 Theme 1: ET Role Allocation and Professionalisation

In contrast to what is prevalent in the previous literature, it appears from this research that team roles at the initial formation stage are not always characterised by a lack of clear titles and features. While in the teams created initially according to a logic of "let us be a team and create our firm", the nature of the roles was loose and unclear prior to the identification of the venture opportunity. On the other hand, in the teams that were created initially according to the logic of "we know well what we want and let us do it" the members were added to perform roles with particular features and titles. This does not negate that these roles were in the process of being crystallised to be more formal and clearer.

Accordingly, this study extends the prior research by illustrating the importance of the initial logic underpinning the venture creation sequencing of team formation (whether teams form prior to or as a result of opportunity recognition) in determining the initial allocation of roles. Creating the team initially after the recognition of the opportunity was associated with the appointment of members according to specifications, competencies and skills to assume specific roles and positions.

Through the case studies analysed, it is possible to distinguish between two stages of growth and how this affects roles. In cases characterised as in the growth stage (focussed on product-market fit), the teams were developing work plans that included moving roles to more formal ones, which entailed clear and specific structures. This was in conjunction with the entry of new investment rounds, new markets, and the inclusion of new employees. In cases in the growth stage (scale-up), the teams were characterised by intensive changes into domains: the founding team and the employees. The entrepreneurial teams sought to impose concepts consistent with the desired stage of professionalisation, including imposing high accountability and responsibility for each role. For employees, the teams seemed to focus more on human resource issues, such as Saudisation[1] and establishing an Employee Stock Ownership Plan ESOP for employees.

These findings build on prior research by revealing how the structuring of team roles and the redefinition of roles was undertaken by ETs when faced with growth challenges during the critical growth stages. Klotz et al. (2014) argue that as an entrepreneurial team becomes increasingly structured, entrepreneurs must anticipate the actions required to formalise business operations. However, some work has been undertaken to identify entrepreneurial team-oriented factors during development stage. In other words, less research has been conducted on the interrelated complexity of various actions required for entrepreneurs to meet the challenges of team structuring as firms move into critical stages of growth.

6.3.2 Theme 2: Leadership Transitions

In this study the reasons for the transition of leadership among team members revolved around the team's efforts to identify the most 'qualified' or 'capable' leader. This was triggered from the teams' experiences and learning acquired as they dealt with venture creation challenges. Additionally, team leadership change was prompted by the changes in the environment and the growth and development

of the ventures, factors which frequently meant the ventures needed different leadership skills. This aligns closely with previous research on leadership transition which found that as entrepreneurial businesses grow, they come to realise that they require a change in leadership as they outgrow the skills and competencies of their previous leaders (Clarysee and Moray, 2004). However, it took time for the teams to recognise the necessity for a new leader and to acknowledge they did not currently have the correct leadership skills in the entrepreneurial team as currently structured.

This study contributes to the research on entrepreneurial teams by exploring the process of how, at different points in time, different members of the co-founding team emerge as leaders. According to Lyndon and Pandey (2021), the entrepreneurship literature has not sufficiently explored such transitions in leadership within entrepreneurial teams. Thus, this study deconstructs the phenomenon of the leadership emergence transition process amongst members in entrepreneurial teams. This was through capturing the structure of the leadership transition among members, as it revolved around three scenarios. The first scenario was a leadership dispute, with family considerations playing a central role. The second scenario was the nomination of a person who would optimally play the role of the leader through the process of giving different members of the entrepreneurial team a trial period as leader. In the third scenario, there was leadership transition to a new member was a matter that required deliberation and then acceptance across the team.

This study confirms that the entrepreneurial teams focused on ensuring that the team had a ‘qualified’ or ‘capable’ leader, that is the leader with "the ability to guide, direct, or influence people in a way that has great merit" (Thompson et al., 2008, p. 366). Interestingly, this was evident in the entrepreneurial teams comprised of family member, which is in contrast to what prior research has suggested. (Discua Cruz et al., 2013). The selection of leaders is based on who has the talent and desire to be a lead entrepreneur, where there is less self-interested behaviour and a stronger stewardship perspective toward the group. Additionally, there are higher levels of trust, so that the leader does not feel they need to be involved in everything. However, this was not enough in the entrepreneurial family teams in this study – these teams faced challenges and had to persuade one members of their leadership potential and capability, so that leadership transitions could occur.

In this research there were also more complex instances of transition in leadership style from shared to hierarchical and from hierarchical to shared. The factors that led the teams to adopting a shared leadership style are consistent with those identified in previous research (Zhou et al., 2015; Lyndon and Pandey 2019). The teams sought to adopt shared leadership at certain stages to achieve specific goals. These goals included achieving high levels of integration and satisfaction and ensuring the involvement of the entire team in innovation processes. This was achieved through supporting the participatory nature of each member's contribution and by creating spaces to encourage co-operation during shared activities. Shared leadership in these cases revolved around specific leadership functions, most notably monitoring and managing work processes and setting overall direction, and

vision for the team. This study advances the literature by highlighting the concept of 'informal leadership'. Informal leadership does not necessarily involve authority or power but instead, involves the leader influencing others on an interpersonal level through emotional support and motivation (Smart, 2010). During shared leadership, the findings captured the emergence of those within the team who were able to motivate and support the members. In the literature on organisational leadership, informal leadership is championed for the role it can play in organisations in dynamic and rapidly changing environments (Ross, 2014). In the cases that were characterised by a transition to hierarchical leadership, the explanatory factors were consistent with the factors identified in prior research. Engaging with external investors was a prominent driver of the need for restructuring the team. This made leadership become hierarchical, with the need for a specific CEO position. With growth and increased capital and new employees, the teams recognised the necessity of adopting new structures in the ventures, so they transitioned from organic-based structures to more hierarchical structures. This study adds to the literature by highlighting the concept of 'entrepreneurial alertness' which is defined by Tang et al., (2012) how failure may lead to learning that is appreciated when forming leadership in the entrepreneurial team. In cases where teams disbanded and then reformed, the founders initially sought to retain the leadership control, as a precautionary measure due to previous unsuccessful experiences in maintaining the members. However, as the founders felt more confident about the new members and other factors were present, they transitioned to a more shared leadership style.

6.3.3 Theme 3: ET Conflict

In the cases in this study, two types of conflict emerged: cognitive conflict and affective conflict. Cognitive conflict was caused by conflict about tasks, managing daily tasks, and decision making. Affective conflict resulted from conflicts of interests, relationships, and personalities clashes. This study extends the literature on conflict in the entrepreneurial team by revealing both conflict sources. While the source of cognitive conflict was the members' backgrounds, the source of affective conflict was the heterogeneity of members' backgrounds and their personalities.

The findings advance the literature on conflict in the entrepreneurial team by identifying the team's acknowledgement of the positive, healthy effect of cognitive conflict and, conversely, the negative effect of affective conflict. Regarding cognitive conflict, across the teams there were seven benefits cited: improving trust, creating multiple perspectives, increasing innovation and creativity, predicting potential issues early, building commitment, achieving team harmony and integration, and making better quality decisions. The notable effect of affective conflict was the team's recognition of the signs of unhealthy conflict that preceded the eventual consequences of the departure of members. These were resentment low morale, constant disagreement, and a lack of respect and trust. These new insights from this research can help to guide ETs in identifying the early signs of conflict and to address issues before they develop and lead to team dissolution. This research also contributes

to extant research by capturing the structuring of team conflict over time and team responses when they realise the negative or positive impact on the team. The longitudinal design of this research allowed for the observation of the development of team conflict and attempts by the entrepreneurial team to resolve conflict through internal attempts to manage it.

Campopiano et al. (2017) finds that there are fewer conflicts and tensions in family entrepreneurial teams because there are fewer hidden goals and objectives, and they have a history of shared experiences, making them more effective. However, Brannon et al. (2013) claim that family entrepreneurial teams likely experience increased team conflict, particularly if the teams are intergenerational. Brannon et al. (2013) hypothesise that the conflicting identities as a family member and as an entrepreneur can cause team conflicts. This is because the individuals in the team are experiencing identity conflicts between their roles and relationships with other team members. This research showed that conflict in the family entrepreneurial team arose because of interests in equity share and the approach adopted to working as members belonging to different generations.

In addition, this research also found instances of direct conflict between ETs and the incubator's advisors. For this reason, this research finding is unique and has shed light on a social dynamic that hasn't been focused on in previous research but is worthy of further investigation. In this study, conflict arose when teams believed that they had justifications for proceeding with developing their firms in certain ways and the advisors had objections. Collecting amounts from service providers included in the application as an important and necessary indicator of the firm's income, for example, was inconsistent with the objectives of the firm, while it was a condition for moving to a new stage in the incubation process. On this subject, the language of dialogue between the two sides was lost, as each side insisted on its opinion. What aggravated the issue was that the advisors proceeded to submit reports of the firm's poor performance, which made the incubator issue a dismissal decision. The conflict between the case and the incubator led to the complete isolation of the entrepreneurial team from dealing with the incubator team.

6.4 Chapter Summary

This chapter presented the findings and discussion of a cross-analysis of the twelve entrepreneurial teams for three themes related to the evolution dynamics that pertain to social interaction process. Accordingly, it discussed the initial allocation of roles toward professionalisation, leadership transitions, and conflict. In the next chapter (Chapter 7), the focus is on presenting the conclusions drawn from the thesis's findings and contributions and setting out the limitations to this research and suggesting avenues for future research.

Chapter 7: Conclusion

7.1 Introduction

This chapter draws together the conclusions of the thesis, outlining the findings of the study in terms of the research questions and the contributions this study makes to the technology incubation and the entrepreneurial team literature. The limitations of the study are then discussed, followed by avenues for future research. Lastly, the practice and policy implications of the study are outlined.

7.2 Research Questions and Objectives

There are four research questions explored in this thesis:

(R1) How does the composition and structure of entrepreneurial teams evolve over the incubation period?
(R2) What role does the incubator play in influencing the evolution and dynamics of entrepreneurial teams?
(R3) How do social interaction processes influence the evolution of entrepreneurial teams during the incubation period?
(R4) What role does the incubator play in the social interaction processes in entrepreneurial teams?

This research explored the formation and evolution of the entrepreneurial team during the incubation process and the TBI's role in this regard. Informed by a critical realism perspective, a multiple case study methodology coupled with a longitudinal perspective is adopted to study 12 entrepreneurial teams in the context of a technology incubator, BADIR, in Riyadh, the capital of Saudi Arabia. Four data collection methods were relied upon to collect data from the founders, the incubator's advisors, and the incubator's management. The researcher conducted 98 interviews, eight focus groups, ten informal discussions, and four non-participant observations, involving three rounds of data collection points across a twelve-month period from January 2019 to January 2020.

7.3 Findings

Due to the longitudinal nature of this research, the findings capture the formation and evolution dynamics that the ETs experienced during the incubation period and the role of the incubator in this regard. This included changes associated with initial creation/formation, the dynamics of subsequent formation processes, and social interactions processes. The subsequent sections have been divided into three parts, each discussing one research question. The first discusses the formation and evolution of ETs during the incubation process with the second elaborating on the role the incubators played in this evolution and team development. Lastly, the third part addresses the social interaction processes observed during the incubation process and how they impacted ET evolution. It is

important to note that given the close relationship between social processes and entrepreneurial team evolution some parts of these sections overlap.

7.3.1 How does the composition and structure of entrepreneurial teams evolve over the incubation period? (RQ1)

It was found that entrepreneurial teams during incubation experienced significant dynamics in their formation and evolution. The three notable formation dynamics of entrepreneurial teams were especially evident: the initial creation/formation of the team, membership changes, and emergence of sub-teams because of faultlines activation.

Regarding the initial formation/creation of the ET, the findings revealed the transformation from a group with an idea in the TBI context into an entrepreneurial team seeking to seize an opportunity, as well as the well-thought-out and structured process model adopted to create the entrepreneurial team. The findings also show two main motivations behind the changes in membership: first, disbanding the ET because of the departure of members and the resulting consequences, the most prominent of which was re-formation; and second, adding new members during the stages of growth.

By incorporating solo founders who formed entrepreneurial teams during the incubation period, this study was able to show that pressure from incubators was a main factor for adding new members, demonstrating how highly valued ETs rather than individual entrepreneurs are within TBI. Some solo founders first seemed unwilling to add new members. However, within the context of the incubator, this reluctance to add members was countered by the work of the incubator management to persuade the team that additional members would add real value to the venture. In both situations (solo and team-based ventures), the addition of new members in the context of the incubator was characterised by a structured and deliberate process.

This study also adds to a body of research that demonstrates the effectiveness of Faultline theory in analysing developments within entrepreneurial teams (Lim et al., 2013; Yoon, 2018; Ben-Hafaïedh et al., 2022). The findings captured the activation of compound dormant faultlines in the emergence of sub-teams within the incubated entrepreneurial teams. The triggers of this activation appeared related to the consequence of seeking venture growth. This involved the need to adopt a new approach to work and to restructure roles, commitment to the firm and in particular the need to commit full-time.

7.3.2 What role does the incubator play in influencing the evolution and dynamics of entrepreneurial teams? (RQ2)

Within the context of the BADIR TBI incubators were shown to play an active role in helping form and adapt entrepreneurial teams. The TBI's played a prominent role during the significant formation and evolution dynamics of the entrepreneurial teams during incubation. During all the dynamics

related to the formation and social interaction processes, the incubator played a “multifaceted” role; this reflects the fact that the incubator is a “multifaceted” context. In each dynamic of formation and evolution that the entrepreneurial team was going through, the incubator was very involved and intervened using its embedded resources and capabilities. Each of these resources had a dedicated function and thus a different effect. For instance, in Al Jawhara, leadership passed from father to daughter after she proved her capabilities amidst challenges. In the Omar team, leadership was rotated among members, eventually settling with the one who exhibited the best leadership skills. Al Batoul and Aseel teams saw founders stepping down for more capable leaders. The incubator appeared as a five-faceted context that significantly impacted and shaped the formation and evolution of entrepreneurial teams during incubation. These five-facets of context corresponded with the incubator as a distinct “knowledge”, “administrative”, “social”, “advisory”, and “mediatory” context.

The findings embodied the TBI's multifaceted role as a multifaceted context regarding the formation of entrepreneurial teams during incubation. The formation dynamics experienced by the teams under investigation appeared in the initial creation/formation of the ET, the membership changes, and the emergence of sub-teams within the main teams after the activation of the faultlines.

The advisory role of the TBI, as a reflection of being an advisory context, refers to the advisory role that the admissions committee and advisors played during the initial creation of the team. The admissions committee played a prominent advisory role in transforming the founding group into an entrepreneurial team that seeks to seize opportunity and knows the roadmap to create the right team.

As a knowledge context, the entrepreneurial teams absorbed the guidance for the processes of creating entrepreneurial teams. For this, the creation of the entrepreneurial team appeared, following elaborate, structured, and well-thought-out processes (process modelling). When it was time for official procedures, including the assimilation of rights and laws, the TBI appeared as an advisory and knowledgeable context, represented by advisors to clarify all relevant aspects. The incubator also emerged as an administrative context delegated by the team to accomplish all official matters.

During the change of membership, the TBI played multifaceted roles as a reflection of a multifaceted context. Through these roles, the incubator shaped the relevant dynamics, including disbanding the team, reforming it, and adding new members. Considering the incubator as a mediatory context, the VC came from its network, which led to pressures to disband the team. These pressures included conflict over interests and strategic directions, in addition to some members' preference for career opportunities over entrepreneurial ambitions.

After a team was disbanded, the TBI played an advisory role through the moral support provided by the advisors to the founders to reform their teams. In addition to the administrative role represented

in delegating the incubator to complete all official procedures. The incubator also emerged as a knowledge and social context on which the founders relied on to accommodate all the processes involved in reforming the team. As a social context, founders leveraged embedded networks with peers to acquire new members. When adding the new members, the role of the TBI emerged as an advisory context that emphasised the vacant roles and the need to fill them with appropriate competencies. Moreover, the advisors succeeded in convincing the solo founders of the necessity of forming a team and adding new members, even though their initial position was a categorical rejection.

Interestingly, the advisors chaired the interviews before the final agreement regarding the partnership and the joining of the new members. Considering the TBI also as a mediatory context, the VC which came from its network as part of the consequences of growth activated dormant faultlines. The TBI's role emerged as an advisory context that maintained the main team as a unified entity.

The relationship between the ET and TBI varied across cases, showing differing levels of resentment, independence, conflict, cooperation, and sufficiency with specific advisors. Interestingly, both the resentment and conflict shown by the incubated entrepreneurial teams towards the incubator were specific to the Saudi context. The source of both was the constant criticism from the entrepreneurial teams about the theoretical (as opposed to practical) approach used in the advice given and its disconnect from reality and practice. This was in addition to the objections to the incubator's approach to working in general, such as the turnover of professional competencies among the advisors and the gender segregation of team members (i.e., incubator construction design). In contrast, also a reflection of the Saudi context, cooperation emerged between the incubator and the women's entrepreneurial teams around heightening their visibility. This was in the light of Vision 2030, namely supporting talented female leaders and female entrepreneurship.

The Saudi context appeared to have a significant impact in shaping the formation and evolution of the entrepreneurial teams during incubation, where intervention was high. This stems from a reliance on the incubator as a strategic government tool for implementing Vision 2030 by empowering entrepreneurs and facilitating tech entrepreneurship towards transformation into a knowledge-based economy. Thus, the model of TBIs is shaped by the national context (Saudi Arabia) via national policy goals which emphasised the building of strong entrepreneurial teams in technology-based firms as a priority for TBIs.

7.3.3 How do social interaction processes influence the evolution of entrepreneurial teams during the incubation period? (RQ3)

Regarding evolution dynamics pertaining to social interaction processes, which stemmed from the members' attempts to create a space for collaboration, the ETs experienced three prominent dynamics due to composition heterogeneity. These dynamics involved the allocation of the initial roles and the later shift towards establishing organisation and professionalisation; healthy and unhealthy conflict; and leadership and its dynamics. The initial allocation of roles was based on the initial creation approach of the team. A significant difference appeared between teams that started from "let us be a team to start our firm" in contrast to those that started from the point of realising the opportunity and then commencing to create the team and assemble its members. In the first approach, the roles seemed to exist but were overlapping and without apparent features. In the second approach, the roles seemed non-existent, and the dominant feature was scattered tasks.

Later, the cases in the incubator context shifted towards more formal roles with appointed positions associated with specific powers. The findings captured some of the cases' transformation towards professionalisation, reflected at the levels of the founding team and the employees. Regarding leadership, the findings showed not only processes of leadership exchange among team members and leadership turnover from the founding team, but also changes in leadership style from a shared to hierarchical and vice versa.

With regards to conflict as a social dynamic, the findings identified two main types of conflict: cognitive conflict and affective conflict. Cognitive conflict was identified as healthy conflict that emerged around managing daily tasks and decision-making. In contrast, unhealthy affective conflict appeared around the clash of relationships and personalities and conflicts of interests. The findings advance the literature that cognitive conflict can be beneficial in entrepreneurial teams (Amason and Sapienza,1997; Ensley et al., 2002; Vanaelst et al., 2006) as the teams acknowledgement of the positive, healthy effect of cognitive conflict and, conversely, the negative effect of affective conflict.

7.3.4 What role does the incubator play in the social interaction processes in entrepreneurial teams? (RQ4)

Much of the answer to research question 4 has already been covered in the previous section discussing the incubator's role in ET formation. As mentioned, the data reveals that throughout the various stages of formation and evolution that the entrepreneurial teams went through, the incubator was significantly involved and often played an active role. This was particularly evident in evolutionary changes within ETs due to social interaction processes. During these dynamics related to social interaction, the incubator's involvement emerged more prominently in an advisory capacity than in its other roles.

The advisory role was especially noticeable in the context of roles transitioning to professionalisation within ETs. Incubators provided consulting services, shared their social networks with ETs, and organised events. Professionalisation was regarded as a high priority, and incubators frequently encouraged ETs to formally define roles and assign team members to these roles. In terms of

processes related to leadership, incubators played a role in empowering leaders in their positions, especially talented female leaders. The Saudi Arabian context played a pivotal role here, as the incubator's involvement in the social process of role allocation was influenced by its commitment to the 2030 vision of empowering female talent and leaders.

Regarding leadership transitions, incubators not only offered advice on leadership changes but also on changes in leadership style. When conflicts, both healthy and unhealthy, arose, the TBI (Technology Business Incubator) focused on maintaining conflicts in a healthy and constructive manner and preventing them from escalating into a harmful negative state that could harm the team. The incubators thus assumed an essential mediator role. In cases of unhealthy conflicts, the TBI intervened to facilitate resolution and ultimately preserve the teams. In addition, the findings of this research are unique in the sense that it found that conflict was not only found within ETs but also between teams and incubators. With the incubators taking a strong hands-on approach, some teams showed a reluctance to adopt and implement the incubator's advice.

7.4 Contributions of this Research

This research explored the formation and evolution of ETs during the incubation period by tracking, capturing and analysing the ETs formation and evolution dynamics over time. Furthermore, it explored the TBI's role and its involvement in these dynamics as a context that embraces the formation and evolution of the ETs during the incubation period. This was through following twelve case studies longitudinally at three rounds of data collection.

7.4.1 Contributions to the Technology Incubation Literature

Prior literature on technology incubation has been described as fragmented (Albort-Morant and Ribeiro-Soriano, 2016), with a tendency to focus on the outputs/outcomes of the incubator (Hausberg and Korreck, 2021) and on metrics and measurements for evaluating performance, effectiveness, and success. Mian et al. (2016) argues that be consequence of this is that researchers have neglected what happens inside the incubator, i.e., the business incubator model, the prime micro-processes of the TBI to create a new firm (Mian et al., 2016). This research contributes to opening the 'black box' of incubation by exploring, capturing, and analysing one of these prime micro-processes of TBI: the processes related to the formation and evolution of the ET during the incubation period. This research underscores the human element in incubations process as a result of adopting Faultline Theory to explain the dynamics of the formation of the entrepreneurial team within the incubator. This research explains, how faultlines exert their impact through changes in the patterns of social interaction of incubated ETs. Further, it distinguishes faultlines from other dynamics and changes by introducing the concept of 'sub-team entrenchment' and highlights the unremitting collaborative and joint efforts between the incubator and team members regarding the presence of sub-teams within the main team as strong and stable teams.

The previous literature on technology incubation has been criticised for dealing with the incubation model as an isolated entity (Baraldi and Havenvid, 2016). This is due to addressing each incubation level (macro- and micro-) as independent levels that are not affected by each other. This research shows that incubator models are not isolated entities; instead, they are effective tools for policy stakeholders. In the Saudi context in particular, this research shows that the TBI was dedicated to achieving the goals of the national transformation strategy (Saudi Vision 2030, 2020) aimed at a diversified, knowledge-based economy. Cultural nuances with regards to Islamic law and gender segregation also emerged as influential on the experience of ETs during incubation. For example, separating the genders into separate sections hindered the ETs' productivity. One of the entrepreneurial teams was forced to leave in order to create a work environment that was not based on the idea of segregation. In terms of financial matters, there were prominent warnings for the family ETs about the necessity of official documentation of the equity shares. This is because, in the event of the death of the one in whos' name the company is legally established, the other partner(s) will be subject to the division of the inheritance according to the Islamic legal system. According to Islamic inheritance custom, the partner's share may be less than he/she deserves according to their financial contribution. Also, the incubator concentration was prominent in the follow-up on Zakat reports and urged the ETs to pay according to their income.

The previous literature on technology incubation considers incubation as a one-sided context (Ahmad, 2014). For example, while addressing social issues, the focus is placed on the incubator as a social context. This research shows that the technology incubator is a 'multifaceted' context that contributes in different and distinct ways to the creation progress of the new tech firm during the incubation period. During the formation and evolution of the entrepreneurial teams during the incubation process, the role of the TBI emerged as 'a multifaceted context'. From this perspective the technology incubator played multiple roles as an advisory, social, knowledge, mediatory, and administrative context. Each time the incubator was involved in team issues, each issue required the teams to utilise the incubator in a specific way and leveraging specific incubator resources.

7.4.2 Contribution to the Entrepreneurial Team Literature

Prior research on entrepreneurial team formation and evolution is described as fragmented, as each issue, such as 'process formation dynamics', or 'social interaction processes' in the team's initial formation, is discussed separately (Patzelt et al., 2021). Previous research discusses and focuses on the relationship and impact of these issues on performance (Patzelt et al., 2021). Accordingly, a prominent contribution of this research is that it deals with the formation and evolution dynamics of the entrepreneurial teams during incubation as successive processes that affect each other. The research captures and embodies the entrepreneurial team's journey: the initial formation/creation of the ET, the later dynamics of the formation process, and its evolution and associated dynamics.

Lazar et al. (2020) recently argued that advancing the entrepreneurial team literature requires a greater consideration of the context in which entrepreneurial team form and evolve. Thus, it is

important to investigate the extent to which these contexts influence the formation of entrepreneurial teams. This stems from the argument that entrepreneurial teams are dynamic entities that will inevitably be affected by the contexts in which they are embedded. This research contributes to this endeavour by investigating the incubator as a context that embraces the entrepreneurial team processes and the dynamics of its formation and evolution. This research reveals the incubator's high involvement and intervention in the formation and evolution dynamics that the entrepreneurial teams experience during incubation by playing multifaceted roles. These multifaceted roles are a reflection of the incubator being a multifaceted context. This means that in each dynamic of formation and evolution of the entrepreneurial teams, the incubator appeared involved with its different and embodied resources, each of which performs a special function and a different impact on the dynamic.

Patzelt et al. (2021) argue that recent reviews of the entrepreneurial team literature indicates that researchers need to move beyond 'what' research questions and ask 'how' and 'why' questions regarding the formation and evolution of the entrepreneurial team. In addition, these questions should focus on the subsequent processes and related dynamics and changes. For example, the current entrepreneurial team literature focuses on identifying the basic dynamics associated with formation and evolution without diving into its structuring (Patzelt et al., 2021). This research contributes to the ET literature by investigating and analysing the structuring of processes related to each dynamic of the formation and evolution of the entrepreneurial team. For example, while the previous entrepreneurial team literature refers to the type of conflict, this research contributes by capturing the structure and crystallisation of conflict, and then its impact on the team.

7.5 Limitations of the Research

Although this research is significant in exploring and analysing 'Ts' formation and evolution during the incubation period and the role of the TBI in these processes, it has some limitations that need to be noted. These include the following.

- The formation and evolution of the entrepreneurial team during the incubation period was restricted to data collected within one year. A more extended period, such as three years, as in McAdam and McAdam (2008), would be helpful in drawing a deeper picture of entrepreneurial team evolution and incubator involvement.
- This research used a multiple method research approach, using multiple case studies, based on face-to-face and telephone interviews to capture data on the complexities of ETs' formation and evolution, dynamics, and interactions and compare different cases. An alternative data collection process, such as video-based observation, might provide different insights into the complexities and details embedded in the dynamics of ET evolution.
- The research context was one incubator in one country. As noted earlier, this is an important and understudied context, and the type of incubator that was the focus of this study is an important

type in the Saudi context. However, considering that heterogeneity is a prominent characteristic of incubation, focussing on one incubator in one country is a limitation.

7.6 Suggestions for Future Research

The research identifies the following opportunities for future research in order to advance research in this domain.

- This research clearly relates to government-sponsored technology incubators that are institutional mechanisms for implementing governmental goals. This research was conducted in a particular type of incubator in a specific geographical context. As is evident from this research government goals shaped the TBI's interaction and involvement with the entrepreneurial teams during their formation and evolution during the incubation process. In other words, the incubation model and how the entrepreneurial teams were supported during the incubation period by the support providers in the incubator were influenced by the institutional context. Given the importance of context, future research could build on this research by exploring other types of incubators and extending the range of geographical contexts studied.
- This research indicated that there are aspects of the formation and evolution of the entrepreneurial teams during the incubation process that the incubator played a significant role in, such as strengthening the role of female leaders, strengthening the presence of sub-teams, and adding new members. It would be interesting for future research to trace these influences overtime by, especially after ventures graduate and leave the incubator.
- This research captures developments in the nature of the relationship between the incubator and the entrepreneurial teams, the most prominent of which are independence/autonomy, conflict, and cooperation. It would be interesting to extend this research to focus on the results of the cooperation of the entrepreneurial teams with the incubator regarding its marketing and brand building. For example, from the TBI perspective, does the TBI achieve positive results through cooperation with the entrepreneurial teams to convince potential incubatees of its value?
- This research demonstrates the high level of involvement/intervention of the TBI in the entrepreneurial teams' evolution and the related dynamics of the social interaction process during incubation. Interestingly, team composition in terms of demographic and non-demographic factors influences TBI involvement. For example, the incubator was involved significantly with female leaders to support them. Also, the advisors became involved with certain teams in their dynamics of evolution after personal relationships emerged as a result of the compatibility of personalities. It would be interesting to extend this research to focus in the future on the extent to which the incubator considers the composition of entrepreneurial teams when involved with them in their formation and evolution during incubation.

7.7 Recommendations for Policy and Practice

The following recommendations for policy and practice emerge from this research. While these recommendations emerged from the case studies in this specific context, they may however be translated to other contexts.

• **Recommendation 1**. This research reinforces the significant role TBIs play in the formation and evolution of ETs during incubation. To further support technology incubator practices, policymakers should involve technology incubators as professionals in formulating incubator policies. The involvement of incubators in the formulation of policies would draw policies that would enable their internal micro prime processes, perform them effectively and thus ensuring their success (such as building the entrepreneurial teams).

• **Recommendation 2**. Since incubators in the Saudi context target strong entrepreneurial teams as an outcome of their interventions, entrepreneurial teams should be involved in designing the incubation programs used within incubators. The co-production of the incubator management with the entrepreneurial teams in drawing up the features of the support provided and the way it is provided should ensure programs that are compatible with the practices and preferences of entrepreneurial teams. This should ensure that the programs are attractive to strong entrepreneurial teams and promising new technology-based firms.

• **Recommendation 3**. TBIs' managers, as leaders of the processes of creating new tech firms and building entrepreneurial teams, must be fully aware of the necessity of the difficulties and challenges that may hinder the building of entrepreneurial teams during the incubation process. Among the difficulties mentioned in the cases in this study were the turnover of incubator staff competencies (skilled and professional advisors), the segregation of staff by genders during working hours, and the inflexible application of the incubator policy and the lack of accommodate of the heterogeneity of the development needs of ventures.

• **Recommendation 4**. The guiding principles for the working of technology incubators must be formulated on this basis that the incubator is a multifaceted context that plays multifaceted roles for the formation and evolution of the entrepreneurial team during incubation. For example, the capabilities of the incubator must be strengthened as an advisory and trusted context by the ET by attracting high and specialised competencies to be involved in the formation and evolution of the ETs during the incubation process.

7.8 Chapter Summary

This chapter presents the findings, conclusions, and contributions of the thesis in light of its two key research questions. The chapter details the contributions made by this study to the areas of technology incubation and the entrepreneurial team. As a conclusion for both this chapter and the thesis, the study’s limitations were discussed, followed by suggestions for future research opportunities.

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APPENDICES

APPENDIX A: Research Ethics Documentation

Ollscoil Chathair Bhaile Átha Cliath
Dublin City University

Ms Sarah Abdulrahman Al Ayyash
Dublin City University Business School

7th January 2019

REC Reference: DCUREC/2018/229

Proposal Title: Entrepreneurial Teams in the Technology Business Incubator: the relationship between business process development during the incubation phase and the process development.

Applicant(s): Ms Sarah Abdulrahman Al Ayyash

Dear Sarah,

Further to expedited review, the DCU Research Ethics Committee approves this research proposal.

Materials used to recruit participants should note that ethical approval for this project has been obtained from the Dublin City University Research Ethics Committee.

Should substantial modifications to the research protocol be required at a later stage, a further amendment submission should be made to the REC.

Yours sincerely,

Donal O' Gorman

Dr Dónal O'Gorman
Chairperson
DCU Research Ethics Committee

DCU Research & Innovation

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APPENDIX B: Interviews

Interview 1 (Jan 2019)

- First: would you like to tell me a little bit about yourself? For example, your name, age, social status, hobbies, and a little about your personality. Also, could you tell me about your qualifications, your work background, and do you have any previous experience in business?
- How many members are there in the founding team (the team cofounders)?
- Can you tell me about your business and its stage now? How old was the business before it became incubated? How long have you been incubatees?
- The beginnings are always glamorous, especially with the teams. Could you tell your team's story? How did you, as founders, meet? Or how did you form the team?
- Now is the time to get to know you in your team. Can you describe your role in the team? What is your role? If you could give me a brief outline about each of them, and how would you describe your relationship with each of them? (How different and similar are you as team members?)
- When you started as a team, how did you distribute the tasks? How did the work start? And how long did it take you before entering the incubator?
- Can you tell me about the agreement on the equity shares? How did you come to this agreement?
- Great! Can you share with me the story of being an incubatee here? Why did you decide as a team to be incubated? How was the admission process? How have you been involved later as a team in the incubation? How has the incubator been involved with you as a team?
- What changes or developments has the team experienced during the incubation period so far? How has the incubator been involved with your team (assisted or supported you) in these changes?
- These changes, as I explained to you earlier (as shown in this figure), could be related to the developing structure of the team, such as new members joining or leaving, alliances (alignment) or divisions within the team. Tell me about social processes, such as role assignment, disagreement, agreement, harmony, shared processes, such as shared learning (knowledge) decision-making and communication, and leadership. Every time, please, we must focus on the role of the incubator.

Another way to ask the question of the social process:

- It is said that entrepreneurial teams go through stages of disagreements as a result of the diversity in demographic and non-demographic characteristics (providing an explanation for this diversity). These disagreements may not be in the unhealthy sense, but on the contrary, positive and healthy. Then the teams reach stages of agreement and harmony. To what extent is this true, and how do you see it reflected in your team?

  This is the conclusion of my questions today; would you like to add anything? I will see you in six months.

Interview 2 (June 2019)

- First, I would like to share this diagram that explains, or summarises, the story of the early days of your team. Importantly, it explains all the developments that your team went through and how the incubator played a role in these developments (extracted from our last interview and your previous statements).
- Do you have any comment on this?
- Can you describe to me what your team looks like today in all the respects that we discussed earlier? I would like to discuss all the developments and changes of your team and the incubator's role.
- What did the team go through since we last met, and how did the incubator participate?

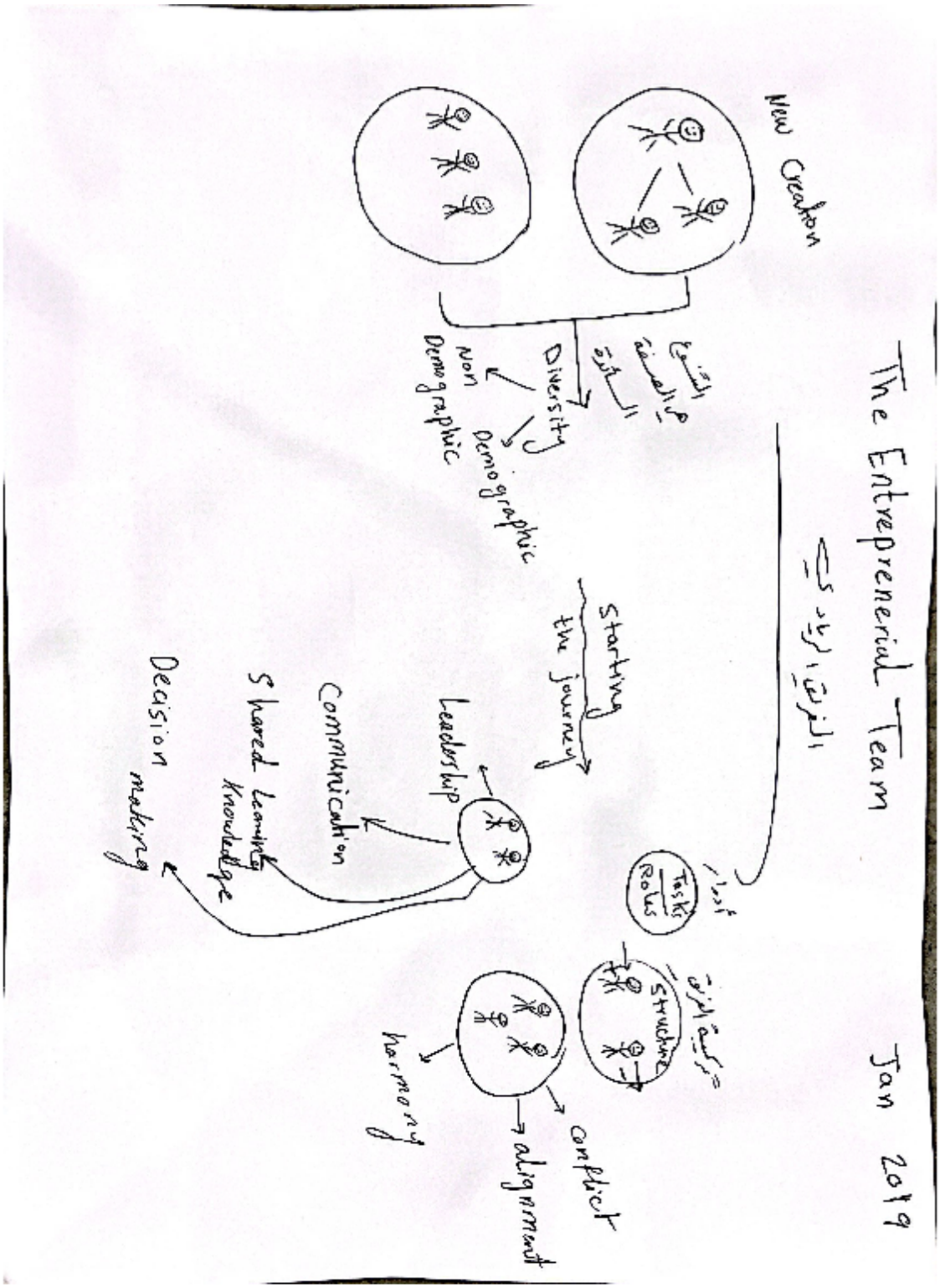
At the end of our meeting today, would you like to add anything? I will see you in six months.

Interview 3 (Jan 2020)

- First, I would like to share this diagram that explains or summarises the story of the early days of your team. Importantly, it explains all the developments that your team went through and how the incubator played a role in these developments (extracted from our last interview and your previous statements).
- Do you have any comment on this?
- Can you describe to me what your team looks like today in all the respects that we discussed earlier? I would like to discuss all the developments and changes of your team and the incubator's role.
- What did the team go through since we last met, and how did the incubator participate?

At the end of our meeting today, would you like to add anything?
I would like to say that I am very grateful that you met me three times over a year. Would you like to add anything?

APPENDIX C: Illustration Diagrams Used in Participants' Interviews



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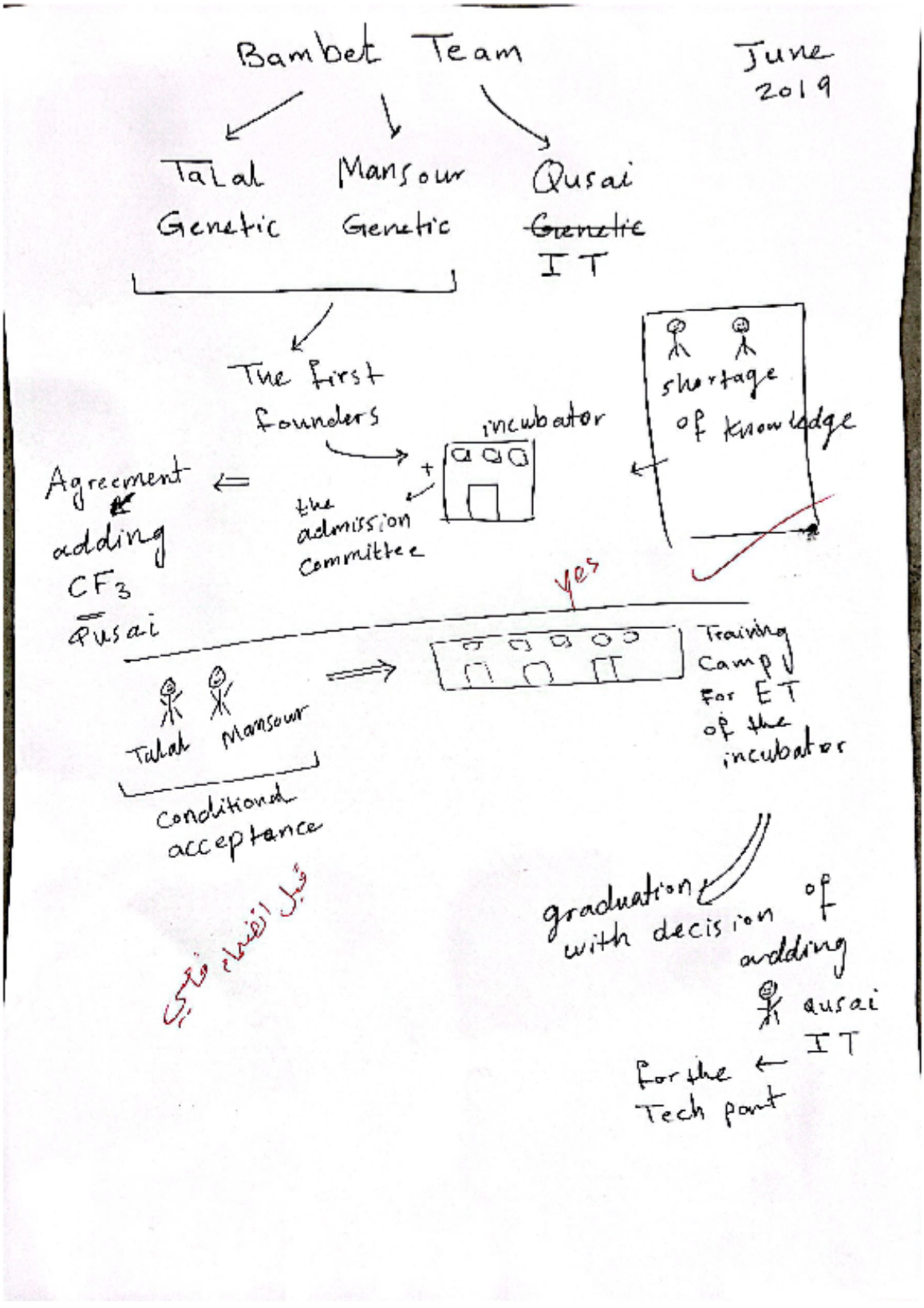

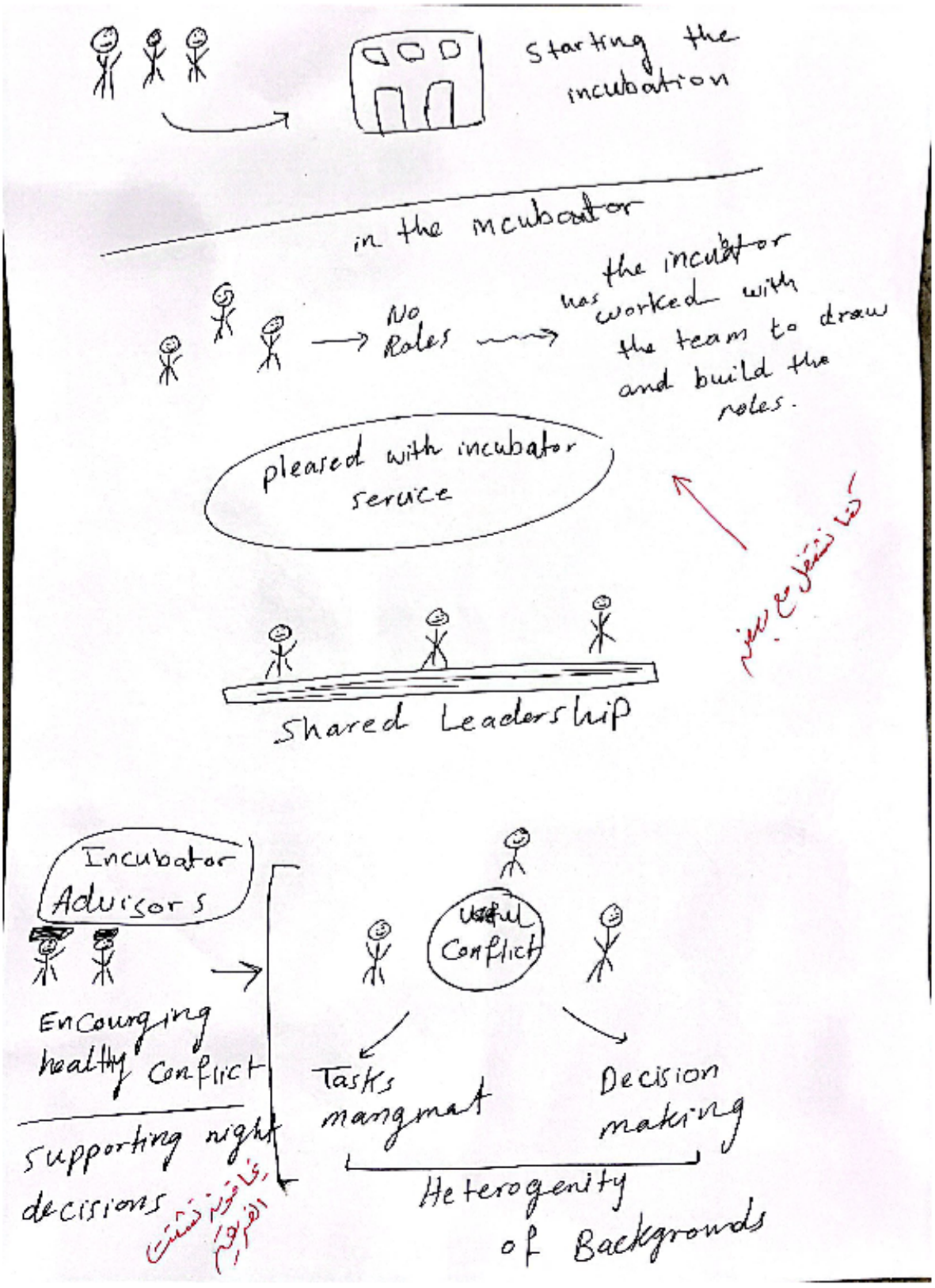

APPENDIX D: An Example of the Coding Process

Page	Line	Comment scope	Codes
3	18	and the nannies the "service providers"	Service providers joining
3	18	She altogether creates the qualification courses which we provide before nannies joining. Her speciality helps me in this a lot.	Utilizing incubator facilities (incubator training rooms) to train service providers
3	17	Haifa is generally the COO she runs operations; she continuously communicates with registered families in the App and the nannies the "service providers". She altogether creates the qualification courses which we provide before nannies joining. Her speciality helps me in this a lot. Haifa also follows the operations in the application every day.	Initial assigning roles based on experience and expertise
3	19	Haifa also follows the operations in the application every day.	Manging daily operations
3	19	Haifa is very accurate in following up on all the details, and she is overall like this even in our personal life.	Reflection of personality at work - realizing of the partner's personality in the way of work
3	23	The incubator provides us with the equipped rooms at the highest levels besides catering to train the nannies who might join	Utilizing of the advanced support capabilities provided by the incubator for business development
3	23	The incubator provides us with the equipped rooms at the highest levels besides catering to train the nannies who might join (qualifying courses for free). Before joining the incubator, we were looking for sponsors to pay for the hotels' halls, which is very expensive	The incubator filled the shortage of tangible resources
3	23	So instead of focusing on arranging issues and logistics, we focus on the training itself.	Creating the favourable conditions by the incubators for the team to focus on the quality and development of the business
3	26	We entered the camp with seventy start-ups; we had acquired excellent relations.	Create and utilize of social networks in the incubator with the incubtees
3	26	We met the largest and most critical graduated firms from the incubator, for example, Wala-Plus and Morni (graduated firms from the incubator).	Gain access to specialized (niche) and professional social networks with graduates through the incubator

APPENDIX E: The Entrepreneurial Teams' Demographic Profiles

Ryan TM1, 29, male

Study Specialisation: Bachelor's Degree and Master's Degree in Genetic Engineering

Work Experience: Worked in the family educational company during summer vacations

Business Experience: N.A

Commitment to the Incubated Firm: Full-time

Ryan TM2, 29, male

Study Specialisation: Bachelor and Master of Power Engineering

Work Experience: N.A

Business Experience: N.A

Commitment to the Incubated Firm: Full-time

Ryan TM3, 30, male

Study Specialisation: Bachelor's and Master's Degree in Computer Science

Work Experience: 6 years of experience managing educational products in a government educational platform

Business Experience: N.A

Commitment to the Incubated Firm: Part-time

Al Jawhara TM1, 32, female

Study Specialisation: Bachelor's Degree in Information System

Work Experience: 1 year as a teacher, 3 months as a member of a hospital technical team

Business Experience: No

Commitment to the Incubated Firm: Resigned to devote to the current firm

Al Jawhara TM2, 57, female

Study Specialisation: Bachelor of Chemistry

Work Experience: 30 years in the Talent Department, Ministry of Education

Business Experience: 25 years in the production of books for student development

Commitment to the Incubated Firm: Full-time

Al Jawhara TM3, 33, female

Study Specialisation: Bachelor's Degree in English Literature

Work Experience: 6 years of experience managing educational products in a government educational platform

Business Experience: No

Commitment to the Incubated Firm: Full-time

Omar TM1, 32, male

Study Specialisation: Bachelor of Computer Engineering

Work Experience: 3 years as a sales manager in a national company

Business Experience: 3 e-shops (e-commerce)

Commitment to the Incubated Firm: Resigned to devote to the firm full-time

Omar TM2, 31, male

Study Specialisation: Bachelor of Computer Engineering

Work Experience: 2 years in construction management

Business Experience: 3 e-shops (e-commerce)

Commitment to the Incubated Firm: Resigned to devote to the firm full-time

Omar TM3, 43, male

Study Specialisation: Bachelor of Business Management

Work Experience: 12 years as an employee in the government communications sector

Business Experience: Co-founder of 3 high-tech start-ups, an angel investor in 4 tech start-ups

Commitment to the Incubated Firm: Part-time in the incubated firm

Al Batoul TM1, 35, female

Study Specialisation: Master of Economics and Bachelor of Business Administration

Work Experience: Two years as an operation developer (automation) in the family business (car showrooms)

Business Experience: No

Commitment to the Incubated Firm: Full-time in the incubated firm

Al Batoul TM2, 32, male

Study Specialisation: Student (Law College)

Work Experience: No

Business Experience: Co-founder of an IT company

Commitment to the Incubated Firm: Part-time in the incubated firm

Alanod TM1, 30, female

Study Specialisation: Bachelor's in Banking and Finance, Master of Technology Entrepreneurship

Work Experience: 4 months internship

Business Experience: Co-founder of three previous start-ups

Commitment to the Incubated Firm: Full-time in the incubated firm

Alanod TM2, 29, female

Study Specialisation: Bachelor of Mathematics

Work Experience: 2 years in customer service, 6 months in sales

Business Experience: Small business on Instagram

Commitment to the Incubated Firm: Full-time in the incubated firm

Warda TM1, 32, female

Study Specialisation: BA of Accounting, Diploma of E-commerce

Work Experience: No

Business Experience: Founder of 1 previous tech start-up

Commitment to the Incubated Firm: Full-time in the incubated firm

Warda TM2, 33, male

Study Specialisation: BA and Master of Marketing

Work Experience: 6 years as a marketing manager

Business Experience: No

Commitment to the Incubated Firm: Part-time in the incubated firm

Aseel TM1, 35, male

Study Specialisation: Diploma in Computer Networks

Work Experience: 9 years as an assistant General Manager in structuring and managing projects in Saudi Telecom Company operations

Business Experience: Two businesses

Commitment to the Incubated Firm: Part-time in the incubated firm

Aseel TM2, 42, male

Study Specialisation: Bachelor's in Strategic Management

Work Experience: Extensive experience in management and strategic leadership in various companies

Business Experience: Co-founder in different tech firms, project manager in Vision 2030

Commitment to the Incubated Firm: Part-time in the incubated firm

Faisal TM1 (CEO), 33, male

Study Specialisation: Bas Banking, Master MPA

Work Experience: 4 months in incubated high-tech startup in Spain. 6 months of internship in an international company

Business Experience: No

Commitment to the Incubated Firm: Full-time, resigned to devote to the current firm

Faisal TM2 (COO), 32, male

Study Specialisation: BA and MA in Project Management

Work ExperienceTwo years as an employee in a company

Business Experience: 3 e-stores

Commitment to the Incubated Firm: Full-time, resigned to devote to the current firm

Faisal TM3, 36, male

Study Specialisation: BA and MA in Strategic Management

Work Experience: Consultant for several companies for three years (business development), official employee in the Ministry of Planning

Business Experience: No

Commitment to the Incubated Firm: Part-time in the incubated firm

Mubarak TM1, 31, male

Study Specialisation: Bachelor and Master of Software Engineering from the United States

Work Experience: 2 years in a tech start-up with the same specialty in Silicon Valley, America

Business Experience: No

Commitment to the Incubated Firm: Full-time in the incubated firm

Mubarak TM2, 32, male

Study Specialisation: Bachelor and Master of Software Engineering from the United States

Work Experience: 2 years as a university lecturer, 1 year in his family contracting company, consultant for tech start-ups

Business Experience: 2 years as a university lecturer, 1 year in his family contracting company

Commitment to the Incubated Firm: Full-time in the incubated firm

Thabet TM1, 36, male

Study Specialisation: Master of Business Administration, Bachelor's Degree in Business Administration

Work Experience: 2 years as a researcher, Director of Public Relations and Official Spokesperson in a government ministry

Business Experience: Business owner of a food truck chain in different Saudi cities

Commitment to the Incubated Firm: Part-time in the incubated firm

Thabet TM2, 31, female

Study Specialisation: Bachelor's and Master's in Kindergarten

Work Experience: 4 years as a lecturer at a Saudi university

Business Experience: No

Commitment to the Incubated Firm: Part-time in the incubated firm

Sumoud TM1, 35, male

Study Specialisation: Bachelor of Arts

Work Experience: YouTube script writer for 3 years (animation)

Business Experience: No

Commitment to the Incubated Firm: Full-time in the incubated firm

Sumoud TM2, 30, male

Study Specialisation: English Literature (BA and MA in the same major)

Work Experience: 2 years as a receptionist

Business Experience: No

Commitment to the Incubated Firm: Full-time in the incubated firm

Sumoud TM3, 29, male

Study Specialisation: Diploma of Digital Effects & Animation Technology

Work Experience: 2 years in the same field in an animation studio

Business Experience: No

Commitment to the Incubated Firm: Full-time in the incubated firm

Sumoud TM4, 33, male

Study Specialisation: Bachelor's in Strategic Management

Work Experience: 3 years in an IT company

Business Experience: No

Commitment to the Incubated Firm: Full-time in the incubated firm

APPENDIX F: Candidate's Published Work

Towards a New Perspective on the Heterogeneity of Business Incubator-Incubation Definitions

Sarah Al Ayyash, Maura McAdam, and Colm O'Goman

***Abstract*—The term "business incubator" (BI) has become an accepted neologism among academics, practitioners, and policy- makers. This is despite the lack of an agreed definition amongst scholars of what exactly constitutes a BI. Using a systematic litera- ture review methodology, we identify and analyse definitions of BIs used in published academic research papers and practice papers over a 35-year period. In this article, we undertake a thematic analysis, using the software package NVivo, of 82 academic and 14 practice definitions used in 61 publications. Our analysis shows that definitions of BIs are constructed around three core themes: the business incubation model; the purpose of the incubator; and the target of support provided by the incubator. By identifying both consistencies and inconsistencies in existing definitions, we provide a more nuanced understanding of the heterogeneity that underlies the organisational form referred to as a BI. We conclude by proposing an agenda for further research.**

***Index Terms*—Business incubation, business incubator (BI), systematic literature review (SLR) methodology.**

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Color versions of one or more of the figures in this article are available online at https://ieeexplore.ieee.org.

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I. INTRODUCTION

FIFTEEN years have passed since Hackett and Dilts [1] first argued that the absence of a clear definition of the business incubator (BI) was one of the greatest challenges faced by researchers in the business incubation research domain. Notwithstanding this definitional ambiguity, there is a general consensus across academic and practice papers that BIs are pivotal instruments that can stimulate innovation and economic development [2], [3], [4]. The absence of a precise definition remains an issue in the BI field, with such ambiguity an obstacle to the advancement of research and practice in the domain [5]. From a practice perspective, the lack of consistency in the use of the BI concept continues to hinder the evolution of business incubation as a credible professional entity or distinctive disci- pline [6]. We, thus, argue that a thorough understanding of this pivotal term should facilitate the evolution of the field for both researchers and practitioners [7].

Business incubation encompasses a collection of support and related procedures responsible for nurturing small fledgling firms [8]. Practically, business incubation comprises initiatives for the "proliferation" and "production" of new ventures through their provision of both tangible and intangible resources [9], [10]. Tangible resources comprise physical infrastructure and real estate, most typically office spaces and associated sup- port services [11], [12], [13]. Intangible resources comprise capability building activities through training and development and access to networks. Most typically this includes support to "secure funding," business plan writing support, training, and coaching [14], [15], [16].

BIs and business incubation have been the focus of BI extant literature over several decades [17], [18]. Over time the nature of business incubation, including incubators, has changed and this is recognised in diversity found within contemporary academic research. This suggests that there is significant heterogeneity in what is understood by the term business incubation [15]. The heterogeneity of business incubation models echoes differences across the philosophy, objectives, and sponsorship that underpin each incubator and its approach to, and program of, incubation [19], [20], [21]. This heterogeneity may also reflect the increased specialisation that has occurred within this field of practice, with BIs and business incubation specialising in terms of types of client ventures (stages of development), industry sectors (such as manufacturing or food), and technology domains (such as high-tech, digital, or biotechnology). This diversity in focus has

consequences for the type and complexity of activities performed within the business incubation process [22]. Other "characterising" variables that distinguish between models of business incubation include the average duration of incubation, that is, the hosting period of the incubatees and the nature of the interaction between the incubator and the management team of the incubated venture [23]. Building on management and organisational studies literature that highlights the importance of context to understanding the nature of organisations, more recent BI research has begun to explore the macro factors of heterogeneity that are associated with hosted environments and geographical contexts [24], [25].

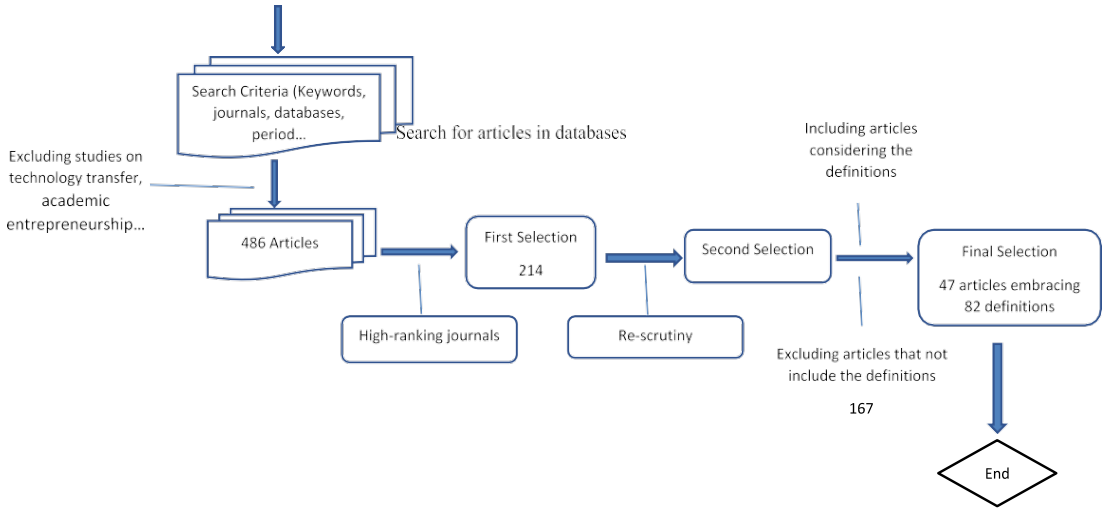

Fig. 1. Logic flowchart of protocol used to find and select articles.

Against this backdrop of significant heterogeneity of business models, the lack of a precise definition of BI has become more notable. Early efforts to define the BI focussed on identifying the basic elements of BIs, in an effort to distinguish them from other organisations [6], [26]. However, this has had limited suc- cess, with the term becoming an "umbrella" term that includes incubators and many other organisations that aim to support new venture start-ups [27]. Considering the challenges of identifying and agreeing a single unified definition of BI, an alternative approach is to identify and define the boundaries of the BI based on how existing definitions are constructed.

In this article, we aim to define the boundaries of the BI organisational form, by identifying how the BI has been de- fined in the extant body of research over a 35-year period. We achieve this by adopting a systematic literature review (SLR) methodology to critically review definitions of BIs used in the published research literature and practice literature. Our analysis of these definitions seeks to identify the most important elements of this organisational form. The paper makes two key theoretical contributions. First, we reveal the boundaries of the BI organisational form and the commonalities relating to BI concept over the last 35 years in both academic and practice literature. As such, we provide an answer to Thorpe *et al.*'s [27, p.174] question—"if the definition of an incubator has to be more precise, then on what basis should this be done?" Second, by identifying the similarities between different definitions of BI, we challenge Norman and Bergak's concern that prior literature is characterised by persistent disagreement [8]. We believe that clarifying the business incubation-incubator definition will aid both researchers and practitioners and provide the basis of a future research agenda.

This article is structured as follows. First, we detail the steps involved in the SLR methodology. Next, the results from the SLR of 82 academic definitions and 14 practice definitions used in 61 academic papers and practice reports are presented. These definitions are analysed—setting out the core elements of the BI organisational form. The article concludes with a discussion of the implications of this review and recommendations for further research.

II. SCHOLARLY LITERATURE: A SYSTEMATIC REVIEW

In this article, we use the SLR methodology to explore the domain of business incubation, identifying the key contribution to the business incubation literature based on broad coverage and synthesis [28], [29]. A SLR primarily involves defining a review protocol to assess and interpret all of the relevant research on a specific research question, subject area, or phenomenon of interest [25]. The SLR is, thus, a key tool in developing the evidence base to improve the quality of the review process by synthesising research in a systematic, transparent, reproducible and, thus, replicable way [26], [27], [30], [31]. The SLR differs from the traditional approach in that it is objective, replicable, systematic, comprehensive, and the process is reported in the same manner used for reporting empirical research [26], [35]. The origin of SLR lies in the management domain and it has been used to provide transparency, clarity, accessibility, and impar- tial inclusive coverage across a range of areas of management research [33], [34]. Klassen *et al*. [35, p. 700] define SLR as "a review in which there is a comprehensive search for relevant studies on a specific topic, and those identified are then appraised and synthesised according to a predetermined explicit method."

A. Review Methodology

The 12-step review methodology adopted is set out in Fig. 1. The focus was on research published from 1984 onwards, with 1984 deemed an appropriate starting point for this review as it coincides with the launch of Temali and Campbell's [36] national survey, which is considered the cornerstone of the business incubation literature [1]. The method utilised in this article, is similar to those utilised in other reviews of the busi- ness incubation literature [1], [25], [37]– [40] (Step 1). We searched the following electronic four databases: ABI/INFORM of ProQuest, Business Source Complete, Science Direct, and Web of Science (Step 2). For each database, 12 keywords were considered: BI and business incubation as per Hackett and Dilts [1]. Furthermore, technology incubator, technology business incubation, science park, technology park, research park, technopole, business development centre, technology de- velopment centre, and accelerator as per Mian *et al*. [24], in addition to the regional development incubator (Step 3). These terms were searched for in the titles, abstracts, and keywords of each paper in each database.

The abstract and introduction of each article were read to ensure that the article fitted the established criteria (Step 4). All papers that were not about business incubation were excluded; for example, studies on social entrepreneurship, innovation, and business models, other disciplines such as healthcare, engineer- ing, or physics. Furthermore, studies on academic entrepreneur- ship, technology transfer, educational case studies, proceedings, interviews, and book reviews were excluded as per Mian *et al*. [24]. The procedure resulted in 486 relevant articles (Step 5). The list was filtered to only include the leading scholarly journals that are often cited and ranked first and second in the 2018 Harsing Journal Quality List that is based on 17 international rankings. Consequently, 25 academic journals were considered as being prominent internationally (Step 6). Based on these journals, the 478 relevant articles from the previous step were reduced to 214 (e.g., 272 articles eliminated) (Step 7).

The abstract, introduction, and discussion/conclusion of the remaining 214 articles were read to establish whether they made a contribution to the field of business incubation (Step 8). The articles included were reassessed based on the stated inclusion criteria (Step 9). Articles with a strong practitioner focus, but little tangible data were eliminated (Step 10), resulting in a final set of 129 articles published in high-ranked scholarly journals (Step 11). The final set included papers were examined to identify articlesthat embrace definitions of BI, resulting in 47 papers comprising 82 definitions (Step 12). Having explained our approach to identify, assess, and screen the articles on pub- lished definitions of BI, the results of the definitions-literature review are now considered.

III. ANALYSIS

A qualitative methodological approach was

adopted to code and identify common themes. All of the identified definitions were imported into NVivo 12 to facilitate a process of open inductive coding [41]. The definitions were then coded into free nodes and grouped into tree nodes (representing open codes and themes/subthemes). To ensure rigor and to increase the reliabil- ity of the coding process, the coding of data was conducted independently in a sequential series of cycles. In cycle one (initial review), we identified and described themes that emerged from the dataset. To limit the effect of bias, all texts were examined independently to label and categorize each extraction until theme saturation was achieved. Within the initial review, we reviewed the independently created themes and generated one master definition per theme. In cycle two, we independently reviewed and coded all texts for accuracy and consistency.

IV. FINDINGS

A. Multiplicity of Definitions Across Journals and Time

Reviewing the literature systematically (up to Step 7 detailed above), identified 214 articles in 25 journals (Table I). Of these, using the criteria set out above we reviewed 47 papers from different 11 journal titles, which resulted in 82 separate definitions of the BI (Table II). By way of comparison, the SLR of Hackett and Dilts [1] included 24 definitions, while the SLR of Hausberg and Korreck [39] included 13 definitions.

The definitions ranged in length between 17 and 250 words. They spanned the entire period of our review, with a "spike" in the period 2002–2006, which accounts for 31% of the definitions analysed (see Fig. 2).

We identified three main themes that emerged as integral to existing definitions of the BI: 1) the BI model; 2) the purpose of the BI; 3) the target of the BI support (organisational bound- aries). Table III illustrates the open codes that aggregate into the three key themes and includes the frequency counts for the three themes and the open codes. We report that 52% of definitions addressed the BI term by BI model; 26% included the purpose of BI, while 20% included the target of BI support (see Table III). Table IV summarises the extent to which each theme appears in each of the definitions we reviewed. As is evident from Table IV, the focus of definitions has changed over time. The focus prior to 2002 tended to be on the provision of resources, with the narrative of BIs as facilities orientated to support start-ups in overcoming the challenges of growth based on the provision of resources. In contrast, the focus of many definitions since 2002 is on internal aspects of BI, with the narrative that the activities of business incubation can add value for the incubate and the incubated venture.

B. Defining the BI

1) Theme One. The BI Model: The BI model comprises four fundamental components: selection, process, mediation, and graduation [6], [8], [20], [42], [43]. As shown in Table IV, our analysis suggests that the definitions have attempted to develop a comprehensive understanding of the BI model. This has resulted in the existence of one or more components in each of our analysed definitions.

a) Screening Criteria (Subtheme 1): Although an impor- tant element in the incubation process, the screening of potential incubates does not form part of the definitions reviewed. When mentioned in definitions, it is confined to statements that suggest that the incubator follows a carefully designed selection process for tenants according to clear entry criteria and well filtering applications that enable the incubator to follow a specialisation approach imposing concentrated efforts, consistent with the industries to which incubators are directed. Alongside this, are references to factors that enable the incubator to be consistent with the objectives, services, and processes that are tailored by BIs to serve a specific type of customer. The definitions might allude to those criteria crystallising around accepting the future tenants with a product or a service mainly based on innovative and technological knowledge as well as accepting the future tenants by taking into account their financial and procedural matters, where they should

have the potential of achieving—in a particular time period—significant growth, in terms of sales, number of employees, and considerable export potential.

Definitions also indicate that the type of incubator plays an essential role in shaping the acceptance criteria, where he choices for-profit incubators, as an example, are based on a developed business plan, potential for high growth, and clear linkage to a long-term technological strategy. However, these criteria are not always the key selection determinant, indeed the financial position of the incubator that requires cash flow may require the choice of tenants who are able to pay the rent more than their ability to achieve desired growth.

Research suggests that the entry decision for the BI is not applied equally and according to what is being developed, due to the different conditions in which the incubator operates. This is encapsulated in one of the definitions: *"A business incubato may be defined as an organisationthat facilitates the process of creating successful new small enterprises by providing them with a comprehensive and integrated range of services, including Strict admission and exit rules, which are designed to ensure that the incubator concentrates its efforts on helping innovative, fast growth business start-ups "* [44].

b) Process of BI (Subtheme 2): When an incubated firm takes a place an incubation, the incubator may add value through activities, such as developing, accelerating, and assisting. For example, Hackett and Dilts [1] state: "*A business incubator is a shared office space facility that seeks to provide its incubatees (i.e., "portfolio-" or "client-" or "tenant-companies") with a strategic, value-adding intervention system (i.e., business incu- bation) of monitoring and business assistance."* The definitions suggest a positive link between the BI and development, ac- celeration, and monitoring of incubated firms. As an example, Somsuk and Laosirinongthong [45] state*: "Business Incubator is an organisationdesigned to accelerate the growth and success of entrepreneurial companies"*

During incubation, the dyadic relationship occurring between the incubated firms and incubator managers leads to the co- production of value, as stated by Rice's [8] definition: "*The en- trepreneurial ventures located in an incubator, as "consumers" of those outputs, operate in an interdependent co-production relationship with the incubator."* Consequently, this coproduc- tion lays the foundation of processes relating to product devel- opment and commercialisation, as emphasised in Eshun's [46] definition: "*Business incubation is also a social and managerial process aimed at supporting the development and commercial-isation of new products, new technologies, and new business models."*

These internal processes of BI may entail periodic monitoring. Typically, incubator managers, assisted by mentors and advisors, meet periodically with entrepreneurs and staff from incubat- ing ventures to discuss venture goals and milestones. This is captured in Adegbite's [44] definition: "*A business incubator may be defined as an organisationthat facilitates the process of creating successful new small enterprises by providing them with a comprehensive and integrated range of services, including professional management, which involves monitoring tenant businesses closely against their business plans and ensuring that the incubator itself operates in a business-like fashion with the prospect of becoming financially self-sustaining."*

The desire to access resources, to reduce costs, and to spend more time on product development are also rationales for joining an incubator. McAdam and Marlow's [47] definition states: "*Business incubator units are an effective support mechanism for new entrepreneurial firms in that they provide basic facil- ities, office space, administrative staff, and expert managers during the volatile start-up and growth process. This enables entrepreneurs to reduce operating costs and focus their attention upon product development."*

A BI may provide an incubated venture with a distinctive package of resources comprising tangible and intangible re- sources. Tangible resources refer to physical infrastructure and real estate, namely, office spaces comprising furniture, sports facilities, a computer network, 24-h security, and in certain cases laboratories.

TABLE I
TOP JOURNALS BY NUMBER OF PAPERS PUBLISHING BUSINESS INCUBATION RESEARCH (1984–2019)

Rank	Journal name	Number of papers
1	Technovation	49
2	Journal of Technology Transfer	36
3	Research Policy	17
4	Journal of Business Venturing	13
5	Small Business Economies	13
6	R&D Management	12
7	International Small Business Journal	8
9	Entrepreneurship Theory and Practice	8
10	Journal of Small Business Management	8
11	Technological Forecasting and Social Change	7
12	International Journal of Industrial Organization	6
13	Entrepreneurship & Regional Development	6
14	IEEE Transactions on Engineering Management	5
15	IEEE Transactions on Engineering Management	4
16	Journal of Business Research	3
17	Regional Studies	3
18	Growth & Change	2
19	Academy of Management Journal	1
20	Business History	1
21	Industrial Management & Data Systems	1
22	Journal of Economic Geography	1
23	Journal of World Business	1
24	OMEGA-International Journal of Management Science	1
25	Urban Studies	1
	Total	214

TABLE II
TOP JOURNALS BY NUMBER OF PAPERS PUBLISHING BUSINESS INCUBATION DEFINITION (1984–2019)

Article / International Organization	The numbers of definitions
The Journal of Technology Transfer	37
Technovation	15
Research policy	6
Small Business Economics	5
Journal of business venturing	5
Entrepreneurship theory & practice	4
Journal of Product Innovation Management	3
IEEE Transactions on Engineering Management	3
Journal of Small Business Management	2
Technological Forecasting and Social Change	1
Entrepreneurship & Regional Development Journal	1
Total	82

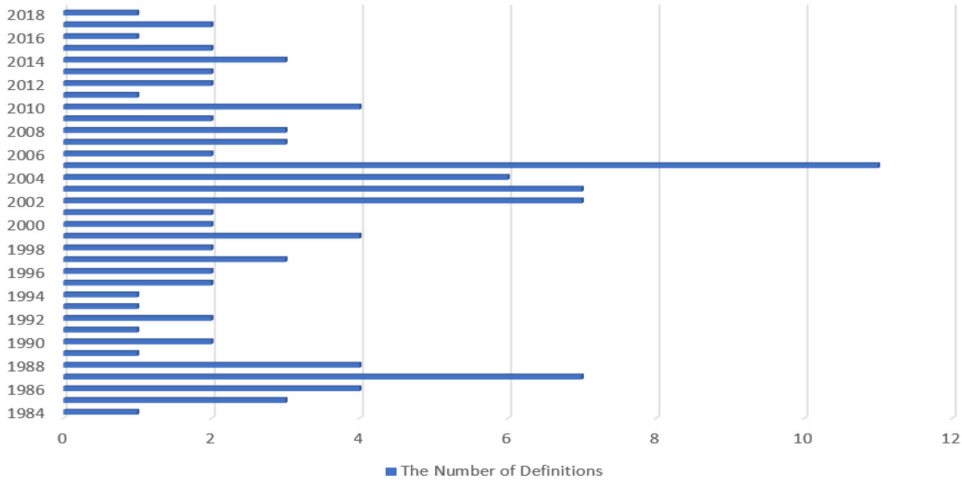

Fig. 2. Number of definitions per year in the business incubation literature.

TABLE III

THEMES USED IN THE 82 DEFINITIONS OF BI

Theme	**Open codes (with frequencies)**	**Number of definitions**
The BI model	- Providing tenants with tangible resources: spaces and support services (45) - Providing tenants with intangible resources (36) - Professional and managerial assistance (15) - Assistance in the critical stage of business development and monitoring (3) - Securing the venture capital (13) - Associating with universities and knowledge centres (15) - Associating with communities (4) - Interactions with stakeholders (4) - Building the management team (1) - Selection criteria (1) - Exit roles (1)	138 (52%)
The purpose of BI	- Organizing, promoting, accelerating the new business development process, launching new enterprises (54) - Economic, entrepreneurship, research, technology development (19)	73 (27%)
The target of BI	- New enterprises, NTBFs, small businesses, Early-stage growth of companies, new or growing businesses, new enterprises, emerging companies, start-ups, young companies, New entrepreneurial firms, Early stage ventures (57)	57 (21%)

TABLE IV

SUMMARY OF FINDINGS

	Source	Theme 1 The model of BI	Theme 2 The purpose of BI	Theme 3 The target of BI	Sub themes
1	Temali and Campbell [36]	✓			Providing resources
2	Allen and Rahman [84]	✓		✓	Providing resources
3	Plosila and Allen [85]		✓		
4	Albert [48]	✓	✓	✓	Providing resources
5	Brooks [51]	✓			Providing resources
6	SBA [86]	✓		✓	Providing resources
7	Smilor and Gill [87]	✓	✓	✓	Providing resources Mediation
8	Kuratko and LaFollette [88]	✓	✓	✓	The process of BI Assistance and development
9	MacDonald [89]	✓			Providing resources Mediation
10	Smilor [60]		✓	✓	
11	Campbell and Allen [90]	✓	✓	✓	Providing resources Assisting the development
12	Fry [62]	✓	✓	✓	Providing resources
13	Merrifield [53]	✓			Providing resources Securing the venture capital Mediation
14	Lumpkin and Ireland [63]		✓	✓	
15	Scherer and McDonald [91]	✓		✓	Providing resources
16	Hisrich [92]	✓	✓	✓	Providing resources Accelerating the development
17	Campbell and Allen [90]	✓	✓	✓	Providing recourses Securing the venture capital
18	Campbell *et al.* [64]	✓	✓		Providing resources
19	Allen and McCluskey [12]	✓			Providing resources
20	Udell [93]	✓		✓	Providing resources
21	Agnete Alsos *et al.* [94]	✓	✓	✓	Providing resources
22	Swierczek [95]	✓	✓		Business development Mediation
23	Mian [3]	✓	✓	✓	Mediation
24	Markley and McNamara [96]		✓		
25	Mian [56]	✓	✓	✓	Mediation
26	Greene and Butler [97]	✓	✓	✓	Providing resources
27	OECD [98]	✓	✓		Providing resources Mediation
28	Westhead [ ]		✓		
29	Molnar [100]	✓	✓	✓	Providing resources
30	Culp [101]	✓	✓		Providing resources
31	Sherman and Chappell [52]	✓	✓	✓	Mediation

TABLE IV

CONTINUED

	Source	Theme 1	Theme 2	Theme 3	Sub themes
32	Bearse [102]	✓	✓	✓	Providing resources Securing the venture capital
33	Autio and Klofsten [103]	✓		✓	Providing resources
34	Roper [104]		✓	✓	
35	Sherman [105]	✓	✓	✓	Providing resources
36	Hansen [109]	✓	✓		Providing resources Securing the venture capital
37	Chinsomboon [107]		✓	✓	
38	Adegbite [44]	✓			Providing resources Securing the venture capital Intensive mentoring Assisting business development Strict admission Exit rules R&D centres interactions Facilitating the process of creating
39	Thierstein and Willhelm [59]	✓	✓	✓	Providing process (more intangible)
40	Thierstein and Willhelm [59]		✓	✓	
41	Phillips [108]	✓	✓	✓	Providing process (more intangible)
42	Etzkowitz [109]		✓		
43	Colombo and Delmastro [58]	✓	✓		Providing tenants with intangible Mediation Transforming the knowledge
44	Lalkaka [110]	✓			Services for mobilizing ICT
45	Siegel *et al.* [61]	✓	✓	✓	Providing tenets with intangible resources Mediation
46	Lockett *et al.* [111]	✓	✓		Providing tenets with intangible resources
47	Lalkaka [110]	✓	✓	✓	Providing intangible resources Developing the business
48	Aernoudt [19]	✓	✓		Interactive development process Providing intangible resources Securing the venture capital
49	Pena [112]	✓	✓	✓	Providing resources Securing the venture capital. Nurturing start-up firms or early stage ventures.
50	Hackett and Dilts [1]	✓	✓	✓	Monitoring and business assistance Providing the resources
51	Hannon [113]		✓		
52	Lee and Osteryoung [114]		✓		
53	Bøllingtoft and Ulhøi [11]	✓	✓	✓	Providing a nurturing business environment by actively ensuring the business growth

TABLE IV

CONTINUED

	Source	Theme 1	Theme 2	Theme 3	Sub themes
54	Chan and Lau [67]		✓	✓	
	Peters et al. [49]	✓			Providing resources
55	Grimaldi and Grandi [22]	✓	✓	✓	Assistance in developing business Building management teams
56	Hannon [113]	✓	✓		Providing resources Inward investment
57	Phan *et al.* [27]	✓		✓	Providing resources related to the knowledge acquisition
59	Clarysse *et al.* [21]	✓	✓		The process of spin-out
60	Von Zedtwitz and Grimaldi [20]	✓		✓	Providing resources Securing the venture capital
61	Becker and Gassmann [115]	✓	✓	✓	Providing intangible resources
62	Voisey [55]		✓	✓	
63	Sofouli and Vonortas [112]	✓	✓	✓	Providing resources
64	Aerts *et al.* [6]	✓	✓	✓	Providing resources
65	McAdam and Marlow [47]	✓	✓	✓	Providing resources (tangible and intangible) Support mechanism for new entrepreneurial firms
66	Link and Scott [117]	✓		✓	Providing intangible resources Mediation with universities
67	Bergek and Norrman [7]	✓		✓	Providing resources
68	Schwartz and Hornych [123]	✓	✓	✓	Providing intangible resources
69	Aaboen [119]		✓	✓	
70	Eshun [46]	✓	✓	✓	Providing intangible resources
71	Honig and Karlsson [120]	✓	✓	✓	Providing resources
72	Fang *et al.* [121]	✓			Increasing the learning curve Mediation
73	Mian [56]		✓		
74	Bruneel *et al.* [66]		✓	✓	
75	Cooper [50]		✓		
76	Coper *et al.* [50]	✓		✓	
77	Soetanto and Jack [122]		✓	✓	
78	Schwartz [21]		✓		
79	Ebbers [10]	✓			Providing intangible resources
80	Somsuk and Laosirihongthong [45]	✓	✓	✓	Providing resources
81	Baraldi and Havenvid [5]		✓		
82	Lukeš *et al.* [57]	✓	✓	✓	Providing high value-added services

Furthermore, secretarial and reception services, mail handling, fax and copying services, computer network sup- port, and book-keeping, as reflected by Albert's [48] definition: *"An enterprise incubator is a collective and temporary place for accommodating companies which offer space, assistance, and services suited to the needs of companies being launched or recently founded."*

On the other hand, intangible resources refer to supports in securing venture capital, knowledge acquisition through coach- ing, networking access, business advisory, and training. This is reflected in Peters *et al.*'s [49] definition: "*The incubator is considered by provision of services, namely: Coaching: which is described as training and educational workshops offered. Seminars or programs offered either for a fee or free of charge to the tenants of the incubators. Networking: in addition, it is described as the access available to the tenants of the incuba- tor to managers, administrative, management, financial, legal, insurance consultants as well as to scientists, academicians, prospective customers, either for a fee or free of charge."* Cooper *et al.*'s [50] definition state: *"Business incubators are entities strive to develop robust business and social networks to bring value to their resident companies in the form of intellectual and material resources."*

Overall, the definitions of the 1980s and 1990s reflect the restrictive nature of resources and models of that era. In contrast, the definitions of the 2000s and later reflect the advancement, diversity of resources, and the added value that has occurred in incubators. Added value is interpreted in the definitions explic- itly: where infrastructure reduces costs, knowledge resources accelerate the learning curve, and network access facilitates obtaining external knowledge and legitimacy. This is elaborated in Brooks's [51] definition: *"A multi-tenant facility which pro- vides entrepreneurs with: 1) flexible leases on small amounts of inexpensive space; 2) a pool of shared support services to reduce overhead costs."* Similarly, Cooper *et al.*'s [50] definition states: *"The incubator is a place in which start-up companies benefit heightening credibility, shortening the learning curve."*

c) *Graduation From BI (Subtheme 3):* The graduation and screening criteria were the least evident components of the BI model, in the definitions of BI, (see Table III). This reflects the scarcity of studies within the literature that address the selection criteria, graduation, and postgraduation period. The only definition that refers to graduation is Adegbite's [44] defi- nition which states that transition to maturity and sustainability requires more time to implement the position assessment in collaboration with the incubator. Thereafter, obtaining indepen- dence should facilitate leaving or graduation from the incubator. Practically, when an incubated firm consistently hits all targets agreed with the incubator, it is typically considered the time for the incubate to consider "graduating." Indeed, this is not only beneficial for the incubate but also for the incubator, as it facilitates the recycling of resources for new incubates. The incubation period ranges usually from three to five years and ends with the graduation, thus, ensuring the turnover of tenants. Adegbite [44] states: "*A business incubator may be defined as an organisationthat facilitates the process of creating successful new small enterprises by providing them with a comprehensive and integrated range of services, including exit rules generally limit tenancy to a period of between three to five years, thereby ensuring a reasonable turnover of tenants."*

d) Mediation of BI (Subtheme 4): As noted in Table III, the BI is not an isolated entity but rather embedded as a strategic actor within a wider regional or national context. This implies interaction and integration with a broader community or set of stakeholders, and a tailoring of incubation programs and objectives to reflect regional or national enablers and constraints [24]. The basis of this collaboration is a trust that is placed on incubators as providers of a protected environment for new ventures, which represent opportunities both for local economic expansion and investment. This was documented by Rice [8]: "*A business incubator—in collaboration with the community in which it operates—is a producer of business assistance programs. A business incubator — in collaboration with the community in which it operates — is a "producer" of business assistance programs".* A narrower perspective is provided by Sherman and Chappell's [52] definition: "*Business incubator is an economic development tool primarily designed to help create and new businesses in a community."*

The incubator's interaction with the external environment in which it is embedded leads, in turn, to embracing a com- fortableness with the

uncertainty that surrounds it. This was alluded to by Merrifield's [53] definition: "*They [business incubators] create an interactive community of entrepreneurs; aca- demic and business interests that stimulate and encourage the sometimes-fragile business incubation process. They [business incubators] often operate as a communications bridge with the community"* .

It is also evident in Table III that the BI is a "bridging agent" between universities and public and private research institutes and the marketplace. Furthermore, the association of incubators with universities may allow incubates to utilise the university amenities such as laboratories and accessing academic networks. This is captured by Rothaermel and Thursby's [54] definition: *"Technology incubators are university-based technology initia- tives that should facilitate knowledge flows from the university to the incubator firms."*

2) Theme Two. The Objectives of BI (Purpose): As shown in Table III, there is increased recognition of incubators as facilitating environments, which develop conditions and sup- port systems to ensure successful new ventures. Consequently, incubators are underpinning local economies, reviving regions, boosting innovation, and commercialising research outputs and technology products. To illustrate, Voisey *et al*.'s [55] definition states: "*Incubation is now viewed as a key component of regional and national economic development strategies, supporting and accelerating growth across all sectors."*

Definitions used in recent studies continue to position incu- bators as reliable tools in accomplishing such purposes. This is underlined by Mian [56] who states: "*Technology business incubator is a strategy adopted by nations that gain better understanding in implementing this novel approach to have an enduring advantage in terms of technological progress, eco- nomic growth, and ultimately quality of life."* Lukeš *et al*.'s
[57] definition embraces a comparable conviction, stating that:"*Incubators and accelerators as relevant policy tools where they are seen as responsible for determining economic policy to initiate and boost innovation in a region and accelerate the development and growth of innovative firms through the provision of high value-added services."*

As noted also in the definitions reviewed (Table III), dictating and formulating the main objectives of BIs is the core role of sponsors and stakeholders. This is as a result of the interaction, collaboration, and relationships, in other words the mediation of BI, between the BI, industry, end users, and communities. However, the heterogeneity of BI sponsors and their objectives result in further heterogeneity of BIs models.

Common sponsors referred to in the definitions include tech- nology BIs (TBI), regional BI (public sponsored), science park (SP), innovation centres, and independent commercial incuba- tor. As such, the TBIs and SPs strive to achieve high-technology objectives through developing technology-oriented firms and transferring the technology. This was central to Colombo and Delmastro's [58] definition: *"A 'science park' is designed to encourage the formation and growth of innovative (generally science-based) businesses and has a management function which is actively engaged in the transfer of technology and business skills to 'customer' organisations."*

Other types are regional incubators that seek to achieve devel- opment and competitiveness objectives, as embraced in Sherman and Chappell's [52] definition: *"SPs reflect an assumption that technological innovation stems from scientific research and that science parks can provide the catalytic incubator environment for the transformation of 'pure' research into production."* However, BIs are integrated systems that have their own unique focus, mission, objectives, and processes, with each element of this series affecting the other.

3) Theme Three. The Target of BI Support (Organisational Boundaries): As noted from Table III, the target of BI support and incubation is the new venture. For example, Thierstein and Willhelm's [59] definition states: "*A locational community of relatively young and mostly newly founded enterprises whose activities mainly consist in the development, the production, or the marketing of high-quality technological products, services and processes"* The frequency of this target varied within
definitions in various synonyms, such as clients, tenants, incu- bates, "new start-ups,"

"small" enterprises, and new technology-based firms (NTBFs).

Despite sharing the same overall aim and resources, it was evident that there were variances in the industries and conse- quently some variation in the services provided. Thereafter, the variation in targeted clients is a determinant in the heterogeneity in the models of incubation and tailoring of programs. The def- initions outlined examples such as TBIs and SPS, for instance, Smilor [60] definition stated: *"A new business incubator is an innovative system designed to assist entrepreneurs, particularly technical entrepreneurs, in the development of new firms."*

Siegel *et al.*'s [61] definition states that: "*Science parks are designed to foster the formation and growth of innovative firms, provide an environment that enables large companies to develop relationships with small, innovative firms, and promote formal and operational links with 'centres of knowledge creation,' such as universities, higher education institutes, and research insti- tutions."* On the other hand, the public BI was illuminated by Fry's [62] definition: "*The business incubator is a new concept in entrepreneurship and economic development that utilises large, often old, building to house new small businesses."*

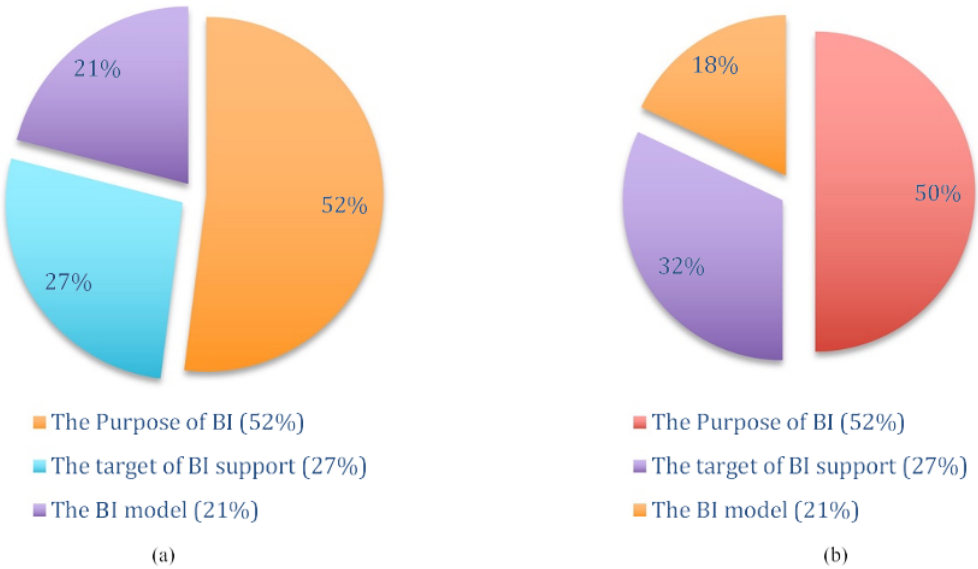

Fig. 3. Themes of BI definitions in the academic and practice literature. (a) Academic literature. (b) Practice literature.

V. DISCUSSION

A. Defining the BI in Academic Literature

The BI model and its components have had a consistent presence across journals in the 35-year time period [17], [18]. The literature in the 1980s and 1990s referred to the incubator as a "black box" [8], [42], [43]. However, as noted by Mian *et al*. [24] research efforts since 2004 to "open" the black box has led to a new orientation within the research domain. This has included, in particular, a focus on exploring the internal processes of business incubation.

Initially, the themes that emerged from the analysis suggest that, the first component, the BI model, is associated with the incipience of the incubation journey, entailing the application of a careful screening criterion [49], [58], [63]. An assumption emerged that selectivity in terms of a narrow range of "type" of incubate would allow the incubator to target efforts and to develop specific networks [26], [45]. In contrast, recent literature affirms the importance of accepting heterogeneous applicants in terms of value chain and life cycle stages, with the presence of heterogeneous incubates posited to create more diversity during the formation of networks [39].

In more recent definitions, concurring with Campbell *et al*.
[64] and Brooks [51], it was reported that the incubation phase considered value-added benefits that refers to the core processes of BI. The added value corresponds with reducing the

costs of the "threshold phase," accelerating the learning curve, providing external resources of knowledge, and legitimacy [65], [66]. All of which eventually results in the accomplishing of initial growth and paving the way for transformation into maturity to ensure sustainability as the ultimate purpose [10]. As noted by the analysis of the definitions, the BI plays a key role in the procedures associated with assistance in assembling the top management team (TMT) [23], [67]. Moreover, securing venture capital leads to self-sufficiency and survival, mostly oc- curring at the end of the five years of the incubation period [54]. In addition to this, prior research and definitions recognise that the BI is not an isolated entity, but rather it is an interactive actor within the local community in which it is embedded [52], [68]. This continued interdependence ensures ongoing alignment with sponsors and stakeholders' objectives, and the continual tailor- ing of programs [1], [8], [52], [68]. Several types of sponsors considered in definitions and literature resulting in variation of models included: for-profit incubator, nonprofit incubator. In addition to technology incubators, universities, independent, virtual, regional incubator, and innovation centres [19], [21], [26].

Building on research by Puranam *et al*. [69, p. 163], the common themes and features that emerged correspond with various leading conceptualisations of an organisational form, which refers to "an organisationas (1) a multiagent system with (2) identifiable boundaries and (3) system-level goals (purpose) toward which (4) the constituent agent's efforts are expected to make a contribution." The BI characterizes a form of organisationas comprising across all captured definitions, namely (1) model of incubation as a system of working with
(2) a certain target for their support/efforts (potential tenants) (boundaries) and (3) specific purposes towards which (4) the constituent agent's efforts are expected to make a contribution." Accordingly, Adegbite's [44] definition could be considered as a unified definition of the BI because it contains all com- ponents suggested by Puranam *et al*. [69]. Similarly, Thorpe *et al*.'s [27] definition captures Puranam *et al*.'s [69, p. 180] essential elements of an organisational form: "*An incubator is a self-contained organisationwith an identity, set of routines, and a strategic core. It has an administrative centre, a distinct mission, and interacts with the external environment as a unified entity.*"

B. Defining the BI in "Practice" Literature

In acknowledging the rich, foundational research, and practice of *"Research-on-Research,"* Rubenstein *et al*. [70] and to glean lessons from the past, we sought to capture key definitions of BIs from the publications of universal organisations in the business incubation domain.[1] The purpose of this was to examine if the themes identified in the analysis of the academic literature are reflected in nonacademic definitions of BI. In other words, if the development of the incubator research field has produced man- agerial insights into their value-added processes. The practice definitions embrace the same themes identified in the academic literature, though there is a difference in degree of emphasis (see Fig. 3). Where the majority of the practice literature aligned with the second theme, *the purpose of the BI*, and the third theme, *the target of BI (organisational boundary)*, only a few included the first theme, *the model of BI*. Acknowledgment of this variance in degree is important in the bridging of research and practice gap and in so doing provides a better foundation for BI performance evaluation, especially when conducting comparison case studies [7]. Furthermore, by eliminating the confusion and constraints associated with measuring the actual population of incubators [25], consequently makes the concept clearer for practitioners, thus leading to best practices based on exact indicators of incubator success and performance. Future research opportunities for the practice literature includes greater focus on the BI model and, in particular, the microprocesses within the BI in order to ascertain if

[1] [1]Definitions used are from National Business Incubation Association (NBIA);
Organisation for Economic Co-operation and Development (OECD); The in- foDev Global Network of Bis (InfoDev); the European Commission (EC); United Kingdom Business Incubation (UKBI); and National Endowment for Science Technology and the Arts (NESTA). References as follows: UKBI [74]; NBIA-2004 [72]; NBIA -2004, Albert et al. [73]; NBIA- 2005 [74]; NBIA- 2007 [75]; NBIA- 2009 [76]; Info DEV-2009 [77]; OECD [78]; EC [79]; Dee *et al*.
NESTA [80]; Info DEV- 2012 [81]; Info DEV- 2014 [82]; OECD (Mason and Brown) [83]; IASP [84].

the lived experiences of its incubates aligns with the overall aims of such support providers.

C. Towards a Future Research Agenda

We now propose an agenda for future research based on the themes identified from existing definitions and the overall view of BI-incubation as an organisational form operating as an open system (see Table V).

TABLE V
SUGGESTIONS FOR FUTURE RESEARCH

Theme/sub theme	Research questions	Possible theory/lens
The BI model		
- Selection criteria	- How does the BI make its choices among the applicants?	Decision making theory
- Process of BI: building management team	- How does the incubated venture's top management team change and develop during the phases of incubation?	Process theory
- Process of BI: knowledge acquisition	- How do the incubated firms acquire knowledge from different training programs of different BIs models?	Configurational theory
- Process of BI: securing venture capital	- How does the incubated venture find, and make a decision on, investors?	Transaction cost theory
- Mediation	- How does the BI leverage external interactions?	Open system theory
- Graduation	- To what extent do BI achieve their goals?	Effectiveness theory
The purpose of BI	- The role and influence of different formal and informal structures on BI performance?	Market orientation / organizational performance
The target of BI support (organizational boundaries)	- What are the causes of incubated venture's growth? - What he factors that leads to limiting BI rate of growth?	Market orientation / organizational performance

VI. CONCLUSION

In this article, we sought to define the boundaries of the BI organisational form by identifying how the BI has been defined in the extant body of research over a 35-year period. In so doing, we made the following theoretical contributions. First, we defined the elements of the BI organisational form and, in so doing, captured the commonalities within the different definitions. The result of this review, based on the organisational structure or form, led to the conclusion that the incubator is an organisationthat is substantially based on the four components of an organisationas suggested by Puranam *et al*. [69]. We argue that the BI is an organisationwith a multiagent system, identifiable boundaries, system-level goals (purpose) toward which the constituent agent's efforts are expected to make a contribution.

Second, based on insights from reviewing, capturing, and analysing all definitions of BI, we revealed the "blurring" that surrounds the concept of BI. That "blurring" is as a result of the heterogeneity of incubation models and the overlapping of the BI type with other types of initiatives concerning supporting entrepreneurs. Our thematic analysis illustrated how the key concepts embedded within this unified definition fit together and make the definition clearer for both practitioners and researchers alike. This reduces the confusion that surrounds the concept of BI. Eliminating this confusion will enhance the use of the concept in practice and its theoretical foundations. Furthermore, eliminating this confusion will pave the way for stakeholder interventions in terms of enhancing new practice, issues, and related development initiatives.

In conclusion, we argue that for practitioners, a clear definition of BI will facilitate their task by helping to build a shared understanding of BI. This should help practitioners in areas such as setting performance measures, evaluating performance, and identifying best practices. For researchers, a clear definition of BI will help the development of the research domain and improve researchers' ability to conduct comparative research of incubators.

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