

Community of Practice: A Flexible Construct to Identify SME Networking Roles in the Irish Agri-Farmhouse Cheese Sector

Abstract

The aim of this paper is to examine the participation identities and networking roles in a Community of Practice (CoP) where members participate in horizontal peer networking in order to enable and facilitate knowledge creation amongst its members. A commonly occurring critique of the CoP literature is that insufficient attention has been paid to the effect of unequal power relations amongst its members, with power in this sense relating to members' position in the social structure of the CoP. In order to address this research gap, our full population country level study which set in the Irish Agri-Farmhouse cheese sector adopted a two-stage research design consisting of social network analysis (SNA) and 51 in-depth qualitative interviews. Our findings not only provide a deeper nuanced understanding and extension of different forms of participation but also of the power dynamics within a CoP. In this particular CoP, we find that membership is not negotiated in a uniform manner and that differences in participation can be identified and categorised by a focus on the intersection of owner-managers' participation identity and firm network positions. Building on this, we develop an original role typology depicting five distinct networking roles and how these different network identities relate to firm network positions and roles. It is posited that this typology can act as a sense-making tool for researchers and practitioners by which to diagnose and understand variation in small firm horizontal peer networking behaviour, particularly within the agri-food sector.

Key words: Community of Practice (CoP); agri-food sector; horizontal peer-to peer networking; participation identities; Social Network Analysis (SNA)

1.0 Introduction

Research on “communities of practice” (CoP) has focused on the development of practice, which refers to the emergence of a shared identity around a topic that represents a collective intention within a community context, as a result of relationships, personal interactions, and connections among participants (Lave and Wenger, 1991; Hank, 1991). In the context of the Agri-Farmhouse Cheese Sector, reliance on their CoP is an effective way for SMEs to access new opportunities, obtain new knowledge, learn from experiences, and benefit from the synergistic effect of pooled resources (Chetty and Blankenburg Holm, 2000). Indeed, CoPs, ‘by their nature, provide a helpful antidote to network failures’ (Autio et al., 2008: 62) by addressing SMEs’ networking and collaboration capability weaknesses (Gronum et al., 2012). However, extant research on CoPs has predominantly focused on large organizations, with little focus on their SME counterparts (Swan et al., 2002; Wenger et al., 2002).

Within this paper, we recognize the Irish agri-farmhouse cheese sector as a CoP due to firms shared commitment to the development of artisan cheesemaking. This recognition is based on account of the following key rationales. First, the sector re-emerged in the late 1970’s when all traditional knowledge of small scale cheese production had been lost. Sage (2003) finds that Irish farmhouse cheese producers have faced a particularly steep learning curve as the practice of cheesemaking had to be developed through trial and error, as a result networking with more experienced peers and informal apprenticeships emerged as a key learning strategy. Cheesemaking like other forms of artisan knowledge is tacit, ‘sticky’ and difficult to transfer in the absence of close and deep interaction (Brown and Duguid, 2001; Pyysiäinen, Anderson, McElwee, and Vesala, 2006). Second, the inherent variability in cheese-making requires

constant learning and adjustments (see Lucas et al, 2005; Lucas et al, 2008). This variability means that farmhouse cheese makers need to make continual incremental adjustments to the process and thus peer networks are likely to be significant resources in understanding why problems occur and developing timely solutions (Freeman 1998; Kaufelt and Thorpe 2006). Given the structure of the Irish the agri-farmhouse cheese sector and the continual need for resources it provides an exceptionally interesting opportunity to understand and map knowledge flows within an industry-wide CoP.

Within this particular CoP, we are specifically interested in the horizontal peer networks which facilitate information and resource sharing relationships between members of the Irish Agri-farmhouse Cheese Sector (Murdoch, 2000). Horizontal peer networking amongst firms in the same sector is deemed especially beneficial as it enables access to sector specific information on regulations, potential customers, competitors and product and process improvement ideas (Kingsley and Malecki, 2004; Boehe, 2013; O'Donnell, 2014). However, there is a lack of understanding as to whether such network benefits are reaped by all members of this CoP and if the development of participation identities, which underlie engagement in the CoP, are negotiated in a uniform manner (Edwards and Sengupta, 2010). CoPs tend to be more tightly-knit than other networks (Brown and Duguid, 2002) and so potentially offer Agri-farmhouse Cheese producers in particular, and agri-food SMEs in general, a means to share information, collaborate and deepen their knowledge within their sector. Surprisingly, the role of CoPs in agri-food SMEs, and how horizontal peer networking enables CoP members to learn and develop their artisanal knowledge in particular, has not been the subject of detailed country level empirical research (Pattinson and Preece, 2014). Given the importance of the Agri-Farmhouse Cheese sector to the Irish economy, this lacuna is worthy of further investigation. Accordingly, the aim of this paper is to examine the participation identities and networking roles in a Community of Practice (CoP) where members participate in horizontal peer networking in order to enable and facilitate knowledge creation amongst its members.

To facilitate our exploration of this CoP, a full population single sector, country level study was utilised (Edward and Sengupta, 2010). This study adopts a two-stage research design approach. First, social network analysis is employed to decipher member positions within the CoP. Second, analysis of firm positions is augmented by in-depth qualitative interviews with owner-managers representing the full population of 51 firms in order to glean an understanding of the key participation identities negotiated within this CoP. In so doing, we respond to O'Donnell's (2014) call to pay greater attention to the normative dimension of networking, the meanings and expectations that individuals attach to their networking behaviour. We then combine analysis of position and participation identities in order to develop an original typology of five distinct roles performed by members of the CoP. Accordingly, we present a holistic understanding of how firms within this CoP negotiate their participation and the roles that emerge at the intersection of owner-manager's participation identities and firm network positions.

Within this paper we make the following contributions. First, we respond to calls by Edwards and Sengupta's (2010) for research into the variation in small firm networking within a single industry sector. Accordingly, we contribute to understanding of CoPs as a network enabler at the national level (McKetterick et al., 2016). Second, building on this, we respond to calls from Handley et al. (2006) for a more nuanced understanding of the participation identities negotiated within a CoP. Accordingly, we extend Wenger's (1998) classification of participation identities, through a focus on owner-managers' interpretations, actions, choices and valued experiences of peer firm networking within the CoP. Specifically, we identify five

distinct participation identities, that of leader, full participant and novice identities and the refinement of peripheral and marginal identities. Third, we provide a deeper understanding as how these different identities relate to firm network position in order to develop a novel typology of five distinct roles performed by firms within a CoP. Fourth, we examine how the roles identified reflect unequal power distribution and participants' motivation for resisting greater integration into the CoP. Finally, from a practitioners' perspective, this role typology provides a flexible framework that can be used to diagnose the informal governance system, address training and development gaps and provide a platform for joint problem solving and shared coordination with supporting organisations and government agencies.

The paper is structured as follows. First, we commence by outlining the rationale for our theoretical framework followed by a discrete analysis of the key constructs – CoP, participation identities and network roles in the context of the Irish agri-farmhouse cheese sector. We then draw these concepts together under the umbrella of our initial conceptual framework which then forms the basis of our empirical illustration of the analysis. The following section presents our methodological rationale and method; this is followed by critical evaluation of our empirical evidence. Finally, we consider the implications of our arguments in terms of the contribution of the role typology to research and practice concerning variation in small firm's horizontal peer networking behaviour. We conclude with recommendations for future research.

2.0 Our Theoretical Framing

2.1 CoP and Small Rural Firms

A CoP is a group of individuals who share a common interest, a set of problems or a passion and who increase their knowledge and the understanding of these aspects through interpersonal relationships (Wenger et al., 2002). Furthermore, each CoP is a different combination of the fundamental aspects of domain, community and practice which evolve according to the context of the community (Wenger and Snyder, 2000). Regardless of context, being a member of a community provides a certain focus or perspective, which manifests as 'a tendency to form certain *interpretations*, engage in certain *actions*, make certain *choices* and to value certain *experiences*' (Wenger, 1998: 152-153). Accordingly, a CoP entails a shared domain that becomes a source of identification with members developing identities as they negotiate their experience of participation (Wenger et al., 2002). Of particular note, is that this identity creates a sense of commitment to the community as a whole, not just connections to a few linking nodes (Wenger and Snyder, 2000).

Research to date on CoPs has predominantly focused on the innovation processes of large organizations, (Loyarte and Rivera, 2007; Swan et al., 2002; Wenger et al., 2002) and as a consequence COPs in the SME sector are essentially an emergent phenomenon (Patterson et al., 2015). This is significant as SMEs in general, and Agri-Food SMEs in particular, often have limited networking capability (Havnes and Senneseth, 2001) and struggle to participate in collaborative practices due to limited resources (Hamburg and Marin, 2010). Du Plessis (2008) argues that the benefits of participation in CoPs is substantial for SMEs, facilitating the development of inter-organisational social networks, combating the attrition of tacit knowledge and the continuation of craft based practices (Eriksson and Bull, 2017) as new-comers progress from novices to full participants in the community (Gowlland, 2012). However, to date the communities of practice concept has not been systematically applied to investigate the development of inter-organisational relationships between small rural firms.

A number of studies have applied the CoP construct to examine inter-organisational networking in rural areas. Mtika and Kistler (2017) draw on the CoP construct to examine community development and identify different levels of engagement in rural areas of Malawi and Kenya. Sonnino and Griggs-Trevarthen (2013) do not use the CoP construct explicitly, however their examination of the values, views and social relations between community food members and the need for collective mobilization of local resources has strong parallels with Mtika and Kistler's (2017) study. However, variation and even conflict in the community is an acknowledged but an underexplored dimension of the CoP literature (Lefebvre et al., 2015). As Wenger (2002) argues the concept of community denotes commonality but not homogeneity. Long-term interaction creates a common history but also encourages differentiation among members. Members have different motives for participating, make diverse contributions and hold different viewpoints (Harrison et al., 2002). According to Wenger (2002: 35) participation identities develop as members 'take on various roles officially and unofficially. They gain a reputation. They achieve a status and generate their personal sphere of influence. In other words, each member develops a unique individual identity in relation to the community'. However, there is a current paucity of research which looks specifically at the different forms of participation identities negotiated by small rural firms. In this paper, we focus on the development of such participation identities to examine variation in firms networking behavior.

2.2 Participation Identities

Participation refers to the process of being an active participant in the practice of communities (Wenger, 1998). It is through participation in the CoP that identity and practices develop (Handley, Sturdy, Fincham and Clark, 2006). In Wenger's (1998) conceptualization participation refers to an 'encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities' (Wenger 1998:4). As such, (Wenger, 1998) views participation identity as resulting from the process of participating rather than as a consequence of an individual's ascribed or inherited characteristics. Wenger (1998) used the idea of trajectories of participation to demonstrate that participation identities develop on an ongoing basis and are subject to renegotiation and change. Trajectories incorporate past experiences and future expectations of participation as 'we define who we are by where we have been and where we are going' (Blackmore, 2010: 135). Wenger (1998) distinguishes between inbound, insider and peripheral trajectories of participation. However, research has primarily focused on inbound and insider identities, focusing on an individual's journey from novice to full-participant, with little attention paid to the experiences of members on a peripheral trajectory of participation. Examination of identities which may not lead to an idealized full-participant identity are necessary to understand the experiences and motivations that cause members to resist greater integration into the CoP (Handley et al. 2006; Bathmaker et al., 2012). Non-participation identities are hinted at but underexplored by Wenger (1998) who distinguishes between 'peripheral' and 'marginal' identities. Wenger (1998) defines peripherality as a form of participation which is less than full, whilst marginality indicates a form of participation that prevents full participation, where non-participation dominates. However, as Handley et al. (2006) argue the distinction between different identities of participation and non-participation within CoPs remains ambiguous. A number of studies have built on the work of Handley et al. (2006) by focusing on engagement in practice as the defining feature of CoPs. However, they have failed to address Handley et al.'s (2006) call for more research on different levels of participation, focusing instead, for example, on how practice gives rise to different types of knowledge or knowing (Nicolini, 2011) or examining how participation can be sustained (Fang and Nuefeld, 2009). In focusing on how identities of participation and non-participation emerge and are

enacted we recognize that CoP membership is not negotiated in a uniform manner and different level of participation will lead to unequal power distribution within the CoP (Contu and Willmott, 2003; Handley et al., 2006)

2.3 Network Roles and Unequal Power Relations

A commonly occurring point of critique of the CoP literature is that insufficient attention has focused on the effect of unequal power relations amongst community members (Contu and Willmott, 2003). For instance, Brown and Duguid (1991) argue that such communities have little hierarchy with the only real status being that of member. However, Contu and Willmott (2003) challenge this view and remind us that power relations are a central but underexplored component of communities of practice and that 'unequal relations of power must be included more systematically in our analysis' (Lave and Wenger, 1991: 42). Power in this sense relates to members' prominence or position in the social structure of the CoP; greater network ties and hence centrality within the network proxy for greater power, where power comes from 'access to or control over valued resources' (Ibarra and Andrews, 1993: 227). Unequal distribution of power amongst community members is significant to the extent that it fosters or impedes access to or continuing membership of communities of practice (Lave and Wenger, 1991). As a CoP is essentially predicated upon knowledge, this power is exercised through control of what knowledge is created, what is deemed legitimate knowledge, and who can access to knowledge (James, 2007). An examination of unequal power distribution within the CoP is necessary to address how certain identities may be deemed illegitimate and also to examine participants' motivations for resisting greater integration and centrality within the community of practice (Bathmaker et al., 2011). As Thompson (2000) argues the social structures of relations between network members can be used to uncover power relations. Wenger (1998) specifically uses positional terminology in identifying different modes of participation, for instance newcomers are legitimate *peripheral* participants. However, as Contu and Willmott (2003: 286) argue the 'connections between community members and the structural characteristics of these communities are left largely unexplored'.

2.4 Position as an Indicator of Role Performance

The lack of in-depth structural analysis within the CoP literature may be largely explained by a reliance on qualitative, ethnographic case study research which focuses on the meanings and expectations that members attach to their participation (Wenger 1998; 2002). As noted, the consequence of this has been a paucity of COP research relating to the effect of unequal power relations amongst community members (Contu and Willmott, 2003). Reference to the broader organizational context highlights the use of social network analysis methods to categorize individuals regarding their relative level of importance or hierarchical position within the social network. However, due to the difficulty in collecting whole network data few studies have sought to systematically analyse differences in network positions at the inter-organisational level (Provan et al., 2007). Yet, there is a strong tradition of identifying different positional categories using intra-organisational data. For example, Allen and Cohen (1969) label the most central individuals as stars in the network, while Tushman and Scanlon (1981a; 1981b) build on this classification to distinguish between internal stars who facilitate the flow of information within the network, and external stars who have strong links outside the network. Brass et al. (1995) expand this classification and identify liaisons and bridges that connect subgroups in the network. Cross and Prusak (2002) further expand this classification by labeling employees at the edge of the network as 'peripheral specialists' - network members that work without many network ties, but are valuable to the network as sources of high expertise - arguing that it may not always be necessary or useful to ensure all employees are tightly integrated into the network.

Our initial conceptual model (Figure 1) draws upon the concepts of participation identity, network roles and network positions in order to provide a lens by which to examine and classify the heterogeneous roles performed by SMEs in their CoP. Consistent with Wenger (1998), we define participation identity as owner-managers valued experiences, interpretations and expectations of networking. In line with Cross and Prusak (2002), Rogers (1995) and Brass et al. (1995) we focus on the SME's number of incoming and outgoing ties to identify structurally equivalent positions in the network. Participation identity and network position are depicted as interacting in a cyclical manner, reflecting how identity shapes position in the network as owner-managers choose which contacts to develop and which to forego. In addition, network position informs identity as occupying a given position in the network gives rise to social experiences of interaction, which in turn impact owner-manager valued experiences, interpretations and choices. In line with the aim of the study and based on a review of the CoP literature and the conceptual model depicted in Figure 1 our underpinning research question is as follows: *What distinct networking roles emerge based on an analysis of owner-manager participation identity and network position in a CoP?*

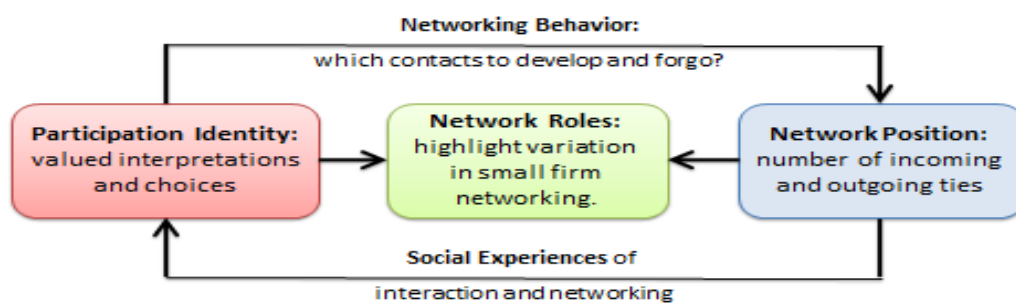


Figure 1: Initial Conceptual Model Classifying Networking Roles within a CoP based on analysis of Identity and Position

Positional analysis provides a measure of firms' relative centrality within the CoP. However, purely positional analysis lacks necessary context and meaning, which Smith et al. (2014) describes as akin to aerial photographs of a crowd. Participation identities, focusing on the meanings and expectations that firms' attach to their participation, addresses the limitations of positional analysis and provides insight into a SME's future trajectory of participation within the CoP. By combining both position and participation identities a more nuanced understanding of role performance is achieved which takes account of a SME's current and future participation in the CoP, the expectations and motivations that underlie participation and the relative distribution of power within the CoP. The next section will outline the research methodology employed to explore our underpinning research question.

4.0 Methodology

4.1 Research Design

Within this paper, we consider the Irish Agri-farmhouse cheese sector to be a CoP whereby firms share a common set of problems and can deepen their knowledge of farmhouse cheese production and selling through horizontal peer networking. In order to answer our underpinning research question, we adopted an interpretive methodology. Such an approach allows us to build an understanding of the properly contextualized experiences of the Agri-Food SME owner-managers within their CoP. In order to achieve this understanding, it was necessary to examine patterns of relationships within a specific community practice, in addition to its members' choices and attitudes to networking (Shaw, 1999; 2006). Thus, we required an approach that enabled both the structural and interactive dimensions of small firm horizontal networking within a CoP to be considered. To date, research examining both the structural and interactive dimension of small firm networking across a full population of firms is scarce due to costs in time, resources, and overall difficulty in collecting whole network data (Provan et al. 2007). We address this scarcity and overcome such difficulties by providing empirical evidence collected from 51 firms actively producing and selling farmhouse cheese in Ireland (Hatala, 2006). Furthermore, this full population country level study differs from previous research which primarily relied on regional level data (McAdam et al., 2015).

Accordingly, we adopted a two-stage research design approach consisting of social network analysis to decipher member positions within the CoP, augmented by in-depth qualitative interviews with its members to glean an understanding of the key participation identities negotiated within this CoP. In so doing, we present a holistic understanding of Agri-Food SME owner-manager identity, and the views, meanings and expectations that owner-managers attach to networking behaviour of the firm. In addition, representatives of two sector specific support organizations were also interviewed. The interview data were supplemented with archival analysis of documents including white papers and government reports. These secondary sources provided a richer context for understanding the support organisations and Agri-food SME owner-managers' responses and as they were typically produced in "real time" served as a means of triangulation, thus counteracting any anomalies, preferential hindsight or retrospective memory bias that may have arisen during the interviewing process (Yin, 2011).

4.2 Research Context

In responding to calls by Edwards and Sengupta's (2010) for further research into the variation in small firms' horizontal peer networking behaviour within a single industry, we provide a full population study of the horizontal peer networking within the Agri-Farmhouse Cheese Sector. The Agri-Farmhouse Cheese Sector was deemed an appropriate research context for the following reasons. First, the sector is populated exclusively by small and medium firms, nascent but growing with significant potential for expansion. For instance, retail sales in Ireland increased by 43% between 2011 and 2013 (BordBia, 2013). The sector has an estimated total revenue of €19m per year, including exports to over 25 countries, with Teagasc, the Irish food and agriculture authority, estimating that the sector is currently operating at only 40% capacity (Teagasc, 2016). Second, the sector re-emerged in the 1970s, due to an interest in locally produced cheese (CAIS, 2010). Sage (2003) finds that Irish farmhouse cheese producers have faced a particularly steep learning curve as they have sought to upgrade their scale and methods of production and comply with demanding regulations. These factors then create strong horizontal peer networking drivers as firms sought to acquire necessary technical, marketing and regulatory knowledge and expertise. Third, as a consequence of this lack of a traditional knowledge base each cheese is unique to each producer. This has the advantage of allowing for innovation and creativity, while respecting particular styles of cheese making

(Sage, 2003). Fourth, and in support of Agri-Farmhouse cheese SMEs' desire for horizontal peer networking, two formal trade associations were established: CAIS, the Irish farmhouse cheese-makers association in 1984 and IRCMC, the Irish Raw Cow's Milk Cheese Slow Food presidium in 1996. Collectively, these characteristics suggest that the sector provides an excellent example of a CoP in which member firms may choose to participate in horizontal peer networking in order to address resource constraints and facilitate the development of a shared but highly specialised knowledge domain.

4.3 Data Collection and Analysis

Data collection began with a dataset of firms registered as producing farmhouse cheese with the Irish Department of Agriculture. The selection criteria focused on identifying firms involved in the production and selling of farmhouse cheese that had been operating commercially for at least two years. In line with this selection criteria, 58 firms were initially contacted, 7 of which were later excluded, as they did not produce cheese on site, resulting in a final list of 51 firms. All 51 agri-food SMEs and their associated owner-managers agreed to participate fully in both stages of the data collection process and all were subsequently interviewed. In addition to this, interviews were conducted with two supporting organisations, Bord Bia the Irish food board and Teagasc the Irish food and agriculture development authority in order to provide greater insight into how firms in the sector interacted with external information sources and the use of supporting organisations as a substitute or complement to horizontal peer networking. In order to aid contextualisation, Table 1 includes information on each agri-food SME included in this research and serves as a basis for the subsequent discussion.

Table 1: Agri Food SME Background Information

Firm Name	Years of Operation	Employees (FTE)	Market	Production (Tonnes)	Associations
FALSTAFF	25+	16-20	International	280	CAIS
PETRUCHIO	25+	6-10	International	100	CAIS
CASSIUS	25+	2-5	International	80	CAIS
TITUS	16-25	2-5	International	80	CAIS
ROSALIND	6-15	11-15	International	50	CAIS
HORATIO	6-15	6-10	International	30	CAIS
LANCE	25+	2-5	International	25	CAIS
EMILIA	25+	6-10	International	25	CAIS
DESDIMONA	2-5	2-5	National	23	CAIS
GONERIL	25+	6-10	International	20	CAIS
HENRY	6-15	2-5	National	16	CAIS
DION	16-24	2-5	National	15	CAIS
JACQUES	2-5	2-5	National	12	CAIS
PAULINA	2-5	1-1.5	National	10	CAIS
REGAN	25+	2-5	National	8	CAIS
THESEUS	25+	2-5	National	8	CAIS
MIRANDA	6-15	2-5	Local	8	CAIS
RICHARD	16-25	2-5	National	4	CAIS
ROMEO	25+	1-1.5	Local	4	CAIS
LEONTES	6-15	1-1.5	Local	4	CAIS
NURSE	6-15	6-10	National	3	CAIS
MACDUFF	2-5	1-1.5	Local	2	CAIS
HERMIA	16-24	1-1.5	Local	2	CAIS

MAMILLIUS	6-15	1-1.5	Local	2	CAIS
LENNOX	2-5	2-5	Local	2	CAIS
RICHARD	6-15	2-5	Local	1.5	CAIS
MIRANDA	16-24	1-1.5	Local	1	CAIS
PORTIA	25+	1-1.5	Local	1	CAIS
JACQUES	6-15	2-5	Local	0.5	CAIS
TIMON	16-24	11-15	International	200	CAIS/IRCMC
OPHELIA	25+	2-5	International	27	CAIS/IRCMC
HERMIONE	6-15	2-5	National	10	CAIS/IRCMC
CASCA	6-15	2-5	Local	7	CAIS/IRCMC
BENEDICK	6-15	2-5	National	4.5	CAIS/IRCMC
LEAR	25+	1-1.5	National	4	CAIS/IRCMC
PUCK	6-15	1-1.5	Local	3	CAIS/IRCMC
MACBETH	2-5	2-5	National	5	IRCMC
OTHELLO	16-24	11-15	International	20	None
BEATRICE	6-15	1-1.5	Local	15	None
HAMLET	6-15	2-5	National	12	None
ROSALIND	16-25	2-5	National	4	None
MERCUTIO	16-24	1-1.5	Local	4	None
CLEOPATRA	2-5	2-5	Local	3	None
TYBALT	6-15	2-5	Local	2.5	None
VIOLA	6-15	1-1.5	Local	2	None
JULIET	16-24	1-1.5	Local	2	None
CAMILLO	16-24	1-1.5	Local	2	None
TITANIA	6-15	1-1.5	Local	1.5	None
PROSPERO	25+	1-1.5	Local	1	None
TAMORA	6-15	1-1.5	Local	1	None
EDMUND	6-15	1-1.5	Local	1	None

The first stage of data collection process began by asking the Agri Food SME owner-managers to identify the firms in their CoP that they typically sought advice from. The UCINET social network software package (Borgata et al., 2002) was then utilized. As this was a full population study, a sociogram of the entire CoP was then constructed which demonstrated each members' incoming and outgoing ties (Gluckler and Doreian, 2016; Brusco et al., 2011; Grasenick et al., 2008). The results were then aggregated across all members in the CoP, enabling the identification of four distinct positional categories – isolate, leaf, mesh and super-node. Our definitions of structural network positions are based on classifications of functionality in computer networks (Hughes and Walkerdine, 2008).

In the second stage of the research process, different categories of owner-manager identities were developed by examining the meanings and expectations which owner-managers attached to their networking behaviour via the in-depth interviews. Interviews lasted approximately 60 minutes and usually took place at the firm's production facility or adjoining family home. The 51 interviews which were augmented by personal notes were audio recorded and transcribed resulting in over 1000 pages of text. Interviewees were encouraged to speak openly and freely and were assured that their responses were confidential and would be anonymized (See Appendix for Interview Schedule). For this reason, we assigned a Shakespearean pseudonym to each of the firms as the sector is small and firms may be easily identified by firm or owner-manager attributes. In order to ensure the validity and reliability of our data, we supplemented interviews with secondary published data, developed a case study protocol and database,

focused on pattern matching and explanation building while addressing rival explanations (Winter 2000; Yin 2009; Leitch et al., 2010), for more information see Tables A1 and A2 in Appendix. Initial analysis of the qualitative data began in parallel with the interviews as early impressions and emerging patterns in owner-managers perception of networking were recorded in field notes (Miles and Huberman, 1984). The transcribed interviews were then coded manually with an initial focus on owner-managers open or closed networking orientation. The stage round of coding involved the integration of first order codes and creation of theoretical categories thus signifying the transition from open to axial coding (Locke, 2001). This was a recursive rather than a linear process; we moved iteratively between our first order categories and the emerging patterns in our data until adequate conceptual themes emerged (Eisenhardt, 1989). Once these theoretical categories had been generated, in stage three we then looked-for dimensions underlying these categories. We organised these theoretical categories or second order codes into aggregate theoretical dimensions (see Table 2 - Data Structure) (Corley and Gioia, 2004; Maitlis and Lawrence, 2007).

Table 2: Data Structure: Inductive Analysis and Data Coding

Creating Provisional Categories and first Order Codes	Theoretical Categories (2nd order themes)	Aggregate Theoretical Dimensions
Statements about the indirect benefits of peer networking to increase the quality and reputation of all firms in the network; difficulties of product replication, market munificence and resulting low risk of peer networking.	Engaged in networking as a tool for sector development based on a belief that peer networking has few risks and significant indirect benefits.	Leader Identity
Statements about the benefits of peer networking as a platform to share information with peers; focus on peer networking as a means to access common market and regulatory information; managing risk while remaining open to peers.	Participated in networking as a platform for cooperative knowledge sharing rather than 'learning' from peers.	Full-Participant Identity
Statements about the benefits of learning from more experienced peers; positive contributions to sector development by firms with long tenure in the industry.	Engaged in networking as means to enhance own knowledge and viewed established firms as pioneers.	Novice Identity
Statements about the risks of increased competition; unintended information leakage; need to severely restrict peer networking due to risks involved.	Belief that networking was high risk and interactions should be severely restricted to few trusted peers who are not direct competitors.	Peripheral Identity
Statements about minimal benefits of peer networking and / or high costs due to firm characteristics, being especially small or rural; personal preference for isolation.	Viewed networking to be of limited benefit and as a result chose to not actively participate in the network.	Marginal Identity

5.0 Findings and Discussion

As the study adopts an interpretive focus, the results and discussion are presented or integrated

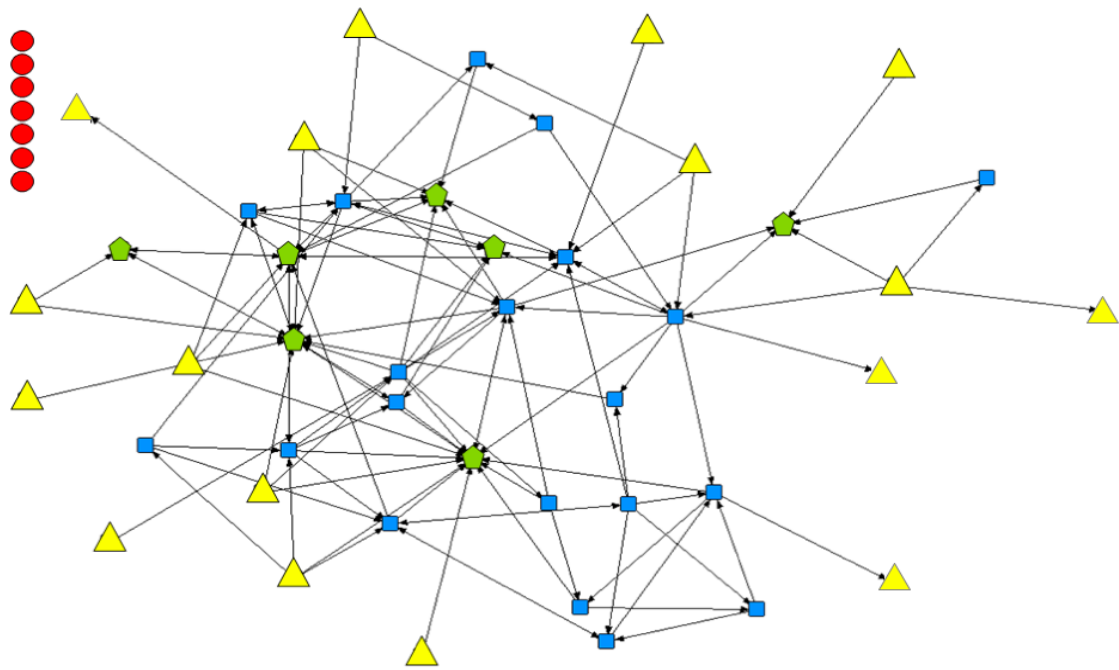
conjointly as suggested by Yin (2009). We begin by presenting our findings with respect to network positions and the identification of four classes of position (isolate, leaf, mesh and super node). We then categorise participation identities (leader, full participant identity, novice, peripheral and marginal) and then we develop a typology of five distinct network roles (promoter, practitioner, apprentice, free-rider, outsider), which classifies variations in small firm horizontal peer networking in relation to firm position. We conclude by presenting a redefined conceptual model that combines the classification of network position and participation identities to identify heterogeneous roles within small firm communities of practice.

5.1 Firm Network Positions

In order to identify heterogeneous networking roles within this CoP, we examined and then classified firm's position in the network and owner-manager identity separately. We then combined analysis in order to examine firm's position in the network in the context of owner-managers views on horizontal peer networking leading to the development of an original typology of five distinct roles performed by members of this CoP. For the purposes of this paper, we refer to firms as occupying structurally equivalent positions if they had a similar ratio and number of incoming relative to outgoing advice seeking ties (Gluckler and Doreian, 2016). The direction of ties was also important, as it allowed us to classify firms based on their contribution to the network (incoming ties) or dependence on peers (outgoing ties) (Brusco et al., 2011). By classifying firms based on their ratio of incoming and outgoing ties, we were then able to illuminate the natural hierarchy present within the peer firm network. In doing so, we build on Thompson's (2002) assertion that the social structures of relations between members can be used to decipher the distribution of power. This was deemed important given the criticisms that have been made against CoP in relation to the insufficient attention to unequal power relations amongst community members (Contu and Willmott, 2003).

Analysis of firms' position within the network led to the identification of four classes of position: isolate leaf, mesh and super nodes (see Figures 2 and 3). An isolate is a node that is disconnected from the network with no ties; a mesh-node has an approximately symmetric number of incoming and outgoing ties; a super-node supports far more incoming ties than outgoing ties, forming an important hub within the network; a leaf-node makes only a few outgoing ties to mesh-nodes or super-nodes and is therefore weakly connected in the structure of the network. In a super-node network, the most centrally connected nodes (i.e. super-nodes) are targeted to take on the work of forming and maintaining the network, while conversely, weakly connected nodes (i.e. leaf-nodes) are shielded from the overhead of network coordination.

Figure 2: Taxonomy of Network Positions



Super nodes ($n=7$): We classified firms as super-nodes if they had at least three times more incoming ties relative to outgoing ties to indicate the significance of their contribution to peers in the network. Super-nodes tended to be amongst the larger and more experienced firms in the network (Klerkx and Aarts, 2013). Such firms had few outgoing, advice seeking ties to peers in the network, indicating a preference to seek information and advice outside the CoP. Super-node firms act as anchors in the network facilitating the development and durability of the network (McAdam et al., 2015; McKitterick et al., 2016), as indicated by their central position and high proportion of network contacts. Super-nodes are likely to highly influential in terms of network reach and in facilitating the spread of information, ideas and attitudes within the network. However, there is a risk that super-nodes may become overburdened and create bottlenecks in the flow of information in the network (Cross and Prusak, 2002).

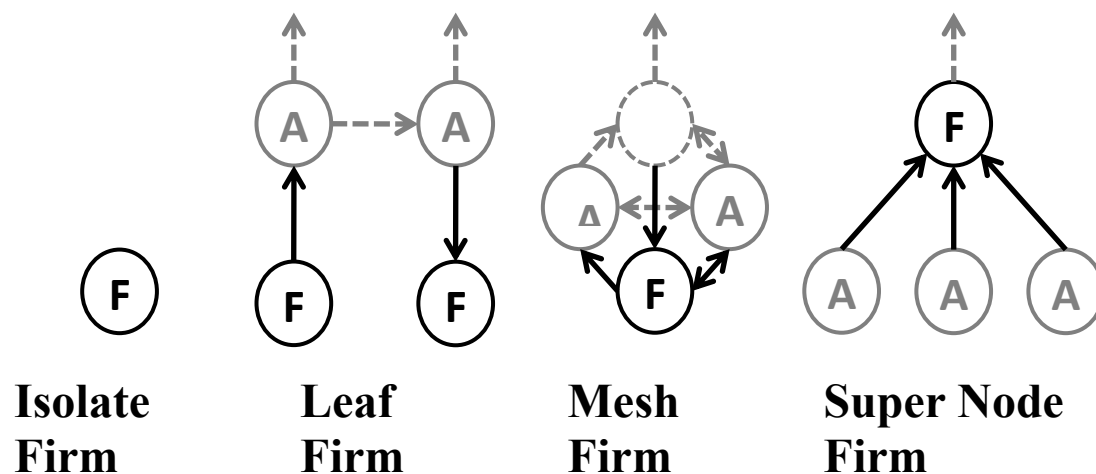
Mesh nodes ($n=20$): These firms were classified as occupying *mesh* positions in the network, the largest positional group. Such firms have approximately equal numbers of incoming relative to outgoing ties (Gluckler and Doreian, 2016). Such firms act as conduits for the flow of information and are the ‘mesh’ that holds the network together and are key links in circulating information gained from one part of the network to another (Provan and Kenis, 2007). Mesh node firms have on average 16 years of experience and 3 employees in comparison to firms occupying a super node position, which tend to be larger with an average of 26 years of experience and 8 employees. When questioned about the nature of their network ties, owner-managers explained that their networking activities focused primarily on accessing and collecting market information, particularly on customers, distribution and marketing trends (McAdam et al., 2014).

Leaf nodes ($n=17$): These firms occupied *leaf* positions in the network with a single network tie, usually to well-connected mesh or super-node firm. Such firms are located on the periphery

of the network with limited connection to peers (Wenger, 1981; 1986). In fact, it emerged that leaf firms varied significantly in terms of years of experience. While some firms are likely to be new entrants who wish to integrate more fully in the network over time, others may choose to remain largely disconnected from peers for personal reasons or due to the circumstances of the firm. It could be argued that such peripheral firms should be better integrated into the network in order to access and preserve their expertise for the benefit of the sector as a whole (Murdoch, 2000). However, understanding firms' motivation for peripherality is critical to any intervention to engage peripheral firms and integrate them into the network (Cross and Prusak 2002).

Isolates (n=7): Every network has its outsiders, firms who are members but choose not to develop or maintain active networking ties (Cross and Prusak, 2002; Brass et al., 1995). This study identified seven *isolate* firms with no active incoming or outgoing networking ties to peers in the sector. While some firms may choose to disconnect from the network for largely neutral reasons such as firm circumstances or personal preference, for others isolation may be a response to past negative experiences (Zaheer et al., 2010). Understanding the factors that lead to firms becoming isolates in the network is highly beneficial in limiting the proportion of firms who choose to withdraw from the network and in ensuring that resources to promote networking are not wasted on firms who are neither willing nor able to network with peers.

Figure 3: Sociogram of advice relationships in the Irish Agri-Farmhouse Cheese Sector



5.2 Owner-managers Identities of Participation

In line with Smith et al. (2014: 4) we view social network analysis as analogous to 'aerial photographs of a crowd', which require 'on the ground' interviews to provide necessary meaning and context. While analysis of network positions allows us to map the density and nature of network interactions, they do not provide an understanding of the decisions made by owner-managers that lead to these positions. In order to address this, we now provide evidence from the second stage of the data collection process, illustrated with fragments of the narrative, with more comprehensive excerpts outlined in Table 5. In analyzing the interview data, we noticed clear patterns emerging in owner-managers' perceptions of horizontal peer networking. In order to better delineate such different perspectives, we drew on Wenger's (1998) concept of heterogeneous participation identities that arise due to differences in owner-managers

interpretations, actions, choices and valued experiences of networking. In so doing, we address Handley et al.'s (2006) call for a greater focus on *why* small firms differ in their network participation. Accordingly, our analysis revealed five categories of participation identity: leader, full participant, novice, peripheral and marginal, summarized in Table 3. We now outline each identity category in turn and show how this identity classification relates to agri-food SME owner-managers' perceptions of their horizontal peer-to-peer network within their CoP.

Table 3: Categorization of Participant Identities and Supporting Evidence

Identity	Source	Quotation
<i>Leader: emphasis on developing peer firms and enhancing quality and reputation of sector (n=8)</i>	<i>Ulysses Cheese</i>	<i>"I spent all day at the Moorepark with Sarah and the chairman of CAIS developing a workbook for HAACP for farmhouse cheese makers in Ireland, to make it easier for new beginners and small producers...."</i>
	<i>Portia Cheese</i>	<i>"We helped set up the cheese makers association, CAIS, and worked with UCC on these courses because I was beginning to feel a bit overwhelmed".</i>
	<i>Tamora Cheese</i>	<i>"I think good relationships between cheese makers is vital. The better the relationship the better it will work. We just need to be helping one another".</i>
<i>Full Participant: emphasis on cooperating with peers, managing risk and providing advice to peers (n=19)</i>	<i>Helena Cheesee</i>	<i>"We were afraid of each other. I was afraid that I'd tell you something that would help you. Open now, we work with each other now because we can help each other, especially in marketing and all that".</i>
	<i>Titius Cheese</i>	<i>"No. I think the market is big enough for everyone. So it only makes us all better, really. Everyone gets problems with lysteria or whatever at some point. So rather than panicking, it's better if everyone discusses".</i>
	<i>Lance Cheese</i>	<i>"Yeah I would. I'd be very close with Ophelia and Emilia. We've helped each other out in the past".</i>
<i>Novice: emphasis on learning from peers to develop own limited knowledge (n=9)</i>	<i>Ariel Cheese</i>	<i>"The established ones, they all started on their own too. They were people who just started in their kitchens, even though they've got big."</i>
	<i>Viola Cheese</i>	<i>"I'd ask anybody I thought would help or who I thought would know anything about it. I suppose more from people with experience - that have actually dealt with it".</i>
	<i>Cleopatra Cheese</i>	<i>They have been a long time in the business and they know what they are talking about whereas we were learning and ah you know if you're a long time in the business you have a history there too back up your product, to back up your own self-esteem and your confidence</i>
<i>Peripheral: emphasis on the competitive risks as necessarily limiting networking behaviour. (n=10)</i>	<i>Othello Cheese</i>	<i>"You know when somebody else is looking for a slice of your action, you're not really going to give too many secrets away or...I think it's kind of natural way to have the things".</i>
	<i>Tybalt Cheese</i>	<i>"If it was an assembly line for someone producing goat's cheese and you were to help them, well you're not going to help them, because setting up against your own business would affect the market because it's such a small market for goat cheese."</i>
	<i>Myranda Cheese</i>	<i>"It's much easier to talk to other cheese producers who are involved in different segments of the market but as regards a person involved in your segment no absolutely not."</i>
<i>Marginal: limited benefits of networking due to firm characteristics and personal preference for isolation. (n=5)</i>	<i>Rosalind Cheese</i>	<i>"It's the financial thing. I mean it's just not worth it to me. It's such a small amount of cheese".</i>
	<i>Titatania Cheese</i>	<i>"I'm a little bit out of the loop, in a way from my own choosing. I just prefer to do my own thing. It's an awful lot of talk".</i>
	<i>Romeo Cheese</i>	<i>"I have found that... and this sounds maybe very arrogant...but they spend a lot more time drinking and chatting than doing something that would actually help me."</i>

Leader Identity (n=8): Leader identity was identified by a focus on positive experiences of

helping peers in the network, a belief that providing advice to peers facilitates the development of the sector as a whole and an expectation that networking will not lead to negative consequences for the firm. Leader firms' relationship with peers is likely to be multiplex involving product distribution, other business linkages such as cooperative lobbying for regulatory changes (Batterink et al., 2010). Multiplex relationships engender close coupling and joint commitment strengthening the relationship between leader firms and others in the network. Leaders are passionate and committed to building the reputation of the sector and in a number of instances sought to proactively shape institutional aspects of the sector (Klerkx and Aarts, 2013). For instance, within this research, leader firms were responsible for establishing the two sector specific associations, CAIS and IRCMC and coordinating lobbying on agri-food regulations. Leaders had significant power in the network and sought to exert influence over what was learnt and what was accredited as legitimate knowledge. This can be clearly seen in efforts by Emilia Cheese to establish a formal apprenticeship system, *"I've been trying to convince people [to set up an apprenticeship system] ... the whole system of having a guild where there is a very high standard established for excellence, that's what we need in this country"*. What was striking about leader firms was that their motivation to participate in the network, and exert their influence, was based on the indirect benefits of enhancing the status and reputation of the sector and as a result they were prepared to go to considerable lengths to advance this objective. As Tamora Cheese explains, *"big cheese makers, whatever you perceive big to be, are dependent sometimes on the smaller cheese maker as the smaller cheese maker is dependent on the big cheese maker good relationships between cheese makers is vital. The better the relationship the better it will work. We just need to be helping one another"*.

Full-Participant Identity (n=19): Full participants valued sharing sector specific market and customer information with peers in the network (Batterink et al., 2010). This was based on the belief that networking can be used as inspiration for new business ideas and that the risks of networking could be managed by limiting the sharing of sensitive information to highly trusted peers (Brown and Duguid 1991; 2001). Cooperation was primarily informal and ad-hoc, sharing of information on markets, customers and distributors. The informal nature of cooperation is underlined by Casca Cheese, *"Shows, promoting a product, advertising, advertising PR... Then the other aspect would be the social part of it. I think it is as much about putting people together and talking as it is about the actual cheese it"*. Owner-managers in this group were aware that networking may pose a risk in terms of unintended information leakage but believed that by sharing information on common issues and threats the benefits of cooperation outweighed the risks. Full-participants are primarily focused on developing their own practice, particularly in terms of accessing market information and addressing common problems. However, full participant's focus on enhancing their own practice may unintentionally exclude others. For instance, as Petruccio Cheese remarked *"There's a core group you've probably discovered. I attended two meetings. It was like this is a waste of my time, I need to be making the product not sitting here, watching people talk quietly with others and not share information with you."*

Novice Identity (n= 9): A novice identity was defined by a focus on the positive benefits of learning from peers in the network. In other words, a belief that established firms who are pioneers in the sector are important sources of advice and support and an expectation that networking will provide benefits either now or in the future (Murdoch, 2000). The majority of novice owner-managers chose to join CAIS or IRCMC, even when owner-managers were not certain of the specific benefits of supporting organisations, they felt that being a member would help form relationships with peers and support learning. For novices, developing relationship

with leaders and full-participants in the CoP networking was a fundamental component of learning. As Macbeth Cheese remarked, *“I would probably be one of the least experienced cheese makers in Ireland at the moment. All you have to do is listen and you’re going to learn something.”* Although owner-managers in this group were very aware of their own limited influence, they could and did exert power indirectly through their relationships with leaders in the network. In particular, such influence was important in terms of accessing support in coping with the stringent regulatory framework. As Beatrice Cheese explains, *“She’s experienced with dealing with the bureaucracy. That would be normally the areas that I’d be in contact with her.”*

Peripheral (n=10): Owner-managers with a peripheral identity were aware of the benefits of networking but resisted greater integration into the CoP due to high perceived risks of unintended knowledge leakage and increased competition. This view is underlined by Hamlet Cheese, *“Maybe we should be talking I don’t know it’s very hard that’s the trouble you have fought very hard to get in there and get in there and you want to hang onto that you know”*. Consequently, peripheral firms have low power and influence and limit their potentially beneficial knowledge and information. Peripheral firms choose to largely withdraw or severely limit their network interactions to a small number of trusted peers, who are not direct competitors, producing a very different type of cheese or serving a different market. This finding is in line with Curran and Blackburn (1994) who argue that small firm owner-managers display a fortress mentality and are largely unwilling to share information with firms who may be considered to be potential competitors.

Marginal (n=5): Marginal owner-managers view networking as having few potential benefits due to the characteristics of the firm, such as being especially small or rural and not wishing to grow and expand production (Traegear, 2005). In addition, owner-managers also referred to a personal preference for isolation and to limit interaction with others. As Rosalind Cheese explains, *“It’s a small business...So you’re making cheese and you’re packing cheese and you’re answering the phone and you’re selling cheese. You can’t do it all”*. The choice of marginal firms to largely withdraw from the network is based on a belief that the direct benefits are limited. However, as a result of their weak connection to CoP members they also severely limit their ability to influence the development of policies and practices within the community. Although, marginal and peripheral owner-managers were not members of CAIS or IRCMC industry organized representative groups, supporting organizations such as Teagasc, the food and agricultural authority, were key sources of advice. By comparison firms with a participant identity (novice, full-participant, leader) placed a higher value in seeking advice from others within the CoP or expert international sources. It may be the case that non-participant firms place a higher value on formal support as there was no implied dependency or reciprocity but rather a direct exchange of information. This is the view taken by Yorrick Cheese, *“Oh (Teagasc) they more than helpful anytime we ever asked for help we mostly got it. When we set up first they brought us down to Fermoy and they showed us around and (unclear) because we knew nothing about cheese making, absolutely nothing you know”*.

In order to address our research question, analysis of firm network position (isolate, leaf, mesh and super-node) and owner-manager participation identities (leader, full participant identity, novice, peripheral and marginal) are now combined to develop a typology of five distinct network roles (promoter, practitioner, apprentice, free-rider, outsider). Accordingly, the five distinct network roles which classify variation in small firm horizontal peer networking are now presented as a typology in Table 6 and are subsequently discussed in turn.

5.3 Roles performed by CoP Members

First, *promoters* were those firms occupying super-node positions in the network and are led by an owner-manager with a leader identity. Identification of promoters in the network demonstrates how established firms with significant reputation and status in the network can orchestrate and coordinate networking activities in the absence of a formal network administrator. We found significant evidence of promoter firms facilitating the germination of new practices and the flow of information and ideas within the sector working collaboratively with supporting organisations to establish formal networks such as CAIS and IRCMC and training and support initiatives. Our study demonstrates that firms who perform the role of promoters actively seek to influence what knowledge is created and deemed legitimate, for instance by promoting an apprenticeship based model of learning which promotes artisan and craft based knowledge (James, 2007) and are motivated by a desire to increase the status and reputation of the sector.

The second role category that emerged was *practitioners*, firms that occupied mesh positions in the network and are led by owner-managers who view networking as a tool for firm development. These firms participated in networking in order to access market information. This finding contrast with Brunetto and Farr-Wharton (2007) who argues that small firms primarily join networks to access opportunities for learning, with such learning occurring at a largely formal level, with little evidence of small firm owner-manager learning from peer firms. Practitioner firms have significant influence in the network as they are centrally connected however their focus is on developing their own practice rather than changing the institutional framework in which they operate.

The third role category, *apprentice* firms focus on networking as a means of developing mentoring relationships with established firms in the sector. These firms occupied peripheral leaf positions in the network with a novice identity and are eager to learn from peers hence they prefer to develop advice seeking ties with established firms. Prior work on roles at the intra-organisational level by Cross and Prusak (2002) has tended to view individuals on the periphery of a network choosing non-participation. However, our findings suggest apprentice firms are on a trajectory of increasing participation in the network. Building on the work of Shaw (2006) and O'Donnell (2014) our analysis provides greater clarity into why small firms participate in horizontal peer networks, demonstrating that direct learning is likely only to be important to new entrants. In this case it is artisan knowledge, which is often difficult to transfer or 'sticky' thus requiring close and frequent interaction (Szulanski 2003; Eriksson and Bull 2017). Apprentice firms have low power within the CoP however this is likely to increase in line with their tenure in the CoP.

The fourth role category, *free rider* firms, occupied the same positions as apprentice firms but were unlikely to contribute to the network due to their lack of trust and the risks of increase competition and unintended information leakage (Boegenreider and Nooteboom, 2004). Free rider firms are willing to seek information but only from a select group of firms who are viewed as being of low competitive risk and operating in different market niches (Edwards et al., 2006). However, inability to trust others can be a severe limitation for firms, significantly constraining their power and influence in the network. Firms who take a limited view of the market may become locked out of the information flow and miss out on valuable opportunities for cooperation. To use Curran and Blackburn's (1994) terminology such firms risk developing a fortress mentality.

The final role category *outsiders*, firms with no or few active ties to peers in the network and

is underpinned by a belief that networking with peers is of limited benefit due to the characteristics of the firm and preference for self-reliance. Outsider firms tend to have a significant tenure in the industry and may have been active in networking previously but believe that networking is no longer necessary or beneficial. Our identification of outsider firms supports O'Donnell's (2014) contention that small firm networking is based on an intuitive cost-benefit model.

Table 4: Typology of Network Roles based on Firm Position and Participation Identity

Role within the CoP	Firm Position	Participation Identity
<i>The Promoter:</i> values networking as a means to support peers and enhance the capabilities of all firms in the network. Firms leader identity is validated by a high number of incoming advice seeking ties but few outgoing connections. (n=8)	Super Node: core node with large number of incoming ties, few internal but many external ties n=7 (super node) n=1 (mesh)	Leader: views networking as (a) a means to develop peer firms and enhance the quality and reputation of the sector, (b) valued positive experiences of providing advice and support to peers and (c) did not directly benefit from networking. n=8
<i>The Practitioner:</i> values networking as a platform for cooperation with peers. This full participant identity is supported by a central position as advice trader with a similar number of incoming and outgoing ties. (n=19)	Mesh: core node with similar number of incoming and outgoing ties. n=19	Full-Participant: views networking as (a) platform for cooperation rather than learning, (b) of manageable risk and (c) emphasised the importance of sharing information with peers. n=19
<i>The Apprentice:</i> values networking as means to learn from experienced peers. Currently occupies peripheral positions in the network but likely to become more central as experience increase. (n=9)	Leaf: peripheral node 1 or 2 network ties. n=9	Novice: views networking as (a) a means to learn from experienced peers and (b) emphasised own limited knowledge. n=9
<i>The Free Rider:</i> views networking as somewhat beneficial but high risk. Networking limited to a small number of firms serving different markets or indirect contacts leading to a peripheral position in the network. (n=10)	Leaf: peripheral node with single tie (outgoing) n=8 (leaf) n=2 (isolate)	Peripheral: views networking as (a) risking increased competition and unintended information leakage and (b) a saturated market. n=10
<i>The Outsider:</i> does not actively participate in the peer network based on a belief that networking is either of limited benefit (n=5)	Isolate: peripheral node with either no ties or single tie to the network (incoming) N=5	Marginal: views networking as (a) having uncertain benefits and due to firm characteristics e.g. especially small or rural and / or (b) strong personal preference for isolation n=5

5.4 CoP and Unequal Power Distribution

The role typology developed supports Harrison et al.'s (2002) assertion that CoP members have different views and motives for participating and make diverse contributions to the community. Specifically, the role typology outlined shows a distinct hierarchy in terms of the distribution of power in the community based on member's contributions and influence. At the top level of this hierarchy are sector promoters, who actively seek to shape what knowledge is deemed legitimate and who has access to that knowledge. Next are practitioners, while promoters are driven by strong ideals regarding the development of the CoP, practitioners are more pragmatic, with their participation is largely instrumental, focusing on the development of their own practice. Apprentice firms occupy the next level, with their participation motivated by a desire to enhance their production and selling abilities and to help with the negotiation of challenging and complex regulatory frameworks. While such firms' overall level of participation is low as demonstrated by their few network ties, when identity is considered we can see they are on a trajectory of increasing participation in the network. Although the ability of apprentice firms is limited, they are in a position to influence the functioning of the CoP through their engagement with experienced practitioner and promoter firms. Free rider firms occupy similar positions to apprentice firms but their stance towards participation - fear of the risks of networking - means that they are on a trajectory of increasing peripherality in the network. Outsiders are even more disconnected from the network with no or few ties to network members; their position is motivated not by fear but by a belief that networking has few benefits. Free rider and outsider firms have the weakest power in the CoP. While their decision to remain largely disconnected from peers is based on choice they may nevertheless be locked out of the flow of sector specific information and lack the ability to influence institutional change, for instance in terms of regulatory frameworks or governmental assistance. Our findings directly challenge Brown and Duguid's (1991) assertion that CoPs have little hierarchy and in fact show that a consideration of status, power and influence is critical to understand who reaps what benefits from participation and why some members choose to resist greater integration into the community. In so doing, we contribute to Contu and Wilmott's (2003) call for systematic analysis of the unequal distribution of power within CoPs.

As a consequence of our discussion of the antecedents of networking and how this influences owner-manager identity, the process of networking and the emergence of distinct network role, our initial conceptual model (Figure 1) has been refined (Figure 2). This refinement provides a more nuanced understanding of the participation identifies relevant for the Agri-Food sector and how these classifications inform and are also dependent on the role and networks occupied by members of this CoP.

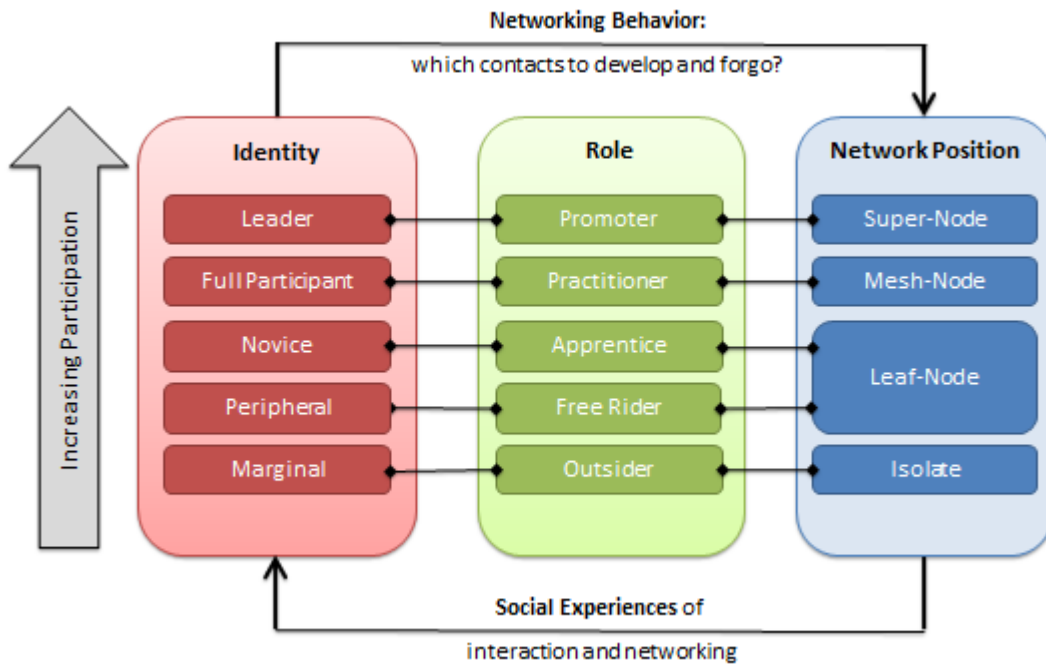


Figure 4: Refined Conceptual Model Classifying Networking Roles within Irish Agri-Farmhouse Cheese Community of Practice.

6.0 Conclusion

This paper aimed to examine the participation identities and networking roles in a CoP where members participate in horizontal peer networking in order to enable and facilitate knowledge creation amongst its members. Within this paper we make the following contributions. First, we respond to calls by Edwards and Sengupta's (2010) for research into the variation in small firm networking within a single industry sector. Accordingly, we contribute to understanding of CoPs as a network enabler at the national level (McKetterick et al., 2016). Second, building on this, we respond to calls from Handley et al. (2006) for a more nuanced understanding of the participation identities negotiated within this CoP. In terms of participation identities, we highlight the critical role played by owner-managers with a leader identity, who are distinguished from full-participants by their commitment to shaping what knowledge and practice is viewed as legitimate, in contrast to practitioners who are motivated to participate in order to enhance their own practice. In relation to non-participant identities, we provide greater understanding of peripheral and marginal identities in regard to relations of power within social structures, as a CoP cannot be disconnected from the 'social organisation of and control over resources' (Lave and Wenger, 1991:37). A focus on non-participation identities highlights that identities of participation may exist which may not lead to an idealized full-participant identity, acknowledging that not all firms are able or willing to become leaders in the CoP (Klerkx and Aarts, 2013). Thus, we remove some of the ambiguity associated with the distinction between different identities of participation and non-participation (Handley et al., 2016) and in so doing enhance their legitimacy and relevance as analytical tools (Lave and Wenger, 1991). In so doing, we respond to O'Donnell's (2014) call to pay greater attention to the normative dimension of networking, the meanings and expectations that individuals attach to their networking behaviour.

Third, we provide a deeper understanding as how these different identities relate to firm network position in order to develop a novel typology of five distinct roles performed by firms within a CoP. Consequently, we argue that although a CoP may have a shared identity(ies), its members should be not considered as a homogenous group (Harrison et al., 2002; Wenger, 2002) but rather the sources of variation and heterogeneity should be highlighted and explored. Fourth, we examine how the roles identified reflect unequal power distribution in the network and participants' motivation for resisting greater integration into the network. In so doing, we address concerns by Contu and Willmott (2003) relating to lack of exploration of power relations in CoP extant research by providing empirical evidence of the effect of unequal power relations amongst its members. In particular, we focus attention on how firms exert power and influence in the CoP in accordance with the role they perform. Indeed, our examination of power in the CoP is fundamental to understanding what knowledge is deemed appropriate and why and to examine participant's motivations for increasing or resisting integration within the CoP.

Finally, from a practitioners' perspective, this role typology provides a flexible framework that can be used to diagnose the informal governance system, address training and development gaps and provide a platform for joint problem solving and shared coordination with supporting organisations and government agencies. By examining the different roles performed within the CoP and the distribution of power in relation to the roles it is possible to examine what helps and hinders fuller participation, and movement of firms from weakly to centrally connected. Mtika and Kistler (2017) argue that rural community development efforts need to move away from simple provision of services and instead focus on self-empowerment of local stakeholders. The role framework developed therefore can be used by practitioners to understand power distribution in the community, develop leadership and capacity building, promote broad involvement and increase tolerance and equality among members (Mtika and Kistler, 2017). Furthermore, we echo Edwards and Sengupta's (2010) call for supporting organisations to intensively engage in deep dialogue and discussion with agri-firm SMEs at all different role levels to establish their specific needs and how these can be addressed by drawing on their peer to peer horizontal relationships within their CoP. Indeed, this CoP was shown to have significant latent resources called upon in times of need and crisis but under-utilized by firms on the periphery whose participation was limited by their lack of experience, competitive fears or failure to identify synergies with peer firms.

6.1 Future Research

Our discussion suggests a number of possibilities in terms of future work to address some of the limitations of this study. First, all participants were members of a single industry, which may raise concerns in relation to the generalisability of the role typology. Accordingly, future research should focus on validating and enhancing the role typology through its application in different contexts and industrial sectors. In addition, a longitudinal focus involving the collection of data at different points in time would enable the capturing in real time of the emergence, development/ change, in the ability of firms to assume different roles over time. Finally, we recognise that the owner-managers included in this research come from different backgrounds and markers of difference, such as gender, race/ethnicity or education are likely to intersect with their participation identities and influence firm networking behaviour. Indeed, one of the strengths of the farmhouse cheese sector is its diversity. Therefore, future research could draw on the framework offered by intersectionality, in order to explore how different markers of difference interact to influence participation and power dynamics within a CoP and the conflict that arises when individuals belong to multiple CoPs. (Hooks, 1981; Crenshaw, 1997). In addition, future work should also examine conflict that arises when individuals

belong to multiple CoPs. Notwithstanding these limitations, we believe that this paper demonstrates the usefulness of the Community of Practice concept as a flexible construct to understand firm networking in diverse industry settings, even when there is not a clear resource demand and with a different industry ownership structure.

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Appendix

Table A1: Validity and Reliability in Social Network Analysis

Tests	Explanation	Phase of Research	Application in Study
Construct Validity	Identifying correct operational measures for the concepts being studied.	Research Design	Advice seeking chosen to measure inter-organisational information flow within the network (Cross and Prusak, 2003)
Internal Validity	Seeking to establish a causal relationship whereby certain conditions are believed to lead to other conditions as distinguished from spurious relationships.	Data Analysis	Whole population study to guard against spurious relationships. UCINET software package to analyse findings using mathematical techniques.
External Validity	Defining the domain to which the study's findings can be generalised.	Data Collection	Boundary specification – limiting study to all farmhouse cheese makers in Republic of Ireland.
Reliability	Demonstrating that the operations of a study – such as data collection procedures – can be repeated with the same results.	Data Collection	Objective, low-inference measure of advice seeking used.

Table A2: Validity and Reliability in Qualitative Research

Tests	Tactic	Phase	Application in Study
Construct Validity	Multiple Sources of Evidence	Data Collection	Interviews with 51 participants. Extensive search of published literature relating to the industry and firms.

	Establish a chain of evidence	Data Collection	Written field notes and transcription of taped interview, over 1000 pages of text.
Internal Validity	Do pattern matching	Data Analysis	Owner-manager statements about networking behaviour grouped into theoretical categories leading to development of five identities of participation.
	Do explanation building	Data Analysis	The participation identity categories were compared with firm position in the network to understand the role performed by the firm in terms of both contribution to the network and the meanings and expectations that underlie that contribution.
	Address rival explanations	Data Analysis	Data analysis was guided by a focus on statements that explained owner-manager participation in peer networks. Rival explanations were explicitly sought in order to identify differences in meanings and expectation of peer networking.
External Validity	Use theory to frame analysis	Data Analysis	CoP literature, with a focus on identities of participation and non-participation informed the identification of major themes and data analysis.
Reliability	Use case study protocol	Data Collection	Semi-structured interview schedule tested prior to data collection with four firms who provided critical feedback.
	Develop case study database	Data Collection	Transcribed interviews resulted in 1000+ pages of text which were stored online. Transparent presentation of research design, instrument and analysis to allow for audit/replicability.