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Innovators intent: role of IT in facilitating innovative knowledge practices in social enterprises

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INNOVATORS INTENT: ROLE OF IT IN FACILITATING INNOVATIVE KNOWLEDGE PRACTICES IN SOCIAL ENTERPRISES

ABSTRACT

With this paper we want to explore further the innovators intent, where social enterprises use imaginative ways to take advantage of information technology to create, share and manage the knowledge pool of their small enterprise. We draw on several perspectives on how information processing needs are addressed, as well as the manner in which IT enables and facilitates sense-making. Studies exploring the role of IT in organisations abound, however our focus is not large organisations but small social enterprises (SEs) and how they use IT to further their business objectives. Hence there is still a lack of understanding on how IT can support the management of knowledge within the context of SEs dealing with different contextual settings influenced by: constant tensions between social and economic objectives, more focus on sustainability than competiveness, limited resources, and high levels of democratic participation. All these conditions manifest themselves in SEs, aiming to tackle social problems, improve communities, people's quality of life, and environment. To obtain a conceptual and empirical understanding of how IT can facilitate acquisition, conversion and application of knowledge in SEs, we conducted a qualitative study with 21 interviews to owners, senior members and founders of SEs in the UK, underpinned by findings from a quantitative survey with 432 responses. We found how IT was supporting informal practices of knowledge management in SEs, more the recovery and storage of necessary information in SEs, and less the collaborative work and communication among enterprise members. However, it was established that SEs were using different technologies, such as, cloud solutions and web 2.0 tools to manage informally their knowledge. The possible impediments for SEs to support themselves more on IT solutions can be linked mainly to economic

and human constraints. These findings elucidate new perspectives of how small and hybrid organisations are supporting their operations using IT and the crucial role of cloud and web 2.0 tools in facilitating informal knowledge management practices.

Keywords:

Social Enterprises, Information Technology, Small Firms, Knowledge sharing, knowledge management

INTRODUCTION

Social enterprises (SEs) are businesses that trade to tackle social problems improve communities, people's life chances, or the environment, as defined by the UK government. Their current impact in the UK is both social and economic with over 70,000 SEs contributing at least £24 million to the economy and employing almost a million people, with 31% working in the most defined communities in the UK (Villeneuve-Smith and Temple, 2015). Government and private organisations are looking at ways of enhancing the sector and maximising their social and economic impact. However, there is still a lack of understanding of how these organisations operate and innovate. Our paper looks to answer to this need by exploring and studying the role of IT in SEs, both in facilitating the management of knowledge and enabling and facilitating sense-making. Significant literature has explored the crucial role of IT in improving organisations (Weick, 1995; Gioia and Chittipeddi, 1991; Wolbers and Boersma, 2013; and Brown et al., 2015), however, these studies are focused mainly in large organisations where the abundant of recourses can facilitate the embracement of technology. We need to understand how the already identified practices and advantages of IT for larger organisations, can be translated in the context of SEs. We

need to know how these hybrid organisations, normally micro and small, with little financial and human resources, are using technology in innovative ways to manage their knowledge.

To answer this question, we conducted a qualitative study with 21 interview to owners and senior managers of SEs in the UK. The interviews were supported in findings from a quantitative survey questionnaire with 432 responses from senior members of SEs exploring knowledge management capabilities in SEs.

Our paper starts with a review of the state of art, including an epistemic perspective of SEs, and the role of IT in organisations. This is followed by a description of the methodology. Lastly, findings, discussions, conclusions and limitations are presented.

STATE OF THE ART: AN EPISTEMIC PERSPECTIVE ON SOCIAL ENTERPRISES AND INFORMATION TECHNOLOGY

To study the role of IT in SEs, it is important first to understand the main characteristic and particularities of these type of organisations, highlighting their challenges and main research gaps. Although there are still discussions about the definition of SEs (Robinson *et al.*, 2009; Castresana, 2013; Urban, 2015), they are normally small and medium size enterprises that behave entrepreneurially to engage in processes that create value, which can be economic and social, embedded within a socio-economic context (Chell, 2007). In other words, SEs are organisational with primarily social drivers that undertakes innovative business operations in order to be auto-sustainable and guarantees the creation, sustainment, distribution and/or dissemination of social or environmental value. Thus, economic drivers are means to a social end, not the end in itself. The SE ethos convey certain conditions that frame its organisational behaviour and challenge the

application of traditional business practices into its particular context. These conditions include a multi-bottom line, related to social, environmental and economic goals, their multi-stakeholder dimension, and a broader financial perspective to focus on sustainability (Bull & Crompton, 2006; Meadows & Pike, 2010; Paton, 2003; Somers, 2005). Moreover, SEs normally operate in dynamic and turbulent environments characterised by unstable resource means, complex government regulations and strong reliance on volunteer workforce (Shah, 2009; Teasdale, 2011).

These characteristics of SEs have resulted in two important challenges which make them different form their counterpart in the private, public and charity sectors. One challenge is associated with the way these organisations create value without the need to capture value (Santos, 2012). This dichotomy results in organisations focusing their efforts towards more sustainable solutions, rather than sustainable advantages. In other words, SEs do not normally focus on scaling up and long term visions, but in creating value and solving the social issue, which may result in finishing the SE. Moreover, SEs create value by empowering internally and externally others, such as communities, citizens, as opposed to a more traditional position of control (Santos, 2012). The second challenge, which is currently one of the main discussion in SE and social entrepreneurship literature, is they hybrid nature of SE's mission. By having an hybrid mission with both charity and business aspects combined in their core, SEs are forced to be accountable to achieve both financial and social objectives, which in the majority of cases are contradictory (Galaskiewicz and Barringer, 2012; Battilana and Lee, 2014; Besharov and Smith, 2014; Ebrahim *et al.*, 2014; Mair *et al.*, 2015). Hence, the values, identity, ethos, decision making and resources are influenced by the constant tension between social and economic missions (Battilana and Lee, 2014; Stevens *et al.*, 2015). This provides a distinctive context for studying how IT can facilitate innovative practices among SEs, as has been studied in larger organisations.

Understanding that IT comprises the hardware, software, middle-ware and protocols that allow for the encoding and electronic exchange of knowledge (Meso & Smith, 2000), it has been recognised how IT can effectively leverage the collective experience and knowledge of employees to support information processing needs, as well as enabling and facilitating sense-making activities of knowledge workers (Wickramasinghe, 2003). Thus, the strategic objective of IT is facilitating knowledge creation, embodiment, dissemination, integration, use and management inside and outside the organisation to enhance performance (Gold, Malhotra, & Segars, 2001; Leonard-Barton, 1995; Tanriverdi, 2005). This has been supported by empirical studies in large organisations which have found, for instance, how IT increases the speed, quality and efficiency of knowledge sharing (Albino et al., 2004; Coakes et al., 2010), facilitates knowledge integration by aggregating multiple sources (Nickerson and Zenger, 2004), enables knowledge preservation and retention (Teece, 1998); and lower temporal and spatial barriers between knowledge workers (Hendriks, 1999). However, researchers have also cautioned that systems can only handle information, thus, only human cognition can transform this information into knowledge (Powell & Dent-Micallef, 1997). Therefore, for an IT system to add value to the organisation it requires to incorporate the proprietary know-how about a specific task in the organisation's particular work environment (Leonard-Barton, 1995), match the cognitive characteristics of people in the organisation (Albino et al., 2004) and consider the enabling context in which the IT is deployed (Newell, 2015). This justifies the need to expand our understanding of the role of IT in managing knowledge from large resourceful organisations to the particular context of SEs.

Since the majority of research relating IT and KM has focus on large organisations, little is known about how IT is being used and exploited in the particular context of SEs (Bagnoli & Megali, 2009; Doherty et al., 2009; Paton, 2003). Although this does not infer the absence of technology in SEs,

the limited research in the subject suggest little interest, both from academics and practitioners, to study in more detail the influence of technology on SE or, as has been identified with other management theories, social entrepreneurs do not consider this issue part of their priorities to develop. Few studies exploring IT in SEs recognised that SEs are taking part in the IT phenomenon (Aruch, Loja, & Sanders, 2013; Bull, 2007; Mohan & Potnis, 2010; Paton, 2003; Richardson, Kettinger, Banks, & Quintana, 2014; Tobi, Amaratunga, & Noor, 2013). Thanks to the significant reduction in prices and improvement in quality, SEs are incorporating technology systems to handle, for example, supporters' and donors' records, staffing records and project records (Paton, 2003). All these implemented under certain constrains, such as, time limitations of busy managers; the instant access to information that organisations need in order to input data into IT systems, which can be difficult and time consuming; inexperienced field staff; and less resources available for training (Bull, 2007; Mohan & Potnis, 2010). These findings present an initial account of certain elements of IT in SEs, however, there is still a need for understanding how SEs are embracing IT, how IT is supporting the management of knowledge and how is this implemented under the particular organisational settings of SEs.

RESEARCH SETTING AND DESIGN

To support the empirical understanding of how IT is supporting the management of knowledge in SEs, our study followed a qualitative approach. This helps us illuminate complex concepts proposed in the literature, and possible relationships and explanations that are unlikely to be captured by predetermined response categories, or standardised quantitative measures (Venkatesh, Brown, & Bala, 2013). The qualitative study follows on from a quantitative survey exploring knowledge management practices in SEs with 431 founders and senior managers of SEs (Granados, 2015). The population of the quantitative study was SEs in the UK that were self-defined and were

members of at least one of the listed UK SE networks. Thus, we followed a convenience sampling approach, where participants were chosen from the respondents identified in the quantitative survey that were conveniently available and willing to participate further in the qualitative study. We conducted a total of 21 semi-structured interviews to owners and senior members of SEs, these are described in Table 1.

Insert Table 1 about here

Semi-structured interviews allowed us to obtain retrospective and real-time accounts of IT and KM practices from those experiencing within the SEs (Gioia et al., 2012). General questions about the working practices in their SEs related to IT and KM were asked. The interviews were set up face-to-face at a venue convenient to the participant or through online video system Skype for geographically disparate research participants. The interviews were recorded, transcribed and upload into NVivo for further analysis. The analysis was conducted following the Gioia et al. (2012) approach to qualitative analysis, classifying the data into first and second order categories to facilitate their later integration into a structured form. The data structured presented in Tables 2 and 3 provide a representation of how we progress from the interview data to themes.

The data structured in Table 2 presents the analysis of specific examples of IT support in SEs, identifying the main knowledge/information activities as aggregated dimensions, describing also the technology involved and its impact. The data structure in Table 3 identifies as aggregated dimensions the barriers and challenges for IT in supporting information and knowledge activities in SEs. Further discussion of the dimensions and their implications for our study are presented in the following section.

Insert Table 1 about here

Insert Table 2 about here

FINDINGS AND DISCUSSION

To understand the current IT support in managing knowledge in SEs, each indicator used in the quantitative survey, which related to the main dimensions presented in Table 1, is discussed in relation to the findings from the qualitative study and relevant literature.

IT supporting collaboration work among enterprise members of SEs

Respondents to the survey assessed this activity as the least commonly supported by IT in their SEs (Mean = 3.58). However, when discussing this element with participants in the interviews, more than half of them described having IT systems that facilitated, in some way, collaboration and knowledge sharing among employees. These systems were primarily online cloud solutions, such as Dropbox and Google Docs, and centralised shared servers.

Considering cloud solutions, it was identified that only micro enterprises, with less than 10 employees, were using them. These were used mainly to facilitate the access to information and share files and information with other members of the SE, who, in some cases, did not share an office space and worked remotely. Therefore, these solutions, combined with the use of email and Skype, which is a video internet-mediated system, were crucial for the operation of the SE and communication among its members.

One example of this is the SE of participant SE11, which is a community-focussed SE that uses the arts to transform and regenerate communities. This is obtained by developing educational and training programmes that offer arts practice using digital storytelling methodology in action. This allows communities to have a voice and be able to share their experiences. With only three

members, the SE employs a significant number of free-lance people, who provide different activities for the SE. These people need to be connected with the SE, but, because they are not formal members, they do not have access to the internal network. Thus, the Director decided to use Google applications, such as, *Google Docs* and *Google Calendar* to share information with them. These applications are free and can be accessed from any computer with Internet. This has improved not only the communication with free-lance, but also it allowed the three members of the SE to access information from outside their offices. As the Director explained:

> *'... if we are out doing project work, this is where the Google docs and Calendar becomes really handy because you just have to be part of a network. You are an extended information pool as well.'*
> *(SE11)*

This demonstrates how cloud solutions were definitely supporting members of the SEs to work collaboratively and sharing knowledge and information, concurring with similar findings in SMEs by Wee and Chua (2013).

In relation to centralised shared servers, both micro and small organisations were using them. The main purposes of these servers were centrally storing and securely backing-up organisational information, and allowing their retrieval. As some participants described, their shared servers were also an important way of communicating the organisational mission and vision. However, these servers did not always facilitate the interaction among members of the SE, resulting in a more one-way relationship. Enterprise managers communicated the organisational policies, rules and procedures by uploading the files on the share server. Members were storing and retrieving the information required for their work. Still, managers were not accessing, validating and commenting on operational information, nor members reviewing and evaluating the organisational information shared by managers, or other members. This can be illustrated in the SE of participant SE6. This

is a consultancy company with twelve employees that provides public engagement services to the public sector and housing associations. The SE helps organisations to engage with communities to explore complex challenges and create actions to improve wellbeing and the organisation's services. Recently, the SE introduced a *shared server* that permits all members to share the same files. The information is organised by headings that everybody shares, such as, policy and research. Although the CEO considers that the server is working, she accepts that people have still some issues on sharing information and knowledge through the server. As she explained it:

> *'People, I think, are still bit nervous to get poking in a folder that they are not really familiar with. I think people don't quite feel that everything there it is in common ownership. So, it's not perfect yet. There is probably quite a lot of duplication between different folders because people call things different things and store it in different places.' (SE6)*

This example demonstrates how issues of ownership and trust were involved in discouraging members of the SE to share their information and access other members' information. This finding corroborates empirical evidence on SMEs presented by Nunes *et al.* (2006). It is demonstrated that, even if centralised shared servers offer an opportunity to facilitate knowledge sharing among members, it is still required to integrate a collaborative and trustful culture in the equation.

IT supporting communication involving the enterprise

This activity was identified as the third most commonly provided by IT in the survey (Mean = 3.76). When conversing with participants in the interviews, they mentioned how IT solutions, such as, websites and 'Web 2.0' solutions, such as, Facebook, Twitter, LinkedIn and Blogs, were supporting their communication with customers, stakeholders and general public.

Regarding websites, these were described as one of the main ways of sharing information with the community and general public (SE21). In the case of SE3, the website permitted them to: collect

information about housing, support and care services; share information and tools efficiently with other professionals and agencies; supporting and encourage partnerships to improve housing advice for older people; and raise the profile of the SE amongst its peers. As was found in small firms (Gray, 2006), SEs are taking advantage of the Internet. It offers significant opportunities for improving communications and rapid access to relevant and timely information, therefore facilitating knowledge sharing and acquisition.

The second group of technology supporting communications in SEs was 'Web 2.0' solutions, such as, Facebook, Twitter and LinkedIn. These help SEs to make available information about advisory network meetings (SE8), product/services (SE19) and promoting the work of the SE (SE19 and SE21). The reasons for using this type of technology to communicate externally concurred with the reasons identified by Jackson (2010) in his empirical study to evaluate the impact of Web 2.0 in knowledge capture. Web 2.0 solutions are very cheap and simple to use, with low barriers to entry, accommodate many forms of media, the information can be updated and shared with immediate effect, and users can structure and describe it using 'tags'. Despite some SEs mentioning not using social media, overall, participants recognised the importance of incorporating social media in their communication strategies and expressed plans to implement this soon. That is why various participants described having social media training as a priority in their training base.

IT supporting retrieving and storing necessary information

These two activities were identified as the most commonly provided by IT in the survey (Retrieving Mean = 3.77, Storing Mean = 3.82). Participants in the interviews explained that, apart from supporting some collaboration activities, centralised shared servers, cloud solutions and databases

were also mechanisms employed to keep and secure the information of the organisation for further use in its operation.

Concerning centralised shared servers, as described before, participants explained that these servers were used to store all the information related to the operation of the SE, such as costumers, products and service information, procedures and policies. This information is backed-up regularly and, in some cases, these servers have online applications that allow a real-time, secured back-up of their information.

Cloud solutions were also used by SEs to store and retrieve information. As was discussed before, these applications were very common in micro SEs that normally do not have a designated office space. Members do not have available space to store physical information, relying more on virtual resources. Moreover, the information needs to be available to other members of the SE, not through a corporate network, but through the Internet. This allows members of the SE to work remotely without jeopardising the work and operation of the SE. Nonetheless, some participants mainly working on micro SEs (SE8, SE9 and SE14) described not using cloud solutions or shared servers to store information, but were using their laptops instead. This results in some risk for SEs, as SE9 expressed it:

> *'Well, everything, all that data, all that communication, all of that goes to my laptop, basically and my head, all of it. My laptop is, if I didn't have it, I think I would just be unable to function.' (SE9)*

Participants recognised this risk of losing the SE information, and also for the information to be used inappropriately by other people, and declared that their SEs were looking for more IT solutions, such as cloud to store their information.

Lastly, databases were the most common system described by participants to manage their knowledge and information. These databases ranged from normal Excel spread-sheets to more sophisticated software, some of them in-house-designed. Excel was used by seven participants from both micro and small enterprises to keep record of customers, finances, sales and stock. This system was easy to use by members of the SE to record, store and retrieve information.

Concerning the more sophisticated software, five participants described systems that support specific areas of the organisations, such as customer record management systems, sales systems and accounting software. These were all used by small and medium size enterprises and were inexpensive commercial software. The other type of system used by SEs was 'in-house' developed databases. These were more sophisticated and complex programmes that were designed, or are continually re-designed, by members of the SE based on their experience, requirements and necessities of their work. This was the case of SE3, SE10 and SE17, all small enterprises.

The use of these 'in-house' developed databases was beneficial to the SEs, who very proudly described their systems. These findings concurred with empirical studies in small firms (Lim & Klobas, 2000; Maguire, Koh, & Magrys, 2007). These studies argued that small firms prefer to design their own systems because it can suit their environments. Equally, the software offered in the market is normally too expensive and not appropriate to their characteristics and processes. However, there is a disadvantage in using these customised developments. In-house designs can result in incompatibilities with other systems of suppliers or distributors, risking the accurate and effective movement of information across the supply chain (SE17).

Another technology system used by SEs to acquire information and knowledge was SurveyMonkey, which is an Internet-based, survey data collection programme. This solution was used by two

micro-consultancy SEs, SE8 and SE14, to gather information about their clients and to receive feedback on their services/products. This corroborates the increasing use of Internet solutions by SEs to manage their knowledge and information.

In general, all participants were using some kind of technology to store, acquire and retrieve information in their SEs. Some were using more basic systems, like Excel, but were aware of the need of more sophisticated software, such as customer relationship management systems, that would improve their performance.

Generally, participants acknowledge the importance of, and the need for, technology in their enterprises, with some participants accepting that *'... whenever possible, if we can afford it, we would use the technology that is available to put in systems and processes to do that'* (SE2). This more technology-orientated attitude contrasted with the findings of Reilly (2009) in not-for-profit organisations. He found that this type of enterprise was reluctant to rely too heavily on technology for communications and knowledge sharing, mainly because they feel that technology disassociates them with the people with whom they are trying to engage. As was demonstrated by this research, SEs are looking at ways of improving their communication with stakeholders as well, which would result in increasing their social impact. But, different from not-for-profit organisations, they recognised that a good way of improving this communication is by using more technology, such as information systems and social media solutions.

Similarly, recognising that the SEs studied were all micro, small and medium enterprise, these findings can be compared with previous studies in private SMEs. Desouza and Awazu (2006) proposed that technology was never used as a means to manage knowledge because the use of technology in SMEs was limited to acts of automation and informative purposes. In the case of

SEs, although they were using technology to support some processes of storing and retrieving knowledge and information, there is still a lack of IT support to facilitate their ability to move throughout the enterprise.

The possible impediments for SEs to support themselves more on IT solutions can be linked to economic and human constraints. Some impediments expressed by participants concurred with previous studies in non-profit organisations (Hume & Hume, 2008) and SMEs (Lim & Klobas, 2000; Maguire et al., 2007; McAdam & Reid, 2001; Wolcott, Kamal, & Qureshi, 2008; Wong, 2005; Wong & Aspinwall, 2004). These included people related issues, such as, lack of time to take advantage of ICT; managers focus on core business and pay less attention to other issues; members with limited knowledge about computers and technology; and skills and trained staff shortage, and resources related issues, such as, SE cannot afford, or do not want to commit, to expensive consultancy services; and insufficient organisational processes.

CONCLUSIONS

As has been demonstrated in previews studies, IT plays an important role in the effective management of knowledge in organisations since it is through information and communication technology that knowledge travels. This study presented empirical evidence from SEs, which are organisations with particular organisational characteristics associated with their multiple missions, broader stakeholder perspectives and long term vision focus on sustainability. The participants recognised the crucial role of certain IT, such as, cloud computing, social media, and shared servers in allowing SEs to store, retrieve and share knowledge internally and externally. Even though not all participants were completely engaged with IT, they were aware of the importance of using more technology and were taking some actions towards that. This may suggest that supporting

governmental institutions or associations should support SEs in embracing technology. Moreover, SE and KM researchers should study further the characteristics and potential of IT in supporting these important organisations. A recommended framework for this is proposed by Banerjee (2015), who suggested the need for ICT in SEs to be malleable, scalable and co-evolvable. Thus, ICT can support SEs to share ideas, knowledge and spread innovations rapidly, while adapting themselves to the dynamic and challenging environment.

An important conclusion is that, as identified by Newell (2015), traditional IT solutions for KM are being supplemented by new types of IT, such as social software and cloud solutions, as demonstrated by SEs. This is particularly evident for small organisations that did not count with the resources to implement expensive and robust KM system and had to rely on more personal technology, which they were more familiar with. These expanded new opportunities for IT to support KM, perhaps not considered in previous larger organisations.

While it appears that the primary concepts of IT and KM can be transferred from large to small, multi-strategy organisations, the empirical data presented in this paper demonstrate that KM and IT practices are likely to differ substantially among different types of organisation. The understanding of these differences would enable academics and practitioners to design, implement, and manage effective strategies with less risk of disruption to the organisations themselves.

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Table 1 - Interview participants

Part.	Participant's information		SE's information	
	Gender	**Job title**	**Size of SE**	**Age of SE**
SE1	Female	Founder / Managing Director	Micro	8 years
SE2	Male	Director of Operations	Micro	16 years
SE3	Male	Senior Manager	Small	28 years
SE4	Male	Managing director	Micro	16 years
SE5	Male	Chief Executive Officer	Small	22 years
SE6	Female	Chief Executive Officer	Small	3 years
SE7	Male	Founder / Managing Director	Micro	3 years
SE8	Female	Founder / Managing Director	Micro	1 year
SE9	Male	Founder / Creative producer / Director	Micro	7 years
SE10	Male	Founder / Chief Executive	Small	11 years
SE11	Female	Managing director	Micro	6 years
SE12	Male	Managing director	Micro	4 years
SE13	Female	Chief Officer	Small	1 year
SE14	Male	Founder / Managing Director	Micro	1 year
SE15	Male	Chief Executive Officer	Small	26 years
SE16	Male	Executive Manager	Micro	13 years
SE17	Female	Finance Director	Small	37 years
SE18	Female	General Manager	Micro	1 - 2 years
SE19	Male	Founder / Managing Director	Micro	3 - 4 years
SE20	Female	Chief Executive	Micro	4 years
SE21	Female	Founder director	Micro	1 - 2 years

Table 2 – Data structure – IT support

First order	Technology used	Outcome	Activity	Main dimension
Accessing information using e-books, e-resources	E-resources	Save physical space	Access information	Retrieving and storing information
Scan customer satisfaction evaluations and store them for further improvement	Scanner / database	Further improvement	Capture and store information	
Small office space so decided to scan and seal documents to preserve paper copies	Scanner / database	Preserve paper copies of documents		
Use software to capture evaluation questionnaires from patients and produce a report for CQC	Software	Produce report for CQC based on evaluation surveys	Collect information	
Use SurveyMonkey to collect information from clients to use for lobbing	SurveyMonkey	Lobbing		
Use SurveyMonkey to evaluate impact with clients	SurveyMonkey	Evaluate impact		
Data collection system recording information of everyone using the SE services and the type of contact with the SE to support clients and measure social impact	Database	Measure social impact	Collect, store and retrieve information	
Use client records management system to collect information from telephone help-line, analyse it and produce research reports	Database (telephone help-line)	Produce and sell reports for research		
Data system with general information about policy available to everyone	Database	Policy information available to everyone	Store information	
Information about members store in laptops networked	Networked laptops	Know members		
Use central database to store information	Central database	Decision making		
Use database to store candidates information but lack security (back-up)	Database	Maintain information without secured back-up		
Use network to store scanned confidential information	Database	Store scanned confidential information		
Use cloud solutions and laptop to store information about clients, current projects, business plan (info that helps run the SE)	Cloud	Help to run the SE	Store and retrieve information	
Use database system (Access) to collect and present online information to clients in website	Database	Present information online for clients		
Use database system to document/record/manage/track orders	Database	Track orders		
Use database to store information and use it to grow business, as evidence of what SE do and to prove what they can do	Database	Evidence of SE work and impact		
Use Electronic Point Sale system to manage stock information and allocate stock	EPS system	Manage stock		
Use online database to manage patient information and process within the SE	Online database	Manage patient information		
Use share server to store and retrieve policies, procedures, board reports (things people may be interested to look at)	Shared database	Make policy information available for employees		

Use shared database to store and retrieve information about accounts, editorials and marketing, life cycle of production	Shared database	Operation (control life cycle of production)		
Use shared file online with policies available for employees	Online server	Make policy information available for employees		
System in place to allow employees to be assigned to a client and have access to that information only (for confidentiality issues)	Database	Relationship with client (maintain confidentiality)	Retrieve information	
Use cloud solutions to access information when working in projects outside	Cloud	Access to information anywhere		
Use online backup system	Online back-up system	Back-up	Protect information	
Use remote server to back up information from database	Remote server	Back-up		
Use central server to share information internally	Central server	Share information internally		Collaboration work among enterprise members
Use cloud solution to share information with colleagues (no office), use Skype	Cloud (Google docs, Skype)	Access to information anywhere		
Use cloud solutions to share information with people outside SE (free-lances)	Cloud	Share information with free-lances		
Use online calendars to share among employees	Online calendars	Support coordination	Share information	
Use online interactive platform (forum) for community to share information	Online interactive platform (forum)	Share information with community		
Use webinars to train staff and connect with people around the country	Webinars	Train staff and connect with people		
Use YouTube to share digital stories from clients with wider audiences	YouTube	Share with wider audiences		
Use social media to make minutes of meetings available to people	Social media	Make available minutes for meetings	Communication	Communication involving the enterprise
Use social media to update stuff and connect with people externally	Social media	Keep community/clients updated		
Use websites for marketing and present impact	Website	Marketing and present impact		

Table 3 - Data structured – IT barriers

First order	Second order	Main dimension
Acknowledge importance of IT but lack resources, financial based and are a skinny crew	Lack resources	Economic barriers for IT
Create database (policy hub) but people do not use it, they want only the answer	Lack of engagement	Human barriers for IT
Do not have time and 'was uncomfortable' updating blogs	Lack of time	
Employees finding challenging to use Internet and computers	Lack of trained employees	
Lack of time to update information in database	Lack of time	

Members not using internet for lack of knowledge/training	Lack of trained employees	
Information keep only in one laptop, difficult for other people to access it	Centralisation of information	Technical barriers for IT
Lack of integrating systems to gather, collect and process data	Lack of integrated system	
Member with slow internet connection	Internet restriction	
Need for a database to learn how to sell things better	Lack of integrated system	
Need for CRM system to avoid contacting same person about different things	Lack of CRM system	
Problems of incompatibility between databases	Incompatibilities between databases	
Intention to use the cloud in the future because do not have hardware capacity	Need cloud	Future needs
Need robust database to process data	Need robust database	
Need to explore cloud solutions to be mobile	Need cloud	