LOCAL GOVERNMENT INTERVENTIONS FOR FACILITATING SME IT INNOVATION

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Abstract

This research extends the body of knowledge on SME IT innovation by identifying practical, locally-delivered interventions to assist SMEs to innovate with IT. The research was conducted in two phases over a two and a half year period employing an action research methodology. The diagnostic phase, which has been reported on previously, explored IT adoption factors and provided recommendations to assist SMEs in this area. The local council subsequently delivered a series of workshops and mentoring programs. The therapeutic phase of the research, being reported on here, evaluates these initiatives and provides further recommendations for local interventions. A typology depicting the different phases of IT use by SMEs was developed. Recommendations for local council are presented for each of the phases in the typology. The findings from this study indicate that a tailored approach recognising industry-specific factors is required to facilitate SME IT innovation. The findings also suggest that there is significant scope for local government interventions assisting SMEs with basic IT use and using IT for improving efficiency. However, the area with the greatest potential for benefits through local level interventions is assisting SMEs with IT innovation in terms of developing new products or services and/or different business models.

Keywords: SME, IT innovation, intervention, local government.

1   INTRODUCTION

There is an abundance of research examining the factors influencing the adoption of technology by small and medium enterprises (SMEs). This is hardly surprising given the proportionally large numbers of SMEs in any nation's economy and the contribution they make to wealth and job creation, as well as the increasing importance of technology in driving business success. This paper builds on the existing body of knowledge by moving beyond an examination of factors influencing IT adoption to identifying practical, locally-delivered interventions that will assist SMEs to innovate with IT. The main purpose of this research is to develop a 'toolkit' of intervention strategies which can be appropriately deployed by local institutions to facilitate SME IT innovation within their communities.

The research for this paper was undertaken in the local government area of Salisbury in South Australia, drawing on the work the council undertakes with business owners to facilitate IT innovation. Background regarding the role of SMEs in the digital economy is presented with justification for the importance of local level interventions in facilitating SME IT innovation. Next, the context for this research is described to situate the research geographically, within particular industries and within the ongoing research related to council initiatives. The literature review draws on previous research to develop a typology characterising the nature of IT use and a framework for classifying the factors influencing IT usage. The methodology used in this phase of the research is outlined, followed by a discussion of the findings. Finally, recommendations for local interventions to facilitate SMEs as they move through the various stages in the typology of IT use are outlined.

2   BACKGROUND AND CONTEXT

In recent years there has been a re-emergence of interest in industrial policy and the interplay between local interventions and 'space neutral' approaches. In Australia the distinction between these paradigms is epitomised by the differing approaches of the Rudd-Gillard Government that favoured industrial intervention in specific locations and the Productivity Commission that advocates the use of broader economic policy settings for increasing the resilience of regions to structural change (see, for example, Productivity Commission 2014). Over the past two decades an increasing number of local and regional authorities have actively pursued local economic development initiatives. This focus has arisen because of the perceived failure of top down strategies to address market failures (Rodriguez-Pose & Palavicini-Corona 2013), social capital (Putnam 1993), evidence that formation of SMEs is strongly influenced by local networks (European Union 2010), the role of regional innovation systems (Todtling & Trippl 2005), regional differences in industrial specialisation (Breschi 2000), spatially bound knowledge spill-overs (Bottazzi & Peri 2003), the importance of agglomeration and clusters (Porter 2000) and responses to poverty alleviation (Barca 2009).

Within Australia, one or more of these factors has generally underpinned the rationale for regional development policies and program delivery which in many cases have been led by local government, groups of local government bodies and coalitions of industry and local governments. There appears to be a much richer history of local economic development interventions in Europe. EU Commission's Structural Funds have supported local initiatives such as Regional Innovation Strategies (Landabaso & Rosenfeld 2009) and within the UK, concepts of new regionalism and localism have become pervasive in economic development discourse (Bentley & Pugalis 2013). This emphasis on "place-based" policy is borne out by growing demand for decentralisation of powers from national to sub-national governments and recognition of the efficacy of locally appropriate interventions (Parkinson et al. 2014). Fernando et al. (2013) justify the appropriateness of local government interventions in the context of facilitating SME IT adoption.

Australia's economy is undergoing a period of profound structural change with archetypal manufacturing regions such as Salisbury, South Australia bearing the brunt of this. A challenge for policy makers is how to identify and develop the competitive basis on which future economic growth

can be nurtured. The roll out of Australia's high speed broadband network is seen as central to this because it "will give businesses the opportunity to increase productivity, save time and money and the ability to compete on a global scale" (National Broadband Network Co. 2014). However the availability of digital infrastructure, although necessary, is an insufficient condition for economic growth (Graham 1999; Hackler 2003; Kolko 2010). Tranos (2012) claims the reasons for this include the absorptive capacity of communities, which is influenced by factors like income inequality (Kaplan and Mossberger 2012), worker skill levels, knowledge and education (Gabe 2009; Mack & Faggian 2013). These findings are consistent with endogenous theories that emphasise human capital, innovation and technology as determinants of long run economic growth (Romer 1990).

The digital economy contributed $100.62 billion to the Australian economy in 2011, which in turn resulted in between 6.9% and 16.8% of GDP (Australian Computer Society 2013). The City of Salisbury's economy is the fourth largest local economy in South Australia with an estimated gross regional product of $4.62 billion (Blandy 2013). The confluence between the role of technology in supporting economic growth and the importance of local initiatives is recognised by the City of Salisbury because "in a knowledge based economy, prosperity is increasingly based on innovation, entrepreneurship, participation in the digital economy and management skills…Council will work with entrepreneurs and existing firms to promote innovation and support the development of business ideas." (City of Salisbury 2012, p. 21).

The Rudd-Gillard Governments provided $16.8 million in grant funding to establish and support the Digital Enterprise Program in 69 communities across Australia. The Digital Enterprise Program provides free group training and face-to-face mentoring for SMEs and not-for-profit organisations to help improve business practices and online service delivery. The City of Salisbury received two grants to deliver this program in Salisbury and Modbury. Since October 2012, the City of Salisbury, through its business support channel, the Polaris Centre, has delivered 92 workshops with 961 attendees and provided face-to-face mentoring to over 320 business owners. In the 2013-14 financial year the Polaris Centre provided business advisory and growth services to over 900 business owners.

This research focussed on three different industry sectors in the Salisbury area for several reasons. Manufacturing, because it is the area's largest employing sector (7,862 persons) and the greatest contributor to economic value added ($768 million); Retail, because it is a very low productivity sector ($53,269 value added contribution per person), but a significant and growing employer (4,471 persons); Property and Business Services, because as a sector it is an important driver in the knowledge economy, yet employment fell between the 2006 and 2011 censuses by 351 persons or 2.3%. The other rationale for selection is that the use of technology and globalisation are profoundly changing the operating environment for these sectors.

In manufacturing, the emergence of Australia as a high cost economy has occurred at the same time as a massive expansion of global manufacturing capacity in emerging nations. Australia has a larger presence in sectors classified as low and medium-low technology than its developed competitor nations (Prime Minister's Manufacturing Taskforce 2012). Technological innovations such as additive manufacturing, design-led production and nano-manufacturing are irrevocably changing the sector. Within Salisbury the announcement that the adjacent GM Holden plant will close in 2017 means there will be a significant flow on effect to suppliers located within the municipality, which will hasten their closure or force them to diversify or redesign their production processes.

In retail, on-line competition is decreasing the margins of local retailers, but providing opportunities for local retailers to expand their geographic markets. Cloud computing and mobile platforms allow savvy retailers to capture and analyse customer data, then make real time targeted offers. Digital convergence is eroding boundaries so consumers demand a consistent experience in every channel, whether in-store, mobile or on-line. Firms with a low level of technological knowledge will increasingly become uncompetitive or be forced to compete in a very niche or localised market. The challenges for local retailers presented by GM Holden's closure include a drop in consumer confidence leading to an increase in savings and the loss of up to 2,447 jobs within the City of

Salisbury with the ensuing flow on decrease in local demand (Barbaro et al. 2014). There is also limited capacity for significant residential growth, which will arrest the local demand-led growth that has supported retail growth over the previous two decades.

Small businesses in the Property and Business Service sectors have been transformed by technology including enhancing energy efficiency in buildings, using platforms to offshore routine business services, introducing bring your own device strategies, using private clouds for business continuity purposes and the utilisation of big data to support business decision making. Sassen (1981) highlights the tendency of advanced business services to agglomerate in major cities around the globe. In Australia there is already evidence of such agglomeration in Sydney and Melbourne with smaller capitals such as Adelaide being bypassed (Spiller 2009). Within the Greater Adelaide Metropolitan area, the central business district and inner-suburban areas have an above average proportion of advanced business service jobs while outer suburban areas such as Salisbury have an under-representation. This raises serious questions about the future trajectory of economies in suburban locations including the efficacy of technology to make geographic locations irrelevant.

This research was conducted in two phases and this publication reports on the second phase as described in the Methodology section. Phase I took place from February through June, 2012 and has been reported on previously (Fernando et al. 2013). Following an action research methodology (Baskerville 1996), the purpose of the first (diagnostic) was to conduct a collaborative analysis exploring factors influencing SME IT adoption in order to provide the City of Salisbury with recommendations for tailoring interventions targeted at facilitating SME IT adoption (Fernando et al. 2013). The factors were explored through an extensive literature review and 17 interviews with decision makers from SMEs across the industry sectors of manufacturing, retail trade, property development and business services.

Findings from the literature review in the first phase were synthesised to characterise the types of factors influencing SME IT adoption based on individual, organisational, industry and national readiness. The findings from the interviews highlighted the importance of an IT champion possessing sufficient vision and expertise to drive IT adoption. Other key factors facilitating IT adoption included an identified technology adoption process and employees with digital skills relevant to the business context. These findings led to recommendations for delivering digital workshops focusing on enhancing digital skills and raising awareness of the importance of these skills through grass-root marketing campaigns. Beyond enhancing digital skills, it was suggested that local government could play a consultancy role in defining and guiding the adoption process through mentor assistance programs. Increased opportunities for networking and access to external expertise when required were identified as key factors in creating a sustainable environment for the ongoing evaluation and adoption of IT. These factors were considered further during the second phase of the research alongside the theoretical typology developed through the literature review as described in the next section.

3   LITERATURE REVIEW

This section draws on Rogers' (2003) diffusion of innovation theory and activity theory (Engestrom 1987) in order to frame the research in terms of moving from IT adoption to innovation and classifying factors that influence this transformation. The authors argue that in order to understand IT innovation it is critical to consider the nature of IT use rather than simply when it is adopted, which has largely been the focus of previous research. A typology is developed for characterising the nature of IT use. Previous research into the factors affecting IT adoption and innovation is reviewed and concepts from activity theory are used to develop a framework for categorising the factors that influence IT adoption and innovation. Previous research into factors that impact IT innovation are then summarised according to the classification developed during Phase I. Finally, this section reviews the literature on interventions designed to facilitate SME IT innovation. In terms of identifying and addressing theoretical gaps, there are three aspects to consider. The typology presented in Figure 1 addresses a gap in the research for characterising the nature of IT use. The framework presented in

Figure 3 addresses a gap in the research for classifying the factors influencing IT adoption and use. Both the typology and the framework were used in this research to explore SME IT innovation and to evaluate the appropriateness of local government interventions. This research also identified a theoretical gap in the area of local government interventions for facilitating SME IT innovation and contributes some preliminary findings towards the longer term goal of developing a generalisable theory in this area.

Adoption vs. Innovation. Through its intensive engagement with business as part of the action research methodology during Phase I of the research, Polaris Centre staff have observed that the nature of IT use within businesses is changing and different 'levels' or 'phases' of IT use can be identified. The Australian Bureau of Statistics defines innovation as "the introduction of a new or significantly improved good or service; operational process; organisational/managerial process; or marketing method" (Australian Bureau of Statistics 2014, p. 24). Based on this definition and extensive interactions with clients, the Polaris Centre has developed the following four-point typology to characterise technology usage representative of the types of innovation used by SMEs, illustrated in Figure 1:

1. **Basic:** Basic use of technology and engagement in the digital economy, but minimal value added to the business;
2. **Efficiency:** Application of technology and engagement with the digital economy used to increase efficiency through process improvement;
3. **Innovation:** Technology and the digital economy used to support or drive innovation; and
4. **Transformational:** Technology and the digital economy used in a way that creates new business models or transforms business strategy
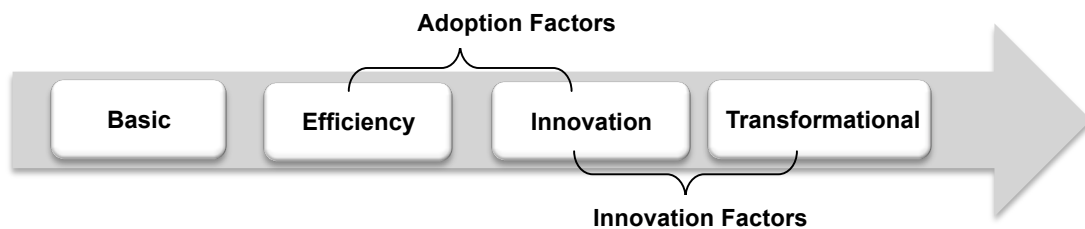

Figure 1.   Typology characterising the nature of IT use

This typology has some similarities to Rogers' (2003) diffusion of innovation classification. However, rather than focusing on when innovative practices or technology are adopted, this typology concentrates on the nature of IT use in terms of innovative practices. Rogers classifies early-adopters as being more innovative than laggards due to first-mover competitive advantage, whereas the typology presented here encourages further thought about the nature of IT use. This is an important shift in focus, given that existing or older technology can be used in an entirely novel way to transform processes or products and conversely, new technologies can be adopted for operational, day-to-day purposes that do not qualify as innovation. The authors argue that innovation in IT is not solely limited to traditional innovation (Tornatzky & Fleischer 1990), which centres on the processes through which new tools and devices are developed. Conceptual models on SME IT adoption presented in Molla (2006) and Thong (1999) focus on basic and efficiency types of activities and do not progress towards innovating or transforming the business. It is important to investigate ways in which IT can add value in terms of business goals and objectives. This shift in focus offers an ideal framework for understanding SMEs' motivation for IT use and developing appropriate interventions. This research study focuses on understanding the factors affecting IT innovation in SMEs and how governmental interventions can assist with this process.

Transforming from Adoption to Innovation. This research draws on concepts from activity theory (see Figure 2) in order to frame the research around factors influencing IT innovation. Hasan (2002) argues that activity theory is a useful framework for studying information systems because of the

unique way in which it incorporates the human aspects of systems and their relationship to IT tools. Activity theory provides an overarching framework for conceptualising a system including all of the complexities of the social reality within which the system exists. An activity is defined by an object which is the purpose of the activity. Subjects carry out the activity using instruments according to rules defined by the community. The division of labour is determined by relationships within the community. For the purposes of this research, the activity system being conceptualised is an SME and the elements of activity theory can be defined as follows:

- Object - to use IT in innovative ways in order to achieve business objectives
- Instruments – IT / technologies
- Subject – **individual** involved in IT implementation
- Division of labour - defined by **organisational** factors
- Community - the **industry** in which the SME operates
- Rules - defined by the external environment including **national** policies and regulations.
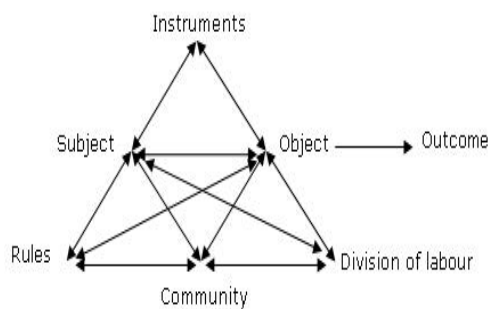

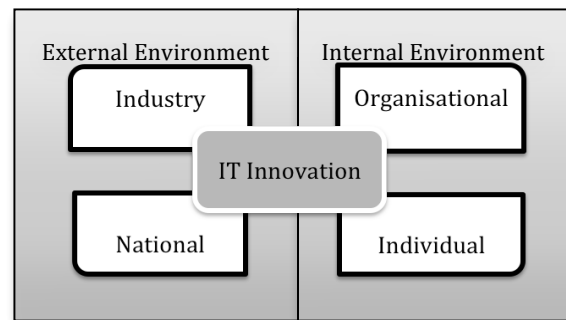Figure 2.   Activity theory (adapted from Engestrom (1987))

Figure 3.   Classification of factors influencing IT innovation

These elements are captured in the framework diagrammed in Figure 3, which provides a classification of the types of factors influencing IT innovation. This classification is derived from an analysis of the literature and is reflective of the recommendations proposed in Phase I (Fernando et al. 2013). The purpose of classifying the factors was to develop a tailored set of local council interventions where specific interventions target different groups of factors. For example, workshops addressed individual factors, mentoring catered to organisational factors, collaborative spaces addressed industry factors and national factors were determined to be out of scope for meaningful impact by local government bodies. This classification approach also helped formulate the interview questions to explore the different factors influencing IT innovation in SMEs. Barriers and enablers to IT adoption in SMEs have been widely researched and documented in the literature. IT adoption is influenced by a number of factors including a reliance on the SME owner's leadership, capital for investment, the processes involved, internal and external pressures and national trends (Thong 1999; Kurnia et al. 2009; Chong 2004; Rashid & Al-Qirim 2001; Fernando et al. 2013; Nguyen 2009). Molla (2006) argues that sometimes adoption is non-progressive, inhibiting growth and offering diminishing value. Based on observations of both successful and unsuccessful SMES studied through the lens of action research, the authors observe that while some SMEs fail, other succeed due to the presence of key individual, organisational, industry and national factors. The discussion below highlights key factors identified in each category for facilitating IT innovation.

In terms of **individual and organisational factors**, the ability to think creatively, be open-minded and innovative are shown to be psychological factors that affect an entrepreneur's personality and subsequently impact how SME's view technology as a driver of innovation (Marcati et al. 2008). In a study about open-innovation adoption in Korean SMEs in the manufacturing industry, CEO characteristics were found to be important in influencing technology adoption and innovation (Ahn et al. 2013). However, before effective knowledge transfer can occur within an SME's networks, SMEs

must be aware of the need for innovation and their capability for knowledge absorption and exchange (Bradford et al. 2011). In cases where there are insufficient skills, capabilities and resources to adopt and innovate with technology internally in an organisation, accessing external expertise enables this gap to be bridged (Nguyen 2009). The authors argue that having an expert (either internally or accessing expertise externally) with sufficient knowledge of the organisation's goals and competencies, and the insight and expertise to understand how technology can transform the business is crucial to innovation. In the case of providing external expertise, local government interventions help facilitate this gap in technological and business insights and enable transformation through the stages outlined in Figure 1.

Often the required external expertise is located within **industry networks** local to SMEs and can act as a source of information or a goad to innovation. Open innovation is based on the premise that access to internal and external knowledge can increase internal innovation and can provide expansion of external innovation into products and markets, as innovative ideas can be obtained internally or externally (Chesbrough 2006). This process influences an organisation's development and the development of networks and shapes the types of relationships that SMEs have with their external environment (Nguyen 2009). Networking has been shown to be a valid source of knowledge, which enables SMEs to be sustainable or remain competitive with their products and services (Chaston & Mangles 2000). **National** trends, infrastructure development and government policy and regulations impact IT adoption (Notley & Foth 2008; Williams 2011). For SMEs to progress beyond adoption, locally delivered interventions provide a sustainable source of support and access to skills and resource development as advocated in Figure 1 in contrast to existing frameworks (Tornatzky & Fleischer 1990; Baker 2012; Molla 2006).

Interventions Facilitating IT Innovation. Existing literature has outlined interventions for facilitating adoption and innovation in SMEs (Scupola 2009; Nørager 2007; Edwards et al. 2007; Vega et al. 2008). Some generic methods of intervention for SMEs include abiding by voluntary or compulsory regulations or standards, obtaining sources of financial penalties or support, self-directed and facilitated learning and education, audits and reviews, and business advice and help lines (Parker et al. 2009). Public intervention programs need to be flexible enough to cater to the varying needs and capabilities of SMEs (Vega et al. 2008). Mentoring workshops represent a popular example that achieves this flexibility. Policy-based interventions also need to appropriately identify and support innovative practices of SMEs and monitor and evaluate these practices using suitable methods (Edwards et al. 2007). Nørager (2007) outlines a model for transforming a non-innovative SME into an innovative SME by focusing on enhancing human resources, developing internal and external stakeholder engagement, and aligning leadership and strategy with the transformation process. However, in terms of transforming from IT adoption to innovation, the authors argue that other criteria such as accessing external expertise and insight into aligning business processes with innovation goals are required.

King et al. (1994) developed a scheme for characterising the different types and dimensions of interventions to assist with IT innovation including increasing awareness, providing training/education and funding initiatives. Their research findings support the importance of interventions in general, across a range of institutions including government initiatives, but not specifically addressing local government interventions. Yap and Thong (1997) state that government intervention programs accelerate adoption as these programs help alleviate resource poverty or a lack of access to resources and knowledge. A number of prior studies have observed the positive effects in diffusing innovation in an SME through institutional or government interventions (Gao 2015; Choudrie & Culkin 2013). Further studies call for government led efforts to build knowledge and resources, and deploy capability and entrepreneurial activity in local economic settings (Montealegre 2012). The authors argue that there is a theoretical gap in understanding the role and value of local government interventions in IT innovation pertaining to SMEs.

SMEs have traditionally been difficult to engage in initiatives that aim to improve business outcomes (National Centre for Vocational Educational Research 2007). Effective knowledge networks can be

built between universities, industries and governments, which can play a pivotal role in increasing knowledge exchange among SMEs leading to effective innovation (Bradford et al. 2011). Carr et al. (2013) suggest that online knowledge sharing can be encouraged by assisting owner-managers to envision the business value of IT innovations. Government support in training, and development of IT based skills and capabilities through subsidised training and development programs have a positive impact on IT adoption among SMEs (Ghobakhloo et al. 2012). The Australian government, in particular, has supported these types of improvement interventions through policy initiatives that target development of managerial skills, innovation, technology and business processes (Ahmad & Seet 2009). The authors argue that government interventions are best implemented at the local government level as councils are not confined to particular business sectors or types of industries, but aim to serve businesses located within a specific geographical area, thereby contributing to local economic development. This phase of the research addresses the research gap in the area of local government interventions to facilitate SME IT innovation by providing a typology to characterise IT use and a framework for classifying factors that influence IT use. The typology and framework are used to explore IT innovation by SMEs and to evaluate the effectiveness of local government interventions in relation to this. The findings from this study can contribute to the longer term goal of developing theories to improve understanding and effect change in the area of local government interventions designed to facilitate SME IT adoption and innovation.

4 METHODOLOGY

The second (therapeutic) phase of this research took place from February through June, 2014 with a shift in focus from IT adoption to IT innovation and an emphasis on studying the effects of the initiatives following on from the Phase I recommendations. The purpose of Phase II was to evaluate the effectiveness of the council's collaborative change initiatives pursued since the completion of the first phase and to provide further recommendations for local council interventions. Based on the results from Phase I, the council delivered workshops and mentor-assistance programs focused on basic digital skills and the need for uptake of IT in SMEs. Feedback from participants in these programs indicated that SMEs in the Salisbury area now understand the need for IT and are looking for assistance with moving beyond simple adoption. Hence, we investigated the progress of intervention initiatives since the completion of Phase I to provide a longitudinal view of local government interventions and develop further recommendations to assist with SME IT innovation. This two phase iterative, cyclical process adheres to the action research methodology (Baskerville 1996) with the focus in the second phase concentrating on studying the effects of changes developed based on the diagnosis undertaken in the first phase.

A mixture of quantitative and qualitative methods was used to gather data. Mixed methods provide an opportunity to collect varied points of data to understand the research problem (Creswell & Clark 2011). The use of mixed methods enables gathering of viewpoints from different stakeholders and provides multiple angles to investigate the problem within a context (Barbour 2008). Surveys were selected as a data gathering method because this enabled information to be captured from a sample of participants from different program offerings (intended recipients of local government interventions). This purposive sampling of stakeholders included participants from different types of programs such as mentoring, advisory, networking events and technology-focused workshops, drawn from the different industry sectors described under Section 2. Interviews supported the primary method of data collection by providing an in-depth, qualitative perspective on the data gathered. The survey focussed on three major lines of investigation, namely, an evaluation of the effectiveness of local government intervention initiatives, SME motivation for participating in programs and for using IT and the nature of IT use within SME organisations both currently and into the future. The interviews delved further into the nature of IT use and also explored factors that enable or inhibit the ability of the SME to capitalise on IT, including the internal or external factors that drive IT innovation.

Survey. A survey of 120 Polaris Centre clients was conducted across the range of participants who attended one or more components of the Digital Enterprise Program offerings. Purposive sampling

representing target units of Polaris Centre clients was used in the survey to eliminate bias. The target groups consisted of sampling 20 clients from each of the centre's five key program areas of mentoring for success, business advisory and information, networking, digital workshops and digital mentoring and a random sampling of a further 20 participants from these program units. The survey questions were developed collaboratively by Polaris Centre staff and the researchers and the survey was administered by McGregor Tan Research. The objective of using surveys as a tool was to measure participant expectation through to program feedback. Responses were obtained from 33 clients who attended digital workshops and 20 who participated in digital mentoring, resulting in a response rate of 44%. The survey was comprised of three different sections. In the first section, a series of quantitative questions explored the effectiveness of the programs. These questions were based on a Likert scale ranging from 'not at all satisfied' (1) through to 'very satisfied' (5). The relevance of the programs was also explored through questions using a Likert scale that ranged from 'not applicable' (1) through to 'all of the information received through the program was applicable' (5). The second section consisted of a series of open-ended questions investigating respondents' motivation for participating in the programs and for using technology. Finally, a series of quantitative questions explored the nature of IT use based on a four point Likert scale where the levels correspond to the categories in Figure 1.

Interviews. In-depth, qualitative interviews were then conducted with two SMEs from each industry sector (six interviews in total) to further uncover the factors influencing SME adoption and innovation, and to explore the mindset of SMEs in relation to innovating with IT. Using interviews as a method meets the purpose of exploring the reasoning behind factors impacting innovation and allows evaluation of expectations in an unbiased manner. Thematic analysis was used to derive themes from the data gathered, thereby identifying emerging viewpoints expressed qualitatively in the interviews (Boyatzis 1998). These findings were then compared with the quantitative survey results. The authors identified factors affecting SME IT innovation and the effectiveness of local government interventions and categorised key themes from this analysis as outlined in the following section.

Observations. In addition to the interview data from SMEs, observational insights were also sought from key council staff involved in designing and delivering the workshops and mentoring. The main aim of using observations as a technique is to evaluate the outcomes versus expectations from a program facilitator point of view. This program facilitator perspective provides a valuable insight into how SMEs progress with IT innovation over time through interventions addressed via programs. This dual role of researcher and participant played by the council staff is common with an action research approach and facilitated the development of the intervention toolkit as described in the final section of the paper.

5 FINDINGS AND DISCUSSION

This section discusses the findings from the second phase of the research. The results from the survey are presented first, including an evaluation of the initiatives pursued since the first phase of the research, followed by an analysis of the responses relating to the nature of IT use by SMEs. The interview findings are then examined to elaborate on the findings from the survey in terms of the nature of IT use and the factors influencing IT innovation. Throughout the discussion, potential approaches to include in the council's intervention 'toolkit' are highlighted and these are integrated under the relevant categories in the next section.

Survey - evaluation of Phase I workshops. During the period October 2012, through April 2014, the Polaris Centre delivered 92 workshops with 961 attendees as part of the Digital Enterprise Program. Topics covered in the workshops included WordPress, social media, getting ready for the NBN, online marketing and Google analytics. The workshops were designed to increase awareness of the importance of IT for SMEs and to enhance digital literacy skills. The survey confirmed that attendees were extremely satisfied with the delivery of the workshops in terms of professionalism and customer service and responses indicated a very high level of satisfaction with the quality and usefulness of the information received. Overall, attendees were relatively satisfied with the extent to which the

workshops met their needs. In terms of applying the information from the workshops to their business, 70% of respondents indicated that some of the information was applied, and 21% responded that all of the information was applied.

Survey - evaluation of Phase I mentoring. During the same time period as the workshops, the Polaris Centre also provided face-to-face mentoring to over 320 businesses as part of the Digital Enterprise Program. The mentoring program consisted of a series of two 2 hour face-to-face meetings between a mentor from the Polaris centre and an SME program participant. Once again, there was an extremely high level of satisfaction with the delivery of the service in terms of professionalism and customer service. There was also a very high level of satisfaction with the perceived usefulness of the advice received and the level of understanding of the SME's particular needs. In the case of the mentoring program, 85% of respondents were able to apply some of the information gained through the service and a further 10% were able to apply all of the information to their business.

Survey - evaluation of Phase I motivation. A series of open-ended questions were included in the survey to better understand the underlying motivations for participating in the program and using IT. The reasons for participating in the workshops included developing an online presence and taking advantage of social media in order to increase customer reach and improve communication with clients. The reasons for participating in the mentoring program were similar with some respondents indicating that the desire for more tailored information was also important. In relation to motivation for adopting IT, the responses were consistent with previous research on IT adoption and included factors such as saving time, saving money, increasing skills, improving business efficiency, extending customer reach, facilitating growth and the fear of not keeping up with competitors. In terms of the toolkit, the workshops were seen as beneficial for addressing basic use of IT while the mentoring program provided opportunities to capitalise on an organisation's specific IT requirements in relation to business objectives.

Survey - nature of IT use. The final section of the survey sought to understand the current and potential future level of IT innovation being undertaken by the businesses and whether the workshops and mentoring program catered to these needs. There were 41 responses to this section of the survey and these responses are summarised in Figure 4. The majority of respondents indicated that IT is currently being used by their business to improve efficiency, with some SMEs still only making basic use of IT and a small number using IT to innovate or transform the business. The workshops and mentoring program were perceived as helpful for basic IT use, improving current business practices (efficiency), innovating in terms of improved product or service offerings and, to some extent, for transforming the business. In terms of future use of IT, the majority of respondents are expecting to use IT to transform their business within the next 5 years, while a similar number expect to be using IT to innovate or improve current practices. Very few respondents expect to still be using IT at only a basic level five years from now.
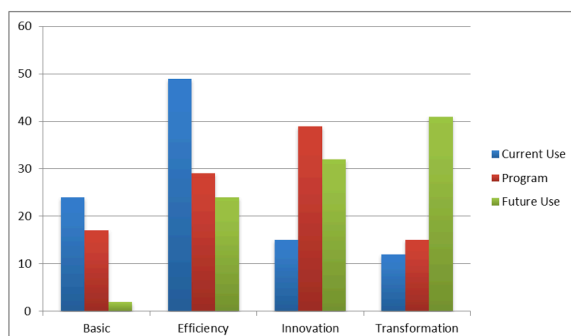

Figure 4. Survey responses – nature of IT use

It is interesting to note the shape and the position of the peaks for the three different facets depicted in the graph. Current use of IT focuses on **efficiency**, the Digital Enterprise Program was perceived to contribute the most value in terms of **innovation** and future use of IT is moving towards **transformation**. There is clearly a desire by SMEs to increase IT use and to capitalise on IT in ways that have significant business impact. There is a perception that the programs offered by the Polaris Centre can facilitate moving towards more innovative use of IT.

Interviews - current use – efficiency focus. The interviews confirmed the survey results in terms of the nature of IT use with all six interviewees specifying efficiency, in terms of improving current

business practices, as the main focus of their IT initiatives at the present time. Four of the interviewees plan to increase their use of IT to underpin innovation by developing new business practices, or offering different products or services and the remaining two interviewees expect they will still be focusing on improving efficiency through their use of IT over the next five years. The examples around using IT for efficiency were remarkably similar across all three industry sectors – developing an online presence, using social media to connect and communicate with customers, making use of cloud-based accounting packages and customer databases etc.

Interviews - future use – innovation focus. The discussion around future use of IT for innovation differed significantly for every SME. A common theme was the desire to grow the business either through different product or service offerings or by expanding into new markets. However, the particular path to follow and the mechanisms for achieving growth varied considerably. Some illustrative examples are provided below:

- One manufacturing company, currently offering a single product predominantly to the South Australian market, hoped to develop new product offerings to expand globally with IT seen as the mechanism for conducting extensive market research and for reaching customers and suppliers around the world.
- A small retail business specialising in casting of children's hands envisioned using technology to broaden product offerings through online and mail order products based on pre-packaged kits and possibly making use of 3D printing technology.
- A small bookkeeping business was interested in capitalising on cloud based software packages to develop alternative business models and reach a broader customer base.
- A real estate company described how IT could facilitate innovation through real-time, online contracts, automated client follow-up capabilities and support for catering to overseas investors.

One of the most striking aspects of the interviews was the lack of ability of interviewees to imagine how they might be using IT in the next five years. The literature highlighted the need for SMEs to be aware of the need for innovation and the importance of being open-minded, innovative and able to think creatively. SMEs are constrained in terms of time, skills, funds and other resources and consequently, the majority of their efforts go towards the day-to-day operations of the business. With this focus on the present and immediate future concerns of the business, long-term planning often does not receive significant attention. This short-term focus combined with the rapid pace of IT development and IT industry hyperbole means that businesses will tend to keep doing the same things, perhaps in slightly different ways, unless there is a catalyst to encourage SMEs to imagine a different future. In terms of the toolkit, council interventions need to focus on catalysing creativity and helping business to imagine a different future in order to progress with innovative initiatives.

Interviews – adoption and innovation factors. The interviews also explored the range of factors influencing the SME's ability to capitalise on IT, including both enabling and inhibiting factors. The **individual factors** displayed some consistency with most interviewees highlighting a lack of skills and a desire to find a sustainable mechanism for ongoing IT developments either through their own skill development or access to external expertise. Motivation to grow the business and capitalise on IT was identified through the interviews as a key factor in enabling IT innovation. **Organisational factors** once again focussed on a lack of skills in-house and some of the issues with outsourcing, such as cost. A concern with outsourcing was the lack of insight into alignment of IT with business objectives as outsourcing usually involves specific requirements to be outlined and conveyed. The **industry factors** highlighted by the interviewees were extremely varied with each industry experiencing different trends and competitive pressures. Analysing industry trends to identify potential opportunities and consider how to capitalise on these through IT requires a certain amount of empathy with the business and specific knowledge of the industry. In the retail industry SMEs who can find a way to align their business with the trend towards online shopping increase their opportunities for success. An increased interest in handmade crafts opens up opportunities for the SME offering casting products. A growing desire to reduce unwanted noise in urban environments is driving demand for specialised acoustic products. A resurgence in foreign investors after the downturn following the

introduction of the GST is opening up new markets for real estate services. All of these opportunities are accompanied by related competitive pressures, which are also specific to each industry sector. **National factors** were not perceived by SMEs to play a significant role in terms of IT innovation. Businesses highlighted that they need to be aware of national regulations and how these potentially impact on business practices and the NBN was mentioned, but none of the national factors were highlighted as critical for using IT to progress with business objectives.

6   RECOMMENDATIONS

The recommendations outlined in this section have been developed based on an analysis of the survey and interview results which provided feedback regarding previous council initiatives and suggestions for future interventions. This feedback was combined with a reflection of the findings from the literature review and key insights from council staff were incorporated. A series of possible interventions are presented, characterised according to the innovation typology described previously and depicted in Figure 1, starting with basic use of IT and progressing through using IT for improving efficiency, IT innovation and finally transformation. These recommendations represent a 'toolkit' of intervention strategies that can be appropriately deployed by local institutions within their communities to facilitate IT innovation among SMEs.

Basic Use: The workshops presented by the Polaris Centre funded through the Digital Enterprise Program primarily address basic IT use by SMEs. Feedback from participants strongly supports the effectiveness of the workshops. In terms of future offerings, participants have requested full day workshops with more detailed technical information about specific products such as customer relationship management systems and cloud-based accounting packages. Several interviewees expressed a desire for further information regarding search engine optimisation. Given that most SMEs expect to have moved beyond basic IT capabilities within the next 5 years, the nature of the workshops should move towards outlining new trends and technologies to enable SMEs to keep abreast of developments that may impact their business.

Efficiency: Increasing efficiency through improved business practices requires consideration of business processes and how these align with the SME's goals and the industry environment. The literature review highlighted the importance of aligning business and IT capabilities to achieve results in innovating or transforming an organisation's product or service offerings. The mentoring program is ideally structured to achieve this and the recommendation here is to expand the mentoring program as the main intervention for supporting efficiency improvements through IT. One interviewee suggested that there should be a team-based mentoring offering with an IT mentor combined with a business mentor. The overall feedback regarding the mentoring program was overwhelmingly positive and so the recommendation is to expand into the team-based offering and also to offer more ongoing sessions over time. One of the factors influencing the success of the mentoring program is the inherent accountability of the program. The follow-up sessions encourage participants to follow through with initiatives discussed at previous sessions and the development of a relationship enables an iterative process that can be used to progress from efficiency initiatives to possibilities for innovation. This intensity of engagement and type of mentoring applied to the specific business context of the SME facilitates the development of internal SME capabilities to innovate.

Innovation: Assisting SMEs with using IT for innovation by offering new or significantly different products and services, or developing new business models, represents the largest area of opportunity for local interventions. This level of innovation requires close alignment of IT with core business capabilities. An understanding of the industry and a clear articulation of business goals are critical underlying factors for achieving success in this area. Local interventions can address this area through a regional innovation system. The literature review outlined how open innovation can provide access to creative ideas from both internal and external sources. Interviewees highlighted the need for networking opportunities to creatively imagine or brainstorm new opportunities and to collaborate with clients, suppliers, academics and relevant industry bodies. Local government, or local services

such as Business Enterprise Centres, can play a facilitating role by providing a venue for collaboration with high-end communication facilities and using these to put SMEs in touch with relevant contacts around the globe.

Transformation: The research did not uncover any significant initiatives for business transformation through IT where local interventions would play a key role. Although the survey results indicate a desire to use IT to transform the business over the next five years, the examples expanded on in the interviews indicated that SMEs are actually looking to innovate with IT through new business practices or different products or services and no genuine examples of transformation were uncovered.

7   CONCLUSION

This research offers two main theoretical contributions to the body of knowledge on SME IT innovation and a series of practical contributions in the form of a 'toolkit' for local level interventions to facilitate SME IT innovation. The first theoretical contribution is the typology depicting the nature of IT use by SMEs (Figure 1). This typology can be used to understand the nature of current IT use and to facilitate the progression towards more innovative use of IT by SMEs. This typology represents a critical distinction from previous theories that characterised IT adoption in that it forces a focus on the business value provided by IT innovations. The second theoretical contribution is the framework classifying factors influencing IT innovation (Figure 3). This framework can be used by future researchers, and by industry, to identify and consider how to address the range of factors with significant influence on a particular SME or SMEs within a specific industry.

In the long-term, a theory incorporating both the typology of IT use and the classification of factors would be developed to understand and guide local government interventions for facilitating SME IT innovation in any context. Preliminary results here suggest that local interventions at the basic level of IT use, typified by the workshops, primarily address individual factors such as a lack of IT skills and knowledge. Improved efficiency can only be achieved by considering organisational factors and the mentoring program is ideally suited to surface and address these factors. The literature review highlighted a range of organisational factors influencing the absorptive capacity of a firm and suggested that external expertise, such as that provided through the mentoring program, could bridge the gap when appropriate organisational capabilities are not available in-house. Interventions designed to facilitate IT innovation are critically dependent on industry factors and initiatives in this area need to focus on the appropriate industry connections. National factors such as government policy and regulations can have a significant influence on industry and subsequent business transformation, but these influences are beyond the scope of this paper as local interventions do not address these factors. Exploring these indicative results further will help to move towards developing a generalisable theory for local level interventions.

A series of practical recommendations for local level interventions were presented for the Salisbury context categorised according to the various levels or phases of the typology. There is potential for future research to build on the findings presented here in a range of areas. Pilot interventions following on from the recommendations can be trialled and refined in various contexts, including different industry sectors and different geographical areas. Industry specific considerations can be identified and incorporated, especially for the 'innovation' category of the typology where industry specific factors play a key role. One of the key insights from the research in this area is that there is a critical need for interventions that focus on catalysing creativity and helping businesses to imagine a different future in order to progress with innovative initiatives. Although this research was conducted with SMEs in a particular area of South Australia, the background highlighted the emphasis on local level interventions around the globe and future research applying the recommendations in other contexts would be useful for extending and validating the research.

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