25 EXTENDING THE RESEARCH AGENDA ON DIFFUSION OF INNOVATIONS: The Role of Public Programs in the Diffusion of E-Business Innovations

Arturo Vega
Mike Chiasson
David Brown
Lancaster University Management School
Lancaster, United Kingdom

Abstract *Given the important but largely unstudied role of contextual influences on the diffusion of innovations, theories and methodologies which take context into account are increasingly relevant. One such approach, the system of innovation approach (SIA), considers context as a network of organizations and groups involved in the production and diffusion of innovations. In addition to the focal innovation, these organizations and groups are influenced by other contexts, and so the further study of their diffusion settings extends the diffusion research agenda. To this end, we focus on a subset of the public programs involved in the diffusion of e-business innovations to small- and medium-sized enterprises (SMEs). E-business applications are complex innovations, and the need for outside assistance is especially significant for SMEs because they often lack the knowledge and resources to strategically adopt, modify, and use e-business applications. To understand how these programs influence e-business adoption, we used theories that examine the contexts around public program interventions in order to explain its form and outcome. The empirical findings suggest that many public programs fail to effectively deliver interventions because program personnel work in contexts that restrict their focus and ability to completely assess SME business needs.*

Please use the following format when citing this chapter:

Vega, A., Chiasson, M., and Brown, D., 2007, in IFIP International Federation for Information Processing, Volume 235, Organizational Dynamics of Technology-Based Innovation: Diversifying the Research Agenda, eds. McMaster, T., Wastell, D., Ferneley, E., and DeGross, J. (Boston: Springer), pp. 379-392.

Keywords Research agenda, context, e-business, systems of innovation approach, SMEs, diffusion of innovations, public programs

1 INTRODUCTION

A review of the diffusion literature illustrates an increasing need to study contextual influences around adoption and diffusion. Few attempts have been made to broaden the research agenda to include institutional contexts such as suppliers, knowledge, supply-push, and government (e.g., Attewell 1992; King et al. 1994).

One approach to context is the systems of innovation approach (SIA) (e.g., Edquist 2005). The SIA recasts innovation as a network of participants and innovations jointly and sometimes remotely involved in the production and diffusion of intermediary innovations, leading to a focal innovation. The SIA suggests an extended research agenda examining the intermediary systems that affect the production and diffusion of innovations. These can include university–industry links, consultancy accreditation, assessments of public assistance, immigration laws, perception of organizational decision-takers on systemic issues, professional and trade association roles, support centers, assistance brokerage, and online collaborative strategies, to name a few.

Following this extended research agenda, we decided to study one systemic issue: public programs and their influence on e-business adoption by SMEs. Given the broad scope and resources consumed by such programs, which includes e-business awareness, project management, SME training, and consultancy support, there is an increasing interest in the impact of these initiatives on the adoption and use of e-business applications (European Union 2001; OECD 2004). The topic is relevant for both developed and emerging economies which are involved in e-business diffusion (CEPAL 2007).

Academics have, so far, given little attention to the study of public programs for e-business innovation in SMEs. We identified two research studies that have examined policy choices to engage SMEs in e-business technology (Gengatharen et al. 2005; Hira 2002), and research that generally examines information technology government programs (Yap and Thong 1997). Both types of research (i.e., choice and evaluation) are valuable first steps in this area of research. To complement this, we study public program delivery, its influence on e-business adoption by SMEs, as well as program personnel behavior and the context around them. We focus specifically on consultancy support programs. We conclude that public program delivery is affected by a number of contextual influences that inhibit the adequate assessment and delivery of tailored programs to an SME. We also conclude that additional theories and methodologies are needed to study context systemically, including the systems of innovation approach.

Our paper is organized as follows. Section 2 explores theory relevant to the study of e-business adoption by SMEs, including the SIA. Section 3 provides a general theoretical model to study e-business adoption in SMEs. The model includes program and SME contexts, diffusion of innovations, and the stages of program intervention. The research methodology is explained in section 4. In section 5, there is a description of the findings of a case study, which is analyzed and described in section 6. Finally, we conclude by examining the applicability of the theoretical model to study and evaluate program interventions.

2 RESEARCH AGENDA FOR E-BUSINESS INNOVATION IN SMES

The *diffusion of innovations theory* (DOI) (Rogers 2003) defines diffusion as the process in which an innovation is communicated through certain channels over time among the members of a social system. For simple innovations, the DOI can be conceptualized as the transmission of information from change agents to adopters, and the use of incentives to increase the creation of critical mass. However, most innovations are **complex** (Attewell 1992; Eveland and Tornatzky 1990), including e-business applications. In these cases, the diffusion of complex innovations requires a study of the various contextual influences from participants around the adopter, in the creation, implementation, reinvention, maintenance, and coordination of innovations.

For example, a booking system for the lodging sector could require other participants to support its adoption and use, such as an application service provider who hosts the application. To be successful, the on-line booking application will require the careful design of its functionality, through studies of multichannel sales. Any problems in the available bandwidth or the lack of marketing resources would fail to produce and diffuse a usable and useful innovation. Finally, the application's value will depend on the trained and skilled use of the application by motels, restaurants, and museums to create joint tourist packages.

The *system of innovation approach* (SIA) considers that innovation success and failure could be located in any part of a complex system of participants, producing many intermediate innovations for a focal innovation to diffuse. A failure could be the result of missing or inappropriate activities, organizations, institutions, or linkages (Edquist 2002). The SIA takes into account not only the proximal causes described in the last paragraph, but also the **causes of these causes**, in any part of the system. Policy intervention is required to complement or correct these **systemic failures** which inhibit the effective production and diffusion of innovations (Lundvall and Borras 2005; Nyholm et al. 2002).

As an example with the diffusion of e-business applications and SMEs, there could be a lack of marketing expertise in a region which could affect the shaping and delivery of an e-business system. In response, a publicly funded program could be introduced to address this knowledge gap. This could include the use of university students with marketing expertise. This initiative would link marketing expertise in academic organizations to e-business adoption activities in an SME. However, the SIA approach does not often stop at the public program intervention—the first contextual layer. It can further investigate the context around the context by, for example, exploring the evaluative and compensatory mechanisms of the public program, and how it influences the behavior of the students in their consultancy interventions.

In terms of practical implications, the SIA suggests that the context around the SME affects the diffusion of e-business innovations, and that this context also has its own context. As a result, there could be numerous causes that contribute to an inadequate set of resources to assist in the effective production and diffusion of innovations. For instance, the lack of marketing knowledge available for SMEs could have multiple causes. To mention only some, there may be few marketing consultants in the region, SMEs may not have the economic capacity to employ or contract these resources, SMEs may be unable to find them or they may not know how to select proper consultants.

The implications for public policy are the consideration of the contextual systems around the SME, and where the policies need to be targeted in concert with other initiatives, to produce a working innovation system. For instance, the supply and access to marketing knowledge could be increased in several ways, depending on the contextual influences around the SME: creating marketing programs in universities, increasing the quality of these programs through the selection of skilled workers, subsidizing student placements, establishing consultancy accreditation schemes, softening immigration laws to attract skilled marketing people, improving the working and living conditions of these professionals, subsidizing training for consultants, and sponsoring quality awards for marketing consultants. It may also be the case that there are so many contextual gaps preventing the production and delivery of innovations that any policy initiative will do little if anything for e-business adoption.

In terms of the specific literature on e-business adoption by SMEs, there is a potential to inform the research on e-business innovation in SMEs using the SIA. The literature so far has studied only a few systemic issues related to the adoption of e-business by SMEs. For example, consultancy accreditation (Morgan et al. 2006), the role of governments and industry actors to stimulate the adoption of sector applications (Dierckx and Stroeken 1999), the availability of technical facilities and support services related to information technology (Jansen 1998), and industry cooperation for the development of standards (McGowan and Madey 1998).

In general, the systemic approach to innovation extends the research agenda not only on e-business and SMEs, but also for the adoption and diffusion of other complex technologies. We turn next to a theoretical model that guides our various studies of public program interventions in the adoption of e-business innovations by SMEs.

3 THEORETICAL MODEL

Various theories can be drawn upon to examine the contextual influences on the diffusion of innovations. Traditional diffusion of innovations research defines an **adoption process** (agenda-setting, matching, redefining, restructuring, clarifying, and routinizing) as a sequence of stages through which decision-making units pass in evaluating and adopting innovations. Despite its great value, it is a general theory, which was not specifically developed either for e-business or SMEs. In most cases, the DOI has to be complemented by the **factors of adoption** of specific innovations and specific types of adopters.

For instance, SMEs tend to be centralized in the chief executive officer or owner to makes decisions. This will bias the perceived attributes of an application toward this one person (Grandon and Pearson 2004). In cases where a chief executive officer decides not to adopt an application during the matching stage of adoption, a **barrier** is created. On the other hand, if the decision-maker decides to adopt the innovation, the redefining and restructuring stage would be quick, which would be a **motivator**.

In addition to the implications of the DOI and the e-business innovation in the SME literature, public programs represent an important influence on SME adoption. "Policy intervention is an ongoing, socially constructed and negotiated process, not simply the execution of an already-specified plan of action of expected outcomes" (Long 1999, p. 4). In terms of the process of implementing public programs, program officers select recipients, design interventions, deliver policies, connect their work with other programs,

follow-up client processes, and evaluate outcomes. These various stages can be considered **program processes**.

The effect of program processes and adoption processes are interrelated. On the one hand, the decisions and outcomes of the program officer are influenced by the adoption process. For example, the *design* of the assistance must take into account the *stages* of the SME's adoption process that need support. On the other hand, the decisions and outcomes across the adoption process are influenced by program processes. For instance, the *clarifying stage* could be deficient because of poor *delivery* of the program assistance. So, the program process is influenced by the program context and adoption processes, and the adoption process is influenced by the factors of adoption and by the program processes.

In addition to adoption processes, the program context affects the working conditions and capabilities of the public worker. For example, **bureaucratic routines** can create both barriers and motivators in the delivery of public programs, and their ability to assess and monitor program outcomes. Lipsky (1980) explains various program contexts of public service workers and the effects that they have on the execution of their work. Public service workers grant access to government initiatives and provide services within them (e.g., program consultants and public assistance brokers). These workers often have significant discretionary judgement given the fact that their work tends to be complicated and subjective (Argyris 1964). Additionally, they have relative autonomy given the taken-for-granted assumption that they agree on the goals of the program organization. In this reality, policies tend to be made at the **street-level**, and not from the heads of policy agencies (e.g., Juma and Clarke 1985; Lipsky 1980).

In general, the **contexts** around program consultants are complex and tend to negatively affect the quality of their work. There are often inadequate resources to meet client demand, in terms of time, knowledge, information, and budget. Public workers operate in an environment in which there is a constant displacement of ambiguous and competing goals (e.g., client-centered, social engineering, and program-centered goals). This issue is more problematic because of ill-defined performance targets. Given this climate, however, program consultants also have a position of relative power over the client because they control the benefits of their service, and have the capacity to deny or to make access more costly. In some cases, the benefits of the programs cannot be found elsewhere. Adding to the difficulties of program evaluation, clients may manipulate or evaluate positively poor programs in order to have access to the agency's services in the future.

In this environment, workers can also become alienated because their services are only a part of a wider need. This can reduce their motivation, resulting in an alienation from their work and clients. For example, a program worker could develop a software application based on a deficient functional specification given by the client. Another consequence is the disconnection between the work of the bureaucracy and the next stages of the process of the clients. For example, an information technology strategy could have been successfully defined in a program workshop, but the decision-taker of the SME did not have the knowledge to manage the rest of the adoption process. Finally, the pace of the work is another dimension of the program workers that tends to be alienated from clients. This is represented when the response time of public services becomes too long because of the excessive and confusing work that the same customers generate.

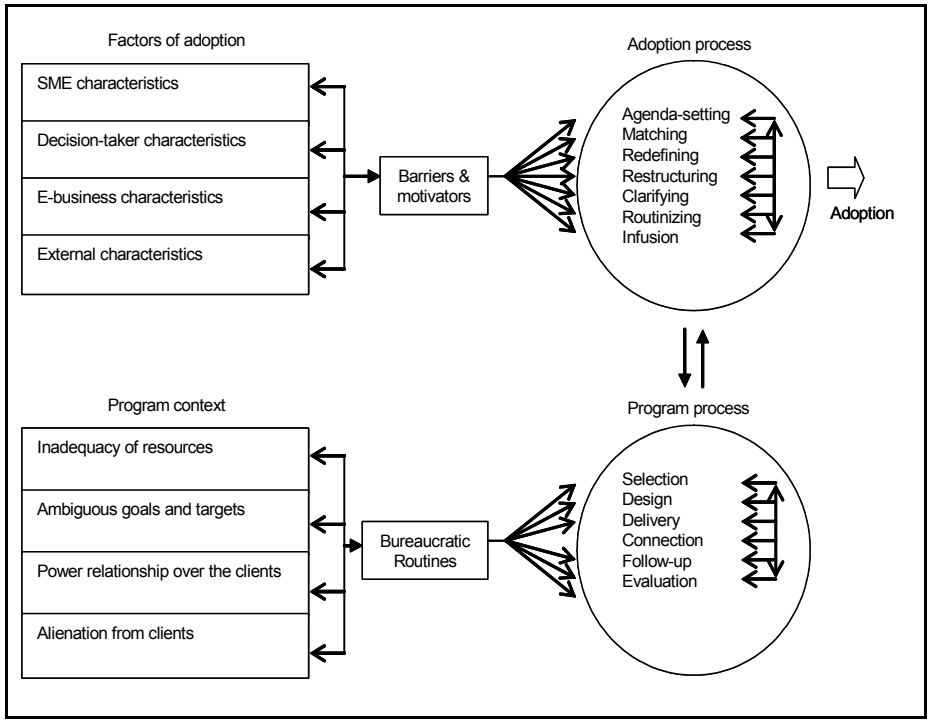

***Figure 1*. Theoretical Model to Explain Public Program Intervention in SMEs**

Figure 1 shows the entire theoretical model. In this paper, however, we focus primarily on the public programs and their effect on SME adoption of e-business applications, with only moderate references to other contextual influences on program and SMEs. After reviewing the literature of e-business adoption by SMEs, we decided to classify the factors of adoption in four groups: SME characteristics, decision-taker characteristics, e-business characteristics, and external characteristics. In one way or another, most of the research is located in this classification (see Thong 1999). Note that we are considering one more stage in the adoption process, *infusion*. Infusion measures the extent of use of an application in organizations by measuring the types of transactions and the quantity of transactions per type. Interestingly, this addition is supported by research on the adoption of e-business systems in SMEs (Cooper and Zmud 1990).

4 RESEARCH DESIGN

To investigate the public program influence on the adoption of e-business innovations in SMEs, we chose a case study methodology (Yin 2002). We focus on the experiences of SME adopters and program officers in the delivery of public programs. In doing so, we studied the phenomenon within its real context. To understand the events and experiences of participants, we interviewed decision-takers in SMEs to determine the outcomes of the adoption processes. We also interviewed program consultants to figure out how

they designed and delivered the services to the SMEs. Finally, we interviewed program directors and reviewed program files to understand and determine the program processes and outcomes in several SME cases. The theoretical model was used from the beginning, but as a way to organize our questions and participants' answers.

The unit of analysis was the individual policy interventions. In addition, the embedded unit of analyses were the stages of the adoption process and the stages of the program process. So, the gathering of information focused on how these complex and interdependent stages developed over time.

The case studies were based on two programs supporting SMEs, both delivered by one university but from different departments. The projects are co-funded by public organizations and the university. Whereas one of the programs is focused exclusively on information technology support, the other gave business assistance to some e-business adoption processes. The information technology support is normally given by student placements, and the business assistance is delivered by a pool of consultants that work for the university. The seven SMEs that participated in the study were direct beneficiaries of these programs. In addition to these two programs, we contacted the director of another program from a different university and the program manager of an entire regional plan, both oriented to e-business innovation in SMEs. These contrasting cases and programs represent excellent sources of data for the research.

The research is based on the study of adoption and program processes. Process research (Mohr 1982) implies an understanding of what events occurred throughout time, with the purpose of analyzing a causal order to these events. For these reasons, the research entailed the use of qualitative methods, in our case, semi-structured interviews and documentary evidence.

All of the participants are located in England. As part of the field work, we completed 16 interviews, of which 13 were tape recorded. The three interviews that were not tape recorded were summarized in text and sent to the interviewees for their corrections and conformity. Given space limitations, we focus on the detailed explanation of one case in our findings, drawing initial conclusions to consider in our other cases.

5 EMPIRICAL FINDINGS

This section describes the program and SME case, through the relevant opinions of some of its participants. For confidentiality reasons we use letters to name the SMEs and the program (e.g., SME B), and we give only the job positions of the participants (e.g., managing director, etc.). These findings will be analyzed in detail in next section using a part of the theoretical model described in section 3.

5.1 The SME Assisted and the E-Business Initiative

The company assisted was SME A. However, it was a joint venture formed by SME B and SME C. The start-up was a third-party e-marketplace for the building supplies sector. SME B is an expert on Internet information systems and SME C is a distributor of architectural hardware, a subsector of the building supplies segment. The managing director of SME B was the managing director of the venture, SME A.

The e-business model was based on resale agreements with brick-and-mortar shops. The gross profit of the venture was the difference between the selling price of SME A to its customers and the buying price from the shops. The shopping basket of each client of the e-marketplace could include products from different shops. However, the delivery to the customers of SME A was made directly from the warehouses of the shops. As a result, the delivery charges to the clients varied depending on the shop.

5.2 The Development of the Initiative

The partnership started in the middle of 2002. Once the application was developed and the company recruited eight or nine shops, SME A made an initial market research. At that point, the results of the research were considered promising by the partners. In the middle of 2003, SME A received public consultancy support from program A and received loans from two financial institutions. At the beginning of 2004, the company used the loans to develop a marketing strategy. Despite of the recruitment of more shops, the sales results were not as expected. One year later, SME A employed a student on an MBA summer project to try to improve the competitive position of the company. However, the venture remained unprofitable. The company closed down in the middle of 2006. For the managing director of SME B, the collapse of the venture was caused by the lack of knowledge of the whole building supplies sector of SME C. The managing director expressed that the personnel of SME C only knew about the architectural hardware subsector and that this affected all of the marketing initiatives of the company.

5.3 The Program and the Assistance

The purpose of program A was to provide coaching and mentoring to SMEs on several business subjects, using e-learning techniques and traditional face-to-face teaching methods. The program was run by a university and employed an e-learning platform and several full-time employees to deliver the services. Program A was partly funded by a public organization and the university. The program had major problems finding clients for its funds.

The requirement of SME A was quite open: to increase the web traffic and the conversion and retention rates of the clients based on modifications of the web presence. The company expected recommendations around the core e-business model, unless other expensive and important issues were needed for it to survive. The consultant for the program built his recommendations based on the analysis of the operation of other e-marketplaces (e.g., Amazon.com) and on his personal experience. Apart from his work in the university, the program consultant was the sole trader of a company that provides web design and development as well as basic marketing services. The total time employed for the entire program process was around 1 week.

The first advice of the program was related to the delivery charges. The recommendation was to use one group of conversion factors based on the total weight of the products of the shopping baskets. This advice was rejected by the managing director because he considered it impossible for SME A to absorb the economic differences of the charges. Secondly, the program advised the company to display the e-marketplace by shops on the web site. In spite of the fact that SME A accepted this recommendation, it

was later rejected and replaced with a presentation of product categories, from the MBA project's recommendations. The managing director trusted the advice of the MBA student because it involved 8 weeks of comprehensive work, was based on empirical data, and was clearly expressed in a detailed report. Additional advice of the MBA project was also used to change the commercial name of the venture. The final recommendation of the program was related to the look and feel of the application. This advice was implemented by the partners.

The assistance was evaluated via a form from the public organization that co-funded the program, about 6 months after delivering the service. This is a simple form that asks for basic information such as the increase in sales, the jobs created and safeguarded, etc. In theory, these numerical indicators are to be attributed exclusively to the assistance. For example, the form indicates an increase in sales of £ 67000. Finally, at the moment of the interview, the consultant of the program was unsure about what advice was implemented by SME A.

6 ANALYSIS AND DISCUSSION

This section uses the theoretical model presented in section 3 to analyze and discuss the information described in the previous section. We start identifying the barriers and motivators that affected the adoption process of the SME. Then, we review the outcome of the assistance and give recommendations about the possible actions that could have improved program assistance. Finally, we examine the context that surrounded the program in order to determine the factors that influenced the program processes.

6.1 Barriers, Motivators, and the Adoption Process in the SME

Three organizational and venture-related **barriers** were identified in the case. There was a lack of business know-how of SME C about the entire building supplies sector. There were restricted financial resources to continue with the venture. There was also missing business knowledge which prevented the effective design of certain aspects of the web presence (e.g., presentation of the e-marketplace and definition of the commercial name). On the other hand, the technical knowledge of SME B was an important **motivator** for the adoption of the application. These three barriers and the motivator are **SME characteristics** affecting adoption.

The adoption of the e-business application in the SME collapsed in the **infusion stage** because the venture was only able to sell a limited number of products to its customers. This eventual infusion of the e-business system depended on adoption by their customers (buyers). However, the attempts to influence buyer adoption were unsuccessful.

6.2 Review of the Assistance

Although the process collapsed in the infusion stage, we need to tease out the various considerations of when and how the program did and could have influenced this outcome. Although it could be assumed that the venture failed despite good and targeted program interventions, the program intervention can be questioned from several points of view.

The partners did not accept most of the advice provided by the program. The advice of the delivery charges was not accepted and the advice of the presentation of the e-marketplace by shops was reversed after the MBA project. The advice that was accepted was for the look and feel of the web site. This could suggest that if the advice was accepted, or was rejected in the case of the look and feel, the venture would have succeeded. However, various case data suggests that the rejected advice was inappropriate, and the advice that was accepted was advice that could have been generated by the venture itself. For the latter, the SME had expert web site design knowledge with their partners. For the former, the negative opinion of the managing directors suggests that both the intervention methodology and the knowledge and experience of the consultant were poor.

Assuming that the advice was valid and was implemented by the partners, it is possible it was incomplete, taking into account other reasons for closing down the venture, such as sector knowledge. Finally, the assistance was given by a program that was created for another type of service. Program A was created to provide coaching and mentoring based on e-learning techniques as well as to complement it with face-to-face teaching methods, and not for traditional consultancy services.

6.3 Recommendations for the Intervention

In addition to the irrelevant advice that was already available to the SME, or the poor advice that was rejected, there were other gaps in the SME knowledge that needed filling if the venture was to succeed. This suggests various possibilities for a more actively engaged public program participant. The program personnel could have not **selected** SME A because of the insufficiency of the advice, or in **designing** the assistance, program workers could have taken into account the other barriers that were affecting the adoption process of the SME. To address these knowledge gaps, program personnel could have **connected** SME A with other programs or contracted third-party service providers to overcome the barriers of sector know-how and business knowledge for the web presence. Program workers could then have focused their intervention on those barriers for which they could have **delivered** acceptable and practical advice. As a final step, an assessment of the entire adoption process could have been done through an independent **follow-up** of the final outcomes of the adoption process.

However, the program personnel did not address these other knowledge needs, and so the funds were, to a large extent, blindly applied without full consideration of SME needs. Certainly, the **evaluation** form did not reflect either the final result of the adoption process or the impact of the assistance on it. We recommend modification of the measurement instruments, and rethinking the methodology of getting this information. Appropriate and complete evaluation mechanisms represent systemic issues that deserve to be studied and implemented.

6.4 Context Around Program Personnel

Beyond the specific recommendations above, we can examine the context around the program personnel to understand what factors influence their actions and decision. The program targets and measures provided little to explain the quality of the assistance. In addition, the quantitative information was **difficult to measure**. For example, an

increase in sales of £67,000 could have been caused by the venture's growth and increasingly favorable market conditions, unrelated to public assistance. However, we also suggest that clients can **manipulate** the evaluation data because they feel they may need the assistance of the agency in the future. This client behavior could be a manifestation of a relatively **powerful position** of the public workers over the clients (Lipsky 1980).

Both the lack of proper performance measures and the relatively powerful position of public workers left program personnel free to choose the level and quality of the program intervention. At this point, there is a **conflict** between **client-centered goals** and **program-centered goals**. On the one hand, program personnel could have met completely the requirements of the clients in a proper way. On the other hand, public workers could have decided to produce a minimal service because the performance measurements did not effectively capture more important outcomes for the client.

There are three factors that could have played in favor of program-centered goals. The first is the **alienation** of the consultant from clients. This problem could result from the fact that the program capabilities were only a **part** of the total needs of the client. This limitation of the program personnel to consider all elements of the SME's needs may have contributed to this outcome. For example, program personnel did not take into account the **circumstances** of SME A in proposing the delivery charges. According to the managing director, the advice was impractical because it did not match with the e-business model of the company. Additionally, program workers were **disconnected** from the next stages of the adoption process by SME A. This was evident when the program consultant was unsure about which recommendations were implemented by the client. What is more, the consultant did not realize there were other barriers to SME A's business plans and e-business strategies, and was therefore unable to connect the client with other programs to address these needs.

A second reason for program-centered goals may be the **inadequacy of resources**. We believe the one week of time provided by one consultant was not enough **time** to deliver a proper program outcome. The managing director of SME B questioned the lack of data to justify the advice. In this case, the seriousness of the advice should have been justified by primary data (e.g., surveys or focus groups), as was done in the MBA project. In addition, the consultant was very young at the time of the service, and appears to have only had basic **knowledge** of web design and marketing. Finally, any limitations on time or expertise could be overcome by contracting third-party service providers. However, we need to gather additional data to determine if there was a **budget** for this activity.

The last reason to focus on program-centered goals is the **demand**. The demand for program A was extremely low. Public workers may have felt the pressure to meet the targets of the entire program. This was evident when the consultant delivered a service that was not in the purview or expertise of the program consultants. So, the inadequacy of resources and the low demand caused a goal displacement when client needs were subordinated to the needs of the program.

7 CONCLUSIONS

The research agenda on e-business innovation and SMEs is traditionally represented by the DOI. The SIA concepts of activities, organizations, institutions, and linkages depict the real-life complexities of innovation. In general, they broaden the research agenda for

the adoption of complex innovations to a systemic examination of the contexts and innovations around focal innovations. Accordingly, our study of public program intervention showed additional systemic issues that need to be researched, for example, the dependency of multiple adoption processes, consultancy training, power relationships between public workers and clients, cross-program collaboration, program targets definition and measurement methods, and program demand generation. Program interventions and the focal innovations they target depend on these systemic issues.

The study of the implementation of public programs demonstrated that the research of systemic issues has to rely on theoretical models that go further than the DOI. We used concepts from the study of bureaucracies to explain the reciprocal relationship between public programs and adoption. These concepts were developed in the political science field. In fact, program intervention is explained by concepts such as the lack of program delivery knowledge, limited time for the interventions, low demand of public services, conflict between client and program-centered goals, incorrect program targets and evaluation mechanisms, powerful position of program personnel over clients, and alienation of the personnel from clients. Nevertheless, the adoption process is also necessary to explain the evolution of the different stages of the program process. Concepts from bureaucracies and the DOI are general frameworks which can be used to explain program intervention for the adoption of other complex innovations and types of organization. This consideration enhances the usability of the theoretical model.

To conclude, the practical implications of the research stem from both theoretical and empirical contributions. For instance, the research will help program managers to select SMEs with greater chances of finishing the adoption processes, to help assistance brokers identify programs that can address specific SME issues, to help program officers think about the resources and needs of SMEs to shape effective interventions, to allow SME decision-takers to understand the complexities of the adoption processes, and to identify and employ information technology suppliers to work effectively with public programs.

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About the Authors

Arturo Vega is a doctoral candidate at Lancaster University Management School where he received his MBA. He earned his B.Eng. from Ricardo Palma University in Peru. He has 10 years of international experience in multinationals. His research interest is a mix of information technology, business strategy, innovation, and public policy. He can be reached by e-mail at a.vega1@lancaster.ac.uk.

Mike Chiasson is a senior lecturer in the Department of Management Science at Lancaster University. Mike's research examines the relationships between institutional contexts and the development and implementation of information systems. His work includes action research, user involvement, IT diffusion, privacy, outsourcing, and social foundations of IS development and use. He can be reached by e-mail at m.chiasson@lancaster.ac.uk.

David Brown is a professor of Strategy and Information Systems at Lancaster University Management School. He is also director of the Lancaster Center for Management in China. His research interests include strategic management, strategy, and IT and management in transitional economies. He has published widely in these topics, including books. He can be reached by e-mail at d.brown@lancaster.ac.uk.