

# ES Adoption in Chinese SMEs: Policy Effects on Users and Providers

Full Paper

**David Brown**

Lancaster University Management School  
[d.brown@lancaster.ac.uk](mailto:d.brown@lancaster.ac.uk)

**Zheng Xu**

Lancaster University Management School  
[z.xu4@lancaster.ac.uk](mailto:z.xu4@lancaster.ac.uk)

**Mark Stevenson**

Lancaster University Management School  
[m.stevenson@lancaster.ac.uk](mailto:m.stevenson@lancaster.ac.uk)

## Abstract

The main literature on Enterprise Systems (ES) focuses on large Western firms and has resulted in theoretical models to explain adoption, largely from the perspective of the adopting company. In contrast ES research, and in particular on SMEs in China, is limited. This research examines ES engagement in Chinese SMEs from the joint perspectives of both the SME and the ES technology provider in the context of government policies. The research is based on four cases in Shenzhen, PRC and an extended analysis of relevant government policies at central and local levels. Using King et al's (1994) institutional analysis it argues for the need of theory to specifically recognise institutional policies. It recognises also, however, that the problems of policy implementation are significant and suggestions for practice are offered.

## Keywords

China; enterprise systems (ES); SMEs; adoption; institutional theory; case study; ICT policy

## Introduction

This research explores the process of adoption and implementation of Enterprise Systems (ES) in Chinese Small and Medium sized Enterprises (SMEs) in the context of explicit policy initiatives from the Chinese government. The relevance of this work is twofold. First, from the research literature perspective, ES in Chinese SMEs is under researched and doesn't sufficiently reflect the institutional policy context. Such institutional policy support is very different from that found in mature economies on which most of the ES literature is focused. Second, from an economic perspective SMEs are crucial to China's economy. There are over 21 million registered SMEs (99% of all firms) which contribute 60% of GDP and are the major source of new jobs (Mofcom, 2012, 2015). However, many of these firms lack technology and are relatively inefficient.

The Chinese government's ICT policy initiatives seek to address this concern, at least in part, by incentivizing both the SME and the technology provider, in this case the ES implementer. This may go some way to help explain the extraordinary growth of the ES market in China since 2014 of 14.25% p.a. which is twice that of mature economies (Technavio 2015). Much of this growth is in the SME sector reflecting both the size of this sector and its economic importance. What remains unknown is how effective such policy intervention is in practice.

The above context led to the research questions in this paper:

*To what extent is ES engagement in Chinese SMEs – evaluated from both the SME and ES vendor perspectives – shaped by the ICT policy context, and what are the associated theory implications?*

To help answer these questions a case based method was adopted combined with an institutional analysis approach for the data. Four cases have been completed. In this research, the unit of analysis consists of the SME and the ES vendor together as a single case, both operating in the same context of ICT government policies. After this brief introduction the paper is divided into six further sections.

Section (2) is the literature research covering both ES and the interpretive frame for this work, King et al's institutional theory. Section (3) describes the ICT related policies at national and city levels. In section (4) the research methodology is discussed. The main analysis is presented in section (5). Here one example case (Plasbox & GZsoft) is selected and the influence of policy is examined in detail; the remaining three cases are summarized. The final step in this section is a cross-case analysis. A discussion and key findings and contributions provide the conclusion (6).

## **Literature Review**

The ES literature selected and reviewed here aims to summarize the research gaps, and is presented in two parts. First research on SMEs is discussed, followed by studies relating to Chinese enterprises. A third part of the review introduces the main interpretive frame used in the study, institutional theory including King et al.'s (1994) framework.

### ***ES research on SMEs***

Before turning to ES research on SMEs it is important to acknowledge the significant influence on SME research of the mainstream ES literature. This is typically based on large firms in developed countries (Li et al. 2014). Such research can be broadly categorized as ES adoption, ES implementation, and critical successful factors (CSFs) (Esteves & Bohorquez 2007). Whilst research on ES adoption is still underdeveloped (Alves & Matos 2012), there are many research studies on ES implementation (Hendricks et al. 2007). The study of CSFs, however, remains the largest strand of research, addressing both adoption and implementation (Esteves & Bohorquez 2007).

In a majority of the above work the analytical focus is on the company adopting the ES – the ‘user’ company (Esteves and Bohorquez 2007). A second common trait is the dominance of survey based methods and statistical analysis (Li et al. 2014). Research, however, is notably limited in two areas (i) the perspective of the ES provider, and (ii) the wider institutional setting and contextual analyses.

Such characteristics and approach to ES research in large firms appears extensively in the SME literature. But arguably SMEs present separate challenges due to their different experience of ES adoption and implementation. Lack of resources is normally considered as a major problem (Raymond & Uwizeyemungu 2007), which in turn may additionally exacerbate other issues, like software application complexity (Brown & Lockett 2004), less motivations and low readiness (Buonanno et al. 2005). Moreover, SMEs may be predisposed to short-term tangible benefits with a shorter and informal decision making process. Similarly, their implementation process is prone to be incremental and phased (Malhotra & Temponi 2009).

The studies using critical success factors are dominant, and commonly highlight the essential roles of project management (Ahmad & Cuenca 2013), relative advantage (Ramdani et al. 2009), low readiness and engagement (Buonanno et al. 2005), knowledge deficiency (Ramdani et al. 2009), and organisational fit (Buonanno et al. 2005). However, there is some recognition of the significance of third parties such as application providers (Brown & Lockett 2004), and the importance of government and social network (Aleke et al. 2011).

In light of the discussions above two common SME characteristics emerge which distinguish them from their large firm counterparts. First they are resourced constrained. There is wide recognition that SMEs lack resources. It can be argued that this induces SMEs to pursue a shortened lifecycle for an ES project to minimize risks, which may also intensify the state of external dependency (Malhotra & Temponi 2009). Second, SMEs' decisions on ES are relatively more impacted by external influences. These include the service providers, consultants, government, and market pressures (Brown & Lockett 2004; Brown & Thompson 2011).

### ***ES research on Chinese SMEs***

The research on ES in the China context is still underdeveloped, and heavily influenced by the dominant Western literature in terms of research approach and strategy (Li et al. 2014). The survey-based research method is still popularly employed, and driven by firm-centred discussions (ibid.). Many findings about SMEs generally are applicable to Chinese SMEs, possibly to a greater extent (Xia et al. 2009).

Despite the similarities, Chinese firms in general have passive attitudes towards ES innovation (Srivastava & Gips 2009), and are predominantly influenced by stronger hierarchical power (Ge & Voß 2009). Two characteristics emerge from the extant research that provides a point of comparison and reference to Western experience. First, the study of Chinese culture is frequently emphasized, and considered as an effective way to guide the ES customization and minimise issues of organizational fit. Chinese firms are commonly depicted as having strict hierarchical structure and poor engagement of innovation. Although understanding Chinese culture will reveal some behavioral tendencies regarding ES innovation, the cultural study arguably has limited explanatory power to the process of ES adoption and implementation.

The second characteristic, and central to this paper, is that government in China is more active than most Western governments in influencing enterprise practice by issuing relevant policies or initiating national projects (Hassard et al. 2008). However, research which focuses on ES related ICT policies that impact on SMEs is absent, despite the evidence of such policies.

### ***Introducing institutional theory***

The analytical framework which informs the design of this research and the interpretation of the results is institutional theory. This is a complex and broad approach largely exploring non-economic factors in organisational behavior. For instance, Scott (1995) and DiMaggio & Powell (1983) made seminal contributions identifying institutional isomorphic influences on the organization. The authors are aware of this and other scholars' contributions however King et al. (1994) institutional analysis is employed here. It was devised specifically for the analysis of policy initiatives to encourage innovation in firms (Brown & Thompson 2011). The analytical framework explores how institutional policy actions (knowledge building; knowledge deployment; subsidy; mobilization; standard setting; and innovation directives) may play regulatory or influential roles to create supply-push or demand-pull forces influencing the firms' behavior.

## **Policy Context**

The policy context in China is an essential construct of the Chinese institutional environment. Studying the policy context reveals the governmental settings, and most importantly it assists later sections of this paper to understand the issues of policy implementation, and to what extent the ES engagement in the cases studied influenced by the policy context.

Compared to governments in developed nations, China is a transitional economy and the Chinese government arguably exerts stronger hierarchical influence (Hassard et al. 2008). Such influence is manifested in the issued laws and policies, including those targeting ICT based innovation and SMEs, which is the focus of this section. The policy environment can be generally studied at two levels: national level and local level, and government at these different levels have different focuses. Considering the length of this paper, only selected examples of policies are demonstrated.

### ***National policy context for the development of ICT and SMEs***

The national government plays an important role in influencing the development of ICT and SMEs, including the potential impact of the former on the latter. To achieve this, appropriate laws and policies are introduced that reflect the governmental interventions, which are discussed further below in terms of stakeholders, key legislation, relevant policies with regard to ICT and SMEs.

#### **Stakeholders and key legislation**

National People's Congress Standing Committee (NPCSC) and General Office of the State Council of the People's Republic of China (GOSC) are the most important stakeholders at the national level due to their legislative and administrative power. Under the GOSC, three ministries: Ministry of Industry and Information Technology (MIIT), Ministry of Finance (MoF), and Ministry of Science and Technology (MoST) are selected here due to their relevance to the research focus. The importance of SMEs and ICT has been recognised by the Chinese government for a long time. Three laws have been predominately influential (Table 1).

## Relevant key policies

Regarding the context of this research policies that are relevant to ICT and SMEs are identified, and are summarised in Table 2 below. The policies presented in Table 2 are arguably designed to serve multifarious purposes, however, only their principle ideas central to this research are addressed here.

Relevant Laws	Essence
Law of the People's Republic of China on Science and Technology Progress' (MoST 1993)	Promotes the development of information technology, and encourages hi-tech research and the establishment of hi-tech industrial parks, research bases and training facilities
Law of the People's Republic of China on Popularization of Science and Technology' (MoST 2002a)	Provides legal guidance and funding support for IT dissemination in local areas, and schools or educational institutes are responsible for integrating technology dissemination into the curriculum
Law of the People's Republic of China on Promotion of Small and Medium-sized Enterprises' (MoST 2002b)	<ul style="list-style-type: none"> <li>• Promotes funding mechanisms and clearer IS/IT related guidance for SME development;</li> <li>• Stimulates technological innovation in SMEs through education and training.</li> </ul>

**Table 1: Relevant Laws**

Key Policies (National)	Essence
National Mid-and-long-term Plan for Science and Technology Development (2006-2020) (GOSC 2005, Document No.44);	Promotes funding provision and research institute construction
Action Plan for the Improvement of National Scientific Competence (2006 - 2010 - 2020) (GOSC 2006)	Stimulates nationwide scientific training through education reforms, integrating scientific knowledge into students' curriculum, etc.
Torch Programme (MoST)	<ul style="list-style-type: none"> <li>• Stimulates technological development;</li> <li>• Promotes the construction of hi-tech industrial parks.</li> </ul>
863 Programme (MoST)	Encourages cutting-edge research on information technology through the guidance of national projects.
973 Programme (MoST)	Promotes construction of scientific research facilities and scientific training.
National Key Technology R&D Programme (MoST)	Utilises national projects to guide and stimulate ICT innovation in major industries (e.g. agriculture, manufacturing) regarding vital technical issues.
A Provisional Plan to Stimulate the Development of SMEs Through Government Procurement (MoF 2011, Document No.181)	The government is required to reserve more than 30% of the total procurement budget for SMEs.
Qualification Measures for the Construction of National Service Platform for SMEs (MIIT 2012)	Attracts IS/IT providers to serve SMEs' ICT-related needs and promotes areas like consultancy, training, fundraising, etc.

**Table 2: Relevant Key Policies (National Level)**

## Local policy context for the development of ES and SMEs

Whilst the Chinese central government plays a vital role in stimulating the development of ICT and SMEs nationwide, a different agenda may be introduced by the local government due to its interpretive power, and it is critical to explore this. Regarding the context of this research, the government of Shenzhen city was selected since all the four cases were situated here. Policies issued at local level may relate to both ICT and ES. The relevant policies are illustrated in Table 3.

In summary the central government serves at the national level constructing policy intents, and the local government (Shenzhen) is responsible for policy implementation. Overall, Chinese government at different levels clearly intends to create a supportive policy environment to influence and stimulate ICT/ES development in SMEs. In respect of the differences, the central government arguably aims to establish a comprehensive policy mechanism for ICT development across the nation, with issued policies focus on funding support, infrastructure and facility construction, training, guidance of national projects, etc. On the other hand, Shenzhen government interprets national policies in the context of local needs. More targeted consideration for ICT/ES development is shown highlighting funding support, construction of infrastructure, and the introduction of talented ICT/ES personnel.

Key Policies (Local)	Essence
Action Plan to Stimulate the Development R&D Institutions (2013-2015)' (Shenzhen Technological Innovation Committee 2012, Document No.8)	Promotes the establishment of innovation demonstration parks and hi-tech industrial parks.
<ul style="list-style-type: none"> <li>• Policies to Develop the Industry of Information Technology (Shenzhen City Council 2011, Document No.210);</li> <li>• Provisional Measures on Special Fund Management for the Development of SMEs in Shenzhen (Shenzhen SME Service Centre 2006).</li> </ul>	Promotes funding provision and tax benefits.
Opinions to Implement the 'Peacock Scheme' to Introduce Overseas High-level Talents (Shenzhen city council 2011, Document No.9)	Provides funding support to attract overseas talented personal.
Blue Tunnel Project (Shenzhen City Council 2005)	Establishes information platform and enhance the ES competence of local SMEs.
<ul style="list-style-type: none"> <li>• Hi-tech Enterprise Certification (Shenzhen Technological Innovation Committee 2009, Document No.1);</li> <li>• Double-soft Certification (Double-soft Certification 2012).</li> </ul>	Sets standards and offers tax benefits for qualified companies.

**Table 3: Relevant Key Policies (Local Level)**

## Methodology

The discussions in the literature point to the need for a richer understanding of Chinese SMEs approach to, and experience of, ES adoption and implementation, including their relationship with the ES provider and the policy context. To achieve this a processual and case based method is adopted. Comparing with other types of qualitative research, case study research embraces multifarious variables and the flexibility to cope with situations with soft boundaries (Merriam 2002). This is ideal for exploratory studies where theoretical support is limited, as is the situation in this research. Furthermore, to provide more robust insights, a multiple case approach was employed (Yin 2009).

In brief, and using the above principles, the empirical design was based on the selection of four SMEs (defined by the Chinese firm classification regulations), all in Shenzhen, Guangdong Province, China. Generally, the selection criteria were: 1) The user company must be a SME according to the Chinese firm classification regulations; 2) The user company must have implemented an ES; 3) Robust information regarding ES adoption and implementation must be ensured and accessible for both the user company and ES vendor. For each company the relevant software provider firm was identified and included in the study. There were two such providers. For all the firms involved, semi-structured interviews were employed. Multiple interviews with the most relevant personnel (e.g. general manager, vice-general manager, ES implementer/consultant, etc.) were carried out as appropriate. The data was either audio recorded or hand written in Chinese, which was verified by the interviewees with their signatures. Firm documentation where relevant was collected. The strict government hierarchy in China significantly constrained the effectiveness of interviews with governmental officials in practice. However, document analysis was used and proved efficient to complement the policy analysis.

The study is retrospective and covered recent implementations over a five-year period. This is a relatively long time frame but had advantages in that companies could be revisited for the effectiveness of the government policies to be judged. As previously mentioned, four SMEs were studied along with their respective ES provider. It is a common practice that most ES vendors in China provide both software and consultancy to the user companies. Since the four cases are selected from the same city – Shenzhen China, the same influences of local government are applicable to all of them. The overview of the four user companies and the two ES vendors is shown in Table 4.

## Case Narratives and Policy Analysis

The empirical data gathered from each case reflects each unique experience of ES engagement and effect of policy influence. King et al.'s (1994) institutional model is employed to study the governmental influence, and case data – from both the user and vendor perspectives – is used to evaluate the effectiveness of laws and policies. More detail information is provided for the case of Plasbox & GZsoft, nonetheless the other three cases are presented in summaries with highlights only.

User Company	Company Brief	ES Vendor	Legacy ES?	Key Issues encouraging ES adoption
Plasbox	Manufacture plastic products; 40 Million RMB turnover; 260 employees.	GZsoft	Yes	Poor managerial competence; pressure of market competition; Risks of customer loss; Insufficient competence of legacy ES.
Battery-Shell	Manufacture aluminum shells; 200 Million RMB turnover; 420 employees.	GZsoft	No	Poor competence of management; Pressure of market competition; Limited knowledge about ES and ES market; Unclear requirements for ES selection.
TradeIT	Manufacture GPS receivers; 12 Million RMB turnover; 15 employees.	CH Solution (CHS)	Yes	Ineffective legacy ES and order processing; Poor customer management; Limited knowledge about ES market.
Track-Tech	Trading company providing accessories and consumables; 40 Million RMB turnover; 57 employees.	CH Solution (CHS)	No	Pressure from market competition and customer management; Poor information flow; Information loss; Ineffective management of manufacturing outsourcing; Limited knowledge about ES vendor market.
<p><b>GZsoft</b> – Competitive domestic ES vendor providing various ES packages with customisation;  <b>CHS</b> – A Taiwanese software company with a primary focus on the manufacturing industry.</p>				

**Table 4: Overview of the SMEs and Their ES providers**

### **Example case: Plasbox & GZsoft**

Table 5 evaluates the direct applicability of policy influence to Plasbox and GZsoft using King et al.'s (1994) framework. Examples of the detailed findings linked to the institutional actions (labelled (a) to (f)) are provided below.

#### **Ineffective knowledge building and development (a+b)**

The training and knowledge dissemination programmes initiated by Chinese government, at both central and local levels, have scant influence on Plasbox and GZsoft. For instance, Both GZsoft and Plasbox had not even heard of the 'Blue Tunnel Project'. Moreover, although CESA and Chamber of Commerce arrange regular meetings to disperse governmental policies, Plasbox took these as marketing opportunities.

#### **Great potentials of subsidy (c)**

Despite all the resources invested, the evidence from both Plasbox and GZsoft however indicates the ineffectiveness of the financial support at the organisational level. The complex application process with low success rate was the focal concern for Plasbox in this regard. Plasbox had no in-house expertise for funding application. The consultants GZsoft also were negative about government involvement and related bureaucracy.

#### **Poorly managed standard setting and innovation directive (d+e)**

The lack of clear governmental guidance to the SME or the provider meant that Plasbox had to rely on its social connections to justify the vendor selection. GZsoft had a different concern. There was widespread plagiarism and copying of software by other providers operating with low cost on-line business models and no support. This damaged R&D focused ES vendors, like GZsoft. The government has gradually lost its credibility at the organisational level. Government officials later confirmed their unwillingness to intervene in the market, however flawed. The comments from the government officials implied the duality of ShenZhen government in terms of issuing ICT/ES related policies: conformity to the stance of the central government vs. the local plans for ICT/ES development. The issues in policy implementation were major and are dealt with in the conclusion.

#### **Success in mobilization (f)**

Mobilization is a collective effect. Generally, Chinese government provided a constructive environment for the development of ICT/ES (Tables 2 & 3). However, in practice it was difficult for Plasbox and GZsoft to benefit even when the funding support was recognised. Although the ShenZhen government had

decreased the support on ES in particular, to the authors it appeared to be significant enough to stimulate SME interest in ES and the involvement of the providers.

### **Summarised cases**

While the full case of Plasbox & GZsoft has been demonstrated, gaps can already be identified between policy intent and policy implementation at different governmental levels. The three other cases produced similar findings but there were differences. These are explored in the cross case analysis. A common finding across all four cases is that policy influence on the ES providers, GZsoft and CHS, was weak and is not included in the table.

### **Cross-case analysis**

All four cases share similar traits but the influence of policies can still be diverse (Table 6).

Institutional Actions	Plasbox	Battery-Shell	TradeIT	Track-Tech
Knowledge Building	No Evidence	No Evidence	✓ Weak	No Evidence
Knowledge Deployment	✓ Weak	No Evidence	No Evidence	✓ Weak
Subsidy	✓ Weak	✓ Weak	✓ Strong	✓ Moderate
Standard Setting	No Evidence	No Evidence	No Evidence	✓ Moderate
Innovation Directive	No Evidence	No Evidence	No Evidence	No Evidence
Mobilization	✓ Weak	✓ Moderate	✓ Moderate	✓ Weak

**Weak** - No explicit evidence but may have implicit indications: **Moderate** - Some evidence about behaviour change: **Strong** - Direct evidence connects to behaviour change.

**Table 6: Overview of the Effectiveness of Governmental Influence**

The discussion of the findings and their significance from the detailed Plasbox – GZsoft case and the cross case analysis follow.

## **Findings and Conclusions**

There are four main findings. First, all four SMEs show evidence of the influence of ICT policy, albeit weak, but for different reasons. In terms of the institutional policies “subsidy” and “mobilization” are the two main intervention actions since they influence all the four cases. The influence of “subsidy” has great potential, and was particularly strong in TradeIT as governmental funding support was primarily considered during vendor selection and decision making. In contrast “knowledge building”, “knowledge deployment” and “standard setting” had relatively less influence.

Second, there is overwhelming evidence from the raft of policies of the Chinese government’s intention to drive ICT innovation through supply-push policies. This is evident in the construction of hi-tech industrial parks, educational reform, the provision of ICT training, the provision of funding support, the bidding for national ICT projects, etc. The supply-push forces generated from the policies aim to stimulate ICT innovation, including initiatives such as ES for SMEs. However, more focus is given to the establishment of motivation rather than the guidance of the process, including clear objectives, targets and measurements. The latter introduces uncertainties and ambiguities into the empirical operations.

Third, there is convincing evidence that ineffective policy implementation is an issue. The central government arguably aims to ensure homogeneity across the country through the hierarchical structures. Below this, however, local government interprets and prioritizes to suit their agenda. So too can the SMEs and the ES providers in order to serve their own agendas.

Four, there is strong evidence that the ES providers are not influenced by, or engage in, the intended policy. The research suggests that the lack of “standard setting” may be an important factor here.

These findings have both theoretical and policy implications.

Institutional Actions	Chinese Central Government Policies	Chinese Local Government Policies	Direct Applicability to Plasbox	Direct Applicability to GZsoft
(a) Knowledge Building	Stimulates hi-tech research (MoST 1993), conducts education reform and ICT training (Xinhuanet 2006), and provides funding support to ICT academic research (MoST 973 programme)	Establishes an administrative service platform to provide training services to local SMEs, and assist them to better understand governmental policies (Shenzhen City Council 2005).	No evidence of substantial influence	No evidence of substantial influence
(b) Knowledge Deployment	Integrates ICT knowledge into the students' curriculum (MoST 2002a).	Employing government information system platform to register local SMEs to improve ICT application (Shenzhen City Council 2005).	Uses "China Electronics Standardization Association" (CESA) and local Chamber of Commerce to obtain information about ES related policies, industry development, and customer orders.	No evidence of substantial influence
(c) Subsidy	Provides various funding support and special grants (MoST 2002a; GOSC 2005).	Promotes special funds, pecuniary rewards, and interest-free loans (Shenzhen SME Service Centre 2006).	Interest in potential funding support from local government - no application was made by Plasbox.	Receives government funding for other work. No connections were identified for its ES-related business and the Plasbox project.
(d) Standard Setting	Sets clear requirements for the national hi-tech company certificate in terms of turnover, number of employees, etc. (MoST Torch Programme).	Sets standards for software company and software product, involving identification of intellectual property, software product testing and registration, etc. (Double-Soft Certification).	CESA frequently acts like an agent assisting Chinese government (e.g. MIIT) to propel the standardisation process, however its influence on Plasbox is minimal.	No evidence of substantial influence
(e) Innovation Directive	Directs the construction of hi-tech industrial parks across the country (MoST Torch Programme); Specifies government procurement budget for SMEs (MoF 2011).	The local tax bureau has very strict governance over companies' tax reports, validation of tax receipts, and other tax related issues. Thus, the tax bureau has particularly authorized taxation software for companies to use.	Plasbox must follow the format of tax reports required, however such requirement has no connection with the ES project.	No evidence of substantial influence
(f) Mobilization	Encourages ICT adoption and innovation through national ICT project (MoST 863 Programme); Attracts competent projects and companies to stimulate ICT development in a wider areas (MoST National Key Technology R&D Programme).	Attracts overseas high-tech personnel to work in ShenZhen (Shenzhen City Council 2011. no.9); Intensifies the technological reform to enhance investment in ICT research and the construction of demonstration areas (ShenZhen TI Committee 2012, Document No.8).	The encouraging environment stimulates the development of the ES market in the south of China particularly, which offers legitimate explanations for ES adoption and implementation in Plasbox.	GZsoft is aware of the supportive environment, and understands the adoption of ESs is the future of local businesses.

**Table 5: Governmental Influence on Plasbox & GZsoft**

### ***Significance of institutional influence in ES innovation***

The Western focus on the user company is problematic in the context of Chinese SMEs. As suggested in the literature (Hassard et al. 2008), developing countries traditionally have stronger governmental controls over reform and innovation. China is the same. The different structures of government and degrees of governmental intervention differentiate Chinese institutional context from that in developed economies.

Hillmer (2009) evaluated and compared a wide range of technology adoption theories and models, and subsequently indicated that “all models remain mostly one-sided and limited” (ibid. p.27). Factors such as subjective perceptions and rational interests are commonly identified as the central influence (ibid.). However, in practice, both SMEs and ES vendors are in a relationship and have to make difficult decisions beyond the control of a single party, including policy influences. This research challenges the effectiveness of adoption theories in the context of China SMEs. Dominant theories such as Diffusion of Innovation theory (Rogers 2003), Rational Choice Theory (Scott 2000), Technology Acceptance Models (TAM) (Davis 1989), and derivatives are focused on the user company and are not comprehensive enough in explaining ES engagement in Chinese SMEs. The institutional policy context needs to be taken into account for both the user SME and the ES provider. The fact that the policies for ICT and SMEs in Shenzhen are not as effective as intended is not necessarily a permanent state of affairs.

### ***Issues of policy implementation***

A clear finding of the research is that national policy for ICT enhancement in SMEs is less effective than anticipated. China’s national policy initiatives in this area aim to increase innovation and productivity. Specific initiatives are implemented through the agency of local government and ES providers, which are private companies. The evidence here is that neither SMEs nor ES providers are benefitting from the intended policies. Given the importance of SME sector to the Chinese economy this represents a failure of policy.

Matland (1995) examined the policy implementation literature and identified two streams of work - top-down and bottom-up. Regarding the role of government focus is given to the top-down and most research attempts to indicate potential policy initiatives (e.g. national programmes, projects, guidance, and standards) rather than exploring how these aspects were implemented (Aleke et al. 2011; Ge & Voß 2009). For the most part the results of policy implementation were taken for granted. Matland (ibid p. 146), however, points to the significance of the local level to make policy through their implementation role. Other scholars have identified the crucial role of implementation (e.g. Jong et al. 2016)

Given the above, the implication for practice suggests that the Chinese government should enhance its intervention by introducing more clearly defined guidance for SMEs and mandatory regulations for ES providers for enhanced outcomes. Effective policy implementation requires better coordination and negotiation among central and local government, and user and provider companies. A mechanism of policy evaluation is necessary to collect feedback from lower hierarchical levels to support policy design, and a better supervision of policy implementation is also required.

### ***Limitation and future research***

The main limitation is that although these four cases were situated in the same city, under the same policies it is possible that elsewhere in China the policy implementation issues may not be as severe. Replicating the study in a different province would be helpful to test this. Additionally, the researchers were conscious of the difficulties of accessing sufficient government officials, especially at the local level. Finally, the research has identified the importance of the SME and ES provider relationship and the influence of “subsidy” and “mobilization” and their potential impact on ES adoption. This would provide a basis to design survey based work to a large sample to further develop adoption theory that explicitly recognises the institutional policy context.

### **References**

Ahmad, M.M. and Cuenca, R.P. 2013. “Critical Success Factors for ERP Implementation in SMEs”, *Robotics and Computer-Integrated Manufacturing* (29:3), pp.104-111.

- Aleke, B., Ojiako, U. and Wainwright, D.W. 2011. "ICT Adoption in Developing Countries: Perspectives from Small-scale Agribusinesses", *Journal of Enterprise Information Management* (24:1), pp.68-84.
- Alves, M.D.C. & Matos, S.I.A. 2012. "ERP Adoption by Public and Private Organizations - A Comparative Analysis of Successful Implementations," *Journal of Business Economics and Management* (14:3), pp.500-519.
- Brown, D.H. & Lockett, N. 2004. "Potential of Critical E-applications for Engaging SMEs in E-business: A Provider Perspective," *European Journal of Information Systems* (13:1), pp.21-34.
- Brown, D.H. & Thompson, S. 2011. "Priorities, Policies and Practice of E-government in A Developing Country Context: ICT Infrastructure and Diffusion in Jamaica," *European Journal of Information Systems* (20:3), pp.329-342.
- Buonanno, G., Faverio, P., Pigni, F., Ravarini, A., Sciuto, D. and Tagliavini, M. 2005. "Factors Affecting ERP System Adoption: A Comparative Analysis Between SMEs and Large Companies", *Journal of Enterprise Information Management* (18:4), pp.384-426.
- Davis, F. D. 1989. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly* (13:3), pp.319-340.
- DiMaggio, P.J. and Powell, W.W. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organisational Fields", *American Sociological Review* (48:2), pp.147-160.
- Esteves, J. & Bohorquez, V. 2007. "An Updated ERP Systems Annotated Bibliography: 2001-2005," *Communications of the Association for Information Systems* (19:20), pp.286-446.
- Ge, L.P. & Voß, S. 2009. "ERP Application in China: An overview," *International Journal of Production Economics* (122:1), pp.501-507.
- Hassard, J., Sheehan, J. and Yuxin, X. 2008. "Chinese State-enterprise Reform: Economic Transition, Labour Unrest and Worker Representation", *Capital & Class* (96), pp.31-52.
- Hendricks, K.B., Singhal, V.R. and Stratman, J.K. 2007. "The Impact of Enterprise Systems on Corporate Performance: A Study of ERP, SCM, and CRM System Implementations", *Journal of Operations Management* (25:1), pp.65- 82.
- Hillmer, U. 2009. *Technology Acceptance in Mechatronics: The Influence of Identity on Technology Acceptance*, 1<sup>st</sup> Edition, Gabler.
- Jong, M.D., Yu, C., Joss, S., Wennersten, R., Yu, L., Zhang, X. and Ma, X. 2016. "Eco City Development in China: Addressing the Policy Implementation Challenge", *Journal of Cleaner Production* (134), pp.31-41.
- King, J.L., Guibaxani, V., Kraemer, K.L., McFarlan, F.W., Raman, K.S., and Yap, C.S. 1994. "Institutional Factors in Information Technology Innovation", *Information System Research* (5:2), pp.139-169.
- Li, L., Gao, P. and Mao, J.Y. 2014. "Research on IT in China: A Call for Greater Contextualization", *Journal of Information Technology* (29:3), pp.208-222.
- Malhotra, R. and Temponi, C. 2009. "Critical Decisions for ERP Integration: Small Business Issues", *International Journal of Information Management* (30:1), pp.28-37.
- Matland, R.E. 1995. "Synthesizing the Implementation Literature: The Ambiguity-Conflict model of Policy Implementation", *Journal of Public Administration Research and Theory* (5:2), pp.145-174.
- Merriam, S.B. 2002. *Qualitative Research in Practice: Example for Discussion and Analysis*, 1st Edition, Jossey-Bass, John Wiley & Son.
- Mofcom 2012/15, <http://english.mofcom.gov.cn/aarticle/zm/201205/20120508136044.html>, accessed 26/02/17
- Ramdani, B., Kawalek, P. and Lorenzo, O. 2009. "Knowledge Management and Enterprise System Adoption by SMEs: Predicting SMEs' Adoption of Enterprise Systems", *Journal of Enterprise Information Management* (22:1/2), pp.10-24.
- Raymond, L. and Uwizeyemungu, S. 2007. "A Profile of ERP Adoption in Manufacturing SMEs", *Journal of Enterprise Information Management* (20:4), pp.487-502.
- Rogers, E. M. 2003. *Diffusion of Innovations*. New York, Free Press.
- Scott, J. 2000. Rational Choice Theory. In: G.Browning, A.Halcli, F.Webster (eds.), *From understanding contemporary society: theories of the present*. London: Sage Publications, pp.126-37.
- Scott, W.R. 1995. *Institutions and Organisations*, Sage publications, Inc.
- Srivastava, M. & Gips, B.J. 2009. "Chinese Cultural Implications for ERP Implementation", *Journal of Technology Management and Innovation* (4:1), pp.105-113.
- Technavio 2015, <http://www.technavio.com/report/erp-market-in-china-2015-2019>, accessed 26/02/17.
- Xia, Y.Q., Lok, P. and Yang, S. 2009. "The ERP Implementation of SME in China", 6th International Conference on Service Systems and Service Management, pp.135-140.
- Yin, R.K. 2009. *Case Study Research: Design and Methods*, 4th Edition, SAGE Publishing.