

IT Governance in SMEs: a Theoretical Framework based on the Outsourced Information System Failure

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Abstract

IT Governance in Small and Medium-sized Enterprises (SME) is both controversial and paradoxal. When it comes to IT, SMEs tend to have an idiographic profile with characteristics that differs strongly from larger companies. Although the majorities of organisations comply with the sizing standard of an SME (less than 250 employees) we focus here on family-owned SMEs. In these companies the concept of IT Governance is very elusive if present at all. SMEs tend to be slow adopters of IT but they do invest in strategic IS and face the challenges of adopting IT. However, SMEs depend strongly on external IT expertise for implementing an IS. On the other hand one can observe the vast amount of failed outsourced IS projects in SMEs.

In this work we design a theoretical framework to explain the setting of an SME conducting an outsourced IS project that leads to an outsourced IS failure (OISF). A multiple case study methodology is used to build up the framework. The scene is dominated by two actors: a relatively well informed agent and a less informed SME-principal meeting each other on a typical market. This situation of information asymmetry gives rise to well known problems already predicted by agency theory: moral hazard and adverse selection. However other observable phenomenon's like trust deterioration, misunderstood scope and underfunding of budget can be better explained and/or predicted by other theories. To enlarge the explanatory and predicting power of our framework we draw from four additional theories: Lemon Market Theory (LMT), Prospect Theory (PT), Incomplete Contract Theory (ICT), and Organisational Trust Theory (OTT). The use of different theoretical constructs matches better with the different ways actors deal with the circumstantial settings found in the empirical cases.

We conclude that the framework yields a strong internal validity and enlarges our insight to the level of IT Governance in SMEs based on the sole but rich observation of OISFs. We suggest further empirical research based on the framework to extend the external validity of our framework.

Keywords: SMEs, IS Failures, IS Success, IT Governance, Nomological IS Net

1 Introduction

A lot of scholars posit that SMEs are not little big businesses and the way they deal with IT/IS differs profoundly from large companies (Welsh and White, 1981; Levy and Powell, 2004). Research has also revealed that SMEs depend heavily on external expertise for adoption of IT/IS (Thong et al., 1996). The acquisition of IT/IS in SMEs is mainly done by program management outsourcing including use of vendors. In those cases, vendors are responsible for managing and completing the work (Dibbern et al., 2004).

We focus here on outsourced IS failures (OISF) in SMEs (Devos et al, 2008). An OISF occurs during an outsourced IS project. Research has revealed that outsourcing increases the risk of an IS failure (Natovich, 2003; Aubert et al, 2003).

A failure stance to investigate IT Governance in SMEs is interesting in many perspectives. From an empirical point of view, OISFs are often well documented since most are brought to court with an expert opinion for dispute resolution. These procedures require many documental data that can be harvested for research purposes.

Another interesting perspective is the special attention failures get compared to successes. Other than a success, one is more interested why an IS has failed especially if money has been squandered. Successes have a more summative nature as if they are taken for granted and failures are more evaluated in a formative way (Lyytinen and Hirschheim, 1987).

Thirdly, and this is the most interesting perspective, IS failures have a temporary nature and enterprises must recover from them. This goes to the quintessence of IT Governance. The level of IT Governance before and after an IS failure is well worth looking at, to learn about the efficacy of the current IT Governance mechanisms.

So our research questions are why and how IT projects fail in SMEs. The formative evaluation of IS failures tends to go for a more qualitative nature of the inquiry. To explain causes leading to OISF we conducted a multiple case study of five failed IS projects in SMEs. The cases are carefully selected for their potential explanation power. In this paper we present a theoretical framework build up from empirical findings to explain the setting of an SME conducting an outsourced IS project that leads to an OISF. The foundation of the framework is the nomological IS-net developed by Benbasat and Zmud (2003) and Principal-Agent Theory. The framework is refined with constructs derived from the Lemon Market Theory, Prospect theory, Incomplete Contract Theory and Organisational Trust Theory.

The paper is organized as follows: in the next paragraph we bring a literature overview on the theories that have been used to explain phenomenon's leading to an OISF. In part three we give an outline of our research methodology. We present our framework in part four followed by a discussion and our conclusions in part five.

2 Literature Overview

Research on SMEs and IT is initiated by the seminal work of Ein-Dor and Segev of 1978 where organizational size was negatively related to success of IS (Ein-Dor and Segev, 1978). Although Ein-Dor and Segev did not give a definition of success, it was well understood that IS success is elusive to define. Positive impact of IS in organisations is often seen as IS success. Early literature on SMEs and IT therefore focus strongly on use and success of IS (Raymond, 1985; Yap et al, 1992). Up to date there is still little consensus on the appropriate measures of IS success. A well known theory for IS success is the DeLone and McLean IS success model (DeLone and McLean, 1992, 2003).

Another perspective of looking upon organizational impact of IT, but leading to a different stream of research is focussing on IS failures (Lyytinen and Hirschheim, 1987; Sauer, 1993). Although concepts of success and failure are not bipolar in nature, Lyytinen and Hirschheim argue that 'whatever can be said about evaluating IS success can also be used for understanding IS failure' (Lyytinen and Hirschheim, 1987). Lyytinen and Hirschheim designed a classification framework for IS failures based on the notions of IS use and IS development as the foci of organisational action. These concepts are partly recycled in the concept of the IT artifact and its immediate nomological net or IS-net (Benbasat

and Zmud, 2003). This nomological net was refined by Gable et al. by bringing in constructs from the Delone and McLean IS Success model (Gable et al 2008). Figure 1 presents the original, and figure 2 presents the refined nomological IS-net. The foundation of our framework starts with the nomological IS.

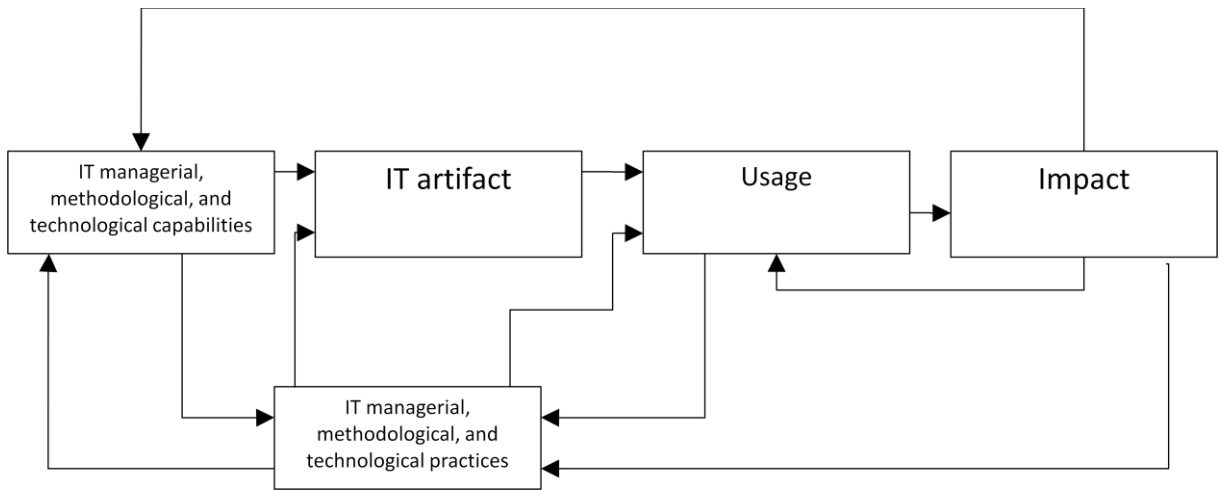


Figure 1: The Nomological IS Net (Benbasat and Zmud 2003)

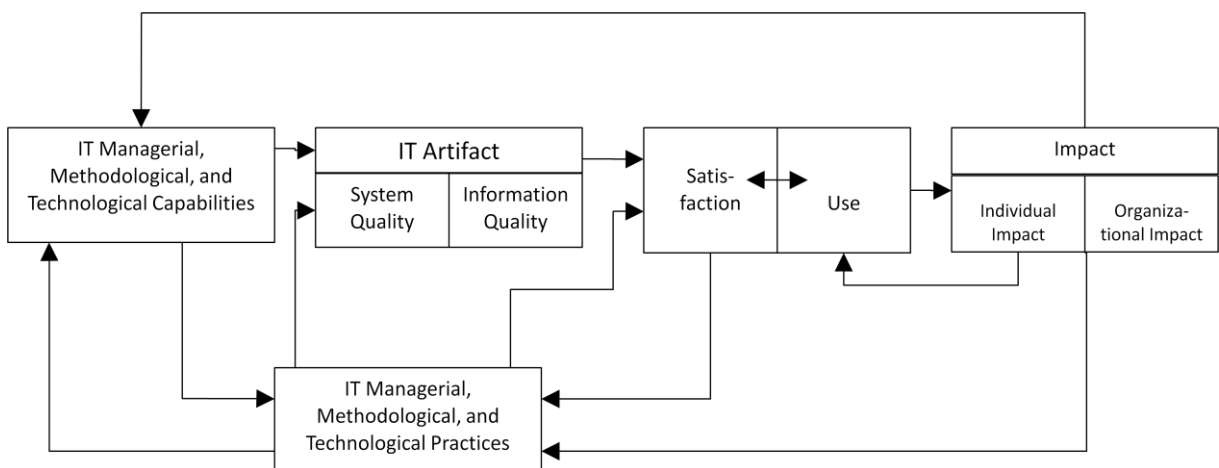


Figure 2: The refined Nomological IS Net (Gable et al. 2008)

Principal Agent Theory (PAT)

A theory central to Western management thinking and one of the cornerstones for governance is PAT (Eisenhardt 1986). Its original setting was the firm's owner(s) as the principal and the manager(s) as the agent. PAT and derivative theories like control theory are very popular theories used in IS research (Aubert et al. 2003, Choudhury and Sabherwal 2003). PAT is seen as a foundation for IS outsourcing (Dibbern et al. 2004). However its contribution is not always very clear since the excessive truth-claims of PAT are based on analyses in environments other than IT/IS.

PAT views problems in outsourced environments as results of three factors: goal differences, risk behaviour differences and information asymmetry. It is assumed that the agent (vendor) has private information that is not available to the principal (SME). According to PAT, agents can therefore act in their own best interest and expose opportunistic behaviour which can lead to moral hazard ex post

and the adverse selection ex ante. In those situations the best solution is to link the reward of the agent to the outcome and establish an outcome-based contract between parties.

We argue that PAT acts strongly as a basic theory for explaining behaviours of the SME-principal and the vendor-agent in a joint IS project leading to OISF. However it was also discovered that in outsourced IS projects, opportunistic behavior is bidirectional and the risk behavior of principal and agent differs from that predicted by PAT (Devos et al, 2008).

Market for the “Lemons” theory (LMT)

The market for “Lemons” is a theory on quality uncertainty and responding market mechanism (Akerlof, 1978). According to LMT there is incentive for vendors selling poor quality where quality of services is linked to an entire group rather than to an individual vendor. This phenomenon was already noticed on IT markets. During the last 10 years, a lot of top ranked ERP system suppliers have tried several times to enter the SME market unsuccessful and returning back to more mature markets (Byron, 2007; CNET Networks, 2008).

LMT offers an extra explanation for the adverse selection since it illustrates that there is always incentive as long as the SME-principal is not willing to pay the cost to fade out information asymmetry and thus creating an ideal environment for OISFs.

Prospect Theory (PT)

PT was developed by Tversky and Kahneman (1979) as a falsification for the Expected Utility Theory (EUT) of Von Neumann and Morgenstern (Currim and Sarin, 1989). PT has already been used in IS research (Keil, 2000; Rose and Rose, 2004).

PT states that decision making is a two phase process. The first phase is an editing phase, where a proposal is framed in either a positive or negative way. The actual decision making is done in the second phase which depends largely on the framing of the proposal. In decision making under risk, where losses loom larger than gains, people tend to search for certainty. So positive framing of proposals can largely influence the decision.

The implementation of an IS is an endeavour with a considerable amount of risk involved (Schmidt et al, 2001). Since most SMEs depend largely on external agents for adoption of IT/IS there is a process of selection conducted. SMEs tend to explore the market by RFPs (Requests for Proposal). Due to information asymmetry, proposals of ISVs cannot be sufficiently screened by SMEs on real content. Proposals are therefore mostly framed in an extremely positive way to evoke the certainty effect by the SME-principal.

Incomplete Contract Theory (ICT)

Incomplete Contract Theory was first mentioned by Hart and Moore in 1988 (Hart and Moore, 1988). It describes the construction of contractual agreements in the presence of information asymmetry. The asymmetry obviously lies in the principal's inability to correctly measure and observe the outcome of the agent's actions but also in agent's lack of information about the real objectives of the principal.

It is not feasible to write a 'waterproof' contract, since it would simply cost too much time, effort and resources to deal with all contingencies that arise during an IS project. A complete contract would specify all legal consequences of every possible state of the project, it is clear that for IS contracts this is not possible. Both parties would still be subject to bounded rationality as well. Anderlini and Felli state that: 'the contracting parties may lack the necessary degree of rationality necessary to describe exactly the various states of nature in the ex-ante contract they draw up' (Anderlini and Felli 2004).

In situations of information asymmetry, the best solution from the principal's perspective is an outcome-based contract. However, this is not true for the ISV-agent who will strive for a behaviour-based contract. So it is most likely that parties will end up with a highly incomplete contract. Once the contract is signed both parties are locked into each other and must rely on other collaboration mechanisms than those stipulated in a written incomplete contract.

Organizational Trust Theory (OTT)

The concept of trust is crucial in business interactions characterised by mutual dependency combined with a lack of mutual control. According to Reed 'the essential character of all trust relations is their reciprocal nature. Trust tends to evoke trust, distrust to evoke distrust.... As trust shrinks, distrust takes over.' (Reed, 2001).

Although there is agreement on the importance of trust there also appears disagreement on the definition of trust. A working definition, already used in IS research and most suitable for our empirical setting, is given by Gefen: 'Trust is the belief that others upon whom one depends, yet has little control over, will not take advantage of the situation by behaving in an opportunistic manner but, rather, will fulfil their expected commitments by behaving ethically, dependably and fairly especially under conditions involving risk and potential loss' (Gefen 2004).

Trust can occur on the personal level or on the organisational level. The concept of personal trust seems to be relevant in family-owned SMEs since in those organizations the central role of the CEO has been identified as a key factor for effective IS implementation (Thong et al. 1997). However, Zaheer et al. found that interpersonal and organizational trust are highly correlated (Zaheer et al. 1998).

3 Research Methodology

Our research strategy consists of building theory from case studies using multiple cases (Eisenhart, 1989, Eisenhart, 2007). Case studies contain empirical descriptions of instantiations of phenomena. In this work we use five contemporary cases of OISFs in SMEs from where we develop theory inductively. We believe that large-scale hypothesis testing in SMEs where OISFs occur is highly unfeasible for a number of reasons. First, the empirical data on the phenomena cannot be easily revealed by surveys. SMEs are not eager to testify and offer valuable documents on a failure. In this work we used unique project documentation, including minutes from steering committees, interviews, and formal letters that were brought into litigation. Secondly, we believe that the data is too rich to be captured in a comfortable amount of variables and still reflecting the richness of the phenomena. Finally we are conducting phenomenon-driven research in an area in its infancy with a lack of plausible existing theory. So an inductive methodology was used to address this shortage.

We consider the OISF in an SME as a phenomenon to learn more about the much broader phenomenon of IT governance in SMEs. Our framework is built up from the five aforementioned theories together with extant literature on SMEs and IT. We induce propositions and match them with empirical findings. The cases are briefly described and can be found on: http://docs.google.com/Doc?id=drvq7vr_57d85p9bcv. To match empirical findings with theoretical propositions we used the work of Schmidt et al. as guidance and use their list of software projects risk factors (Schmidt et al, 2001). We selected risk factors that were relevant in an outsourced environment and added some extra risk factors relevant within the principal-agent setting. We coupled every risk factor to an explaining theory or findings in extant literature. Next we searched into our case databases for instantiations of selected risk factors.

4 The OISF Framework

The OISF framework is shown in figure 3.

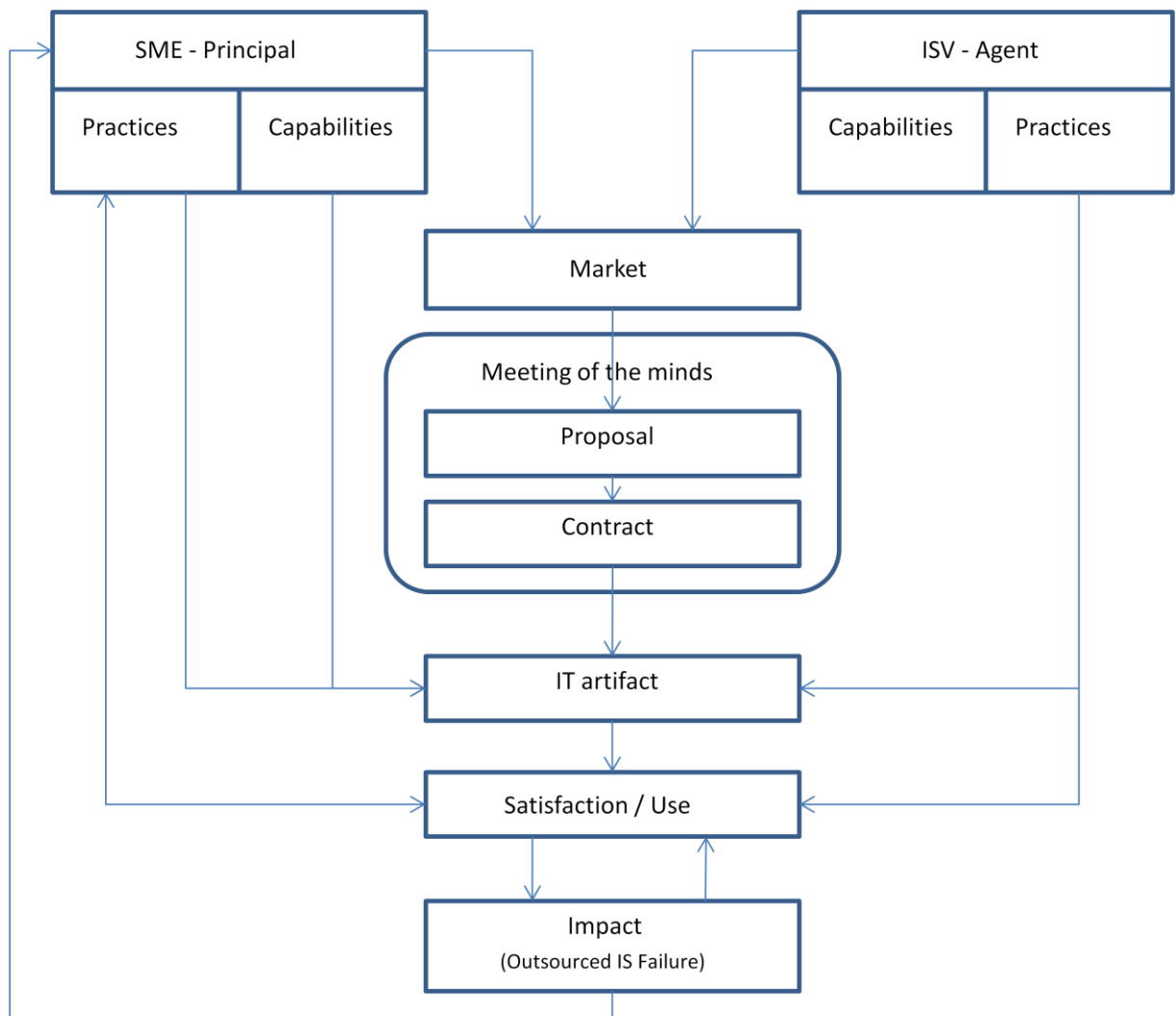


Figure 3: The Outsourced IS Failure framework

The interrelated constructs of the framework are:

- A *risk neutral SME-principal* and a *risk averse ISV-agent*, both with managerial, methodological and technological capabilities and practices involving planning, designing, constructing and implementing IT artefacts.
- A *market* where SME-principals and ISV-agents meet.
- A *meeting of the minds* where SME-principals and ISV-agents contract with each other.
- An *IT artefact* which is human constructed, utilitarian and not neutral.
- The *use and user satisfaction* of the IT artefact, including the development and the implementation trajectory.
- The *impact* of the IT artefact (direct and indirect, intended and unintended) on the organisation. An OISF is considered as having an impact on the organisation.

4.1 The SME principal

An SME is considered as a risk neutral principal taking an entrepreneurial risk by adopting IT. We do not go into explanations why and how an SME make the decision. We assume the SME has the necessary capabilities to come to an IT investment decision and is willing to take entrepreneurial risk.

The IT adoption process involves the implementation of an IT artefact in an outsourced environment. This means the implementation of an ERP, MES, CRM or SCM software package or the development of customized software or a combination of both. The strategic dimension of the investment implies that the SME perceives the IT artefact as having a profound impact on the performance of the organisation.

Characteristics of the SME principal stated by PAT are:

- Constrained by bounded rationality and self-interest
- Cannot observe the outcome
- Cannot verify behaviour of ISV agent

Characteristics of the SME principal revealed by extant research on SMEs and IT are:

- Bound to go to the market for external IS expertise
- Resource poverty: lack of IT skills, knowledge and financial resources

Observations of the empirical findings were:

- Unclear or misunderstood scope and objectives
- Poor or non-existent control
- Hidden intentions
- Lack of effective project management skills and methodology
- Mismatch between company culture and required business changes for the new system
- Lack of inadequate user involvement
- Lack of appropriate experience of user representatives
- Poor risk management
- Distrust ISV-agent
- Low managerial IT capabilities and practices

We derive the following hypotheses:

H1. To avoid OISF, SME-principals should have CEOs who are personally committed to IS projects.

H2. To avoid OISF, SME-principals should have effective project management skills.

H3. To avoid OISF, SME-principals should be convinced that an outsourced IS project is a joined endeavour between two collaborating partners and should to be managed towards an equilibrated balance between control and trust.

4.2 The ISV-agent

For most IS projects, there is a multitude of potential vendors that differ in quality and capability to serve SMEs. ISVs are certainly not a homogeneous group with similar characteristics.

Characteristics of the ISV-agent stated by PAT are:

- More risk averse than principal
- Constrained by bounded rationality and self-interest
- Potential to express opportunistic behaviour

Characteristic of the ISV-agent revealed by extant research on SMEs and IT are:

- Quality of the ISV agent difficult to assess

Observations of the empirical findings were:

- Unclear or misunderstood scope and objectives
- Poor or non-existent control
- Hidden intentions
- Lack of effective project management skills and methodology
- Lack of required knowledge skills in the project personnel
- Lack of 'people skills' in project leadership
- Insufficient/inappropriate staffing

- Staffing volatility
- Poor risk management
- Distrust SME-principal

We derive the following hypotheses:

H4. To avoid OISF, ISV-agents should have a profound capability maturity level on project management.

H5. To avoid OISF, ISV-agents should avoid all distrust mechanisms vis-à-vis SME principals.

4.3 The Market

The market is characterised by constructs induced from both PAT and LMT. The less informed principal goes to the market with the intentions of keeping IT adoption costs as low as possible; this contrasts with the intentions of the well informed agent who will sell projects as lucrative as possible. ISV-agents will show their quality and that of their services to SME-principals. ISVs tend to reflect their quality to that of top ranked IS/IT suppliers like SAP, Oracle and Microsoft by forming business partnerships with them. In that perspective they capture parts of the quality of their suppliers. However, since most ISVs are SMEs themselves and operate mainly on domestic markets they perform on a far less mature capability level than their business partners and are often inadequate to deal with the demands and complex challenges of an IS project.

Since SMEs are not so well informed on the correct capabilities of ISVs, a situation of severe information asymmetry occurs leading to opportunistic and unethical behaviour. A remarkable phenomenon here is the vendor lock-in where an ISV creates a situation of single sourcing by tying a SME-customer to his unobservable but necessary services. The vendor lock-in was identified as a major risk factor in IT outsourcing (Aubert, 2005).

With the quality of the ISV ex ante linked to the perceived quality of major IT/IS suppliers, a situation described by Akerlof as the market for Lemons occurs. SMEs are not willing to pay a fair price for top quality consultants, which would be the best solution in a situation of complete information symmetry. Instead, SMEs are only paying an average and lower price for consultancy which attracts 'lemons' or poor quality consultants and rule out top quality consultants. An interesting phenomenon is the 'Winner's Curse'. The Winner's Curse arises as suppliers make unrealistic bidding promises to ensure they win the contract, but already know, or subsequently discover, that they are unable to recover their tendering, business and operational costs for the near future. (Kern et al, 2002).

Characteristics of the SME-ISV market are:

- Goal conflict
- Information asymmetry
- Quality of ISV-agent is not observable
- No legal or governmental regulations

The SME-ISV market is difficult to observe based on risk factors; however observations of the empirical findings can give some evidence. A noticeable sign of the Lemon market is observable in the tendering phase. The (fixed) prices of the proposals of the competing ISVs lay often within a wide price fork where the highest bidder is sometimes up to several times more expensive than the lowest.

4.4 The Meeting of the Minds: Tendering and Contracting

At a certain moment the SME-principal and the ISV-agent will have a meeting of the minds. This is the moment where both parties are willing to contract. The risk for the adverse selection is now extended by the LMT-situation of market.

The process of contracting is preceded by a proposing phase. The main characteristic of the proposal phase is a positively framed proposal and for the contracting phase, an incomplete contract, based on the positively framed proposal. Contribution for explaining the meeting of the minds construct comes from PT and ICT. Most noticeable signs of positive framing are proposals with fixed prices. Although many work is still to be defined and the scope is far from stable, agents offer already fixed prices.

It is almost impossible to reveal real costs and benefits of an IS project in an initial phase. Costs and benefits do not occur in the same time frame – costs tend to be up-front and intangible, whereas benefits tend to be back loaded and intangible (Laudon and Laudon, 2006). The benefits depend more on future IS use than on the IT artefact itself.

True costs and benefits are not expressed in most proposals. Examples of 'forgotten' costs are coming from organizational disruptions created by the new system, learning curve costs and their impact on productivity and extra management costs. Real benefits are seldom expressed in a proposal since there is also a situation of information asymmetry vis-à-vis the SME-principal. SME-principals do not always reveal all necessary information to the agent for making an optimal proposal.

This is also an ethical discussion, since capable agents are well aware of the true nature of costs and benefits of IT/IS. For some OISFs, courts has already mentioned the legal obligation of the ISV to discourage immature SME-principals to start an IS project.

Observations of the empirical findings in the tendering phase were:

- Lack of due diligence
- Principal has private information
- Agent has private information
- Underfunding of budget
- Artificial deadlines
- Unrealistic cost estimates
- Poor risk management

Observations of the empirical findings in the contracting phase were:

- Fixed price contracts
- Artificial deadlines
- Lack of control objectives
- Poor risk management
- No planning or inadequate planning
- Unclear qualification of contract (behaviour or outcome based)

We derive the following hypotheses:

H6. To avoid an OISF, both parties should avoid fixed price contracts.

H7. To avoid an OISF, both parties should make renegotiable contracts

4.5 The IT artefact

The IT artefact is often reduced to surrogate measures and taken for granted (Orlikowski and Iacono, 2001). In this work we go for an explicit articulation of the IT artefact. IT artefacts here observed are ERP and CRM systems and are embedded in SME organisations, used by people and therefore also shaped by their interests. We focus on IT artefacts as complete, organisational-oriented systems consisting of software applications with the underlying hardware infrastructure. However in our empirical data the software applications are predominant.

Observations of the empirical findings were:

- Introduction of new technology
- Instability of technical architecture
- System is too complex or sophisticated

Surprisingly the IT artefact itself does not attribute much to the OISF, although we observe a lot of complaints on large bug lists and underperforming hardware.

A hypothesis derived from the framework on the IT artefact is:

H8. To avoid OISF, specific IT artefacts should be made for SMEs with less sophistication and build up from their specific business requirements.

4.6 The Usage of the IT artefact

The use construct incorporates the implementation and development process. These processes can be seen as an IT artefact in transition. Although we can see that the seeds of a failure are planted in the preceding phases, OISFs tend to come to the surface in this phase.

Both parties strongly focus on the project and not as much on their relationship. They find it difficult to cultivate a trusting relationship since neither of them has full control over the project. Sabherwal states that interorganizational relationships involve a psychological contract and a formal written contract. The written contract is negotiated and well understood, while the psychological contract consists of unwritten and largely unspoken sets of expectations held by the transacting parties about each other's prerogatives and obligations. IT Governance in an outsourced environment requires dealing with both types of contracts. Trust supports the psychological contract and limits the need for structured controls by reducing the perceived need to guard against opportunistic behaviour when unexpected changes occur (Sabherwal 1999).

Observations of the empirical findings in the use phase were:

- Hidden actions of principal en agent
- Scope creep
- Lack of effective project management skills/methodology
- Failure to manage end-user expectations
- Lack of control over consultants, vendors and subcontractors
- Changing objectives
- External dependencies not met
- Multiple vendor projects

Hypotheses derived on the usage of the IT artefact are:

H9. To avoid OISF, SME and ISV should work together in a spirit of collaboration and openness and keep the balance between control and trust equilibrated.

4.6 The Impact of the IT artefact

The impact of the artefact is a measure at a point in time of the stream of net benefits to date and anticipated as perceived by all key user groups. This 'overall' impact can be split into individual and organisational impact. An OISF is an unwanted impact of the IT artefact on the organisation. The real success of the IS is grounded in the IT artefact but goes over the use phase to the impact (organizational and personal) phase.

5 Discussion and Conclusion

A generic framework for detecting OISFs has been outlined in this paper. The basic underpinning lays within the nomological IS-net added with constructs from five theories already used in IS research. The basic theory for setting the scene is PAT. The market where SMEs acquire IS/IT is characterised as a market for Lemons, where ripe and green walk next each other. To get a deeper understanding of the nature of the meeting of minds, we draw from PT and ICT. Finally IS usage can be conducted with mechanisms from OTT.

A great deal of risk of evoking an OISF is attributable to the inadequate IT practices and capabilities of SME-principal and ISV-agent. Other risk factors are located in the stages between propositions and deploy of the IT artefact. We argue that in the earlier phases the seeds of possible failure are planted.

The hypothesis of a lemon market can only be partly supported from findings in real life cases. However, many risk factors relating to the meeting of the minds and the proposal constructs originate in the lemon market theory.

We strongly argue that the market be controlled and regulated by local governments. Beside incentive programs for SMEs to promote adoption of IT/IS, we believe that there is also a strong need for specific quality and certification programs for ISVs serving SMEs. However, a stream of literature indicates that many government programs are not so successful (Martin and Matley, 2001; European Commission, 2003; Cuadrado-Roura et al., 2004).

The contributions of our framework are threefold. First, the framework is constructed solely from an SME perspective that draws on a qualitative approach of real business cases. Adoption of IT in SMEs is often explained with validity claims coming from theories build up from observations in large organisations. Especially the literature on IS failures is primarily based on large IS projects failures with low affinity to SMEs.

Secondly the framework is generic and not based on particular technology. The unit of analysis is the IT artefact within an SME environment. The IT artefact covers many technologies, although we do not take a nominal view of the IT artefact, we focussed on software application.

Thirdly the framework allows for spelling out the characteristics of IT Governance in SMEs. The focus on OISF allows a complete view of IT Governance since it encompasses the complete cycle of plan-do-run and check.

The cases discussed in this paper indicate the general applicability of the framework to different situations. However further research is needed to test the induced hypotheses. We call upon future research to elaborate on the framework and develop it to greater level of sophistication and generalisation.

Since many countries in the new economy depend largely on SMEs for the creation of new jobs and the uptake of the knowledge economy our findings can also be of help in the development of appropriate supporting programs by government agencies. Finally our work can be of interest for IT practitioners working in SMEs. Extra care is needed, since most of the methodologies used there do not have an empirical theoretical foundation grounded in an SME environment.

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