Sourcing Decisions of Software Applications Hosting – What Influence has e-Government Services

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Abstract. There are a lot of reasons reported for why organisations start a sourcing decision. This paper discusses this theme based on two questions: Does the need and/or wish to increase e-Government services influence the start of a sourcing decision process aiming at reorganising hosting of software applications and if it does, how does it influence the start of such a decision-making process? The point of departure, besides a literature review, is a sourcing decision-making process in a Swedish municipality. When analysing the sourcing decision, five suggested propositions developed from the factors: control, core competence, capability, cost, and strategy, are used. It is concluded that municipalities in Sweden has to prepare for being more of an e-Government organisation, which means that more of the services the municipalities’ employees has done before citizens will do by themselves. This demands that to be able to offer future e-Government services municipalities need to have control over software applications. From this study it is suggested that centralisation of hosting can be seen as decentralisation of work tasks from an e-Government perspective.

Keywords: Centralisation, Decentralisation, e-Government, Hosting of software applications, Reasons for reorganisation of hosting, Sourcing decisions.

1 Introduction

There are a lot of reasons reported for why sourcing decisions are made (Dibbern, Goles, Hirschheim and Jayatilaka 2004). Sourcing in this paper is a generic term for outsourcing, insourcing, external service provision and so on. Sourcing decisions are decisions made in organisations whether too buy or produce services that they need. This paper suggests and discusses five propositions developed from the five factors: control, core competence, capability, cost, and strategy, often reported as influential in a sourcing decision process aiming at reorganising hosting in organisations (Johansson 2004). Hosting in this paper is defined as localisation. It can be said that irrespective of what products or services organisations they need have two distinct options, to buy or to produce. This distinction is discussed in, for instance, transac-
tion cost theory as a distinction between market and hierarchy (Williamson 1985) and by Kishore, Agrawal and Rao (2004) as market governance and hierarchical governance, and can be compared to a decision whether organisations should handle hosting of software applications external or internal. It could also be compared to if hosting should be more or less centralised respectively decentralised.

From the five propositions the focus is on the connection to delivering e-Government services. The question is how the start of a sourcing decision-making process, when deciding on how to host software applications in the future, is influenced from the need to increase e-Government services. The paper uses a sourcing decision-making process in a Swedish municipality to discuss this. The question to a high extent depends on what e-Government stands for. The definition we adopt is: “e-Government is the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees” (Silcock 2001 p 88). Evolution of e-Government is described in different ways, and several stage models have been presented, for example by Layne and Lee (2001). From the definition of e-Government it could be said that e-Government is about how organisation uses its information and communication technologies (ICTs) resources with the aim of reducing its internal workload and at the same time letting the customer (citizen) to the organisation help themselves. E-Government is thereby strongly related to hosting, though customers use software applications and receive services from software hosted by the organisation they interact with. This means that the users of the software could be seen as external by the organisation that delivers the possibility to use the software. In that way this can be related to for instance outsourcing or the usage of external service provision. A commonly quoted reason when organisations decide on adopting or non-adopting external service provision is control (Jurison 1998). This can be described as an organisation that investigate and think about using an external service provider for the hosting often is doubtful about doing so because of the perceived risk of losing control. Control in this case can be compared to questions about security and protection. And how an organisation secure and protect its ICT resources can to a great extent be related to hosting of the resources. Based on this discussion, the paper deals with the following research questions: (1) Does the need and/or wish to increase e-Government services influence the start of a sourcing decision process aiming at reorganising hosting of software applications and (2) if it does, how do decision-makers thought of e-Government influence the start of such a decision-making process?

The paper is organised in the following way. Section two describes five propositions developed from reported reasons in the literature of why organisations start a sourcing decision process. Section three introduces the research design and the case followed by a description of the sourcing decision-making process conducted in the municipality. Section four delivers an analysis and discussion about why the sourcing decision-making process in the municipality started. The final section summarises the paper, give some conclusions that can be drawn from the study together with some issues for further studies.
2 Why Do Organisations Start a Sourcing Decision Process?

The need to increase control is often one reason suggested for why sourcing decision processes start. Control could be either to control the cost of using software applications, or to control the actual usage of the software applications. The latter could be described as a need to control what, when and how the software application is used, so that the software application support the business processes in the organisation. Control can be compared to governance. Weill and Ross (2004) describe ICT governance as decision rights regarding ICT management and they define ICT governance as “specifying the decision rights and accountability framework to encourage desirable behaviour in the use of ICT” (2004 p 8).

Governance, in this context, is about controlling what happens in the organisations and especially how organisations make the best use of ICT. It could be compared to centralisation as well as decentralization, and it can be suggested that in order to increase control (from a specific decision-makers point of view) centralisation of resources are made. It can also be said that the lack of control to a great extent can be traced back to decentralisation of ICT. However, as Simon (1960; 1997) and Markus (1984) say, centralisation or decentralisation is not a question for organisations whether they should centralise or decentralise. Instead it is a question of how far they should go with the decentralisation or centralisation. This means that for organisations’ that need to improve control, centralisation is one way to do that. It can be proposed that the most centralised hosting option is outsourcing. This means that organisations that want to control their software applications outsource to a greater extent than other organisations does. However, it also means that there is a need to have control over software applications before outsource. This discussion can be summarised as: organisations need to increase control over usage of software applications because they have decentralised hosting to a great extent. In order to increase control and thereby governance outsourcing is a feasible sourcing option. However, to be able to have a successful outsourcing the organisation need to have a certain degree of control, and the first step in outsourcing can therefore be said is to do an internal restructuring. Control then refers to both cost control, control over the usage, control over what software applications that are used as well as control over versions of software applications. What can be concluded is that evolution of ICT has made this possible to have, without making increased level of control to become a hindrance for the organisation’s development. From this discussion the following proposition can be formulated:

**Proposition 1:** A sourcing decision process starts because organisations need to improve their control/governance of the software applications used in the organisation.

Another reason often suggested for why sourcing decision processes starts is influences from stakeholders stipulating that the organisation should focus on its core competence. However, this depends to a great extent on how core competence is defined. Axelsson and Wynstra define core competence as: “the most critical and most distinctive resources a company controls and which are the hardest for others to copy when they are in a number of processes connected to the relevant strategic
goals which the company pursues” (Axelsson and Wynstra 2002 p 72). Kakabadse and Kakabadse (2002) say that one key driver for using external service provision is a desire to focus on core competences. Dewire (2001) says that an organisation should adopt external service provision if ICT is not a core competence. Aalders (2001) proposes that ICT outsourcing makes it possible to focus on core competence as well as increase control of the cost and quality of ICT. Besides that it gives the buying organisation access to skilled personnel and ICT competence. This latest statement can be compared with another commonly quoted reason for ICT outsourcing, which is that ICT outsourcing increases flexibility in handling personnel and offers increased competence regarding ICT.

Despite the discussion above it can be said that the start of hosting decisions is influenced by a desire to focus on core competence. It can be described as influencing the start of a sourcing decision because decision-makers see this as a way of focussing on the organisation’s core competence. From this discussion the following proposition can be formulated:

Proposition 2: The decision-makers’ view of hosting as part or not part of the organisation’s core competence influences the start of a sourcing decision process with the aim of focusing on core competence in the organisation.

The need to increase capability and especial capability received by usage of software application influence the final decision in a sourcing decision-making process to great extent (Johansson 2004). If capability also influences the start of the process is dependent on if decision-makers see it as possible to increase the organisations capability gained from software applications usage or not, and if a change in hosting is needed. It is also dependent on the decision-makers thoughts about how different sourcing options impacts and influences the possibility to increase capability, which indicate that if decision-makers not are satisfied with received capability from software application they start a sourcing decision-making process.

From the capability perspective another reason for why organisations start a sourcing decision can be suggested and that is that decision-makers see internal ICT departments as unresponsive to organisational needs (McLellan, Marcolin and Beamish 1998). Organisations want a flexible ICT organisation and the sourcing decision process is started with the aim of investigating how different sourcing options increases flexibility. A change in the structure of the organisation and the usage of external service provision is seen as a way of reaching this. A commonly quoted reason for ICT outsourcing is that ICT outsourcing provides increased flexibility to cope with changes in technology and in the business environment. Paradoxically the traditional ICT outsourcing agreement is based on long-term contracts that rather tend to inhibit than facilitate change (Shepherd 1999). The aim of the sourcing decision process can be said to investigate if external service provision is a way for organisations to take advantage of the rapidly changing opportunities in ICT (Currie and Seltsikas 2000; Turban, McLean and Wetherbe 2001), and if it can assist organisations with ICT skills, especially in the development and software maintenance areas (Kern, Lacity, Willcocks, Zuiderwijk and Teunissen 2001). According to Mata, Fuerst and Barney (1995) organisation of resources is closely related to competitive
advantage, and it can be proposed that having competitive advantage is having capability. Based on this discussion the following proposition is formulated:

**Proposition 3:** The start of a sourcing decision process on hosting of software applications is influenced by a need to increase organisational capability through its usage of software applications.

One of the most described reasons for outsourcing is that organizations thereby reduce costs (Cronk and Sharp 1995). But, as Lacity and Hirschheim (1993) say outsourcing has not fulfilled the cost saving as expected. From this it could be asked how the cost perspective influences the start. A related factor to cost is capability, since if there were no cost limitations, organisations could have the capability they wanted. But this is not the case and therefore it can be implied that a reason for starting a sourcing decision process could be that the organisation needs to decrease costs. The reason is that a lot of resources are spent on maintenance of ICT and software applications in organisations (Brandt, Carlsson and Nilsson 1998). One of the most reported reasons for why organisations make a restructuring is that they want to decrease costs (McLellan et al. 1998). Leffler (1987) argues that in most enterprises the cost for maintenance of ICT amounts to 50 to 80 per cent of the ICT budget. Bearingpoint (2004) suggests that 57 per cent of organisations ICT budget goes to support and maintenance, and it can be said that to decrease cost of ICT, savings on hosting would be fruitful. From this it could be suggested that one reason for starting a sourcing decision is that the organisation needs to decrease its costs of hosting, since hosting is a work task that spend a lot of resources and thereby costs a lot of money in organisations. This indicates that cost probably has the clearest connection to the final choice of solution and also the closest connection to a clear assessment of the outcome of a sourcing decision. In other words this means that the option that has the lowest cost is the one that are finally chosen. Based on this the following proposition is formulated:

**Proposition 4:** The start of a sourcing decision process on hosting of software applications is influenced by a need to decrease the costs involved in the hosting part of software applications.

An organisation’s strategy can also be suggested as a starting point of a hosting decision. It could be clearly stated in the strategy that hosting of software applications is not something the organisation should do. If that not is the case it could be clearly said that the organisation should not deal with questions regarding ICT resources. But, these clearly stated strategies are probably rare. However, in most organisations there exists some kind of strategy, which could be expressed in a written document or just existing in the head of some decision-maker. In any case it can be said that strategy probably plays an important role when it comes to why organisations start a sourcing decision. This can be described as strategic architecture. According to Hamel and Prahalad (1994) strategic architecture is the link between the now and the future. It could help decision-makers to structure the organisation so that it starts to build the competencies that are needed in the future. Relating this to hosting decisions it could be that hosting decisions is initiated from a decision-maker’s thoughts about the future and could be seen as an approach for developing future opportunities.
However, this probably depends on the size and structure of the organisation but also what role hosting plays in the organisation. This could be compared to a discussion about emergent strategy (Mintzberg and Quinn 1996). If the hosting structure is a result from an emergent strategy (the structure emerged from a set of different decisions) this probably demands a reorganisation and a reason to reformulate the organisation’s strategy. From that point the start of a sourcing decision-making process could be seen as departure from a change in strategy. From this discussion the following proposition can be formulated:

**Proposition 5:** An organisation’s strategy acts as the main influence on why a sourcing decision process is started.

This paper has so far discussed why organisations start a sourcing decision process. From that discussion theoretically grounded propositions have been presented. The next section presents a case study of a sourcing decision process.

### 3 The Municipality Sourcing Decision Case

#### 3.1 Case study introduction and research design

This section reports from a retrospective case study of a decision-making process done in a Swedish municipality. In 2002 the municipality, a local government, started to investigate how they should organise its hosting of software applications. The case study of this process consists of eleven semi-structured, tape-recorded, and transcribed interviews. The interviews were made in January 2005, just after the decision-making process was finalised. The material under investigation also consists of documented materials in the form of minutes, reports from investigations made by the participants in the decision-making process, and an external consultancy report. A qualitative content analysis (Krippendorff 2004) was made based on the multiple data sources; typical of case studies (Stake 1994). The propositions presented in the section above have been used to structure the analysis and should be seen as a point of departure for the analysis. The propositions have been used as a theoretical lens (Walsham 1995) when analyzing empirical data. The motivation for the use of the pre-defined propositions when analyzing empirical data also follows the arguments proposed by Walsham (1995) – to take account of previous knowledge and studies. Of course there is also a well-known danger in doing this – the fact that we risk to see only what the propositions focus.

According to Pettigrew (1973), it is important to describe and understand the history of the organisation if a decision-making process and the reasons for starting the process should be described in an appropriate way. The history of the municipality can be described by its ideology, which is to strive for a great extent of decentralisation. The municipality administrative unit consists of eleven different offices. Six of these offices are organised into one group, the municipal executive office. The other five are self-organised offices. They are supposed to be supervised by the municipal executive office. The ideology of the municipality focuses on decentralisation to a great extent which means that the offices have a far-reaching decision authority. The
effects of this ideology are clearly shown in how the municipality has organised its hosting of software applications. Each offices has developed its own organisation of software applications and hosting of their software applications at the same time as the municipal executive office should have the overall responsibility for the municipality’s general ICT infrastructure. To illustrate the effect of this decentralisation, it can be mentioned that a great diversity of software are used in the municipality. There are nine different office products, eleven different database systems, sixteen different operative systems, five different e-mail software and 66 different software applications that are identified as critical for the municipality. In addition to those 66 software applications there are an unidentified number of software applications. The diversity and the huge amount of software applications could be seen as one reason for the decision-making process. As described by the chief executive officer (CEO) in the municipal executive office “the welter of the municipality’s software applications and ICT has to be controlled”. This could probably be seen as the starting point of the decision-making process regarding deciding on hosting of software applications.

3.2 The sourcing decision-making process

The process started in March 2002. A standing committee, consisting of the five municipal commissioners and the CEO of the municipal executive office, gave the municipal executive office the task to investigate the common ICT infrastructure in the municipality. The reason was the expansion of ICT used in the municipality. The directions were to review the municipality’s general ICT infrastructure. The investigation should define the municipal executive office’s responsibilities of development, maintenance and hosting of the municipality’s general ICT infrastructure. It should also describe the need for competence development and how this should be arranged. This directive meant that the municipal executive office engaged an external consultant for the investigation. The consultant interviewed employees on different offices, including some employees with responsibilities for the different office’s software applications. The consultant stated that the organisation was distinguished, to a great extent, by decentralisation, and there were no established long-term plans for how software applications should be developed.

In December 2002, the municipal executive board gave the commission to the municipal executive office, in cooperation with involved offices, to investigate the possibility to coordinate hosting of software applications to the planned data centre. The next step in this decision-making process and the step that probably had most impact on the decision’s outcome was the employment of the new chief information officer (CIO). The CIO began to work in this matter in 2003 and immediately organised the decision-making process as a project. The CIO then presented a report to the municipal executive board, in October 2004, in which the result of the project was described. The report describes that the decision is necessary to position the Municipality for its future development, and that there is a choice between two different options. The options were to “continue with the ICT infrastructure that historically has been built up at the different offices with a very low grade of coordination” or
“to coordinate the ICT function and telephony for better usage of existing resources making the municipality prepared to meet future challenges and possibilities to increased effectiveness”.

The basic data for the decision-making was a report from the project work, a register over investments necessary from 2005 to 2007 and a compilation of costs for hosting after the reorganisation. The municipal executive board decided on the option aimed at restructuring and coordinating hosting of software applications in the municipality. Since this decision demands going beyond the decided budget, it needed to be decided upon in the municipal council. This was granted in November 2004, and the decision was to coordinate operation of software applications in a new data centre. The decision by the municipal council was unanimous.

3.3 Why the decision-making process started

The reason for why the decision-making process aimed at restructuring hosting of software applications started in the municipality can be described in three ways. First, the municipality needed to increase the control over software application costs. The costs for software applications have probably increased considerably. The reason for using the word “probably” is that the municipality does not know how much its software applications cost. Each of the offices has, according to the CEO, a good grasp of its own costs in each office. But, when it comes to the overall control of costs the control is weak. Cost control is emphasised as one area that must be improved. Weak cost control is also given as one reason why not outsourcing was seen as a possible alternative at this stage. The reason reported for that was that it was not possible to evaluate a cost proposal from an external provider since the municipality did not know what the costs for delivering the same services internal was. The attempt to coordinate and to increase control was described as aiming to give the possibility of having an external partner to compete with the internal data centre in the future.

Second, security was raised as an important factor for starting the process. In the decentralised structure the hosting of a lot of critical software applications was dependent on only one person. This was an effect of the decentralisation and the municipality’s decision-makers only saw one way to solve this and that was to centralise hosting. The other security concern was that some of the offices did not have suitable premises for their servers. Both cost and security reasons could be described as a wish to increase control and could therefore be seen as an attempt to increase governance of software applications in the municipality.

Third, the necessity to increase e-Government services to its citizens. According to the municipality’s CIO, the municipality has to prepare itself for being more of an e-Government in the future. To do that he see it as necessary to increase interoperability between software applications. The way to do this is according to him to coordinate the municipality’s hosting of software applications.

To increase control can therefore be seen as the reason for the initial directive from the standing committee in March 2002 which was to investigate the municipality’s general ICT infrastructure. This investigation was done by a consultant and he
gave some advice that a total investigation should be carried out aiming at centralising all hosting to a central data centre. Case study interviews with representatives in the decision-making process indicated that the outcome of the process was already decided on before it started. They also say that they were not involved in the first investigation made by the consultant despite the fact that the investigation involved their work to a great extent. The consultant’s report has one very interesting point that reflects the results of the entire decision-making process. He states that the development of broadband connections in the Municipality put forward the question of a coordinated hosting of the entire collection of the municipality’s servers. This goes back to the start of the investigation and the question of power and politics (Pettigrew 1973) in the decision-making process. In this study it has become clear that there is a group of five persons who, on a more or regular basis, meet every week. This group consists of CIOs from different offices and the CEO of the municipality. They have no formal decision authority but they do have the possibility of discuss and propose what should be done.

It could be argued that one reason for the municipality to start the sourcing decision was that it had decentralised too far at least from the entire organisation’s perspective. The municipality had built up a structure in each department leading to increased complexity in the hosting and maintenance work of its software applications.

4 Analyses and Discussion

The structure of software applications and ICT in the municipality is overgrown and straggling. On one hand it is well controlled, though each office controls its own resources. On the other hand, from an overall perspective, there is weak control. The municipal executive office that is supposed to have the overall control and who also should coordinate generally used software applications and ICT in the municipality has a hard time doing this. That ICT resources are not well controlled in the municipality is shown by, for instance, the statements by the municipality’s CIO who says nobody can clearly inform how many different systems there are. The CIO says that the number of different software applications used is in the range of 300 to 400. The structure of hosting follows the decentralisation ideology of the municipality.

Increasing control and governance (cf. proposition 1) can be seen as reasons for the initial directive from the standing office. The initial directive in March 2002 was, as described in Section 3, to investigate the municipality’s general ICT infrastructure. From the consultancy report it is quite clear that he investigated more than the original directive stated as it was not stated that the different offices ICT infrastructure should be investigated. This increase in scope resulted in that the consultant also advised to do a total investigation aiming at centralising hosting into a central data centre. In the report it is stated that the development of broadband connections in the regime of the municipality put forward the question of coordinating hosting of the entire collection of the municipality’s servers. This was a major reason for the start of the decision-making process regarding hosting. The reason is that the municipality
by providing the municipality’s citizen with a broadband connection they had in mind that the citizen would do more of the communication with the municipality through this broadband. It can also be said that the municipality by investing in broadband connection has to provide that investment with meaningful usage. From this discussion it can be concluded that one reason for the municipality to start the sourcing decision was that the organisation had decentralised too far and that the decentralised hosting structure was not seen as suitable for the municipality when it gave the possibility to citizens in the municipality to what could be seen as e-Government. However, as Simon (1960; 1997) and Markus (1984) describe it, decentralisation is not a question the organisation has to decide on if it should do or not. Instead it is a question of how far the decentralisation should go. In the municipality the decentralisation of software applications has gone too far, at least, when one looks at it from the entire organisation’s perspective. Each department has its own structure of software applications. This means that hosting and maintenance of software applications have increased in complexity which makes it harder to control. To control software applications is important if a municipality should aim at increasing its e-Government services.

Relating the empirical data to the propositions (in section 2) and the questions asked in the introduction of the paper, it can be concluded that the control proposition (proposition 1), the capability proposition (proposition 3) and the cost propositions (proposition 4) are supported. These are factors that the data has raised. It can also be concluded that the core competence proposition (proposition 2) as well as the strategy proposition (proposition 5) also are supported. The strategy of the municipality is to decentralise and this means that the different offices should concentrate on what they do best, in other words their core competence. The decision of centralisation hosting could be seen as going in the other direction. But, this depends on the perspective of the future, and it can be argued that if the strategy is to provide citizens with e-Government services then the centralising hosting strategy aims at decentralising work tasks further. This means that the start of the sourcing decision-making process could be seen as both focussing on core competence, which is to deliver e-Government services to its citizens, as well as initiated by the municipality’s decentralisation strategy.

5 Conclusions and further studies

The strategy of the municipality can be seen as aiming at decentralisation as much as possible. In spite of this it started a sourcing decision process regarding hosting of its software applications, which from the very beginning aimed at deciding on a solution that centralised the hosting to a great extent, a decision contradicting the strategy. An important question is why the decision-makers in the municipality did so. Comparing with Hamel and Prahalad’s (1994) discussion about strategic architecture it can be suggested that the decision was made with the objective of making it possible to decentralise even further. This can be explained if one looks at the new users and the new usage of the municipality’s software applications. The municipality has far-
reaching decentralisation and continued decentralisation by letting the citizens themselves produce the services they need is seen as beneficial. The next step for the municipality is to decentralise (outsource) certain tasks to the citizens and thereby become an e-Government. To be able to do that the decision-makers has seen it as necessary to restructure the hosting of software applications, which means that they have suggested centralisation of hosting as a way of further decentralise usage of software applications. The need and/or wish to increase e-Government services and decision-makers thought of e-Government influences the start of a sourcing decision process aiming at reorganising hosting of software applications.

From this it can be concluded that there is a potential need for municipalities in Sweden to prepare for its future usage of software applications which means that citizens by themselves will do more and more of the services the municipalities’ employees has done before. This demands that municipalities have to prepare to have a higher share and number of services provided by e-Government in the future. The change from a common local government to an e-Government could be seen as a factor that makes organisations start a sourcing decision process regarding hosting of software applications.

This study opens up for a number of further studies. To complement this study further, longitudinal and detailed studies of how the suggested propositions influence organisations when they strive for being an e-Government, delivering e-services, would be interesting. The propositions could also act as input to further quantitative variance studies. From a practical point of view it would be interesting to see in what way decision-makers different assumptions about centralisation versus decentralisation of hosting impacts e-Government in the future. One limitation of the present study is that the case study is not put in the profound light of e-Government literature. The present study has a more exploratory purpose and focus the discussion of the e-Government phenomenon primary from a sourcing perspective. However, it is possible in the future to refer more to the ongoing theoretical work in the field of e-Government, relate the propositions to stage models etc.

References


