Unfolding the Types of Organizational Inertia in Information Systems Adoption

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Abstract

Even though a company is willing to adopt an information system, there is often some organizational inertia associated with the adoption process. In this paper, we explore the types of inertia in IS adoption in the context of a specific business process. Drawing on seven case studies where inertia can be observed, we illustrate the inertia types found in earlier research and find indication for the existence of two new types of inertia: externality inertia and mimetic inertia.

1. Introduction

There exists an abundance of theoretical frames of reference to study assimilation of information systems. Assimilation of information systems is the degree to which information systems become widely deployed and routinized in adopting organizations (see [1];[2]). Assimilation process has typically been defined to include awareness, adoption (or rejection), and deployment (limited deployment and general deployment) stages [3]. What is surprisingly understudied in the existing literature is the inertia that is often associated with IS adoption. In the case of large organizations, inertia has predominantly been seen emerging from organizational structures, bureaucracy, limited resources, industrial environment, and other factors. However, inertia occurring in the IS adoption of small organizations has been addressed quite scantily in the previous literature (see [4]). Moreover, although there have been recent proposals to conceptualize inertia in the IS research stream (see [5]), the typology of inertia is still emerging and calls for more research. Organizational inertia, in the case of innovation implementation, can be seen as an attitude that strongly favors non-adoptive decisions over adoptive ones.

In principle, the decision to implement a new IS that enhances and streamlines processes should be a no-brainer, as it has the potential to produce concrete benefits and cost-savings when implemented successfully. In practice, however, the decision-making process on IS adoption is often prolonged, sometimes leading to non-adoption decisions, which can have various reasons (see e.g. [6]; [7]; [5]; [8]; [4]). In other words, companies are reluctant to make decisions even though they recognize problems in the current way of doing things and are aware of a better solution that exists in the market [9]; [5].

Thus far, empirical qualitative research addressing the different types of organizational inertia has remained scarce, especially in the context of small and micro-sized firms (we apply the EU definition of small and micro enterprises). Our research contributes to filling this gap as we identify distinct inertia types through an interview-based multiple case study.

In this paper, we explore the types of inertia in IS adoption by studying seven organizations in which inertia can be observed. The empirical setting of our study is the adoption of sales invoicing systems. Focusing on one specific business process that exists in all companies provides a controllable environment for collecting empirical data. All the case companies experienced problems with the current sales invoicing process and related technologies. Most also perceived that there would be a better solution on the market for conducting the process. Our objective in this paper is to drill down to the reasons for prolonged decision-making and discover its impact on IS adoption. We set out to address the following question: how does organizational inertia unfold in IS adoption of small organizations?

Our findings illustrate how different types of inertia proposed by the earlier literature are clearly exhibited in the case companies. In addition, we found evidence of novel types of inertia that have so far remained unaddressed by the research field.

2. Inertia in organizational decision-making

2.1. Organizational inertia in innovation adoption

Isaac Newton [10] defined inertia in physics as “The vis insita, or innate force of matter, is a power of resisting by which everybody, as much as in it lies,
endeavours to preserve its present state, whether it be of rest or of moving uniformly forward in a straight line". The concept of inertia has also been applied in organizational context, although not exhaustively. Previous studies have found that inertia or resistance for change seems to occur in some organizations, and when it does, its effect on decision-making can be significant. Since the existence of inertia is often tacit and not recognized in business organizations, it is not always identified as a problem [11]. Prior literature has occasionally confused inertia with habit [5]. The two, however, are distinctly different constructs; while habits are in essence subconscious, inertia is a conscious choice to maintain the status quo, although the origins of this choice may be conscious or unconscious [5]. This key difference separates inertia from habit: an inert uses not necessarily a habitual user of an incumbent system, and a habitual user is not necessarily inert.

The concept of inertia has been used as a tool to investigate barriers for organizational IS adoption. Some previous studies have focused on inertia that emerges from structures and industry characteristics. Gilbert [11] describes structural or organizational inertia as the tendency of an organization to continue on its current trajectory. He has classified the sources of inertia into two distinct categories: resource rigidity and routine rigidity. Resource rigidity is related to companies’ limited financial or technological resources that constrain the capability to invest in new technology. Another dimension of resource rigidity is the use of market power, as the dominant companies may forestall or block the emergence of new technologies in the market by investing in the old ones. This is sometimes referred to as industrial inertia. Routine rigidity, on the other hand, relates to behavioral patterns that are formed through work routines and that collectively start constraining organization’s ability to change. Moreover, [12] describe this problem in management’s routinized attitudes as an incapability to communicate firm’s strategy and set clear goals. Without goals and strategy as a roadmap, the employees and leadership are not sure where they are heading, leading to static state that will most likely eventually harm the company. [3] have further suggested that a firm’s inability to overcome the aforementioned inertial mechanisms will probably lead to non-adoptive decisions when considering IT investments.

2.2. Inertia and organizational size

Innovation adoption may depend heavily on the firm’s own characteristics such as its size. Inertia is often studied within large organizations, but it might play an even bigger role in smaller ones. This issue is somewhat debatable, as [13] have argued that relatively small organizations are “little more than extensions of the wills of dominant coalitions or individuals; they have no lives of their own”, and that they are able to react to environmental changes by changing strategy and structure almost as quickly as the individual decision-maker who controls them. Moreover, [13], as well as [14] propose that larger organizations face more bureaucracy that lowers the assimilation rate. On the other hand, the findings of [3] and [15] suggest that larger firms have greater ability and willingness to overcome organizational inertia and they even tend to implement more radical innovations than smaller firms. For example, [16] found that innovation adoption is prevented especially in SME-sized firms due to resource rigidities.

Indeed, small organizations may have less flexibility to react to changes since they have very limited temporal and financial resources to be allocated for any other than core business activities. The managers might perceive that they simply cannot afford to spend any time on considering new IS implementation as long as the old systems are somehow up and running. This argument is supported by [17], who have studied the IS adoption decision-making of small firm executives. Their findings indicate that small firms often failed to adopt “what might be seen as clearly helpful and even essential form of IT”, because the executives did not perceive it beneficial enough. Moreover, an individual has more influence over firm’s actions in small-scale organizations compared to bigger companies. If the individual in question does not possess capability for change or is just unwilling to do so, no change will occur. For instance, [18] found that the CEO’s level of innovativeness and IS knowledge influenced IS adoption decisions. The small organizational size fosters decision-making processes that are close to the decision-making of an individual and thus may be more strongly and directly influenced by social dynamics within the enterprise. Thus, especially in smaller companies cognitive and behavioral inertia may appear parallel on both organizational level and individual decision-maker’s level [4].

Although environmental pressures are commonly viewed as external factors (e.g. [12], [19]), the magnitude of their effect can be dependent on the subjective perceptions and interpretations of the decision maker. [20] studied 575 small companies and found that resources and environmental pressure were perceived differently between the CEOs of adopting and non-adopter firms. Their results indicate that perceived benefits of IS on an organizational level may boil down to subjective interpretations of the managers. In a similar vein, high perceptions of sunk costs and transition costs have been found to contribute to higher level of inertia [5]. If decisions would be solely based
on objective numbers and facts, or guided by rigid and formal organizational structures, the prevalence of this inertia might be less likely. Similarly, the perception of available technologies in the market [12] can greatly vary depending on subjective biases that small organization size may inflate. Hence, inertia can be reflected in personal attitudes or social interactions that irrationally and strongly favor certain decisions over others, which in the case of innovation implementation can be reflected as favoring non-adoptive decisions over adoptive ones. However, it is important to mention that although one may consider this behavior as irrational and possibly caused by status quo bias [9], it may not necessarily always be so. Sometimes avoidance of uncertainty can be considered as rational behavior, and innovations are not always automatically beneficial for companies [21].

The discussion above somewhat distinguishes small firms from larger organizations, where bureaucratic problems are often seen as sources for inertia. Indeed, especially smaller firms have been found to often make decisions more based on subjective perceptions and human behavior [13].

### 2.3. Components of inertia

Polites and Karahanna [5] have examined the concept of inertia in IS adoption context by dividing it into three components: cognitive, behavioral, and affective. Cognitive inertia is present in a situation where the management is aware that a better option exists, yet still chooses to continue using the incumbent system, perhaps due to wanting to maintain the status quo. Behavioral inertia is manifested in an organization’s motivation to keep using the incumbent system just because that is what they have always done. Affective inertia occurs when there exists a strong emotional attachment or enjoyment related to the current way of doing things or when detaching from the incumbent state is perceived as stressful. Indeed, the risk of new IS implementation causing additional stress for a CEO is particularly relevant in the context of small-sized organizations, as their managers tend to be under a lot of stress even without engaging in such investments.

Recently, Haag [4] has continued on the tracks of recent inertia research and proposed a typology of organizational inertia in IS adoption of SMEs. She views inertia through five distinct constructs based on the concepts proposed by [5], as well as [22]: cognitive, behavioral, socio-cognitive, economic, and political inertia. The model can be reflected with [11], as behavioral inertia relates to routine rigidity while economic inertia is consistent with resource rigidity. While socio-cognitive inertia can be seen as a result the bureaucratic and normative stiffness hampering change in large organizations, in SMEs it relates to inertia stemming from social dynamics of the organization (e.g. close personal relations of managers and employees, one byproduct of low hierarchy). Finally, political inertia specifies inertia caused by the reluctance of an important business partner, such as supplier, customer, or accountant, to adopt a certain system. This inertia type is consistent with normative and coercive institutional pressures, originally coined by [23].

#### Table 1: Types of inertia in earlier literature

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<thead>
<tr>
<th>Inertia type</th>
<th>Definition</th>
<th>References to earlier literature</th>
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<tbody>
<tr>
<td>Cognitive</td>
<td>The incumbent system is being used…</td>
<td>Polites and Karahanna 2012; Haag 2014</td>
</tr>
<tr>
<td>Behavioral</td>
<td>…out of habit, that is what the organization has always done.</td>
<td>Polites and Karahanna 2012; Haag 2014</td>
</tr>
<tr>
<td>Affective</td>
<td>…because detaching from it is perceived as stressful or unpleasant.</td>
<td>Polites and Karahanna 2012</td>
</tr>
<tr>
<td>Socio-cognitive</td>
<td>…because the norms and culture of the organization inhibit change.</td>
<td>Besson and Rowe 2012; Haag 2014</td>
</tr>
<tr>
<td>Economic</td>
<td>…because the organization has insufficient resources to search a better alternative. Also the current system might withhold too many sunk costs.</td>
<td>Gilbert 2005; Besson and Rowe 2012; Haag 2014</td>
</tr>
<tr>
<td>Political</td>
<td>…because organization's external stakeholders require so.</td>
<td>DiMaggio and Powell 1983; Teo et al. 2006; Besson and Rowe 2012; Haag 2014</td>
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While the research field has taken an increased interest in distinguishing the components of inertia, we argue that there is still much to explore. Previous work has not fully covered the sources and manifestations of inertia, and also the typology could be further extended and refined. For example, [4] does not explicitly define what exactly causes the symptoms of socio-cognitive inertia in an SME organization; in which ways is the organization culture such that it hinders the acceptance of new IS? What in particular makes this a relevant type of inertia in the case of small firms? Moreover, are the traditionally acknowledged factors like resource and routine rigidities sufficient in explaining the prolonged decision-making in innovation adoption or are there other, yet undefined factors that influence this process? We set out to address these questions by taking an in-depth look at certain small and micro-sized companies.
As yet, very few (see [11]; [8]) have used qualitative methodology for studying inertia related to organizational IS adoption. Furthermore, since inertia is arguably an abstract concept and open for interpretations, we suggest that taking a qualitative approach could indeed shed more light on the topic.

3. Methodology

By reviewing the recent conceptualizations of inertia in IS adoption (e.g. [5], [4]), we find that while valuable contributions have been made, the concept of inertia is still not exhaustively covered. Thus, we consider qualitative approach suitable for this kind of study that focuses on understanding human behavior and reasons behind the behavior [24] through an explorative lens. We decided to use the multiple comparative case study approach [24]. For data collection, we chose the interview method as it allows a better communication throughout the process than, for example, an online questionnaire. Our interview questionnaire gathered information on five general topics: company background information, management’s general attitude toward change, management’s satisfaction with the current sales invoicing system, possible alternatives, and management’s perceptions of improving the current process and system. The questions were formulated for the purposes of this study by using the prior literature as a basis so that the prevalence of previously proposed significant factors such as cognitive and behavioral inertia [5] could be recognized. On the other hand, we wanted to leave some questions deliberately open-ended and allow some degree of freedom in their interpretation so that interviewees might reveal other, potentially still undiscovered types of inertia. Due to space limitations, the questionnaire is not included in this paper but is available from the authors.

Most of the questions, excluding the background questions, were open-ended or followed by “Why?” in order to identify reasons for the decisions. Compared to predefined answer options, open-ended questions do not set boundaries for the answers. Previously defined answer options would be unable to identify possible influencing factors outside the selected options. Collected information was subjective and based on the respondents’ perceptions. Because of this, all the interviews were conducted face-to-face. This proved to be a good choice of method as respondents often failed to give clear answers to the questions. In many cases, respondents were trying to explain behavior for answering the question “Why?” by just stating “It was the best option”. When this situation occurred, respondents were asked to elaborate more precise reasons for the decision. The interview setting also allowed observations to be made from all the communication that took place during the interview sessions.

During the interviews, we made notes, which were used, along with transcriptions of the interviews, in analyzing the interview data. Based on the interviews, we wrote storylines for each company and analyzed them case by case. More specifically, we analyzed the storylines by searching for cues for inertial barriers to IS adoption and mapped those cues to the concepts in a framework based on prior inertia literature. Most of the distinguished inertia types could be easily allocated to existing components of inertia. However, some of the cues did not fit to any of the concepts discussed in the extant literature. These were further analyzed and, when appropriate, conceptualized.

4. Empirical study

To explore the types of inertia in information systems adoption, we selected a typical business process that exists in all companies: sales invoicing. Focusing on one specific business process provides a controllable environment for collecting empirical data. Sales invoicing is a process that includes multiple steps, typically all of them supported by information systems. The process can vary based on company’s own established processes and is probably slightly different between different industries. A typical sales invoicing process includes the following steps: send quotation for the offer → receipt the offer → input the line items of the invoice (such as hours and/or material) → prepare the invoice → send the invoice.

We chose seven case companies to be included in the empirical study. We chose small and micro-sized companies that exhibited inertia in adoption of sales invoicing information systems. All of the companies (except Company D, according to their office manager) were somewhat unhappy with the current system and were aware of better systems available on the market, thus exhibiting clear signs of cognitive inertia [5]. Also, we wanted to have companies from different industries to avoid industry specificity.

Company A, cleaning, 17 employees, 100 sales invoices/month, interviewee: CEO/owner

Sales invoicing process: Company A uses business management software that is compatible with the accounting software. All financial accounting processes are outsourced to the accounting firm, except sales invoicing. In most cases, time tracking and descriptions of tasks are gathered from physical reports that are produced by the workers (cleaners). These reports are then delivered to the CEO, who checks them for errors and then brings them to the office manager. If customer information is already in their system, the office manager uses previous invoices as templates. She
changes the rows and dates from old invoices to match the correct information. If the customer is new, then the information is filled manually from paper to computer. The invoice is then printed out, put into the envelope, and mailed to the customer. Current process has been in use for the past three years and required a substantial investment in form of physical servers that carry the invoicing data. The investment was made because their accountant recommended it. Most of the invoices are sent within seven days from the day when task was completed. The CEO estimates that all the work that is completed is also billed.

Current system efficiency and alternatives: According to the CEO, superior process could prevent errors and automate the process by connecting employees’ tasks to their payroll. The CEO would like to adopt an additional commission system but this cannot be done with current system. He further explains: “Because the original investment we made (in the servers allowing the use of invoicing software) was large, the change at this point is not worth it.” In addition, he thinks that financial expenses and effort would exceed the potential benefits. The effort refers to the time that would be needed for office employees’ training. The current system is in use because it is “learned and working”, and also because it was recommended by their accountant.

Management’s view toward change: The CEO says that sometimes he is trying to improve the firm’s processes. Improvements are mainly targeted to technological enhancements and employees’ well-being. Most of the challenges regarding the change come from government regulations as illustrated by the following quote: “There are so many laws and regulations related to labor code that it is hard to keep track of those.” The main pressure for adopting new processes comes from outside the firm. The CEO shared his views on change in business: “Constant change is needed because the competition and the industry is constantly changing. If you don’t change, you will be left behind.”

Analysis: Company A’s current sales invoicing process includes multiple steps but the system implemented based on the accountant’s recommendation serves mostly as a communication tool between the firm and the accountant. Final invoices could now be sent electronically to the accountant who uses the same accounting software. Benefits of this improvement are that the invoices go automatically to the accounting software and accounts payable can be monitored more easily. However, this investment mainly affected the final steps of the total process. Invoices are still created in the software manually, using information from previous invoices. The software does not significantly help in tracking or inputting sales. The information of completed tasks is monitored by the CEO, who then carries the paper report by himself to the invoicing room for the office manager. This process takes time and is sensitive to mistakes, as according to the CEO “papers do get lost frequently”. He had neither analyzed the process nor the alternatives, because the previous investment was substantial, clearly exhibiting economic inertia stemming from the sunk costs. In addition, the accountant-firm relationship seemed close, and the accountant’s recommendation possibly has significant weight on the CEO’s decision-making, indicating that political type of inertia would be present. The CEO also felt that change always requires effort, and it seemed that the barriers were perceived higher than they might actually be. This could be interpreted as a sign of affective inertia: the risk of wasting time and money to a fruitless investment would cause additional stress to the CEO.

Company B, electrical engineering, 8 employees, 40 sales invoices /month, interviewees: office manager & project manager

Sales invoicing process: Quotations for customers are created in Microsoft Word, and if accepted, printed out and delivered to the office manager. The office manager gets the project information and billable details of the offer. Every employee involved in the project inputs her working hours to a shared Excel file. From this file, the office manager gathers reported hours for each invoice. Information of used materials for each project is taken directly from electronic invoices and then directed to the appropriate project's invoices. The finished invoice is then sent electronically through the accounting software to the accounting firm, which then delivers it to the customer. Average lead-time of invoicing the finished project is over three weeks. The office manager estimates that it takes around 24-32 hours per month to create all the invoices. The project manager estimated that annually roughly ten invoices never get sent. The project manager also estimated that some of the credit losses could be avoided with a more efficient system. The current system has been in use for seven to eight years.

Current system efficiency and alternatives: Both the office and project managers felt that the current process is not the most efficient one, because it is time consuming and sensitive to errors. The project manager said that, “I don’t know if this is the best system. I think there might be better solutions available but Ecom (current software) is widely used in this industry.” While the management acknowledges that a better system could produce time savings and reduce credit losses, they argue that the old system still works and replacing would be too burdensome due to the need for additional employee training. As the office manager stated: “Why change a system that is working?” The
biggest challenge concerning the search for alternatives and implementation of a new system was found to be the lack of time. No research for alternatives has been made so the estimation of the pros and cons of switching the system was based purely on past experience.

Management’s view toward change: The office and project managers agreed that a profitable company requires changes and innovation adoption at certain times. The pressure for change comes both from the employees and the customers. In addition, new employee regulations require additional training from time to time. When the company has made changes to its routines, they have mostly been focused on reallocating and increasing employee responsibility. According to the project manager, "employees will get unhappy if things do not improve from time to time."

Analysis: Maintaining the status quo seems to be the desired state of Company B as it focuses heavily on running the core business activities. In general, the attitude toward change seems to be more reactive than proactive because the employee training is done only when new regulations demand it. Even though some processes are acknowledged as inefficient, the perceived effort of even just searching for alternatives seems to be too significant compared to the perceived benefits. The company’s processes have become habits or routines and there seems to be an absence of motivation to analyze and possibly reevaluate them. The current time tracking and reporting process is slow and causes errors but it seems to be accepted as one of the ‘cons’ of running the business. Thus, we distinguish clear signs of cognitive and behavioral inertia. Probably also economic inertia has a role to play here as the managers highlight the finiteness of resources available for investments. In addition, the project manager mentioned the fact that Ecom is a widely used system in the industry as one reason for sticking with it. This suggests that inertia in the form of mimetic pressures [23] affects the IS adoption decisions in Company B.

Company C, HVAC (heating, ventilating, and air conditioning), 14 employees, 100 sales invoices/month, interviewee: CEO/owner

Sales invoicing process: Company C’s sales invoices are produced by the CEO. The CEO gathers the invoice information from the physical reports that are filled out by the employees who are working on that particular project. Their reports include the daily hours spent with the project. The CEO also combines information from the materials and items used in the project for the invoices. The information is then sent to the accounting firm, which sends the finished invoices to the customers. Combining the hours from physical reports takes approximately 3–4 days per month. The CEO estimates that credit losses could be avoided by using more efficient sales invoicing methods. The new system has been in use for six months and was implemented based on accountant’s recommendation. The CEO was not very pleased with the new system and a search for alternatives was conducted. However, none of the alternatives was approved, mainly because the accountant objected.

Current system efficiency and alternatives: The CEO is not satisfied with the current system because it is slow and any errors made were hard to fix. The accountant recommended this software because it is compatible with their accounting software. It allows invoices to be sent electronically to the accountant, which makes the information transfer between the companies more efficient. According to the CEO, “The software is slow and it is hard to fix errors after you have made them, but the archive option for contracts is nice.” The current software does not include time tracking for working hours, so project hours are input manually from physical documents. “A superior system would be beneficial as it would save time and make my job easier”, he states. Alternatives were looked for before the implementation of the new system and also after that but with no serious intent to implement any of them.

Management’s view toward change: The CEO is planning to make an action plan for the firm covering next three to five years. He also actively discusses with employees about potential improvements in the firm and tries to improve employees’ working conditions. In addition, he is taking night classes on business leadership for improving his leadership skills. He would like to adopt a commission based salary system, if a working hour monitoring system was to be implemented in the future. According to the CEO, “The biggest challenges regarding the change are the old attitudes of the employees and the routinized behavior of the management.” The CEO continues by stating, “Change is needed for keeping employees happy and for committing the skilled workers.” He further mentions that the pressure for change comes also from new government regulations.

Analysis: The CEO of Company C seems to have a generally proactive attitude toward change and willingness to adopt new technologies and work practices. However, the company seems less proactive in the case of their sales invoicing process. This exhibits a clear case of cognitive inertia: the CEO admitted that it would be beneficial to change the current system, yet for now they are sticking with it. Instead of independently analyzing the process, the change was made purely based on their accountant’s opinion. The new system mainly automated the accountant’s tasks, and actually resulted in a slower total invoicing process for the Company C. This suggests that although the organization might be ready to change, the CEO either
considers the accountant relation too valuable or the independent search effort too costly or both. Thus, we find evidence suggesting of political and economic inertia. The first mentioned seems to be the dominating inertial factor in this case as implementing a better system or even just searching for alternatives would contradict with the accountant’s opinions.

**Company D, earthmoving, 12 employees, 40 sales invoices/month, interviewee: office manager**

**Sales invoicing process:** Company D has one major customer whose orders cover over 90% of their annual revenue. These orders cover various projects throughout the year. Employees report their hours on a physical paper after each day. The CEO uses a significant part of his time for compiling these hours, which he then sends to the office manager. Each invoice is created for the accounting software from scratch. The office manager estimated that their software is very efficient but the working hour reporting system is not. The current software has been in use for 16 years. Company D has experienced neither credit losses nor unbilled invoices.

**Current system efficiency and alternatives:** The office manager had no experience of other accounting or invoicing software. The CEO would be willing to consider alternatives that would automate the system but the office manager refuses to work with any other software. She stated: "Our CEO wanted to compare the software we use for accounting and sales invoicing but I said that I would leave the firm if the change was made. I have been using this software for over 20 years and I am not going to start learning a new one at this age." Her perception on the current system’s efficiency seemed to be based more on her own efficiency with the system than on actual system characteristics.

**Management’s view toward change:** The office manager agreed that it might be beneficial for the company to change from time to time, but their business model is so straightforward that change is not actually required. The office manager stated that “Changing is hard because the time and especially the energy needed to learn new systems is hard to find.” In addition, she saw that new technical adoptions require a lot of data transfer and employee training before they will become efficient. The interview did not include the CEO, but according to the office manager, he is willing to change things and tries to improve employees' working conditions.

**Analysis:** It seems that the office manager has high influence on sales invoicing processes, and that she is not willing to make significant changes at this point of her career. Having a one major customer covering 90% of orders may indicate of stable flow of revenue, and since economic constraints are not mentioned by the interviewee, we might assume that the company does possess the sufficient resources for investing in a new system. Moreover, clearly there is a need to improve the systems since the current working hour monitoring is considered inefficient. Automating the whole system might still require changing the accounting software or at least adding other parallel systems. The office manager seemed to be strongly against this, which most likely works as a major barrier toward any potential changes in the firm’s financial processes. This case illustrates how a hierarchically lower level worker can influence decision-making in the higher levels. Although we could not get the CEO’s personal opinion about adopting new systems from himself, it certainly seems that strong socio-cognitive inertia is prevalent in this organization, consistent with Cooper’s [25] description of how organizational culture may conflict with IT implementation. The social dynamics of the organization have a direct influence on its capability for innovation adoption.

**Company E, accounting, 4 employees, 100 sales invoices/month, interviewee: CEO/owner**

**Sales invoicing process:** Company E’s sales invoicing process is fully handled by the CEO. He checks the rows in their accounting software, where the employees input the customer information, and then creates new invoices by using previous month’s invoices as templates. With some customers, the invoices from previous month are copied and only the dates are changed. Although these customers are not officially contractual customers with fixed monthly prices, they are considered as such, because of the long lasting business relations. The CEO tracks special customer requests by using Microsoft Excel. Many invoices of these special requests are never sent or are sent months after the actual work is done. These delays or errors occur due to the unorganized process. No alternatives have been considered for the system and it has been in use for the past 20 years. Total invoicing process from information collection to the actual invoices takes 2-3 days per month of the CEO’s time.

**Current system efficiency and alternatives:** The current sales invoicing process has been the same for a long time and the accounting software that is also used for customer bookkeeping creates customer invoices. According to the CEO, changing the process would most likely require changing the accounting software. Moreover, “changing the accounting software is not possible since there is no time to do it”, he explains. Adding a new system while maintaining the old software has not been considered. He concludes “the system is working, I should just be more organized.”

**Management’s view toward change:** The CEO sees that change is required when an external pressure, such as new government regulations for bookkeeping or tax returns, occurs. The most recent change in the organization took place two years ago when the
company updated its office facilities to gain more archive space. The CEO commented on process changes: “There is just no time to improve the processes and then teach these processes to the employees.”

Analysis: In Company E, the CEO handles all managerial tasks from payroll to invoicing and customer acquisition. He feels that he has neither the time nor the energy to improve the processes, unless a compelling pressure emerges. Employees, customers and competition were not seen as sources of this kind of pressure. The CEO is also heavily involved with customer service and consultation. A few days of every month are spent only on sales invoicing, which is relatively quite a lot, considering he highlighted the lack of time as a barrier for process redesign. In addition, the tracking system for invoices seems to be very inefficient. Both of these processes could most likely be improved by implementing alternative systems. Furthermore, the CEO could possibly delegate parts of the tasks to the employees through IS enabled process redesign. However, economic and behavioral inertia are encumbering of considering this possibility. In addition, the mention of lack of energy to even consider of improving processes indicates that the CEO is under considerable stress, causing affective inertia.

Company F, HVAC, 7 employees, 50 sales invoices/month, interviewee: CEO/owner

Sales invoicing process: Company F’s CEO is responsible for their total sales invoicing process. He collects working hours used for each project through different channels. There is no exact process for employees to report these hours. Employees report their own hours, and they can use SMS, e-mail or paper reports for doing it. Each employee uses approximately ten minutes per day for reporting these working hours and the CEO uses approximately one full working day to combine these hours into invoices. Annually, around ten invoices never get sent. This system has been in use for ten years and no alternatives have been considered. The CEO sends the information to the accountant through software. The accountant and the firm both have the same software. The accountant then delivers the final invoices to the customers. Often, the CEO uses an invoice from previous month as a template for the new one.

Current system efficiency and alternatives: The current system is not the most efficient possible but it is being used because the accountant, who uses the same system, wants to maintain it. No alternatives have been actively looked for. The CEO gave two reasons for why alternatives have not been considered: “There has not been time to look for alternatives and the current system is working” and “Switching the current software would most likely require changing the accounting firm as well.” According to the CEO, a better system with automated processes for the monitoring of working hours would lead to significant time savings. The CEO noted that the time that is available is mainly allocated to customer acquisition and project management, leaving no time for process improvements.

Management’s view toward change: The CEO agrees that change is required because the environment changes constantly. He further explains: “Competition changes and information technology keeps constantly developing. The business must evolve or it will eventually fail at some point.” He also elaborated that they are trying to improve and automate some of the processes but it is hard to find time for doing that.

Analysis: The CEO of Company F seems to be mostly focused on running the core business processes, which tend to take most of his time. He also handles most of the managerial tasks in the office. Since communicating working hours, for instance, is not regulated in the company by any means, there is arguably room for improvement. The main barrier, lack of time for improving the processes even when it would actually save more time in the future, resonates clearly with economic inertia. Even though the CEO acknowledges that the current system is not the most efficient one, the perceived benefits of changing it are not considered motivating enough, which is a typical case of cognitive inertia. Moreover, as the CEO has a lot of tasks on his hands, he does not seem to call for any additional stress factors, which suggests that affective inertia also influences the decision-making. Finally, we find convincing evidence of political inertia stemming from the accountant’s pressure of maintaining the current system. This seems to withhold another type of inertia as the CEO expects that switching the system would cause an undesired externality: changing the accounting firm.

Company G, speaker agency, 20 employees, 100 sales invoices/month, interviewee: office manager

Sales invoicing process: Company G provides speakers (people) for various events. Most of the employees (17/20) do selling alongside their other tasks. Sales representatives create quotations, which, if accepted, are sent to the office manager through a CRM system. The office manager then collects the information and inputs it into the financial management system that produces the invoices. She then sends these invoices to customers. The company charges a ‘lump sum’ from its customers, so no working hours or materials need to be included in the invoices. Each month, the office manager spends approximately one full working day for creating invoices. The current system has been in use for the past ten years.
Current system efficiency and alternatives: Currently, the company handles different tasks by using two parallel systems that are not compatible with each other. The office manager feels that the current system is inefficient and old-fashioned. Alternatives have been considered but no major search has been conducted. One major barrier for adopting an alternative system is that it needs to be compatible with the current CRM system, which is used for quotations. According to the office manager, “Our current system is slow and hard to use, but it is the way things have been done for a long time and management seems to have gotten used to it”. Company G’s sales invoicing process has fewer steps than the other case companies have. This is because they do not charge materials, products or working hours separately. The main step is thus the information transfer from the accepted quotation to the invoice. The performance of the current process is low, because CRM and sales invoicing software are not compatible with each other. The office manager explains the process: “I get the information of confirmed sales through CRM system and then I take that information and manually input it to the sales invoicing software.”

Management’s view toward change: According to the office manager, changing the current system would have obvious benefits. The main challenge regarding the change is the time required for learning new habits and systems. The company strives to constantly improve processes, and the employees are encouraged to give feedback about the current processes to the managers. Indeed, they have already received criticism about the sales invoicing system. The office manager agrees that the company needs to evolve because the environment and competition changes constantly.

Analysis: Although the inefficiency of the current ten-year-old sales invoicing system has been communicated to the top management, there has been no serious search for alternatives, exhibiting cognitive inertia. The old system is being used out of habit, suggesting that behavioral inertia hampers the search for new options. Also lack of time was mentioned as one intrinsic barrier, indicating the prevalence economic inertia. Finally, similarly with Company F, adopting a new system would also require changing the CRM system, which would be an unwanted externality within the company; another case of inertia that stems from a negative externality.

5. Discussion and conclusions

Types of organizational inertia have been conceptualized in earlier research ([25]; [11]; [22]; [5]; [4]). Our findings, summarized in Table 2, further our understanding on how inertia in IS adoption unfolds in the context of small and micro-sized companies. The main contribution of this paper is twofold: first of all, we found support for previously proposed types of inertia in the context of small organizations, and, on the other hand, we uncovered two new types of inertia that the previous literature has not yet addressed: externality inertia and mimetic inertia. Externality inertia could be recognized in Companies F and G. In Company F, the CEO believed that implementing a new system would have a concrete, undesired consequence: it would result in changing their accounting firm. The risk of this kind of negative externality was found to be an essential factor that forestalls new IS adoption, even though the benefits of adopting a better alternative were recognized. While the CEO of Company F expressed his concern of negative externality extending outside the company, Company G’s management was worried of possible externalities within their company. Changing the sales invoicing system would also mean changing the CRM system. This phenomenon somewhat resonates with network externalities discussed by [26] and [27]. We define externality inertia as follows: the incumbent system is being used because changing the

Table 2: Types of inertia in case companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Problems with the current system</th>
<th>Sources of inertia</th>
<th>Type of inertia</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Not automatic, no additional commission system, papers get lost frequently</td>
<td>Original investment was large, investing in new system seems like not worth it, accountant's opinion</td>
<td>Economic inertia, political inertia, affective inertia</td>
</tr>
<tr>
<td>B</td>
<td>Not the most efficient one, causes credit losses</td>
<td>Lack of time, training employees would take too much effort, no motivation to change something that is working, current system is widely used in the industry</td>
<td>Cognitive inertia, behavioral inertia, economic inertia, mimetic inertia</td>
</tr>
<tr>
<td>C</td>
<td>Slow and errors made are hard to fix, manual input of information</td>
<td>Lack of implementation intention, accountant's opinion</td>
<td>Cognitive inertia, economic inertia, political inertia</td>
</tr>
<tr>
<td>D</td>
<td>Not the most efficient one</td>
<td>Office manager refuses to adopt</td>
<td>Socio-cognitive inertia</td>
</tr>
<tr>
<td>E</td>
<td>Errors and delays caused by unorganized process, lots of manual input, time-consuming</td>
<td>Lack of time, old system considered good enough (CEO feels that he should change rather than the system), old routines</td>
<td>Economic inertia, behavioral inertia, affective inertia</td>
</tr>
<tr>
<td>F</td>
<td>Not the most efficient one</td>
<td>Accountant's opinion, lack of time and energy, current system is working, too much effort compared to perceived benefits, new system would require changing the accounting firm</td>
<td>Cognitive inertia, economic inertia, affective inertia, political inertia, externality inertia</td>
</tr>
<tr>
<td>G</td>
<td>Inefficient and old-fashioned, manual input, slow</td>
<td>Lack of time, large perceived effort, would require changing the current CRM system, old routines</td>
<td>Cognitive inertia, behavioral inertia, economic inertia, externality inertia</td>
</tr>
</tbody>
</table>
system would lead to changing other processes that would otherwise remain intact.

The other previously unaddressed type, mimetic inertia, was expressed by Company B. If the incumbent system is widely used in the industry and thus considered suitable or good enough, there might not occur any further review of what the actual needs of the organization are and whether the current system actually serves them. Smaller companies may not have the time to look for the most suitable option and this may cause them to blindly follow the industrial norm. Thus, mimetic inertia can be closely tied to economic inertia, but conceptually they are different dimensions. Thus, we propose the following definition of mimetic inertia: the incumbent system is being used because it is the industry standard and the organization does not want to deviate from this standard.

We found that lack of time to search and implement alternative systems was the most common source of inertia for the case companies. Thus, system providers should consider this and proactively approach and offer their services to small and micro-sized organizations. Many of the interviewees acknowledged that their current system was not the optimal one but still did not take any action to improve the situation. This further speaks for the importance of system providers taking a more active role in their selling strategy. One of the limitations of this study is the small sample size as only seven companies were included. Furthermore, interviews could have been carried out in a more organization-encompassing fashion, covering several members of the organizations. Finally, our study examined the implementation of one specific technology, automated sales invoicing. Although we find that controlling the type of process was very useful in the context of this study, we encourage future research to validate the proposed new types of inertia also in other contexts.

References