Confronting, Confirming, and Dispelling Myths Surrounding ERP-in-the-Cloud: From Iron Cage to Agility

Although cloud computing is still in its infancy, it is rapidly becoming one of the most used buzzwords in the IS/IT field and ERP-systems are one of the fastest growing SaaS cloud applications. However, given the relative newness of ERP cloud computing, and the lack of empirical research on the topic, there is substantial uncertainty surrounding the benefits and challenges of ERP cloud computing. Consequently, as often is the case with new technologies, popular myths surrounding the technology are used to make adoption and implementation decisions. As a first step toward providing an informed understanding about the true challenges related to ERP cloud computing, it is important to examine these myths in an effort to dispel or support them. In this paper, we attempt to achieve that. Specifically, we explore eight myths related to cloud-based ERP systems through a study involving in-depth interviews with stakeholders related to an ERP cloud-based solution. Our results dispel some of the myths, while supporting others, and highlight how ERP vendors work around the different types of challenges surrounding this technology. Our study also helps understand the benefits of ERP cloud computing, and informs about how cloud-based ERP systems will free organizations from the information system "iron cage" and lead to agile organizations.

1. Introduction

In the last couple of years, cloud computing has become one of the most popular new buzzwords. The National Institute of Standards and Technology (NIST) define cloud computing as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service-provider interaction" [37]. Cloud solutions are categorized as IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (Software as a Service). SaaS is best known to the public from consumer-focused products (e.g., Google, Facebook etc.), but is now spreading fast to business applications due to the early successes of CRM-systems like Salesforce.com.

Although still in its infancy, the growing demand for cloud computing is driven by the huge financial commitments be-

ing made towards its development and deployment by both software developers and organizations. A press release from International Data Corporation (IDC) estimates that public IT cloud services spending will grow to more than $127 billion in 2018 [28], with global SaaS software revenues alone predicted at $106 billion in 2016 [11]. This has had cloud services providers in general, and SaaS providers in particular focusing their resources in these areas. For example, Microsoft plans to spend 90% of its $9.6 billion R&D budget on cloud strategy [19]. Even the US federal government is investing in the cloud. In 2011, Vivek Kundra, former CIO of the US government called for $20 billion or about one-quarter of all government IT spending to be cloud-based [36].

With the increased popularity of cloud computing, IT vendors are also increasingly offering several new applications in the cloud, especially those that they had traditionally offered as stand-alone systems. Notable amongst them are Enterprise Resource Planning (ERP) systems in the cloud. ERP systems are "comprehensive, packaged software solutions that seek to integrate the complete range of a business' processes and functions in order to present a holistic view of the business from a single information architecture" [31]. Cloud based ERP systems are emerging as a strong alternative to traditional ERP systems. The reason is that software vendors portray SaaS products as having the ability to provide robust functionality without the system complexities, institutionalized lock-in, or costs of traditional implementations. ERP in-the-cloud (we denote it as ERPc from here on) is especially suggested to be useful for small-medium enterprises (SMEs), as it makes applications available that they otherwise could not afford. Thus, one of our observations in this paper is that the use of an ERP system in the cloud will free SME's from a very formal constraining institutionalized-based paradigm characterized by bureaucratic rationality, and move them toward an agility-based paradigm that is associated with leanness and flexibility [12] as well as the ability for organizations to respond quickly [45].

The deployment of a traditional ERP system often takes years before the organization can fully experience the benefits of their "new" system. And even then, to add insult to injury, too often the system falls short of meeting the needs of the organization and its users, who feel locked into a solution [25]. Cloud computing, as an innovative technology, presents its

own set of challenges as organizations deal with issues regarding security, data ownership, software customization, reliability, accessibility, system maintenance, and of course cost [22]. Consequently, the combination of ERP and cloud computing raises a number of new challenges. Overall, there is very little research regarding how organizations should deal with these challenges. Practitioner literature identifies and highlights the advantages, but to date very little has been offered in terms of guidelines in successfully dealing with ERPc.

With an absence of guidance, organizations often rely on myths in order to support and validate their actions. Myths can be defined as a "dramatic narrative of imagined events, usually used to explain origins or transformations of something. [It provides] an unquestioned belief about the practical benefits of certain techniques and behaviors that is not supported by demonstrated facts" [52]. Myths, however, are necessarily not always true. Rather they are often misconceptions. Accordingly, the lack of a systematic understanding of the issues related to ERPc prompt organizations' actions to be guided by myths surrounding its benefits and pitfalls, rather than reality, leading to even more challenges. In order to provide a more accurate understanding of ERPc and its perceived benefits, it is important to examine whether the popular myths surrounding this phenomenon are true or false. We aim to achieve this in the current manuscript. Specifically, we examine the validity of these myths in the context of an empirical study of one of Northern Europe's leading ERPc providers, 'e-conomic'. We use the perspective of an ERPc provider to access their insights into the phenomenon, which cannot be understood from users alone. ERPc providers are in a unique position to act as the voice of the users based on their in-depth interactions involving users' perceptions and attitudes. We would also expect ERPc providers to be at the forefront of understanding the myths impacting their business, and formulating strategies for confronting such myths. In addition to interviews with the ERPc provider e-conomic, we also conducted in-depth interviews involving other e-conomic stakeholders including a consultant/accounting firm whose clients use e-conomic, as well as an independent software vendor, who integrated e-conomic into an ERP solution for a group of auto repair garages. We have chosen the approach of exploring myths since past literature demonstrates that the paradigm of myths has been useful in understanding new phenomenon [46]. Specifically, our paper addresses the following research question:

RQ1: What are the myths surrounding ERPc, and which of these can be confirmed?

The rest of the paper is organized as follows: First, we will provide a review of the literature on ERP systems and cloud computing including a discussion of myths. Next, we will discuss our methodology and subsequently outline our study, which involves a series of interviews with e-conomic, their customers,

third party intermediaries and independent software vendors who use e-conomic as a platform for their own software offerings. Through this case study, we discuss the role of myths and whether based on our empirical investigations we might falsify or verify them. Finally, we examine the impact that ERPc can potentially have on an organization and then conclude with a discussion of the results including some reflections on the differences between the characteristics of ERPc compared to a traditional on-premise ERP solution.

2. Literature Review

To date there has been limited research in the area of cloud computing. The work of Yang and Tate [55] categorized current cloud-based research into four broad areas: "technological issues", "business issues", "conceptualizing cloud computing", and "domains and applications". From their review of the literature on cloud computing, they conclude that current research primarily focuses on technological articles (43%), with only 23% focusing on "conceptualizing cloud computing". The "conceptualizing cloud computing" category was further divided into two segments: foundations/introductions (75%) and predictions (25%). In our paper, we aim to augment the predictions segment of the "conceptualizing cloud computing" category, by focusing first on the myths, and then on the impact of ERPc on organizations. In our review of the literature, we took a multi-pronged approach by examining both academic and practitioner literature regarding traditional ERP systems, cloud computing, and ERPc trends. Additionally, we also reviewed literature regarding myths and their role in sense making.

2.1 Cloud and ERPc Trends

According to literature, the cloud is bringing about transformational changes to organizations through increased flexibility, the ability to respond much faster to changes in the environment, the ability to supplement existing resources and skills, and the ability to link the processes of multiple organizations into a single virtual organization [2]. Giniat found that this ability to integrate was especially evident in supply chain relationships and in the health care industry [24]. They found that beyond integration, the cloud could provide organizations and individuals, who lack resources and skills, access to computing infrastructure and applications for the development of their own systems.

Grabski, Leech, and Schmidt [26, p. 61] note that cloud computing "has the potential to radically change the ERP environment" because of the ability to link and collaborate between systems due to the modular designs of ERP-related applications. ERPc systems in their view would allow organizations to implement a core ERP system surrounded by the best of breed applications appropriate for a given organization [8]. Such so-

lutions could potentially bring flexibility and customization to the organization without the costs of custom software development. Cloud computing may also impact the optimal IT governance structure (cost center versus profit centers) based on the type of cloud services used by a firm [9]. Adoption of cloud services can be grouped into factors related to technical, organizational, and environmental factors. Vendor capabilities, including technical, relational, and managerial has been shown impact deployment success [21].

In spite of these positive features, ERPc is not without its challenges [4]. Questions regarding security [3, 6], privacy [30], audit burden [1], as well as legal and jurisdictional issues [29, 54] are abundant. There are a number of studies of cloud computing in general, and ERPc in particular, published within practitioner outlets, but there are only a limited set of studies that empirically test the challenges surrounding ERPc and the enabling/inhibiting factors. Further, many of these studies have focused primarily on predicting how future ERP systems will look as opposed to challenges of the current ERPc, and the impact on organizations. Given the lack of empirical validation, much of the organizational decisions related to ERPc have been guided by myths.

2.2 Myths

Myths serve many roles. They can be seen as devices of the mind that have been used throughout time to provide explanations, reconcile contradictions, and help resolve dilemmas; however, myths have also been known to alter perception or to even lead attention elsewhere [7]. As stated by Bolman and Deal [7] "myths are necessary to create meaning, solidarity, and certainty" and serve to legitimize an organization's actions or activities [10]. Myths influence how organizations attempt to understand new or unsettled situations that may be uncertain or ambiguous [20]. Our aim is to substitute the current myths about ERPc with a more evidence based experience on how ERPc providers confront the myths.

There are several dimensions to myths. Myths traditionally carry a negative connotation and a sense of fiction is associated with them. However, myths are actually often true as they are based on some degree of logic or truth. Therefore, it may be argued that myths can be either true or false. A second issue regarding myths is regarding their impact on actions. A closer examination shows that myths can be constraining as well as enabling [27]. Constraining myths would be those that would prevent actions from occurring, while enabling myths would support and validate actions. Because organizations take actions based on their belief in popular myths, it is critical to verify the veracity of these myths through the use of empirical data [46]. Therefore, in terms of constraining myths, providers of ERPc will

attempt to dispute constraining myths in order to reduce uncertainty and clarify the value the providers bring as opposed to alternative solutions. Myths can also become self-fulfilling prophecies, fueled by an alliance of vendors and analysts. As an example, in the late 90s, the forecast regarding the growth in e-commerce, e-business and e-marketplaces became inflated into absurdity, as vendors of hardware, software, consultants and independent analysts were trying to exceed each other in predictions about the future growth [Telecoms Infotech Forum, 2001]. The dot.com crash, starting in March of 2000, with its devastating erosion of value highlighted that this was probably a myth.

2.3. Common ERPc Myths

As an organization considers deploying an ERP system in the cloud there are many parameters for them to analyze in their decision making process. An organization must assess its business IT acumen, cloud application performance, and cloud interoperability [32]. A complete analysis will assess the needs of (and the impacts on) the stakeholders (providers, consumers/subscribers, enablers, and regulators) involved in this endeavor [35]. This stakeholder analysis is centered on the common myths surrounding the decision to deploy an ERP system to the cloud or to develop and implement a traditional stand-alone ERP package.

In 2010 NetSuite, a $1 billion+ market cap public software company, surveyed 800 accounting and finance professionals on what they perceived to be the single key concern and the single key benefit of moving their financials to the cloud [23]. Even though the concerns and benefits exposed by the NetSuite survey mirror much of the cloud computing rhetoric beyond that specifically related to ERP systems, we still find it relevant to report here, since the concerns and benefits expressed by these professionals represent the current constraining and enabling myths of cloud computing by professionals who deal directly with ERP systems. In other words, we find that this survey mirror practitioner literature as well as several empirical case studies that identify many of these same perceived benefits and challenges to cloud computing in general, and to ERPc in particular [5, 17, 39, 42, 44, 48]. The NetSuite survey has the added benefit in identifying not only the common myths, but also their relative importance for managers. Therefore, this survey can be used as a proxy to represent common myths amongst financial and accounting professionals, which guide CEO and CFO's decisions on whether to implement a cloud-based ERP system or not. We find that their four top benefits and concerns represent the most recognized constraining and enabling myths as evidenced in Table 1, where the percentage of professionals who selected each factor is provided in the last column.

Constraining Myths	Myth #1	Greater security risks	35 %
	Myth #2	Barriers created by regulation	12 %
	Myth #3	Customization is not available	18 %
	Myth #4	Lack of reliability	14 %
Enabling Myths	Myth #5	Lower cost of ownership	30 %
	Myth #6	Contributes to streamlining of business processes	21 %
	Myth #7	Accessibility is improved	28 %
	Myth #8	Upgrades are automated and provided by vendor	9 %

Table 1: Myths of Cloud Computing [23]

In the following, we shall discuss each of these myths in more detail.

2.3.1 Constraining Myths

The concern over security (Myth #1) was nearly twice as high as any other concern and is seemingly embedded in the fact that cloud computing and data transmission occurs over the internet [23]. Additional concerns, feeding constraining myths, include regulatory issues and doubts about the ownership of data, the degree to which customization of cloud software and systems can be performed, and the overall reliability of a system deployed in the cloud. Myth #2, regulatory issues, may, for example, involve the ownership of the data. With cloud-based systems, data can be and is stored in a multitude of physical locations, which has the potential to raise concerns regarding privacy and security of the data. Within the European Union this regulatory issue has been addressed by requiring organizations to store data within the borders of the country from which it originated. We are sure that this is also an issue for countries outside the EU, where laws, regulations or simple customer preference will require ERPc providers to store data within the borders of the originating country. The customization concern, identified as Myth #3, is primarily focused on the software. Organizations often believe, at least initially, that a customized product is a must for them. Myth #4, reliability, involves not only how accurate cloud-based functions are, but also the lack of availability in terms of "up-time".

2.3.2. Enabling Myths

The professionals in the NetSuite survey also identified what they believed to be the key benefits (enabling myths) related to moving their financials to the cloud (Table 1). Myths #5 through #7 all deal with improving economic performance with Myth #5 being the most important concern - that of lowering the total cost of ownership. Reducing the cost of ownership of an ERP system provides the organization with a significant cash-flow benefit. Additionally, once deployed on to the cloud, organizations are able to reallocate their IT budgets from maintenance issues to actually improving business processes and delivering innovation [22]. This is likely to contribute to a streamlining of business processes as suggested in Myth #6. Myth #7 identified the ability to access data anytime, anywhere, in other words, whether the system is able to provide real time access, 24x7, across multiple devices allowing for real-time collaboration. Moreover, an organization can streamline business processes, standardize practices, and operate on a "single version of the truth. Myth #8 from the NetSuite survey was that of easy upgrades. It is estimated that about two-thirds of mid-sized businesses are running old versions of their current ERP systems [22]. As Gill notes, this is the legacy of decades of on-premise software deployments, with incremental releases that never seemed worth the pain of a major upgrade migration project, especially taking into account the fear of losing critical customization.

Both the constraining and enabling myths are likely to have an impact on the decision-making processes surrounding the adoption of ERPc, since when innovations are newly introduced, most organizations do not carry out detailed cost-benefit assessments, but rather institutional factors [51] and/or myths [20] play a prominent role in the decision making process. In most situations, SME companies had acquired their systems after a superficial cost-benefit analysis, where in the end, the decision maker balanced the benefits of the enabling myths with the costs of the constraining myths. Accordingly, these myths are important to SMEs, but they are of even greater concern to cloud based software providers, who actively work to appropriately confirm or dispel the myths in order to support the proliferation of their cloud-based products. However, myths are nothing more than popular views, until they either have been proven or dispelled through proper empirical testing. It is the intent of our article to subject these myths to an investigation through an empirical investigation.

3. Research Method

In order to confirm or dispel the myths of ERPc, we conducted interviews with stakeholders involved with a leading provider of ERPc accounting systems in Northern Europe. We chose to use an exploratory study as our primary research method. In doing so, we do not attempt to show causality in the statistical sense, but rather to understand how actors assign meaning and make sense of a phenomenon [41]. Given that ERPc is a

relatively new phenomenon, we wanted to explore its impact on organizations and to understand how stakeholders comprehend and interpret ERPc within a real-life context [56].

3.1. Data Collection

We chose the company "e-conomic" not only because it is one of Europe's largest ERPc providers, but also because we argue that a study with a large and successful ERPc provider can provide meaningful insight. In this way, e-conomic is a single exemplary case [43]. e-conomic is also a good choice for our investigation, since its customer's choice of an ERP solution is equivalent to the decision faced by many of the respondents of the NetSuite survey. Data Collection occurred in the spring of 2012 through interviews with multiple stakeholders related to the ERPc phenomenon. We began by interviewing e-conomic's CEO, Sales Manager, and Community Manager in order to gain a solid understanding of a cloud provider's business model and their insider knowledge regarding ERPc usage. Next, we interviewed the owner of Okomatch, a third-party independent company which helps businesses streamline their accounting processes through the use of e-conomic. We also interviewed Automester, an independent software vendor (ISV), who used the e-conomic module to provide an integrated solution to a franchise of independent auto repair garages. Furthermore, in November 2013, we interviewed the CEO for a second time to understand changes in the ERPc space, to follow up on developments within the company (especially the change in ownership which occurred in the summer of 2013), and to re-validate that our overall interpretations from earlier interviews still made sense.

In all situations, semi-structured interviews were conducted, each lasting between 45 to 90 minutes. The interviews were conducted in English, with the exception of one interview, which was conducted in Danish by one of the authors who speaks Danish. The interviews (See Table 2 for a list) were recorded, and selected portions were transcribed verbatim. Finally, we scrutinized the e-conomic webpage and blogs for

Position	Organization	Stakeholder
CEO	e-conomic	ERPc Provider
Sales Director	e-conomic	ERPc Provider
Community Manager	e-conomic	ERPc Provider
Owner	Okomatch	Independent Accountant / Bookkeeper
Manager	Automester	Independent Software Vendor

Table 2: List of Interviewees

background and content relating to our research. Through these resources, the use of interviews, and the published documentation, we clarified our interpretation in order to understand how different resources shed light on our research question [49]. In addition to the use of multiple sources and resources, we gained trustworthiness in our results through member-checking [14] and by sharing our results with the interviewees and e-conomic officers, who provided feedback and clarifications regarding our interpretations.

3.2. Background of company and its system

e-conomic, founded in Denmark in 2001, is a provider of cloud-based accounting software aimed at the small to medium enterprise (SME) market in Europe. The founder, Jacob Wandt an accountant, thought there had to be a more efficient way for accountants and their clients to communicate and share data. The CEO of e-conomic, Torben Frigaard Rasmussen, describes the founder's reasons for creating e-conomic:

[The current standalone system for most SMEs was] too complicated, there's too much traveling time, back then you couldn't email it - you had to physically send the big envelope or someone had to take their bike and the shoebox and hand the paperwork off to the accountant. So someone said - can't we use the internet for this? That was the idea 15 years ago.

The company has experienced rapid growth over the last 12 years (see Figure 1). At the end of 2013, e-conomic also offered a free application, Debitoor, which is used by approximately 100,000 customers. Debitoor is an invoicing system that provides VAT calculations, and integrates reporting to banks as well as other authorities. In addition, e-conomic offers a full ERPc system, which at that time was used by over 67,500 customers, and 5,300 accountants and bookkeepers across 9 European countries. Subscribers to the full ERPc system pay approximately $33 USD per month. Turnover in 2012 was around $17 million, a growth of 33 % over 2011. The company was acquired 100 % by the UK-based HgCapital fund in July of 2013 with the declared goal of furthering international growth.

From its inception, e-conomic has focused on providing an ERPc solution primarily through its accounting module. Currently, e-conomic's core package includes functionality that supports a general ledger, accounts payable, accounts receivables, and sales. Add-on modules (some are free; others incur an additional cost) are additional modules to meet a customer's specific need, such as project management, scanning, subscription, and stock management. But e-conomic does not exist in isolation. It is part of an ecosystem that as a whole provides cloud based ERP solutions (see Figure 2). While a single module from e-conomic may not be considered an ERP system, the combination of modules (from e-conomic, or outside vendors), is what comprises the new paradigm of
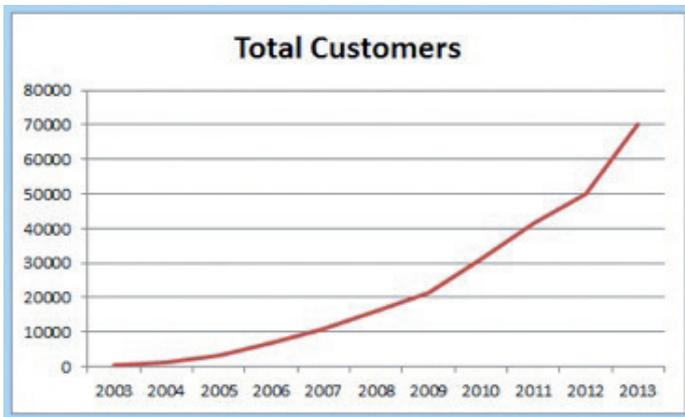
Figure 1. Total Number of ERPc Customers by Year

Figure 2. Ecosystem of e-conomic

cloud based ERP systems. Similar to a traditional ERP system that integrates multiple functions and data across the enterprises, ERPc systems accomplish this through the integration of standard modules chosen specifically and intentionally to meet the unique needs of the organization.

The eco-system of e-conomic consists of the following companies / agents:

- Users – the SMEs utilizing and paying for using the ERPc system / service, either interacting directly with e-conomic or through an ISV integrator
- Independent Software Vendor (ISV) acting as an integrator between users and e-conomic
- ISV Generic firms who develop software that can be used in conjunction with e-conomic
- Independent accountants helping SMEs do their accounts for tax, VAT etc
- Independent consultants offering primarily business processing consulting and IT support to SMEs
- Partners of e-conomic, who receive a commission from e-conomic by soliciting SMEs to use the e-conomic system

An example of the use of an ISV-Integrator is Automester, a franchise chain consisting of 750 independent auto repair garages in a market with 2000 garages. The central office of Automester has 10 staff members including one programmer and three sales/service staff; the company also provides education and training for staff in garages. As a service to its franchisees, Automester has created an integrated ERP system that combines the e-conomic ERPc modules with another cloud-based CRM system. An independent garage (franchisee) pays a yearly fee of approximately $1,100 USD to Automester for the franchise package. On top of this, a garage pays an annual fee for using e-conomic and the add-on 'customer relation management' program (CRM) of approximately $2,200 for a ten user license. In total, there are 750 garages, who use the CRM system, and of these 650 also use the e-conomic accounting package.
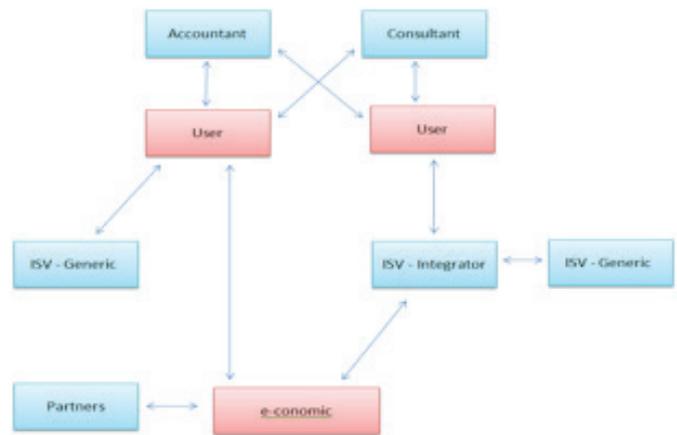
Key to the e-conomic ecosystem are the accountants and consultants who actively use the system in conjunction with their clients. Okomatch is an example of an accounting/bookkeeping firm, which has been in business since 2000. It has eight employees, and it fulfills the role of both accountant and consultant. As a consultant, Okomatch specializes in helping customers set up their back-office processes to be efficient. Once clients have been set up on the system, they often hire Okomatch for their accounting needs as well.

4. Findings

In the next sections we review the eight myths of cloud computing and see how these myths are confirmed or dispelled based on the experiences of the stakeholders described above - namely the ERPc provider (e-conomic), the accountants / bookkeepers (Okomatch), and the software integrators (Automester).

4.1. Constraining Myths

Myth #1- Lack of Security

Security has often been cited in the popular press, and was the most recognized constraining myth in the Netsuite survey, but the CEO of e-conomic provides an alternate view:

A few years ago when you talked about cloud computing, people were concerned about security and back-up. But now they are not. At least not in the Scandinavian countries. Actually, they see the complete opposite. They see how he [e-conomic] has 50,000 companies where they do their books; I'm pretty sure he [e-conomic] knows what he's doing. I'm pretty sure they do what they can do for backup. And everyone can remember the last time their [own] computer crashed or laptop fell in water or whatever, and trying to restore that.

Okomatch's owner confirms that several years ago, clients were more concerned, but she rarely sees this expressed today with her clients:

If some [client] ever asks, and it's not very often, I … say that it's like the bank. If you are safe with the bank system… you can feel safe with this. People are now saying, the safety of having a server in our office, maybe that's not so safe anyway. 'You have to do the backup, and did we do it last week, and did we put it into the bank box'; it's really a bit complicated.

It should be noted that these statements are made regarding financial data, a portion of an organization's data that is sensitive and where businesses will have a relative higher level of concern. The large adoption rates of e-conomic customers, and our interview data cited above highlights customer's lack of concern with respect to security and the fact that their data is being stored in a third party location. While the security threat certainly does not go away, many companies realize that they are themselves ill-equipped to manage their own security and backup and feel more comfortable with a professional technology company, such as a cloud provider, to manage this risk. Accordingly, we can dispel this myth.

Myth #2 - Regulatory Barriers

Regulatory Barriers and the ownership of data is another myth of cloud computing. Regulations can be in the form of national laws and/or organizational policies. For example, many European countries have laws that prohibit personal data from being stored outside of the country's borders. Companies themselves can also have policies concerning how and where data can be stored. For example, e-conomic's data is stored in a high-security facility operated by Fujitsu at two different physical sites [18]. The e-conomic Sales Director explained in the interview:

There is also a local backup in each country because most of the EU regulations ….require data in the local country, where [they] are operating. In our company, there is a daily backup to a server in each specific country.

While this does not give sufficient evidence to dispel the myth, in general we can say that e-conomic has found a way to mitigate the myth for its customers.

Myth #3 - Difficult to Customize

It is a very common myth that cloud applications are not customizable because of multi-tenancy where multiple customers share the same software. What we found is that

ERPc systems are customizable, but in a different manner than traditional ERP systems. Traditional ERP systems are typically customized by configuring and setting parameter values on complex system, or by having a specific code written to accommodate certain needs of a business. This process, which depending on the size and scope of the system, can take from several months to several years to implement [26] with varying degrees of success. With ERPc systems, however, the customization occurs by selecting a unique set of functionalities from a list of possibilities in the standard package, but more importantly from a list of add-ons provided by vendors other than e-conomic. The type of components (i.e., CRM, sales, salary, etc.) and type of provider selected is based on the customer's needs. By choosing components and providers, customers choose best-of-breed solutions for their specific needs, and in effect, build their own customized ERPc system. This is in contrast to the traditional ERP system where a firm may use only a small proportion of the functionality. With a customized ERPc, each piece of functionality is intentionally chosen, and the user typically only pays for the modules used. The e-conomic CEO confirms this as he discusses three different ways that customers use e-conomic based on their individual needs. Some companies only need a basic accounting package and they use e-conomic without additional integrations. The second category comprise companies utilizing e-conomic through an ISV such as Automester who:

Built a platform based on the e-conomic accounting solution and then added whatever strategies the auto dealer [needed]. So they don't really see e-conomic, it is fully integrated. It's an amazing case.

The third group of companies includes organizations that make use of other single-focused components such as a CRM system, and through e-conomic's API integrate one or more components together. In this way, ERPc provides for a new paradigm when thinking about customization. Traditionally, customization has meant longer implementation timeframes and higher costs to develop custom software. However, with ERPc, customization means choosing best-of-breed components or modules from an array of providers offering the best fit with the business, and then simply integrating these through APIs. The e-conomic CEO alludes to this new paradigm:

And then you have guys like webCRM who built integration to us, so a small or mid-size company can build their own ERP system. What I'm saying is that the way we go to market with the architecture and our API, we want to build bridges and not dig trenches.

In terms of how customization takes place, the e-conomic Sales Director points out that SME's are moving towards standardized solutions. The Okomatch owner confirms this trend and estimates that 90 % of business in Denmark could use e-conomic. She sees the standardization as a bonus:

I like that it is only a standard system, because it makes it so much easier for us [accountants] because we always start by saying, 'Well, this is the standard, you can't have any adjust-ments, but tell me about your business, and then maybe I can put it into e-conomic anyway because sometimes it is only a matter of doing this or that and then it can do anything you want.

Our data indicates that the customization may not be the stumbling block it once was with traditional ERP systems, at least not for SMEs, as standardized solutions becomes more and more comprehensive. In addition, our data also points out that focused standardized modules can be easily and efficiently combined in order to build customized ERPc solutions that are simpler than a single large complex ERP systems; ERPc systems provide for a better fit to the custom-er's needs. The myth that a lack of customization constrains ERPc solutions is dispelled.

Myth #4 - Reliability

Reliability encompasses the myth that the data or the ser-vice will either not work properly or will not be available as promised. To this end, ERPc providers respond with trans-parency. e-conomic clearly posts all downtime and prob-lems with the software on their website in order to keep their customers informed. The e-conomic CEO is clear about e-conomic's transparency:

If we make a mistake and someone screws up in customer sup-port or we release some software that didn't get tested prop-erly we don't try to hide it like a lot of companies would do. We just say, 'Boy, we screwed up and we're sorry and we will do better.' We have a huge [number of individuals] . . . engaging with our ecosystem. If we are transparent - there is so much word of mouth, so you can get the ball rolling in a good way.

While it is unlikely for software to be 100% reliable, when ERPc providers allow for a high level of transparency, it lets the customer fairly judge a provider's record. Based on this, they can make their own decision on the reliability of an ERPc provider and also what the true needs are for the com-pany in terms of reliability. Transparency puts the reliability factor under the control of the customer's judgment, and we can therefore dispel this myth.

4.2. Enabling Myths

Myth #5 - Lower Cost

ERPc systems have been touted as more cost effective than traditional ERP systems, which we found to be true over a number of different factors:
- ERPc solutions "free up IT resources to move from an operational role to a strategic role" [23]. When less time is spent maintaining and upgrading software, applying patches, and maintaining the infrastructure, the total cost of ownership is lower.
- ERPc can be a better fit in that many customers do not need the level of sophistication built into a traditional ERP system. Many of e-conomic customers move to e-conomic from a system that is too large and complex for their needs. The e-conomic CEO gives an example of one of e-conomic's clients who was using Microsoft and considering SAP:

They were talking 300,000 Euros for a traditional stand-alone solution, while for e-conomic we are talking only 3,000 Euros before they are up and going.

- Being able to "down-grade" to a system that is simpler and easier to use saves money, in this case by a factor of 1:100.
- ERPc providers typically use a subscription-based pay-ment structure where customers pay a set amount every month or quarter. This is opposed to a traditional ERP system that would entail a large upfront cost, set-up costs, and yearly licensing fees (typically 20% of the upfront license cost). The trend towards a subscription-based payment system is echoed by Forbes, when they predicted it to be a game changer for traditional ERP systems:

The days of traditional ERPs are numbered. And it is because of a fundamental shift that is taking place regarding how people consume products and services driven by the massive growth of the cloud itself. I'm referring to the shift we are experiencing away from a 20th century product-based, "buy once" economy to a 21st century services-based "Subscription Economy" cen-tered around recurring customer relationships. [53]

The Okomatch owner confirms that customers do gain the benefit of the lower costs associated with ERPc:

They like that very much because a lot of customers are used to buying a very expensive program up front, and then they may depreciate it over years, and then it gets old before its

time and they have to buy again. But in this way they pay a very small fee, it's really nothing, next to nothing.

Regarding clients who have bought a more complex ERP system, she reports:

We are able to convince them to stop that and just throw it out and start again, because in the end, this [e-conomic] will be cheaper anyway.

Based on the above, we can confirm the myth that the total cost of ERPc is less than a traditional ERP system, and this lower cost motivates organizations to adopt it. Based on this, we can confirm the myth that ERPc solutions are less expensive.

Myth #6 - Streamline Business Processes

There are several reasons why ERPc can streamline the business process. One might even think of streamlining business processes as the other side of the coin of customization. Okomatch specializes in helping clients optimize their processes and work procedures of their accounting functions. Accordingly, whether the ERPc induces the standardization, or whether the streamlining of business practices makes the use of an ERPc system doable is unclear. However we can say from the e-conomic case that these two are closely intertwined, as e-conomic's Sales Director highlights:

In the future the market will increase because we can see a clear tendency towards standardized systems as ours. In the old days if you had a small deviation then you get the software and build a system to fit this small specialty. But today, [companies] are streamlining their routine, and then they pick a standardized solution; we can clearly see a tendency in that.

Based on this we are able to confirm that ERPc solutions can aid in streamlining business processes.

Myth #7 - Accessibility

Our data confirms this myth in three ways. First, the software is available 24x7 anywhere in the world. Second, there is the availability of the ERPc system on multiple devices. As businesses move toward a more mobile economy having software accessible anywhere on multiple devices will become more important. The third aspect of accessibility is the real-time access that ERPc provides. The ability to share data with others and know confidently that you are all looking at the same "version" of data is extremely

important. E-conomic knew this was one of the critical success factors from the beginning.

In the early days, one of the big hits of e-conomic was the sharing of data in real time. [This is much better than] extracting files from an old ERP system and sending the file to your accountant or bookkeeper, and then while your accountant or bookkeeper is working on your file you cannot do anything because they have the file with the data. So this accessing the data simultaneously, in real time, for both parties, was really a ground breaking idea when e-conomic was launched. (e-conomic Sales Director)
No matter if [your bookkeeper/accountant] is internal or external, that he can anytime, from anywhere in the world … log onto your books and help you; see if you did your quarterly VAT [is done] correctly. We talk this core - the triangle business we are doing with the bookkeeper, the business, and the accountant. That these guys can work together online makes such a big difference. (e-conomic CEO)

ERPc solutions provide greater accessibility for all relevant parties with a high level of ease-of-use, and we can confirm this myth of higher accessibility.

Myth #8 - Easy Upgrades

Proponents of ERPc note that an advantage of the cloud is that customers do not have to be responsible for their own upgrades - as the software is upgraded, these upgrades become immediately available to the customer. We found this myth to be confirmed by the Okomatch owner who notes that e-conomic keeps up with new technologies and consistently introduces new features.

They are very upfront in their new technologies, new features – they were the first to integrate with the bank solutions. If they offer something – it's for free. They just do their own things to make it better all the time.

Based on our findings, we can confirm the myth that ERPc solutions provide for easy and efficient software upgrades.

4.3. Summary of myth findings

We have addressed the eight myths of ERPc identified in the Netsuite study, which coincide with myths in the popular press. We have confronted these myths, and confirmed, dispelled, or mitigated each myth with evidence from our interviews. While it is understandable that myths form to help make sense of new phenomenon [27] it is important to seek the truth relating to each myth as soon as the phenomenon begins to stabilize. The danger in not doing so is that misconceptions can become ingrained in an actor's belief system to the point that decisions

		Myth	Reality	Notes
Constraining Myths	Myth #1	Lack of Security	Dispelled	Whereas security may have been a myth in the past, for our respondents it is hardly a concern for using ERPc today.
	Myth #2	Regulatory Barriers	Mitigated	ERPc providers can mitigate this risk by keeping backups within a customer's home country.
	Myth #3	Inability to Customize	Dispelled	Free APIs allow customers, consultants and/or independent software vendors to build a customizable ERPc system rather easily, if economically valuable
	Myth #4	Lack of Reliability	Dispelled	Transparency enables customers to make informed choices regarding reliability, and an ERPc is typically more reliable than their own on premise installations.
Enabling Myths	Myth #5	Low Cost	Confirmed	Subscription-based pricing is less expensive than paying a one-time substantial amount for acquisition of software/hardware/customizations, plus a yearly licensing fee for software.
	Myth #6	Contributes to Streamlined Business Processes	Confirmed	Businesses are willing to standardize their processes in order to use an ERPc system, typically making processes more efficient.
	Myth #7	Increased Accessibility	Confirmed	Direct access to data is available 24x7 on multiple devices including mobile platforms.
	Myth #8	Easy Upgrades	Confirmed	ERPc providers constantly upgrade their system to include more features for the benefit of their clients.

Table 3: Summary of ERPc Myths – Confirmed or Dispelled

are made and actions are taken based on wrong premises. We might even see remedies applied for issues that do not exist. Our aim is to provide insight, and alternatives ways of interpreting what begin as taken-for-granted-assumptions. These assumptions are often based on traditional ways of thinking that do not always fit a new technology. Through our examination, we offer a shift in paradigms which leads to a better understanding of the true capabilities of ERPc.

Using an exploratory study, as we have done here, provides us with an effective method for understanding the truthfulness or falsehood behind a myth. For example, in addition to dispelling the myth of customization, our qualitative research process also provided us with a different way of understanding and producing a customized ERP solution, which we could not have achieved with a quantitative study. A typical quantitative study would have 'tested' the myths with traditional customization in mind and could only, with great difficulty, allow recognition of the fact that ERPc provides an alternate method of building customized solutions. So while our study does not involve testing in the statistical sense, our approach leads to generalization typical of inductive studies [34].

Table 3 presents a summary of the ERPc myths and our conclusions regarding each myth.

5. Discussion

In this article, we have attempted to examine ERPc from the first level view of subjective understanding where subjective

does not imply bias, but rather acknowledges that actors convey their socially constructed understanding of a given phenomenon [33]. The second level view (interpretive view) is provided by the researcher and seeks to provide meaning to the actor's socially constructed understanding by providing a deeper level of insight that is often not available to the actors themselves [33]. We use this second level interpretive view to address what impact ERPc may have on the organization. In this sense, we provide an understanding of the reality of ERPc beyond the first order impacts of enabling a customizable ERP solution that is cheaper and faster than a traditional ERP solution. By doing this, we provide an initial answer to the question of whether ERPc will only change organizations at a surface level by providing an easier and less expensive option or, alternatively, whether ERPc will enable a paradigm shift to occur within organizations.

We begin to answer this second research question by first attempting to understand the impact of traditional ERP systems on the organization based on our interview data and existing research. Past literature has confirmed that ERP systems are costly, take considerable time to implement, and have a life span of several years or even decades [26]. After implementation, the next stage in the systems lifecycle is routinization, where the system becomes a part of the users' daily functions [13]. It may take several years for routinization to occur, but by that point in time, the ERP system is stabilized and institutionalized within the organization [47, p. 390]. For large ERP systems, the time it takes to dismantle them or move to a different

system, often equals the time it took to implement them. This institutionalization can and probably needs to occur because a traditional ERP system will "impose its own logic on a company's strategy, organization, and culture" [15, p. 122] in order to reap the full benefits. For example, an institutionalized system requires less work to manage [47].

However, institutionalized systems can lead to problems, especially a lack of fit as the business needs to change and evolve. Yet the ERP system remains constant. Misfits between an ERP system and the organization can occur due to deficiencies in the software or an enablement misfit due to the impositions that an ERP system makes on an organization, thus reducing

Iron Cage Characteristic	Traditional ERP Solution	ERPc Solution
Institutionalization	Yes Systems will have a lifespan of several years or even decades thereby becoming embedded within the organization	No The modular nature and relatively very low entry cost of an ERPc solution allows for dynamic solutions that can change when required and offers the possibility of changing the ERPc provider.
Enablement Misfits	Yes Organizations become bound by the rules imposed on them by their ERP system	No ERPc systems are smaller and leaner with fewer impositions thus leading to a better fit
Bureaucratic	Yes Systemic organizational red tape is created due to the size and complexity of the ERP system requiring high level of formalization	No The modular nature of an ERPc solution allows for dynamic solutions that evolve over time, with seamless adoption of new modules
Rationality	Yes Organizations misconstrue high (sunk) costs and long implementation timeframes as a rational reason for staying with a system that does not fit the organization	No ERPc systems are smaller and leaner thus allowing organizations to make better decisions about possibly changing vendors

Table 4: A comparison of ERP solutions on Iron Cage Characteristics

Agility Characteristic	Traditional ERP Solution	ERPc Solution
Leanness	No ERP systems typically have superfluous functionality leading to high complexity	Yes ERPc systems are smaller and leaner providing a better and more cost effective fit
Flexibility	No High costs and long implementation times reduce flexibility as organizations are locked-in to their current ERP solution	Yes Modular design, pay-as-you-go pricing, and no data lock-in allow organizations to adapt to changes in the environment
Supports Organizational Processes	No ERP systems have a huge amount of functionality that might be used for a range of organizational processes, but since these systems necessarily are huge integrated packages, they don't allow easily for using a best-of-breed solutions, which might lead to lack of fit for (some) organizational processes	Yes ERPc provides a smaller set of effective systems that either fit the organizational processes or will allow the user organization to use other best-of-breed solutions creating a better fit
Quick Response	No High costs and long implementation times force organizations to be locked-in to their current ERP solution thus preventing them from quickly responding to changes	Yes Pay-as-you-go pricing, and no data lock-in allows organizations to change the configuration of their software in response to changes in the environment

Table 5: A Comparison of ERP Solutions on Agility Characteristics

the organization's effectiveness [50]. The high costs of ERP systems and the long implementation timeframes mean that ERP systems are not implemented routinely. Gosain [25] argues that (traditional) ERP systems are carriers of institutional logic and thus organizations become trapped within the "iron cage" of rationality, and bureaucracy, often suffering through a lack of enablement fit. Organizations cannot easily or quickly escape from this information system "iron cage", because of the large costs and length of time required to develop a new ERP system.

Organizations need to break free of the information system iron cage, in order to respond more quickly and efficiently to changes in the marketplace. In other words, it is important for the new information systems-related innovation to provide organizations with more agility. Much of the IS agility literature focuses on agile development techniques such as scrum and XP. Conboy [12] took an etymological approach in defining agility as having the components of leanness and flexibility. Sarker and Sarker [45] took a more encompassing approach to show that agility enables organizations to engage in quick responses, and is essentially multi-faceted in nature consisting of multiple characteristics. Others have suggested that in agile organizations, there is a fit between its different components including business processes and strategy [38].

In effect, we believe that the shift to the ERPc paradigm will allow organizations to break free from the iron cage and move toward increased agility. The pay-as-you go and modular design options allow organizations to formulate and change solutions faster with less cost due to reduced lock-in and lower direct costs. Flexibility is maintained by ERPc's modular nature, and typically it can be implemented faster, and at a much lower cost.

Our analysis shows that while traditional ERP solutions typically can create an iron cage situation, ERPc solutions can free organizations and lead to a greater level of agility within these organizations. Table 4 compares a traditional ERP solution with an ERPc solution on key iron cage characteristics. Similarly, Table 5 compares a traditional ERP solution with an ERPc solution on key agility characteristics.

6. Conclusion

In this paper, we have attempted to highlight how an innovation such as ERPc can create uncertainty and hype leading to myths about the benefits and challenges in using this innovation as organizations begin to implement and consequentially routinize these innovations. We conducted a case study in which we used the insights and experiences within a real-life context to confirm or dispel the myths of cloud based ERP-systems. Our results show that the scenario of an ERPc must be like nirvana for the user of a traditional ERP system. However, one needs of course to bear in mind that the user organization

will typically only have at its disposal a substantially reduced set of options for finding an ERPc that matches its needs. If such a system exists, or if the user organization can make do with the standard solution in the cloud, the total costs of ownership are reduced by orders of magnitude.

However, our study is not without limitations. The context of our research is limited to Northern European SME's using ERPc systems with core functionality. Future research could be conducted in other regions of the world as well as within larger organizations to determine if our findings apply within these contexts. Furthermore, while our findings are not generalizable in a statistical sense, the empirical data may be generalized to theory through the concept of analytical generalizations [56, 34], which is the use of induction to construct theory that is grounded in the empirical data collected during a study, often with the use of insight from existing theory. Our results confirmed all of the enabling myths, dispelled three of the constraining myths, and mitigated the fourth constraining myths. Further, we combined these "narrow themes" of ERPc myths into an "overarching perspective" and then related these insights with the literature providing "layers" of analysis, which allowed for a broader interpretation of the meaning of our case. [14, p. 36] Accordingly, we see ERPc as freeing organizations from the negative impacts of the iron cage bureaucracy associated with many traditional stand-alone ERP-systems. Cloud based ERP-systems on the other hand, can be implemented faster, cheaper, and with more flexibility. The result is empowered organizations that embrace agility, and the benefits associated therein.

Keywords: cloud computing; enterprise resource planning; ERP; agility; myths; qualitative research

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