Impact of software as a service (SaaS) on software acquisition process

Srinivasa Raghavan R., Jayasimha K.R. and Rajendra V. Nargundkar
Department of Marketing, Indian Institute of Management, Indore, India

Abstract

Purpose – Organizations worldwide are adopting software as a service (SaaS) applications, where they pay a subscription fee to gain access rather than buying the software. The extant models on software acquisition processes, several of which are based on organizational buying behavior, do not sufficiently explain how SaaS application acquisition decisions are made. This study aims to investigate the acquisition process organizations follow for SaaS software, the changes to the roles of the Chief Information Officer (CIO) and the business user and also looks at the impact of SaaS on the proliferation of unauthorized software systems.

Design/methodology/approach – The authors used exploratory research using the grounded theory approach based on 18 in-depth interviews conducted with respondents who have studied with enterprise software delivered on-premise and as SaaS in different roles such as sales, consulting, CIO, information technology (IT) management and product development.

Findings – The authors identified a need to classify the SaaS software and developed a framework that uses software specificity and its strategic importance to the organization to classify SaaS applications. The aforementioned framework is used to explain how software evaluation processes have changed for different kinds of SaaS applications. The authors also found that the CIO's and the business users' have changed substantially in SaaS application evaluations and found evidence to show that shadow IT will be restricted to some classes of SaaS applications.

Originality/value – By focusing on the changes to the roles and responsibilities of the members of the buying center, this paper provides unique insights into how the acquisition process of SaaS is different from the extant models used to explain enterprise software acquisitions. An understanding of how information search is conducted by the business users will help software vendors to target business users better.

Keywords Grounded theory, Organizational buying behaviour, Software as a service, SaaS, Enterprise software selection

Paper type Research paper

1. Introduction

Enterprise software applications are large, configurable and generic software that cover different processes of an organization and helps them achieve cost savings while helping to adhere to industry best practices (Howcroft and Light, 2006). Examples of such enterprise application software are enterprise resource planning (ERP) and software that support enterprise-wide processes such as supply chain management (SCM), customer relationship management (CRM) and human resources management. Software as a service (SaaS) applications are cloud-based applications that are accessed over the internet and are managed by the vendors who charge a "pay-as-you-go" subscription fee (Bhardwaj *et al.*, 2010), whereas "on-premise" applications require the organization to install a version of the software locally, by obtaining a software license (Howcroft and Light, 2006; D'Souza *et al.*, 2012; Bhattacherjee and Park, 2014). Organizations that are looking to acquire information technology (IT) products and services are increasingly adopting a "cloud-first" strategy when it comes to buying new software or replace existing IT assets (Gartner, 2019).

As SaaS (and cloud computing) is a relatively new area, the extant research has focused on the reasons why SaaS is adopted by organizations (Abd Elmonem *et al.*, 2016) rather than how they go about identifying and adopting a specific SaaS application. Other areas of research in SaaS have focused on issues such as security concerns with SaaS (Benlian and Hess, 2011; Sommer *et al.*, 2012), diffusion of SaaS (Martins *et al.*, 2016), customization challenges (Mijač *et al.*, 2013) and so on. Research that focused on how SaaS selections have suggested quantitative models to identify a specific SaaS application from a long list using tools such as analytical hierarchy process (AHP) (Godse and Mulik, 2009; Mital *et al.*, 2014), balanced scorecard (Lee *et al.*, 2013) and potential adoption index (Ercolani, 2013). During this review of the extant literature, we did not identify any study that examined the process followed by organizations to organizations identify and select a specific SaaS application.

The extant studies on on-premise enterprise software selection have used the lens of organizational buying behavior, as they are often a multiphase, multi-person, multi-departmental and multi-objective process and is normally a very long complex process (Verville and Halingten, 2003a; Bhatti, 2014), which is a key aspect of business-to-business buying (Grewal *et al.*, 2015). Business-to-business buying is

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going through an era of rapid changes, which are technology-induced or because of macro-economic conditions and demographic changes (Wiersema, 2013). There is a new generation of business-to-business buyers who are empowered end-users. They place greater value on the buying experience, convenience and simplicity while making purchases for their own use and that of the organizations (Forrester Consulting, 2014). In most purchases, the users get through more than half of their purchase decision-making process before they engage with the supplier's sales representative directly (CEB Global, 2018).

Our research looks at some of the key aspects of the SaaS acquisition process using the organizational buying behavior theory. We aim to understand if the process followed by the organizations has changed substantially for SaaS applications when compared to on-premise applications.

SaaS applications have also caused a major shift in the power equation in the software selection process where the users conduct information searches, trial the software without the help or approval of the Chief Information Officer (CIO) (Zainuddin, 2012). This bottom-up adoption of new, unauthorized software applications, referred to as shadow IT, helps users to maximize their performance and helps to get over the limitations of the current enterprise systems that their organization uses. Zimmermann *et al.* (2017) study showed that shadow IT was beneficial to organizations that they studied, but these benefits had to be weighed against the high risk of process failure and compliance and security issues. They also state that from an organizational perspective, there is a risk of inefficiencies arising from immature processes, time-intensive use of resources and redundancy. Studies on shadow IT have generally focused on personal productivity applications and very rarely on enterprise-class applications (Haag *et al.*, 2015; Zimmermann *et al.*, 2017).

This study looks at the impact of SaaS on:

- the software evaluation process;
- the changes in the roles and responsibilities of users and the CIO in the evaluation process; and
- the user-led unauthorized software adoption process in organizations.

We use the extant organizational buying behavior frameworks to identify the steps followed by organizations and to identify the changes to the roles and responsibilities of the decision-making unit (also referred to as buying centers).

2. Literature review

SaaS presents a completely new option for organizations that are looking to replace their existing IT systems or looking to automate new business processes. In this section, we will review the available literature on areas such as SaaS, shadow IT systems, enterprise software acquisition, the roles of CIOs and business users.

2.1 Software as a service

On-premise installation of ERP, CRM and other enterprise application software requires a combination of software licenses, hardware, infrastructure and system integrators to work (Somers and Nelson, 2004; Howcroft and Light, 2006). Every time that the software vendor comes with a new upgrade, the system integrator and the IT organization have to expend a lot of effort to ensure that there are no regressions.

Cloud-based software is generally classified as

- SaaS;
- Platform as a service; and
- Infrastructure as an service (Wu *et al.*, 2011).

Of these variants of cloud-based services, SaaS is the equivalent of the on-premise packaged solutions and offer similar functionality and benefits, but through a completely different business model. SaaS follows a software delivery paradigm in which the software is hosted off-premise, delivered via the web and customers pay a subscription fee, rather than a license (Godse and Mulik, 2009; Katzmarzik, 2011). The SaaS provider is responsible for delivering, securing and managing the application, data and underlying infrastructure (Kaplan, 2007). The SaaS market has been constantly growing and it is forecast to reach nearly $95bn by 2019 and companies are now adopting a "cloud-first" strategy when it comes to acquiring new software or replacing a legacy application (Gartner, 2019).

The table below summarizes a few of the key studies on SaaS in areas such as adoption, business models and SaaS evaluation (Table I).

The literature on SaaS adoption (Martins *et al.*, 2016; Oliveira *et al.*, 2019; Van der Panne, 2003; Wu, 2011) shows the use of different theories and frameworks such as transaction cost theory (TCT), deployment models transition framework, contingency approach and so on. To explain how cloud computing and SaaS solutions have been assimilated in organizations. Similarly, studies that have examined acquisition processes (Ercolani, 2013; Godse and Mulik, 2009; Mital *et al.*, 2014) have presented perspectives on identifying tools and techniques to identify the right software rather than focus on the process itself. The aforementioned studies neither do explain the changes to evaluation processes to accommodate the development of cloud-based applications nor do they study the changing roles of the CIO and the business users in this evaluation process. Our study intends to fill this gap by examining key aspects of the software evaluation process by extending the extant literature to classify SaaS applications (Benlian *et al.*, 2009; Sesser, 2013).

2.2 Shadow information technology

Shadow IT has been defined as follows:

> [. . .] the voluntary usage of any IT resource violating injunctive IT norms at the workplace as a reaction to perceived situational constraints with the intent to enhance the work performance, but not to harm the organization (Haag and Eckhardt, 2014).

A report by Forrester group says "[. . .], different business departments were bringing in these systems, often with little or no reference to typical IT sourcing teams. Employees are self-provisioning without any involvement from IT" (King, 2010).

Behrens (2009) suggests that users adopt a shadow IT system, as a gap exists between the users' expectations and solutions offered by the IT department. The current generation of users has enough experience in procuring their own software for their personal use and this knowledge is percolating to their workplaces (Petrocelli, 2013b). The users who were forced to live with a sub-optimal solution can now evaluate and acquire subscriptions of SaaS applications at a fraction of the cost.

Table I Review of SaaS literature

Study	Focus	Summary
D'Souza *et al.* (2012)	The business model of SaaS	Provided a transition model for on-premise vendors to move to SaaS and proposed a deployment models transition framework
Winkler and Benlian (2012)	IT governance	Studied the impact of different aspects of application specificity using the lens of TCT
Winkler *et al.* (2011)	IT governance	The used contingency approach to investigate how firms allocate authority for SaaS applications
Mital *et al.* (2014)	SaaS evaluation	Identified, ranked and classified the dimensions affecting SaaS sourcing and then analyzed the framework using AHP
Wu, Lan and Lee (2011)	SaaS adoption	Studied trust issues and concerns in SaaS Adoption using a modified decision-making trial and evaluation laboratory approach
van de Weerd *et al.* (2016)	SaaS adoption	Studied determinants of SaaS adoption and identified top management support as an enabler for SaaS and SMEs more likely to adopt SaaS
Martins *et al.* (2016) and Oliveira *et al.* (2014)	SaaS adoption	Studies that looked at SaaS adoption using a different lens such as TOE framework, diffusion of innovation and institutional theory
Benlian, Hess and Buxmann (2009)	SaaS adoption	Classified SaaS applications based on factors derived from TCT, RBV and planned behavior theories to study SaaS adoption
Benlian and Hess (2011)	SaaS adoption	Studied adopters' and non-adopters' perceptions toward risk, cost, etc. using the theory of reasoned action
Bhattacherjee and Park (2014)	SaaS adoption	Used migration theory to identify and explain factors that enable or hinder migration
Zainuddin (2012)	SaaS adoption	Model to study stealth adoption of IT by organization units using the lends of innovation adoption
Mager *et al.* (2014)	SaaS classification and marketing strategies	Proposed a model for marketing SaaS applications using strategic marketing theory
Tyrväinen and Selin (2011)	SaaS marketing strategies	Model for software vendors to design marketing and sales strategies
Ercolani (2013)	SaaS evaluation	Model to evaluate SaaS applications using the potential adoption index
Godse and Mulik (2009) and Mital, Pani and Ramesh (2014)	SaaS evaluation	Models for SaaS evaluations using AHP
Lee *et al.* (2013)	SaaS evaluation	Used balanced scorecard to identify factors for evaluating SaaS
Chen and Zhao (2012) and Subashini and Kavitha (2011)	Security and privacy concerns	Studies on data security and privacy and concerns of organizations on cloud

Zainuddin (2012) looked at shadow IT adoption in the context of SaaS applications and calls this bottom-up adoption of new IT systems, which are subscribed to without the knowledge of the organization's IT unit, as "stealth adoption" of SaaS applications.

2.3 Enterprise software selection

Organizational buying processes have been described as multiphase, multi-person, multi-departmental and multi-objective process and is normally a very long complex and objective process (Grewal *et al.*, 2015). Enterprise software selection has been explained through the lens of organizational buying behavior, as it also involves a long complex process that involves a committee drawn from various departments (Verville and Halingten, 2003a; Bhatti, 2014). The team members play different roles in the committee constituted for the specific task of buying, called buying center such as users, buyers, influencers, deciders and gatekeepers and sometimes multiple roles are played by the same person (Sheth and Howard, 1970; Webster and Wind, 1972).

Once a need has been established that a new enterprise software package is required, the management tasks a few key individuals (called project champions) to form a committee (often called a steering committee) to evaluate and pick a vendor (Somers and Nelson, 2004). This committee is formed by drawing individuals from various functions such as marketing, sales, warehousing, manufacturing, finance and so on. To ensure that the software selected is acceptable to all stakeholders (Verville and Halingten, 2003b; Somers and Nelson, 2004; Palanisamy *et al.*, 2010). While the committee is responsible for evaluating the vendors and for proposing the shortlisted vendors, the final decision is taken by the CIO, along with other members of the management such as Chief Financial Officer (CFO), Chief Executive Officer (CEO) and the board (Willcocks and Sykes, 2000; Bernroider and Koch, 2001).

2.4 Changing role of the CIO

The focus of the practitioner and academic literature on software acquisition has been on the role and responsibilities of the CIO, as they were considered the subject matter expert. Traditionally, it was the most important role in software buying, as they played the role of the "buyer" in the buying process, gatekeeper and also exerted a great deal of influence in the final decision (Ross and Feeny, 1999). It was the CIO's responsibility to ensure that the software chosen was a good fit for the organization's needs (Hong and Kim, 2002).

The role of the CIO is changing from someone who managed routine tasks such as installation, maintenance and so on. To someone who can focus on more strategic tasks of the organization because of SaaS and similar cloud applications (Malladi *et al.*, 2012). The advent of cloud applications also

complicates the job of the CIO, as users can evaluate and adopt systems without their knowledge (Zainuddin, 2012). Cisco's Bob Dimicco says that:

> IT has lost control here, because organizations, lines of businesses are saying I can go to the Web and get an application or service within minutes and start being productive (Corbin, 2015).

2.5 User involvement in software selection

Though user buy-in is a very important factor in choosing the vendor, organizational cultural and political influences can limit the influence of the user feedback in the buying decision (Verville and Halingten, 2002).

In the standard industrial buying scenario, the purchasing agent had great exposure to the commercial sources and it is a common practice that the salespersons are discouraged to talk to the engineering or manufacturing personnel. The information that the engineering and manufacturing personnel get is either from the buying agent, which could be biased information or from trade shows, magazines, etc. The information asymmetry between the various members of the team, which was endemic to the buying process has been more or less eliminated owing to technology (Alejandro *et al.*, 2011). As the predominant theories in organizational buying behavior were formulated well before the advent of the internet, the impact of technology on the organizational buying process is not fully explained (Lewin and Donthu, 2005).

The internet has helped democratize the information search process; the buyers have direct access to information, without the need for salespersons and other intermediaries. In fact, a recent study noted that the latest generation of empowered buyers complete more than 60 per cent of the purchase process before they even speak to a sales representative (Forrester Consulting, 2014; CEB Global, 2018) business users do not have to depend on CIOs or salespersons to get access to software, they can go directly to vendor websites and sign-up for a trial account for free and get immediate access to software (Cheng *et al.*, 2015). This has led to increased user awareness, and vendors having to change their sales strategies substantially to focus on business users directly. In a study by enterprise strategy group on the influence of marketing professionals on IT buying, they found that "42 per cent reported that they were involved in the final decision to purchase software and 20 per cent said they were the final decision maker" (Petrocelli, 2013a).

2.6 Gaps in the literature

From our review of the extant literature, we conclude that the research in the area of software evaluation and high technology purchases have not been updated to understand the major changes that have been heralded by the widespread adoption of SaaS and other cloud-based applications.

Organizational buying behavior is still the most dominant framework used to explain the process of acquiring business software. These models assume that the buying center constituting various users identifies the applications to be bought and the CIOs, CEOs and CFOs acquire the software. These models have also not been updated to understand the impact of empowered users identifying and selecting systems without the involvement of the buying center. With the business users being able to perform their own information search and evaluation independently, in several cases, the software of choice is already known even before the sales representative gets involved in the evaluation.

Therefore, the aim of the study is to understand the changes to the software evaluation processes because of SaaS, identity the changes to roles and responsibilities of the key members of the buying center and analyze the impact of SaaS on shadow IT applications.

3. Methodology

3.1 Research approach

Our study of the extant literature on the subject of SaaS software evaluation led us to a belief that these existing models do not sufficiently explain the acquisition of SaaS software. Hence, we decided to perform an inductive grounded theory-based research to identify a new theory that can help explain the acquisition process of enterprise SaaS software. Exploratory qualitative research has been shown to help researchers to provide insight into the subject when there is an absence of a large body of published work on the subject (Hyde, 2000).

As we aimed to study the changing trends, we decided to collect data through in-depth interviews of sales personnel, implementation consultants, software developers and industry experts to get a well-rounded understanding of how the processes and roles played by the members of the buying center are changing. In-depth interviews were used, as they help to extract "deep answers from experts in the area, helps uncover the *how* and *why* of an issue and helps to elicit the interviewees' views on processes, norms, decision-making, belief systems, mental models, interpretations, motivations, expectations, hopes and fears" (Guest *et al.*, 2012). We decided to follow a purposeful sampling approach and the sample selection was done based on the purpose of the study, the unit of analysis and the resources available (Emmel, 2013).

3.2 Sampling

The following criteria were used to identify the participants in this study: the subject should be very familiar with enterprise applications and should have worked as either in the sales role or as an implementation consultant or should have been involved in the development of such software for at least 10 years so that they would have worked both in the era of on-premise applications and are now working with SaaS applications.

We started with an interview guide that listed the open-ended questions that can elicit responses on the various aspects that cover the research propositions identified as part of the research proposal (Yin, 2015). These interview protocols were fine-tuned to match the roles that we had planned to interview: industry analysts, implementation consultants and sales personnel.

The sample size in qualitative inquiry depends on several factors such as the research question, the purpose of the study, what will be useful, be credible and what can be done with the available time and resources (Patton, 2002). Patton (2002) goes on to say that the:

> [. . .] validity, meaningfulness and insights generated from qualitative inquiry have more to do with the information richness of the cases selected and observational/analytical capabilities of the researcher than with the sample size.

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Extant research on sampling in qualitative research has studied the merits of determining sample size *a priori* using rules of thumb, conceptual models, using empirical models or statistical formulae vs determining the sample size based on theoretical saturation (Sim *et al.*, 2018). They concluded that determining the sample size *a priori* is problematic particularly for interpretive models of qualitative research. Studies on the ideal number of interviews after which saturation was found to have been achieved have ranged from 12 interviews (Guest *et al.*, 2006), to 16 or fewer interviews were sufficient to identify common themes among homogenous groups (Hagaman and Wutich, 2017) and 20-30 for research that uses grounded theory (Creswell, 1998). We found that we achieved saturation at around 15 interviews, and hence, stopped collecting new data at that point. We conducted three more interviews after this with CIOs and IT managers for validating the information obtained from the earlier interviews.

A total of 18 in-depth interviews were conducted, both face-to-face interviews and telephonic interviews, as the participants were not co-located with the researchers and research has shown that there is no substantial difference between face to face and telephonic interviews (Sturges and Hanrahan, 2004). The anonymous profiles of the respondents are included in Table II.

The interviews were semi-structured and we used the interview guide to ensure that the important questions were not omitted. All the interviews were recorded on a digital recording device to ensure that a complete verbal record of the interview exists (Patton, 2002; Belk, 2007). To ensure that no part of the interview was lost, *verbatim* transcripts were created from these audio files by a professional transcriber (Guest *et al.*, 2012).

3.3 Data analysis

Based on our research questions, literature review and our understanding of the business, we started with a broad category of themes that included demographics of the interviewee, their experience in the industry, their perception of how the software evaluation process has changed, how the roles of business users and CIO has changed and role of SaaS in shadow IT. Using these broad categories, the transcripts were analyzed and specific Level 2 codes were identified based on the content in the transcript (Miles *and* Huberman, 1994; Charmaz, 2001). Coding was a cyclical task, where we constantly went back to the list of codes (Levels 1 and 2) to modify/add codes to better manage, filter and highlight the salient pieces of the conversations (Saldana, 2009).

The codes were marked against the relevant pieces of the transcript using Microsoft Word's comment functionality and then they were tabulated into Microsoft Excel using a macro. To reduce the researcher's bias, and to improve the validity of the coding process, the transcripts were coded by another person, who was neither familiar with the research nor the field of study (Creswell and Creswell, 2017; Yin, 2015). For the purpose of this research, we decided to collate all the responses, discuss and negotiate the agreements and disagreements (Armstrong *et al.*, 1997). The rationalized data from the different researchers were merged into a single Excel file was used as the basis for analysis by the researcher. Figure 1 provides an overview of the data structure of how the codes emerged out of the analysis and how they were related to the theoretical categories.

3.4 Trustworthiness

Morse *et al.* (2002) define verification as the mechanisms used during the process of research to incrementally contribute to ensuring reliability and validity and, thus, the rigor of a qualitative study. They suggest that verification strategies are interwoven in all steps of qualitative research to ensure that reliability and validity are built into the research. The following were some of the strategies that we followed during the study to ensure that verification is built through the process.

A purposive sampling approach was used to ensure that a diverse sample that consisted of sales personnel, implementation consultants, industry experts and CIOs were used for the study. The participants were assured of anonymity and all interviews were recorded on an audio device and transcribed by a professional transcriber (Guest *et al.*, 2012), which was then validated word for word by the researchers because of the technical nature of the conversations. We reviewed the transcripts after the first few interviews and did a preliminary analysis to test the codes that we started with, and added more codes to the list and then used them to all the interview transcripts to ensure that there is a continuous feedback loop through the various phases of the study. To reduce the researcher's bias and to improve the validity of the coding process, the transcripts were coded by another person, who was neither familiar with the research nor the field of study (Yin, 2011; Creswell and Creswell, 2017). The codes and the conversation snippets were then compared and the disagreements and agreements were negotiated (Armstrong *et al.*, 1997).

4. Findings

4.1 Need for classifying software as a service applications

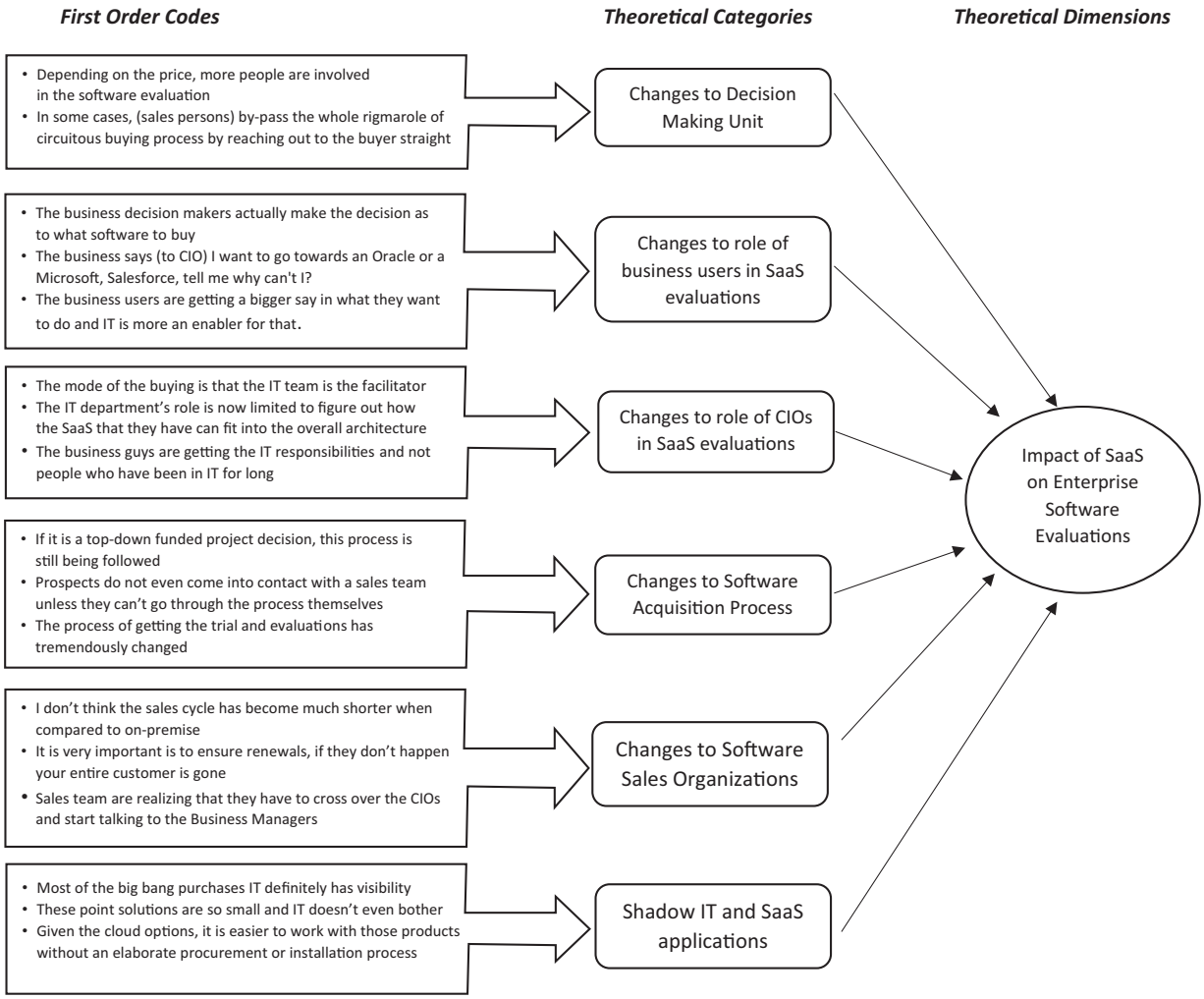
During on our discussion with the experts, we came across several instances where they responded to the questions on enterprise software by qualifying their answers using terms such as "point solutions," "niche solutions," "core solutions," "peripheral areas" and so on, to describe the kind of software that they had in mind while responding to the questions. This leads us to think that there is a need to classify the enterprise SaaS software better to help present our research findings. Enterprise SaaS applications can range from small solutions used by a handful of users to large and complex enterprise-wide applications, and hence, is too broad a term (Sesser, 2013).

There are a few classifications of SaaS available in literature including the model proposed by Benlian *et al.* (2009) where they analyzed the adoption of SaaS applications through the lenses of popular theories such as TCT and resource-based view (RBV) and Sesser (2013), who proposed a model to classify the software based on the sales efforts (low-touch, moderate-touch and high-touch). The Sesser (2013) model of classifying the SaaS software would be very useful for marketing and sales strategy studies, and hence, was found to be inconsistent with the objectives of this study.

Table II Participant profiles

Name*	Designation	Company Profile	Experience (years)	Experience profile
SP	Global Head of Marketing	A global leader in independent testing services employs over 2,100 people worldwide with revenue of around $300m (2017)	12	Varied experience from testing, consulting and marketing of enterprise applications
GJ	Managing Director and Founder	Software products and platform company has over 200 customers using solutions worldwide	28	Runs an organization that develops and sells SaaS enterprise products. Previous experience in product marketing and management in ERP, since the mid-1990s
KS	Founder CEO	Traditional and digital marketing solutions provider	30	Various roles in enterprise software companies including sales, marketing, implementation, support and country management
HK	Vice President, Cloud Applications	Large cloud and platform vendor operating worldwide, with revenue of over $40bn and employs over 140,000 people worldwide	25	Manages outbound product strategy for cloud applications in Japan and APAC. Prior experience includes heading consulting practice in a large IT services company managing over 4,000 people
AS	Lead, Enterprise Mobility and Security	Large software products vendor with revenues over $100bn and employs over 131,000 people worldwide	20	Enterprise application sales. Now, handles sales of cloud productivity software to large organizations
SA	Consulting Editor	A Large business magazine based out of India	12	Enterprise IT application product management and sales experience. Writes about buyer advocacy, data journalism, etc
BS	Associate Director	Large cloud and platform vendor operating worldwide, with revenue of over $40bn and employs over 140,000 people worldwide	16	Entire IT experience with ERP vendors. Currently, handles sales enablement for large cloud deals
SR	Director	Large cloud and platform vendor operating worldwide, with revenue of over $40bn and employs over 140,000 people worldwide	23	Entire IT experience in consulting, development and sales for enterprise applications. Past 10 years have been with cloud ERP vendors
BT	Global Practice Head – Data and Analytics	Large IT services vendor with revenues over $6bn and 114,000 employees worldwide	20	Heads a global analytics team with over 800 members reporting to him. Prior experience includes product management, consulting, providing thought leadership in India and US
SM	Head, Professional Services	Multinational mass media and information	16	Member of the CIO organization in a large IT services company (during the time of interview)
HM	Managing Consultant	Large IT services vendor with revenues over $6bn and 114,000 employees worldwide	27	Leads consulting and management services team that works with clients across the world, 27 years total experience of which last 17 with the same company
SV	Practice Lead, SCM	Large IT services vendor with revenues over $15bn	19	Product management, software development and consulting experience
MG	Principal Project Manager	Large software products vendor with revenues over $100bn and employs over 131,000 people worldwide	18	Product management, consulting and sales experience with ERP applications since the late 1990 s. Currently, Principal Program Manager for enterprise applications implementations in EMEA
DR	Principal Program Manager	Large software products vendor with revenues over $100bn and employs over 131,000 people worldwide	20	Product and program management in one of the largest software companies. Currently, lead program manager for enterprise mobility and security services
KI	Key Account Manager	Large IT services vendor with revenue of over $80bn and employs around 366,000 people worldwide	17	Experience in software testing, implementation and sales
RM	IT Manager	Large oil and gas company based in Dubai with interests in refining, aviation and retail	40	Experience in business development, IT corporate governance, IT products implementation, audit and quality management of IT products
VP	IT Manager	Large multinational that provides technology, engineering and construction solutions to the energy industry	17	Experience in various roles including product development, solution consulting and now part of IT
AR	CIO	A top-ranked business school based out of Bangalore	20	Been part of the development and implementation of e-learning systems in educational institutions across India. Is currently the CIO of a B-School

Figure 1 Overview of data structure



For this research, we decided to use two of the factors suggested by Benlian *et al.* (2009):

1 Application specificity, derived from TCT theory, is deemed to be high if the SaaS application is highly specific to an organization and contains company-specific processes and organization-specific data.
2 Strategic value, based on RBV theory, which suggests that a SaaS application is considered to be high on strategic value if it supports critical functions and processes in an organization.

We propose a new framework depicted in Figure 2 that can be used to classify SaaS applications, which can help understand the enterprise application topology in an organization. Similarly, Table III lists the four different classifications of SaaS applications and provides a few examples of such software used by organizations. We used this classification to help explain the impact of SaaS in the various aspects of software evaluation and acquisition.

4.2 Software evaluation process for software as a service applications

From our discussions with the experts, we infer that the software evaluation process is more or less the same when it comes to large enterprise-wide systems. What seems to have changed is the sequence of steps that the organizations follow and more specifically how the information search phase is conducted.

> *HM: If it is a top-down funded project decision, this process is still being followed. For many of these larger firms, the consensus is very important. So there is a process, there is a committee, presentations from multiple functions, a proper evaluation. In many cases, a third party involved sets up scenarios. They will ask for specific points as proof of concept to be demonstrated, all of these are still happening.*

> *KS: Committees are still there, it is still taking the time. The dream of catching someone and signing them overnight will not really happen, at least for enterprise software.*

A big change to the evaluation cycle that was identified by several of the experts is how the business users get access to the software to try out the software without the sales personnel much earlier in the evaluation cycle. The users can sign up for a trial version directly without having to install any hardware or software and can start using it within a matter of minutes.

> *KS: In the case of the cloud, it is just a uniform resource locater and a user id and password. The prospect says that you give us a demo and we will play around it. The vendor does not know what exactly is happening. The vendor does not have his eyes on the demo as it is happening. Prospect is probably playing around the same extent as before but without the vendor present in the same room.*

Figure 2 Enterprise SaaS application classification

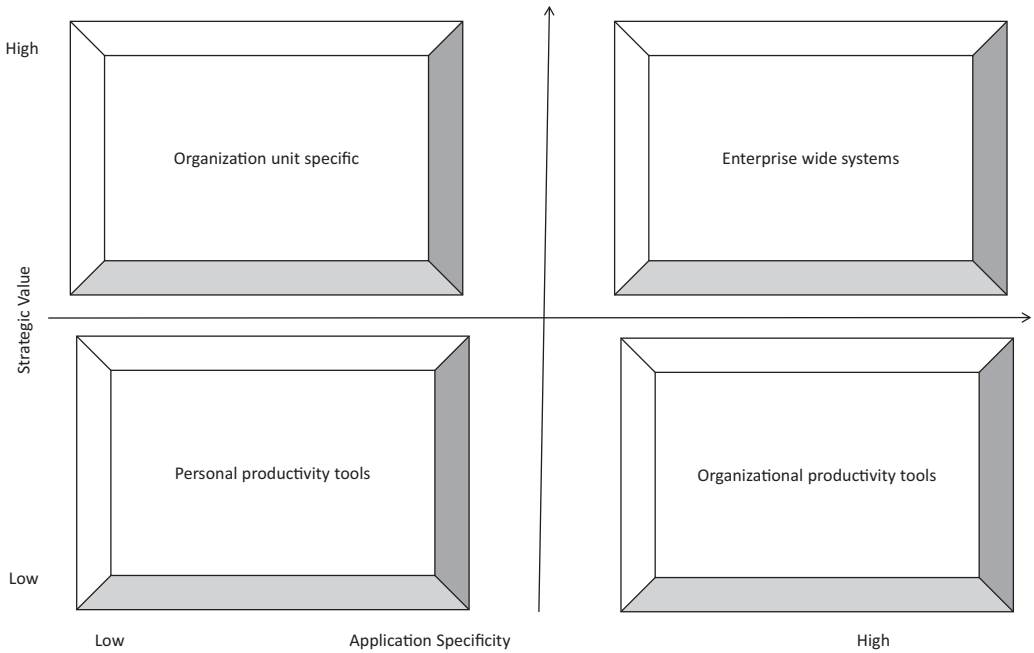


Table III SaaS Software classifications and examples

Quadrant	Classification	Explanation	Example
Application specificity – high Strategic value – high	Enterprise-wide systems	Solutions that address the organization's core processes and address organization/ industry-specific business processes. The organization's core processes will fail if any of these solutions are down, and hence, are very important to the organization	ERP and SCM
Application specificity – high Strategic value – low	Organizations productivity tools	Solutions that are used by a wide variety of users within the organization to help collaboration and improve productivity. These solutions have organization-specific information but are not mission-critical	Collaboration tools (Slack) and office automation (Office 365)
Application specificity – low Strategic value – low	Personal productivity tools	Solutions used by a very small set of users within an organization to help improve their productivity and quality of deliverables. These solutions are not organization-specific and are not mission-critical	Data visualization tools and macros
Application specificity – low Strategic value – high	Organization unit specific	Solutions that have a small footprint in the organization and is very critical for a small group of users. It has high importance for a very small group of users within the organization	Salesforce automation and laboratory management systems

The evaluation process is not the same for all kinds of software and SaaS solutions that are not enterprise-wide and used by a small group of people seem to have very little or no formal evaluation processes.

KS: In some categories of software, it is happening. For example, you take Hootsuite, which is a social media tool. Definitely, there was no evaluation cycle, I just signed up [. . .] Even Slack, enterprises have signed up for Slack without long sales cycles but if you are taking a core banking software, no chance. It does take time. You take ERP, CRM, CPQ or marketing automation: all of them do take time, do have a committee and do have evaluations.

KI: You could now, possibly, by-pass the whole rigmarole of the circuitous buying process by reaching out to the buyer straight. This applies to situations where the solution can be consumed stand-alone, without having to integrate with a lot of applications. It caters to the uses of a particular department or scenario.

These lead to summarize that the overall process for evaluation of large, complex enterprise-wide applications has not changed

much when compared to the process followed for on-premise applications, whereas it has changed substantially for some, which leads us to the first proposition:

P1a. The software evaluation process for enterprise-wide systems and organization productivity tools SaaS is still a multiphase, multi-person, multi-departmental and multi-objective process and is normally a very long complex process.

P1b. The software evaluation process has changed substantially for personal productivity and organization unit-specific SaaS software with little or no formal evaluation processes.

4.3 Role of the CIO in software evaluations

In our discussions with the experts, we found resonance in the literature to the description of the role of CIO, which has changed substantially in the past few years because of the advent of cloud computing (Malladi *et al.*, 2012; Plant, 2014). They do not seem to play an influential role in the SaaS software evaluation processes, as they did with the on-premise applications' evaluations.

> *MG: Gone are the days where the CIO organizations were making the decisions with respect to the business applications especially in the ERP and CRM. That is, completely old age syndrome. These days, the business is making decisions.*

> *GJ: It has already happened where CIOs have stopped controlling. They have only set a bunch of policies. They say for security we follow certain standards. If you are going for a cloud there must be certain standards, if you are going for payment gateway you must follow these standards. They have set up all these policies and standards and allow people to take their own decisions.*

In recent times, the role of IT has increasingly become challenging and strategic, as IT has become a major differentiator in how companies perform in the marketplace (Lane and Koronios, 2007). The widespread adoption of SaaS applications across the enterprise meant that the organizations do not need in-house expertise to manage the IT infrastructure, software, licenses, upgrades and other activities that used to be carried out by the IT organization.

> *GM: However, the customers more and more realized that the value of the internal CIO-based organizations has to be business-centric rather than a kind of managing license, rather than managing the internal infrastructure, which is best left to the external vendors who are able to provide their expertise.*

> *HK: The entire CIO function is like that. In fact, the CIO functions are getting restructured. In fact, the CIOs of many organizations are not typical IT guys. They have been moved from their business to IT functions.*

We found that the CIOs still play a big role when it comes to the evaluation of large complex enterprise-wide applications but is different for smaller niche systems. The business users might work with the vendors, perform the evaluations but evaluating the software in terms of its ability to co-exist with the rest of the applications and the actual process of buying the software still rests with the CIO. This brings us to the following proposition:

P2a. The role of the CIO has changed substantially, he is no longer the main gatekeeper or decision-maker for enterprise software purchases and his role has evolved to one who helps users acquire the software that they need, subject to some standards on security and integration.

P2b. The CIO is no longer part of evaluations of personal productivity tools and to an extent in organization sub-unit specific software evaluations.

4.4 Changing role of business users

The role of the business user in the on-premise software evaluations was restricted to providing detailed software requirements and participating in the early phases of industrial buying scenarios (Pedeliento *et al.*, 2019). As the deal sizes were large, the efforts of the account management team and the CIO were focused on the board and the senior management to ensure that all the necessary approvals were obtained (Howcroft and Light, 2002). With the availability of free trials of most SaaS software, the user can sign up for a no-obligation trial and perform their own evaluation, without waiting for the CIO office to arrange for one or even the presence of the vendor's account management team.

> *DR: IT controlling every purchase decision in the enterprise is reducing and the business decision-makers are having a bigger say. If the solution is meeting the needs of the business division, they are very forceful in letting the CIO know that they need to make changes*

> *DR: The other thing that we are seeing is from the end user's perspective; they no longer accept IT's my way or highway approach [. . .] They are used to a high quality of services in the consumer space, they expect the same at work. When they come into work life, they feel very restricted in terms of what one can do and cannot do because of policies to procure products and services.*

The business user wields a lot more power in the evaluation cycle and the vendors now directly sell to them, rather than the CIO office. The no-obligation trial models, providing free versions of software help the vendors to get a beachhead into an organization.

> *KT: I can go online and get a clickview or Tableau and I would sign up for a one-month trial version, free of cost and I get access to these products from a trial perspective. If I feel that this is something that would help in the long run and I socialize with other groups in my department, it becomes very easy for product procurement and proliferation within the organization.*

Depending on the type of software, the business user might either approach the CIO to help procure the software or they themselves would conduct the evaluation and purchase the software subscription themselves.

> *GJ: So in all peripheral areas where business operations are crucial the decision is with the operational guy, with the business head and no longer with the IT. However, in the backbone area, like financials and core supply chain, core banking or core insurance, etc., that is, when IT still holds strong.*

In the case of enterprise-wide and organization productivity systems, the business user conducts the information search, evaluates the software and then works with the CIO and management team to acquire the software.

P3a. The role of the business user has changed from being a passive participant in the buying center to a decision-maker. They conduct their own information search, evaluate the software and then work with the CIO to acquire the software.

In the case of organization unit specific and personal productivity tools, the business users conduct the information search, evaluates the software and acquires the software directly.

P3b. The user is now playing the role of the buyer and conducts her own software evaluations and purchases for personal productivity and organizational unit specific software requirements.

4.5 Software as a service applications and shadow information technology

SaaS applications are no longer a capital expense and some of these applications can be easily bought with the approval limits of department heads. Also, the roles of the CIO and the business users are no longer the same as before and in several cases, we have seen the business user wielding a lot more influence than the CIO.

> *GJ: It happens all the time with SaaS products. That is, why I said these point solutions are so small and point that IT does not even bother. They will view it as productivity, people buy it by using their credit card.*

> *SM: Many times I see that shadow IT starts creeping up one or the other way, either the stakeholder has gone in and chosen a vendor and he is saying that I would like to adopt this solution. Or if it is a small spend, which can be accommodated in their budget they even had gone ahead and probably bought those solutions and they have started using it. Shadow IT either they are in the making that already done or many times the CIOs are left with the difficult challenge to integrate this back into the enterprise portfolio.*

> *KS: My exposure is primarily in enterprise applications and I do not think any enterprise applications can be bought without CIO's approval.*

From our discussions, we understand that shadow IT will continue to exist and might become a larger issue in some segments where the business user can take decisions to acquire the software themselves. It became obvious that the size of the software and its importance to the organization drive the adoption of the unauthorized adoption of SaaS software. SaaS applications that are used enterprise-wide have lesser chances of being adopted without IT knowledge, whereas "point solutions" could be easily adopted without IT knowledge. This leads us to the following propositions:

P4a. For enterprise-wide software and organizational productivity tools, shadow IT is not prevalent. In most cases, the users try out various software and work with the CIO to get to a shortlist and the final choice.

P4b. In the case of personal productivity tools and organization unit specific software, business users try out and in most cases, buy the software themselves without approvals from IT, as SaaS offers an easy way to trial and acquire software.

5. Discussions

The existing models for acquiring enterprise applications including the six-stage model of acquiring ERP applications (Verville and Halingten, 2003a) that were based on organizational buying behavior (Sheth, 1973; Webster and Wind, 1972) are relevant to explain the process of buying enterprise applications that are cloud-based. Unfortunately, they are unable to explain the changing roles played by the various members of the acquisition committee for different kinds of SaaS software. Based on our discussions with the experts, we found that the roles and responsibilities of CIOs and the business users who were part of the buying center have changed substantially. A study of the existing models of enterprise software acquisition revealed the following common steps, namely, planning, information search, pre-selection, evaluation, choice, negotiation, acquisition and maintenance (Moreau, 1998; Verville and Halingten, 2003a; Howcroft and Light, 2006; Bhatti, 2014). We will use these set of steps to explain the differences that we found in the software evaluation proc3 shows the role of the CIO and the business users played in on-premise software evaluations. The CIOs and other CXOs were involved in nearly every single stage of the evaluation process, while the business users were involved primarily in the initial stages of the evaluation process (Figure 3).

For SaaS software evaluations, we found that the business users take the lead in most software evaluations and in cases where the solution does not have high specificity, they also don the role of the buyer. In cases where the application specificity is high, the business users still lead the information search, evaluation and probably even the choice and then work with the CIOs and other decision-makers to acquire the software, as shown in Figure 4.

6. Summary and conclusions

6.1 Theoretical contributions

This research provided an insight into the changes in software evaluation processes because of the widespread availability and adoption of SaaS applications by looking at the steps followed by organizations, changes to the composition and roles and responsibilities of the buying centers constituted for such evaluations and provides insight into susceptibility of organizations to shadow IT.

Through our study, we have established that the software evaluation process does not follow a single linear template that can be applied to all software evaluations. While the evaluation process steps are not different for complex enterprise-wide

Figure 3 Role of CIO and business users (on-premise application evaluations)

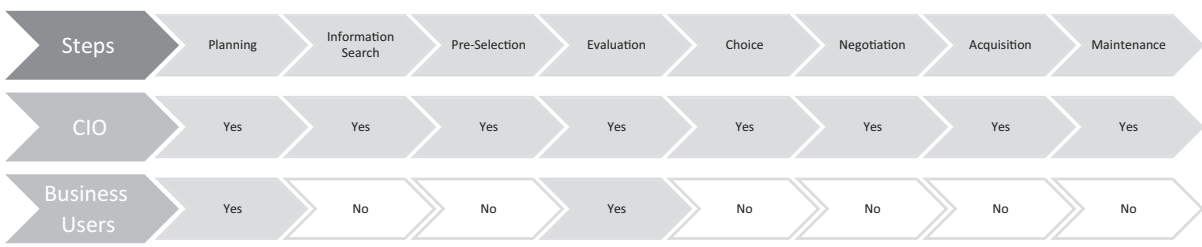
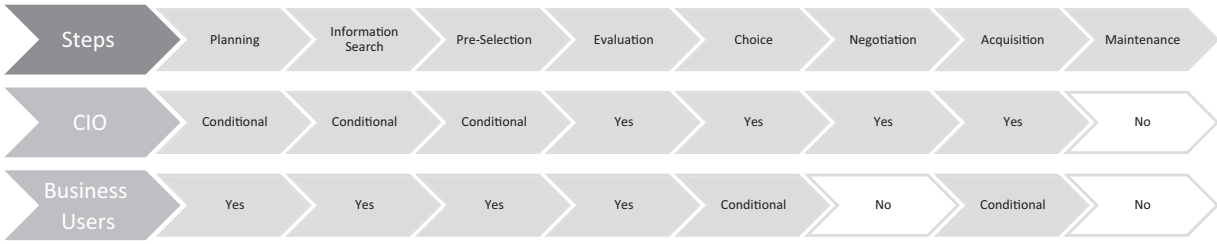


Figure 4 Role of CIO and business users (SaaS application evaluations)



applications from the ones of on-premise applications, it has changed substantially for niche solutions used by a small set of users. We have proposed a new framework to classify SaaS solutions based on application specificity and their strategic value to the organizations, which uses the SaaS classification proposed by Benlian *et al.* (2009). We believe that this framework will help us better insights into enterprise software evaluations.

This research also sheds light on the changing role of the CIO in the software evaluation process. The CIO is still tasked with ensuring that the software proposed by the organization units and business decision-makers are suitable for the organization and they follow the security and interoperability standards set by organizations. We found that the users by-pass the CIOs in evaluations of software, that is, used by a small sub-section of employees. We also heard from the experts that the CIO is no longer a technical expert, but is drawn from the lines of business and someone who is hands-on with the business. Our study will help to formalize this understanding of changes to the role of the CIO.

The business users of today are empowered and knowledgeable and are able to conduct the information search and software evaluation steps themselves (Forrester Consulting, 2014) for personal productivity and organization unit specific software. This aspect of the empowered business user's role in the software evaluation process is an addition to the software evaluation literature.

The role of shadow IT has also been studied and we found that it is very rare for organization units or individual users to onboard enterprise-wide applications. SaaS does have a role in the proliferation of shadow IT applications in some specific categories, as it empowers users and organization units (Zimmermann *et al.*, 2017). This study proposes that we use the software classification framework suggested earlier to study the shadow IT phenomenon and concludes that shadow IT is not possible in complex enterprise-wide systems, but is happening in cases where the application specificity is low.

6.2 Managerial implications

The primary managerial problem that we seek to address in this study is to identify the changes to the software evaluation process for SaaS applications. This will be of use to both parties of the dyadic relationship: the organization, that is, acquiring the software and the sales organizations.

Organizations can use the framework to identify the various kinds of enterprise software that are currently operating in their organization and establish policies for minimum-security requirements and the standards required for interoperability of the various applications. As a lot of organizations are adopting a "cloud-first" strategy, their CIOs and IT organizations need to reorient themselves to being a partner to the business users and provide them advice to choose the right SaaS applications.

In the case of enterprise-wide applications such as an ERP system, the CIO still wields a lot of influence, and hence, the software vendors need to ensure that their sales and account management efforts are focused on issues that are important to the CIO such as security, minimum downtimes, interoperability with other systems and so on. The software developers need to understand the influence wielded by the business users and ensure that they get access to free trials, learning materials and other aids to help them conduct their evaluations on their own. For vendors of organizational productivity tools such as Slack, Office 365 and so on, the primary buyer will still be the CIO and the buying center. The vendors can provide a free version of their products with limited functionality to users so that they get used to the product and then ask their IT departments to make these products and tools available for their work content too. For vendors of organizational unit specific software such as lab information management systems, the business users will be the primary buyer, as these solutions are specialized and have a small set of specialized users within the organization. For vendors of personal productivity tools such as Tableau (a data visualization tool), the business users should be the primary focus, as these are used by a small set of users to improve their personal productivity.

The availability of information online and the fact that no-obligation software trials are available to have led to business users performing their own information search without the involvement of the CIOs and vendors. Organizations need to roll out processes to ensure that the voice of business users are heard and their needs are given the due importance to reduce the chances of shadow IT systems proliferating in the organizations.

6.3 Limitations and future research

As part of this study, we interviewed sales personnel, industry experts and consultants of software product and services companies who have worked with on-premise applications and now work with SaaS applications. They were able to provide a proxy for users and CIOs, as they deal with them in several cases and would also be able to provide cross-sectional data by providing on-premise and cloud applications perspective. Nearly all of the respondents have worked or are currently working with large companies that employ more than 500 people and have worked with large clients. The experiences that

they shared were typical of software acquisition processes followed by these large companies. The software acquisition processes and roles and responsibilities of the CIO and business users could be different in smaller companies, as the buying centers tend to be smaller and members play more than one role in the buying centers. Future studies could also study the effect of the size of the organization in SaaS acquisition processes, as the composition and nature of the buying center would be different for smaller companies. Another aspect that could affect the SaaS acquisition process is the effect of personal traits of CIOs and business users on the SaaS acquisition process, which could be another subject for future studies. Future research could also expand this study by focusing on aspects such as empirically testing the findings with individual cases that belong to different quadrants of the SaaS software classification proposed.

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Corresponding author

Srinivasa Raghavan R. can be contacted at: fi13srinivasar@iimidr.ac.in