Original Article

The Influence of Organizational Factors to Software-As-A-Service (SAAS) Adoption in Vietnamese Enterprises

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Abstract: With the growth of the information technology industry, the literature exploring cloud computing, in particular, SaaS adoption has been developing considerably over the last few years. It is time to take stock of SaaS adoption's determinant factors and its application to more specific contexts. This study endeavored to investigate the influence of three organizational factors (organizational size, organizational readiness, and top management support) to SaaS adoption in Vietnamese enterprises across sectors. Qualitative method was employed to analyze data gathered from 18 case-study companies. The findings reconfirmed that top management support is the strongest enabler for SaaS adoption while there are still some contradictions between organizational size as well as organizational readiness versus SaaS adoption in the context of a developing country as Vietnam.

Keywords: Software-as-a-service, SaaS adoption, cloud computing.

1. Introduction

1.1. Background

The emergence of software-as-a-service (SaaS) as a trend in the information technology (IT) industry has attracted considerable interest from both researchers and practitioners [1]. SaaS, defined as the model of a service provider under the form of software, is one of the most popular cloud computing models at the moment

[2]. SaaS providers create and maintain a software running on website theme wherein clients can access remotely via Internet with fee. SaaS has various advantages over on – premise sofware such as cost savings, high flexibility, and less up-front investments or skilled IT workers (NIST). Most renowned softwares by leading SaaS providers are Amazon Web Services, Oracle, Adobe Creative Cloud, Slack, Drop box, Google, IBM,

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Microsoft, ServiceNow,... In 2020, 73% enterprises in the world are expected to adopt SaaS Software [3].

This trend has recently been a rise in Vietnam as cloud computing has now started to be adopted by many local enterprises across sectors such as real estate, insurance or finance, with the aim of utilizing it for customer service through web-based customer-oriented applications [4]. Cloud Readiness Level of Vietnam ranked 14th in Asia Pacific, just behind China and India [5].

The innovation adoption may change an organization internally and/or externally; hence, it should be taken carefully [6]. Many foreign researchers have investigated factors influencing this decision [7]. Organizational factors, including top management support, organizational readiness and size, are proved to be the most important. Howerver, there is limited research conducted in Vietnam examining this relationship.

This paper explores how the organizational factors influence SaaS adoption in Vietnamese organizations. The study applies qualitative methods only by using both primary and secondary data. Secondary data is collected through Internet, including published reports, research, journals, theses, etc. Primary data is collected through questionnaires and face-to-face interviews.

2. Literature Review

2.1. Cloud Computing and SaaS

Cloud computing was defined by the national institute of standards and technology (NIST) as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., network, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction [8]. Strictly speaking it is not a new concept as it was first mentioned in 1997 but not until recently became

a well-known term [9]. In 2006, Amazon pioneered the trend by releasing the Elastic Compute Cloud (EC2) to the market. However, only until 2010 did the cloud computing become revolutionary following the booms of Amazon Web Services, Microsoft and Google. According to *Statista*, the money spent for cloud reached 77 billion worldwide in 2010, and is forecasted to multiple 5 times (411 billion) in 2020.

Mowbray et al. [10] noted that the central idea of cloud computing services is that they are operated on hardwares that the customers do not own; the customer sends input data to the cloud, then it is processed by an application of the cloud service provider, and the result is ultimately sent back to the customer. Cloud services are thus valuable service solutions; they constitute a new way of utilizing and consuming IT services via Internet. Moreover, Feuerlicht [11] comments that cloud services allow organizations to focus on core business processes and to implement supporting applications that can deliver competitive advantage; and cloud services free organizations from the burden of developing and maintaining large-scale IT systems.

SaaS is one of the service models based on cloud computing, beside Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). SaaS is a potential segment and its utilization can benefit enterprise users in improving IT performance [12]. The applications on cloud services are accessible from various client devices through either a thin client interface, such as a web browser (web-based email), or a program interface. Consumers do not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited users - specific application configuration settings. "Software–as–a–Service Market: Technology and the global market" by BCC Research showed that the SaaS industry is valued $44,4 billion in 2017 and expected to be $94,9 billion in 2020. This indicated a remarkable compounded annual growth rate (CAGR) of SaaS market is 16,4%.

Globally, Salesforce.com's Sales Force Automation is the best representative. It is an excellent sales tool which speeds up and streamlines all phases from lead management to analytics and forecasting. Mowbray et al. [10] commented that when undertaking tasks in Sales force automation, it is understandable to use cloud services instead of purchasing computing hardware and software to do it in-house. Another remarkable SaaS offering is HubSpot, which develops inbound marketing software on the cloud, supply social marketing, content management and searching tools.

Table 1. Cloud Readiness Index 2018

Cloud Readiness Index 2018												
Rank, Economy	**CRI#01 International Connectivity**	**CRI#02 Broadband Quality**	**CRI#03 Power Grid, Green Policy & Sustainability**	**CRI#04 Data Centre Risk**	**CRI#05 Cybersecurity**	**CRI#06 Privacy**	**CRI#07 Government Regulatory Environment**	**CRI#08 Intellectual Property Protection**	**CRI#09 Business Sophistication**	**CRI#10 Freedom of information**	**Total CRI 2018 score (/100)**	**Rank change (since 2016)**
#1 Singapore	7.0	9.5	6.0	4.6	9.3	9.0	9.0	8.9	8.5	4.9	76.6	+1
#2 Hong Kong	9.3	7.7	4.4	5.3	8.1	9.0	6.7	8.4	8.3	7.1	74.1	-1
#3 New Zealand	3.9	5.7	7.2	4.8	7.2	8.5	7.7	8.9	8.7	8.6	71.1	-
#4 Japan	3.5	6.5	5.3	4.4	7.9	9.0	7.7	8.3	7.6	7.1	67.1	+1
#5 Taiwan	6.5	6.5	4.5	4.2	8.1	7.0	7.1	7.4	8.0	7.6	66.9	+1
#6 Australia	3.5	5.2	4.1	4.3	8.2	9.0	7.1	8.3	8.0	8.4	66.3	-2
#7 South Korea	2.8	7.4	4.1	4.3	7.8	8.5	8.0	6.3	8.4	7.2	64.8	-
#8 Malaysia	2.5	5.5	4.0	4.1	8.9	7.5	7.9	7.6	7.8	5.3	61.0	-
#9 Philippines	2.5	4.8	4.5	3.9	5.9	8.5	5.7	5.9	5.9	5.9	53.6	-
#10 Thailand	2.7	6.9	2.2	3.8	6.8	4.5	5.4	5.0	7.7	5.5	50.6	-
#11 Indonesia	1.7	5.5	2.9	3.8	4.2	6.5	5.6	6.4	6.7	6.0	49.4	-
#12 India	1.1	4.7	1.5	3.4	6.8	6.0	5.9	6.3	6.1	5.7	47.4	-
#13 China	1.0	4.9	1.6	3.7	6.2	4.0	6.6	6.4	6.5	2.2	43.1	-
#14 Vietnam	3.6	5.3	2.1	3.9	2.5	3.5	5.7	5.1	6.8	2.6	41.0	-

Source: Asia Cloud Computing Association (2018)

Table 1 presents the Cloud Readiness Index of 14 Asia-Pacific nations in 2018. In general, there are three countries ascending one step, two countries moving down one or two steps while the other nine countries do not change their rankings compared to those of 2018, which indicates a relatively slow pace of Cloud Readiness improvement across the nation. Singapore jumps one step to the top position of CRI ranking. In particular, Vietnam remains at the bottom position. Vietnam is lagging behind the other nations in a number of aspects namely freedom of information, intellectual property protection, and privacy. Meanwhile, the demand for cloud adoption in Vietnam is huge. As estimated by Google in 2018, around 2,4 million enterprises are seeking technological solutions. Popular SaaS providers in Vietnam are Base, Misa, myXteam, 1office, iHCM, etc. These facts are alarming signals about Clould policies for Vietnamese authorities.

2.2. Adoption

According to Rogers [13], adoption is "a decision to make full use of an innovation as the best course of action available. Different theories and models have been proposed to study the process of adopting new technologies. Table 2 presents the nine major theories of adoption model.

Table **Error! No text of specified style in document.**. Adoption Model

Adoption Model	References
Theory of Reasoned Action (TRA)	Ajzen & Fishbein (1980) [14]
Technology Acceptance Model (TAM)	F. D. Davis (1989) [15]; F. Davis (1986) [16]
Motivation Model (MM)	F. D. Davis et al. (1992) [17]
Theory of Planned Behaviour (TPB)	Azjen (1985) [18]
Combined TAM and TPB (c-TAM-TPB)	Taylor & Todd (1995) [19]
Model of PC Utilization (MPCU)	Thompson (1971) [20]
Diffusion of Innovations (DOI)	Rogers (1962) [21]
Technology, Organization and Environment Framework (TOE)	Tornatzky & Fleischer (1990) [22]
Social Cognitive Theory (SCT)	Compeau & Higgins (1995) [23]

Source: Authors.

Among these theories, DOI and TOE models are the most commonly used ones that explained and predicted the adoption of innovations [7]. DOI worked on the adoption decision, specifically factors related to the technology itself (such the technology's characteristics or users' perception).

TOE, on the other hand, overcomes this drawback. This framework not only applies technological aspects of the diffusion process, but also non-technological aspects such as environmental and organizational factors [24]. According to Hsu et al. 2006 [25], TOE improves DOI's ability to explain the intra-firm innovation diffusion.
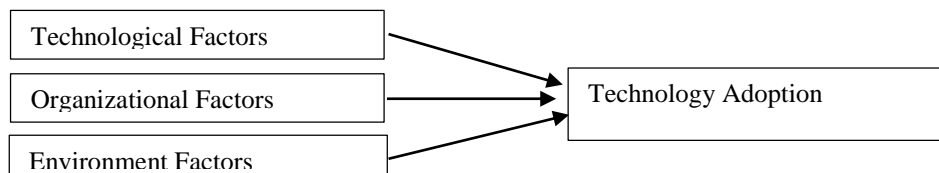

Figure 1. TOE model
Source: Tornatzky & Fleischer (1990) [22]

TOE framework has been widely used in IS field to study new technologies' adoption. Zhu et al (2003) [26] studied the adoption of e-business by organizations. According to the applied TOE model, IT infrastructure, e-business know-how, firm scope, firm size, consumer readiness, competitive pressure, and lack of trading partner readiness are factors influencing the adoption of e-business. Their findings reveal that technology competence, firm scope and size, consumer readiness, and competitive pressure are significant adoption drivers, while lack of trading partner readiness is a significant adoption inhibitor.

Kuan and Chau (2001) [27] studied the adoption of Electronic Data Interchange (EDI) system. Perceived direct and perceived indirect benefits are technological variables, perceived financial cost and perceived technical competence are organizational ones and perceived industry pressure and perceived government pressure are environmental factors. Their results indicate that perceived direct benefits are higher in adopter firms than non-adopter ones. On the contrary, adopter firms perceive lower financial costs and higher technical competence than non-adopter firms.

2.3. Organization

Of all influential factors in TOE model, organizational variables have been widely studied and pointed to be the most important in technology adoption [28], [29], [30]. At the
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individual level, organizational leader's values, roles, and personalities were reported to affect innovations, including technological ones [31], [32]. Adoption decision was most strongly influenced by those with power, communication linkages, and ability to allocate organizational resources and impose sanctions [33], [34]. The importance of the role and attitudes of managers towards innovation adoption and the spread of technology have been strongly emphasized [35]. Moreover, the resources of enterprise: the financial, human and technology resources (computers, telephone lines, cable, etc.) are also very important [36], [37], [38]. In some cases, even when the managers acknowledged the importance of new technological adoption, the enterprises do not have sufficient resources to proceed [39]. Lastly, company size generally appeared to be positively related to adoption. Frequently, this relationship is attributed to economies of scale, which enhance the feasibility of adoption [31], [40].

3. Theoretical Framework

3.1. Organizational Factors

Top management support: top management is one of the most important factors in adopting IT innovations [41]; [42]; [43]; [44]; [45]). When top management support is high, executives are more likely to engage in project meetings and important decisions[41]
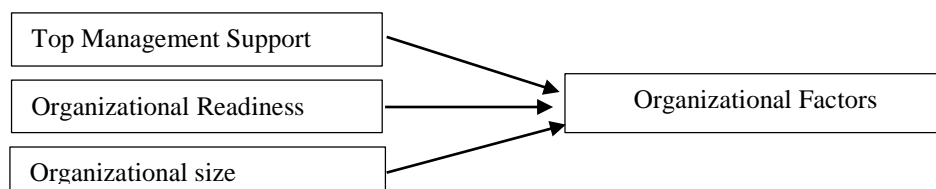
Figure 2. Organizational Factors

Source: [22]

Organizational readiness: the concept of organizational readiness was widely used to
explore or predict the adoption of innovations [46]; [24]. Organizational readiness is defined as

the availability of organizational resources to adopt new technologies [46];[47];[48].

Organizational size: studies have shown that organizational size positively affects an organization's willingness to adopt IT innovations [49];[50], [51].

3.2. Research Methodology and Design

Multiple-case approach is used to investigate how organizational factors influence the SaaS adoption in Vietnamese organizations. This research is conducted from the organizational perspective; specifically organizational size, organizational readiness, and top management support. These variables were defined a priori to shape the design of our research [52]. This analysis is then involved in exploring our understanding of the adoption process and explain why or why not those Vietnamese companies adopt SaaS.

With the aim of determining how these three variables influence the adoption decision, the authors used an explanatory case study approach to explain how or why a certain condition (adoption or non-adoption of SaaS) came to be [53]. Additionally, multiple-case design allowed direct replication, thereby enabling more powerful analytical conclusions, as well as the ability to use cases that offered contrasting situations [53]. Next, the company selection process, data collection, process, and analysis were presented..

3.3. Case Selection

For convenience, interviews are conducted in the interviewees' native language which is Vietnamese.

The convenient sampling method combined both theoretical and literal replication was chosen[54];[53]. The theoretical replication implies that the selected cases will produce contradictionary result, in other words, generate "contrasting results...for predictable reasons" [53] while literal replication predicts similar results within groups with similar characteristics, thus strengthening the robustness and reliability of this study [53].

The size (SMEs or large organizations) could be defined beforehand, whereas the other types were described later after the interviews and first analyses.

Quantitative measurement which is in line with the World Bank definition of organizational size: micro enterprises (1-9 employees); small enterprises (10–49 employees); medium enterprise (50–249 employees); and large enterprises (≥250 employees) was used. To simplify the process, organizations are categorized into two groups only: small and medium sized (including micro enterprises) (up to 249 employees); and large (≥250 employees). Letters of permission were sent to 30 firms, of which 18 Hanoi-based ones, eventually agreed to participate in the study. Table 3 displays details of these companies.

Table 3. Case Selection

#	Company Information				Interviewee Information	
	Sector	Existing SaaS application	Size	IT staff	Position	SaaS awareness
C1	Healthcare	Trello	SME	1		Basic
C2	Healthcare	None	Large	10	Owner	Basic
C3	Healthcare	None	Large	5	IT Manager	Very basic
C4	Healthcare	None	SME	1	IT Manager	Very basic
C5	Healthcare	None	Large	15	IT Manager	Basic
C6	Education	None	SME	3	IT Manager	Basic
C7	Education	None	SME	11	IT Manager	Basic

C8	Banking	None	Large	50	IT Manager	Basic
C9	Banking	None	Large	30	IT director	Basic
C10	Tourism	None	Large	2	Owner	Basic
C11	Tourism	None	SME	3	Owner	Basic
C12	Media	Corporate Google Email	Large	12	IT manager	High
C13	IT	Myxteam	SME	3	IT supervisor	Medium
C14	IT	ASANA	SME	3	IT supervisor	Medium
C15	IT	None	SME	2	Owner	Very basic
C16	Healthcare	None	SME	1	IT supervisor	Very basic
C17	Education	Base	SME	4	IT supervisor	High
C18	Retail	None	SME	0	Owner	Very Basic

3.4. Data Collection

In this study, semi-structured interviews [53] was adopted as the primary data collection method, as it gave more room to ask for clarification, or follow up on interviewees' comments, allowed us to gain additional insights of the adoption or rejection decision made by our case companies. Interview guide was used in each of our interviews with refinements made over the course of the interview series. Data was complemented our data with field notes and desk research through online sources such as corporate websites, their annual reports and IS.

At the beginning, the interviewer introduced herself then explained the study objects and interview process from company background, informant's awareness of SaaS, to the impact of the three organizational factors on SaaS adoption. To clarify the awareness of SaaS, the interviewer first asked whether the informant had ever heard about SaaS and, if so, asked them to describe. She then explained our own definition of SaaS along with several examples of practical SaaS solutions in corporate or personal settings. Once both sides shared the same understanding of SaaS, the interviewer continued.

All information gathered is assured to be kept confidentially including company names;

therefore they are represented by the identifiers C1–C18. The face-to-face interviews were audio-recorded with the permission of the informants. Upon finishing the interview, the interviewer finalized and asked for feedback as well as confirmed the final approval from the informants.

3.5. Data Processing

In our analysis, six codes were used to organize our data. The table below shows the description of each code and its examples.

To begin with, within-case analysis was conducted to structure, define and explain the information, then transcripts, field notes, and online sources (company annual reports, websites) and IS. The results were processed in an informal qualitative comparative analysis (QCA) method originated from management research that helps to "discover combinations of conditions that sufficiently explain a certain outcome" [55], p. V). This not only allows cross-case comparisons but also does justice to within-case complexity [56]. QCA assumes that in order to enable the systematic comparison of complex cases, they have to be transformed into configurations [56] which are a specific set of factors (organizational variables) that produce a given outcome of interest (the adoption of SaaS). In the IS field, QCA is a common method of finding configurations of factors that explain IT innovation outcomes.

Table 4. Coding Scheme

Code	Description of response	Example
SaaS awareness level	Awareness and definition of SaaS	*"Yes, I dis heard about cloud. I think SaaS is a web-based application. (C10)*
Top management support	How the top management makes decisions on the adoption or rejection of SaaS.	*"I am just giving some suggestions on IT implementation. If the budget is too high then we have to propose the director" (C4)*
Organizational readiness	Influences of the availability of the required organization resources	*"In 2000, we started to use a Hospital Information System that had been developed by ourselves. We have all necessary resources to develop our own information system. (C5)*
Organizational size	Size of the company or its IT unit and how this influences the adoption decision	*"This new application is web-based, user-friendly, and supported by IT team of the provider. Thus, this will reduce our cost and IT personnel. Currently we have only one IT employee"(C1)*
SaaS adoption and use	(Non) adoption or use of SaaS	*"We use Base Inside...in the form of a cloud-based internal communication platform)." (C17)*
Developing country	Issues that are typical for the developing countries	*"We are not considering adopting SaaS as we're concerned about the Internet reliability offered by the providers"(C15)*

Finally, QCA was used to identify different configurations leading to either the adoption or non-adoption of SaaS. The goal of the across-case analysis was to find similar patterns, enabling us to conclude the influence of three organizational variables [53].

4. Results Analysis

The results are presented in three parts: first, findings of our within-case analysis, then our QCA results showing how the different cases scored on the three organizational variables in relation to the outcome variable, and finally, across-case analysis in which the patterns were explored and illustrated with interview quotes to shape the interviewees' perceptions regarding these variables.

4.1. Within-case Analysis

Within-case analysis required a thorough breakdown of each separate case based on the three organizational variables and the outcome

variable (adoption or non-adoption of SaaS) as well as any case details, such as awareness of SaaS and any other characteristics that surfaced.

At the beginning of the analysis, a value would be assigned to each of the variables. Organizational size was measurable with objective value acquired via either the interviewee or other sources. Top management support and organizational readiness, however, were more challenging to assess. For organizational readiness, three sub-concepts were taken into account: financial resources, human resources, and installed and in-use enterprise systems and network technologies. An examination of all the gathered information, would indicate whether these conditions were sufficiently presented or not. The evaluation of C1 was given as an example of insufficient readiness. The informant indicated that "[the company had] budget restrictions for purchasing data storage and hiring an IT professional," and "currently we have only one part-time IT employee." This case then is noted as insufficient financial resources; lack of skillful,

experienced and knowledgeable human resources, and insufficient infrastructure to implement and integrate SaaS applications. In contrast, C5 provides an example of sufficient readiness. This company had "all necessary resources to develop our own information system," and "use a Hospital Information System that had been developed by ourselves", combined with data from its annual report, it could be concluded C5 had sufficient resources to implement and integrate SaaS applications. Top management support was assessed based on how informant perceived this variable in his or her organization. For example, as the informantion in C17 explained the rector of his educational facility "suggested us to adopt Base Software," top management support was considered sufficient. Finally, the evaluation of the outcome variable (adoption or non-adoption of SaaS) was verified by informants.

4.2. Qualitative Comparative Analysis

This section discussed how the cases could be classified by using an informal QCA to present the results (following the approach of Rihoux and Ragin, 2009 [56]).

First, each variable was dichotomized with either a 1 or a 0, in which 1 indicates a given condition or outcome's presence and 0 indicates its absence. Following good practice in QCA [56], this method was based on the existing theory. According to several studies [50], [51]), large organizations are more likely to adopt an innovation. Therefore, the authors coded large organizations with 1 and SMEs with 0, sufficient top management support and organizational readiness with 1, whereas insufficient top management support and organizational readiness with 0. The results of within-case analysis was used to assign values, as can be seen in Table 5.

Based on Table 5, the authors developed a truth table that shows all possible configurations of three organizational variables that affect organizational decision to adopt SaaS.

Table 5. Value – Set table of Cases

Case	Organizational size	Organizational Readiness	Top management support	SaaS adoption
C1	0	0	1	1
C2	1	0	0	0
C3	1	0	0	0
C4	0	0	0	0
C5	1	1	0	0
C6	0	0	0	0
C7	0	1	0	0
C8	1	1	0	0
C9	1	0	0	0
C10	1	1	0	0
C11	0	0	0	0
C12	1	0	1	1
C13	0	0	1	1
C14	0	0	1	1
C15	0	0	0	0
C16	0	0	0	0
C17	0	0	1	1
C18	0	0	0	0

Table 6. Truth Table

Configuration	Organizational size	Organizational Readiness	Top management support	SaaS adopted	SaaS not adopted
A: 000	0	0	0		6
B: 001	0	0	1	4	
C: 010	0	1	0		1
D: 011	0	1	1		
E: 100	1	0	0		3
F: 101	1	0	1	1	
G: 110	1	1	0		3
H: 111	1	1	1		

As can be seen from Table 6, there are eight possible configurations. Six of these were found in our data set: A, B, C, E, F, and G. The configurations leading to the adoption of SaaS are B (SMEs with insufficient organizational readiness but sufficient top management support) and F (large organization with insufficient organizational readiness but sufficient top management support). A, C, E, and G did not lead to SaaS adoption. Two absent configurations in our data are D (SMEs with sufficient organizational readiness and top management support that adopted SaaS) and H (large organizations with sufficient organizational readiness and top management support that adopted SaaS).

4.3. Across-case Analysis

Next, general patterns are explored to understand and explain the influence of the organizational variables on SaaS adoption. First, the authors present a general discussion of the SaaS awareness level of our interviewees., then deep dive into each variable.

SaaS Awareness Level

SaaS awareness level were classified into four groups: 1) very basic level –heard about either cloud computing or SaaS but unable to give a correct description of the terms; (2) basic level –heard about both terms but unable to give a correct description of either of these terms; (3) medium level –heard about both terms and able to give an accurate description of one of these terms; and (4) high level –able to give a correct description of both terms. Five out of 18 informants had a very basic level of SaaS awareness, whereas nine were at the basic level. Only two showed medium level and two demonstrated a high level. In other words, most of them had heard of the terms but unable to describe the concepts accurately. They solely described SaaS as a web application, which does not cover the entire definition of SaaS used in our study. SaaS applications may indeed be accessed via the Internet but, more importantly,

data storage is on the provider's server instead of user's server or hard disk. Interviewees' responses are:

"Cloud computing...Yes, I've heard about it...SaaS is a web application." (C11).

"Yes, I did hear about cloud...I think SaaS is a web application." (C10).

Top management support

In our study, top management refers to a person or group of people that makes the final decision of SaaS adoption and to allocate the necessary organizational resources to support the adoption process. In these cases, the decision was made by the business owner, the IT director, or the IT manager, as reflected in the following quotes:

"I am the owner and have sufficient knowledge about IT; the decision was made by me and IT director." (C1)

"As the head of the IT department, I make the decision." (C12)

Top management may also refer to a person who has a significant influence in the decision maker. In one case, even though the IT manager had no power to make any adoption decisions , to some extent, he did have power to influence the main decision makers in his company:

"We have just developed our new Hospital Information System; therefore, I do not think we will adopt SaaS within the next few years. The decision lies at the board of commissioners, I just give them some suggestions on IT implementation." (C4)

Five cases displayed sufficient top management support for SaaS and had actually adopted SaaS, showed that the top management was convinced of the benefits of SaaS:

"If email system went down, top management would be very disappointed...As they feel its importance, they are very supportive of using Google Corporate email...I even have not yet convinced top management to use it, they already acknowledged the severe impact if email system has problems." (C12)

"No... In fact, [the rector] suggested us to adopt Office 365." (C17)

In several cases, top management was strongly influenced by external parties, such as government policies and professional community. Two companies in the banking sector are obliged to comply with the regulations of the Central Bank of Vietnam. Adopting SaaS, having data stored outside the customers' chosen organization, raises compliance problems. Adoption decisions, hence, have to be made at the highest level or even by governmental bodies:

"New IT innovation that is to be adopted must comply with the regulations made by the Government authorities, as regulated in Vietnam." (C8)

"The decision are made by the board of directors, commissioners, and the IT committee of our holding company...I am somewhat pessimistic, because of our banking institutions, many factors must be considered... depend on the permission from the Government and attitude of the decision-makers (whether they are conservative towards new technologies)." (C9)

In other cases, informants implied that suggestions from top management; professional community can influence their adoption decision, including SaaS:

"The decisions are taken by the hospital management with IT department recommendations. However, they sometimes consider the suggestions from their colleagues in other hospitals." (C3)

Although in some cases IT employees did have some influence, it was recognized that SaaS applications were adopted only when top management was enthusiastic about SaaS. Therefore, top management support had a major and positive influence on the adoption of SaaS.

Organizational size

Organizational size was classified into two groups: SMEs (11) and large companies (7). One out of seven large companies and four out of 11

SMEs adopted SaaS. Non-adopting large companies developed their own IS or purchased them from an outside vendor, with slight modifications if necessary. The main reason was the uniqueness of their business processes:

"Since 2009, we have transformed to a new web-based Hospital Information System purchased from an application vendor with approximately 20% modifications to the flow of the system and the features. Its uniqueness is related to our business processes, and different from other hospitals." (C2)

The obligation to use IS that were already developed and standardized by the parent company is also the reason for not adopting SaaS:

"It seems quite difficult to adopt SaaS since we have to follow a standard system set by the principal of our hotel group. We should have a discussion first with the stakeholders if we want to adopt any new IT innovations." (C10)

It can be concluded from these quotes that the size and resources of the companies enables them to use customized IS and to keep IS in house for more control. Another reason for not adopting is the compliance with the rest of the organization: choices are made by headquarters, not by subsidiary companies.

The intention of SaaS adopted large company was for resource utilization. Using cloud appeared to be more efficient and enabled its focus on core business activities:

"For long-term plan, after we made some calculations and comparison between maintaining our own email server and renting from Google, it would be more cost-efficient if we chose the second option. Three out of 12 IT staff were allocated for maintaining our own email server, which was not efficient. Using Gmail help us focus on our core business activities." (C12)

Only four out of 11 SMEs adopted SaaS. Different reasons were given, but most of them mentioned their expectations of cost reductions and the new functionality that the SaaS applications could provide:

"...this new application is already web-based, user-friendly, and supported with experienced IT personnel of the provider. Therefore, it reduces our spending on IT infrastructure and personnel. Currently we have only one part-time IT employee" (C1)

"The current SaaS application enabled us to work internally as well as share knowledge regarding the existing problems and the solutions." (C14)

The non-compliance of SaaS applications with organizations' business processes was mentioned by non-adopting SMEs:

"We were thinking about buying a new application; however, it was not compliant with our business process, we decided to develop our own application." (C4).

"...we will consider adopting SaaS if its features and functions are similar or even better than our current business processes, so we don't have to do lots of customizations that will affect the costs." (C7)

It can be referred from the findings that organizational size is generally not positively related to SaaS adoption as SMEs are more likely to adopt SaaS than large companies.

Organizational readiness

The readiness for innovation adoption can be measured via three types of organizational resources, including financial resources, human resources, and in-use enterprise systems. The general idea is that the absence of one or more is likely to hinder adoption intention. However, our QCA showed that none of the organizations with sufficient readiness adopted SaaS.

The absence of organizational resources was found to prevents innovation adoption as the IT manager of a medical organization stated:

"Considering the IT infrastructure we have, I think we're not ready yet to connect with the cloud...we have IT personnel with their own expertise...but we don't have a budget for regular replacement." (C2)

However, it was also discovered that the lack of budget for IT infrastructure and expertise led to SaaS adoption:

"At first, we preferred the server at our location. However, due to budget restrictions on purchasing data storage and hiring IT professionals to maintain our servers, we later decided to put the system in the cloud." (C1)

In some cases, sufficient funding, good IT infrastructure, and sufficient IT expertise did not automatically trigger the intention to adopt SaaS:

"Since 2000, we started using a Hospital Information System had been developed by ourselves. We do not host it at another place...we have all necessary resources to develop and host our own information system." (C5)

C8 and C9 showed sufficient organizational readiness. C8, for example, allocated huge amount for IT investments, maintained an educated IT workforce (through professional certification trajectories), and had well-developed IT infrastructure (dual data center facility). However, neither organization mentioned "cloud computing" or "SaaS" in their IT development plans as their capacities allowed them to develop and host their own applications and retain the maximum level of control:

"We currently use 100% on-premise applications. All servers are placed at our organization...Thus, it is always under our control. For an application with specific requirements, we prefer to develop it by ourselves." (C8)

To sum up, sufficient organizational readiness does not present a positive influence on the adoption decision. Instead, the informants' responses indicates the inverse association.

5. Discussions

In this section, the influence of the organizational factors on the adoption of SaaS in Vietnam, and then the limitations of this study will be discussed

5.1. Patterns of SaaS adoption in Vietnam

In our across-case analysis, three patterns concerning the adoption of SaaS in Vietnam will be exposed. then each pattern in the context of Vietnam as a developing country will be discussed`.

Pattern 1: Top management support is an enabler for SaaS adoption

Regarding top management support, the role of decision makers is crucial: all the cases with sufficient management support adopted SaaS. Also, how SaaS was perceived by decision makers potentially influenced the support given, which was mostly affected by SaaS awareness levels. In other words, there is a connection between top management support and SaaS awareness. As noted before, most of the non-adopting companies had a basic or very basic knowledge of SaaS. This is in line with Thong and Yap (1995) [38] that the top management characteristics innovativeness, attitude toward the IT adoption, and IT knowledge have a positive influence on the innovation adoption, and the work of Rogers (1995) [13], arguing that the "attitude towards an innovation takes place before a decision to adopt is made."

In some cases, decision makers were influenced by external pressures, such as professional community or the government. The authors do not overlook these factors rather identify this as a form of institutional isomorphism [57], in which organizations adopt similar structures and ideas due to pressure from institutionalized ideas. DiMaggio and Powell (1983) [58] identified three isomorphic pressures: coercive, mimetic, and normative. Coercive pressures come from the state or other powerful relationships, and banking regulations are a well-defined example of this. In other cases, companies were pressured by mimetic forces, such that when they were uncertain about which course of action to take, they looked to their peers (as in hospitals) and imitated their actions.

Based on the existing literature, it comes as no surprise that top management support has a positive influence on SaaS adoption. Many studies proposed that top management support is a strong enabler for the innovation adoption [41];[42];[44]; [45]).

Pattern 2: SMEs are more likely to adopt SaaS than large companies

In terms of organizational size, only one large companies adopted SaaS, whereas four of the 11 SMEs did. This is against several studies on innovation adoption which presented organizational size as a positive influence on an organization's willingness to adopt IT innovations [50]; [51];[59]. However, it is still supported by other studies stating SaaS is particularly fitting for SMEs and organizations with tight resources [45].

Several reasons related to size were mentioned for SaaS adoption. First, some informants expressed the need to control data by placing their own server inside the organization. The fact that large organizations with more resources implies that they can make their choices without considering the cost-efficient factor. Moreover, as discussed before, there is a lack of trust in the availability and stability of Internet connections. This is a key concern in developing countries and has been reported in other studies (Mujinga & Chipangura).

Another reason was requirement of standardized applications in compliance with their parent companies. Large companies usually have more data and more complex business procedures, implying that SaaS adoption may involve major changes in organizational IT governance.

For SaaS adopted SMEs, the rationales are to lower the investment costs in IT infrastructure and human resources, as well as raise the possibility of online collaborating with internal users and customers. The limited data owned by these companies and the simple structure of their business can also be counted. Conversely, the non-compliance of SaaS with existing business

processes had also led to other SMEs' rejection, even some large organizations.

These findings lead to a conclusion that large organizations are not more inclined to adopt SaaS than SMEs, not to mention there were strong indication of the opposite. This is against several studies claiming that the larger the size, the more likely it is to adopt SaaS, reflecting in its abilities to take risks and allocate the required organizational resources [43];[60];[24].

Pattern 3: Organizational readiness for IT innovation reduces the likelihood of SaaS adoption

That four out of 18 cases showed sufficient organizational readiness for adopting IT innovations indicates that these organizations had sufficient financial resources, skilled IT employees, and a decent IT infrastructure. However, none of these companies actually adopted SaaS.

Some companies delayed SaaS adoption due to the concerns about security and reliability of their own IT infrastructure, which actually indicated that higher organizational readiness leads to SaaS adoption. However, limited IT infrastructure and unskilled IT personnel lead to the exact opposite: they were used as adoption motivations. The main reason was that SaaS adoption requires low investments in IT infrastructure and IT personnel. Therefore it is caused mainly by the nature of the innovation (e.g., low up-front investments).

Although there is an overlap between large organizations and organizations with sufficient organizational readiness, it is important to separate these variables. Indeed, this overlap is not unexpected because large organizations tend to have more resources [61]. However, organizational readiness is not comparable one on one with organizational size, which can also be seen in our large cases with insufficient organizational readiness and vice versa. Therefore, the extant literature on IT innovation adoption was followed that treats these variables separately [62].

5.2. Conclusion

This paper attempted to answer the research question "How do organizational factors influence SaaS adoption in Vietnamese organizations?" In particular, the research investigated SaaS awareness in several Vietnamese selected companies and how three organizational factors, namely top management support, organizational size, and organizational readiness, influence their decisions to adopt SaaS.

This paper makes several important contributions to the current theoretical framework. **First**, our study confirmed that top management support is the strongest enabler for SaaS adoption and this result is in line with the literature [41];[42];[24]; [43]. **Second**, the relation between organizational size and SaaS adoption was explored. As shown in our research, that SMEs were more likely to adopt SaaS than large companies is in accordance with the work of Alshamaila et al. (2012) [45], however is against the majority of studies on SaaS adoption [24]; [43]. This also holds for our third finding that organizational readiness reduces the likelihood of SaaS adoption. Again, most studies on SaaS adoption [63]; [44] assume that organizational readiness has a positive influence. This contradiction is believed to result partly from the nature of the innovation: SaaS is a service model that is highly suitable for organizations with few resources. Therefore, the extant theory regarding these variables should be revisited in light of recent IT innovations such as SaaS.

Although our study resulted in interesting findings, it has some limitations to be discussed. **First**, our study focused on three most commonly used organizational factors in the IT innovation literature. This was intentional as this research was dedicated to the organizational aspects of adoption, but it is worth noting that there are other factors to be considered, such as technological or environmental factors. A broader scope might result in a more comprehensive analysis of SaaS adoption in Vietnam.

Second, the sample consisted of only 18 Vietnamese companies spreading over seven industry sectors. Although the literal replication was adopted to strengthen the robustness and reliability of the study, the findings should be interpreted carefully. That several sectors were not included in our study might have influenced our results. And even though Vietnam has the typical characteristics of a developing country, it does not mean the results are consistent with other developing countries without considering cultural dimensions. One proposed solution to overcome the small sample size drawback is to use survey-based research methods so that the study can reach out to more organizations. Nonetheless, any method has its pros and cons; for example, if interesting issues emerge, it is usually not possible to ask follow-up questions in survey-based research than face-to-face qualitative one. It is believed that multiple-case study offers further insight into the adoption process.

Last, although top management support is found to be extremely important in adopting SaaS, there is not much information of personal characteristics of these managers gathered that can put into consideration. This is obviously an interesting direction to be considered for future research of assessing how and to what extent this affects attitudes toward SaaS adoption.

Future research on organizational size and organizational readiness in relation to IT innovation adoption should also explore the influence of different types of innovations. Beyond the theoretical implications, this study also has practical implications. Firstly, our study findings highlight the importance of educating the Vietnamese industry players and encouraging their awareness of SaaS. The Vietnamese government, which obviously play a large role in this, as well as SaaS providers in Vietnam and in similar developing countries may together apply this study to formulate better strategies for SaaS adoption. Secondly, the strong positive influence of top management support on SaaS adoption suggests that appointment of managers with wide knowledge

and favorable attitudes towards SaaS may be essential for adopting these IT innovations. Finally, multiple cases in our research with insufficient organizational readiness for IT innovation adoption still successfully adopted SaaS. Therefore, organizations can be advised not to necessarily reject adopting SaaS if they believe their organizational readiness to be low.

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