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Enhancing the Performance of Educational Institutions by Adopting SaaS Technology Framework

Ibrahim Najmuldeen Abdullah
Al-Hikmah University College, Baghdad, Iraq
ibrahim.najim@hiuc.edu.iq

Abstract

The expanded use by educational institutions of Software-as-a-service (SaaS) software has been triggered by intense frustration of on-site systems allowing companies to buy and use equipment, to share licenses and to pay for costly installation and maintenance services. The current research was conducted to analyze the most critical factors that can impact the adoption of SaaS for enhancing the performance of educational institutions in Iraq. A set of questions were created and then disseminated to the individuals within Iraqi educational institutions. Using primary data collection method, the results identified that (Technology Competence, Security and Confidentiality, System Trust, Network Limitations, Information and Knowledge, Cost saving, Relative Advantages, Customization, Institutional Readiness, and Serviceability) have significant effect on the adoption of SaaS technology. Advice is forwarded for educational institutions in Iraq to engage in a comprehensive investment involving SaaS to get effective service delivery, and enhance the receptiveness towards of SaaS services.

Keywords: *Cloud computing, Adoption, SaaS, Structural Equation Model, educational institutions, Iraq*

1. Introduction

SaaS has evolved in recent years with participation from different stakeholders such as researchers, educational institutions and even companies in the Computer Science and Information Technology (IT). SaaS has modified the manner in which people are spent in IT services through its assurances of the recently announced economic paradigm for computing and ICT in education institutions. This modern revolutionary economic model excludes a considerable amount of money in the purchasing and maintenance of The services from the budget of the educational institution (Nofan & Sakran, 2016). The education institutions can thus conveniently outsource SaaS service providers' IT needs and thus pay for them. Cloud computing, which can help education institutions' technologies compete with advanced corporations, is among the latest Internet services relevant to computer paradigms. This breakthrough will allow access to these specialized computing resources through a network for educational institutions (Polyviou, Pouloudi, & Pramatari, 2014).

Cloud computing is a modern concept that has been established as a national standard and technology institute (NIST) "model for enabling on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell & Grance, 2011). Cloud platforms may be categorized as either IaaS (Service Infrastructure), SaaS (Service Software) or PaaS (Service Platform).

Since the beginning, administrators and analysts have been involved in Software as a service (SaaS) (Amiri, 2016). Worldwide public institutions invest large amounts on SaaS-based technologies. Globally, SaaS-based technologies are developed in various educational institutions (Lee, Chae, & Cho, 2013). SaaS distribution is expected to surpass conventional applications by rising margins Mahowald & Connor, (2012). For eg, SaaS will hit 112.8 billion dollars in 2019 (IDC, 2015), and the utility cost is forecast to rise to 258 billion dollars by 2020 (Goode, Lin, Tsai, & Jiang, 2015). The SaaS system helps businesses to download applications via the Cloud without on-site deployment to reduce high initial development costs (Kung, Cegielski, & Kung, 2015).

This is the best way to approach operations for businesses that have a smaller budget. In addition to cost savings, SaaS also offers a strategic edge and increases product efficiency and market versatility (Ghalsasi, Marston, Li, Bandyopadhyay, & Zhang, 2011).

While scholars are more involved in the SaaS trend, prior studies have primarily concentrated on technology (Choudhary, 2007) and SaaS commercial benefits (Susarla, Barua, & Whinston, 2010). Very few studies have explored the implementation of SaaS at firm level; the direct effects of the independent variables for the individual stage of SaaS implementation are largely localized and certain stages of product diffusion are not taken into account. In an institution 's decision to integrate emerging technology into its value chain operations to gain education benefit, it will be critical and worth taking into account both before and after implementation (i.e. routinization) and the stage to implement it (Akande & Van Belle, 2014). In fact , it is difficult to research SaaS as the idea is in transition and it has only arisen in recent years as a dominant product distribution paradigm (Al-Shqeerat, Al-Shrouf, Hassan, & Fajraoui, 2017). Throughout the various levels of SaaS diffusion in an institution of education the overt and indirect consequences of determinants can be thoroughly understood. We use the empirical analysis model to analyze the factors affecting SaaS propagation. In specific, we aim to better understand the connections between the factors.

2. Software-as-a-Service (SaaS)

In SaaS the software is delivered as a service to customers that have no control over the cloud infrastructure that supports them, such as network, servers, operating systems, storages or even individual applications. On the other hand, providers offer the software pay-by-use without having to invest in advance and convert capital expenditure into operating costs which can be attractive for many business types. In addition, the cloud solution's overall cost is frequently lower than the similar on-site implementation. SaaS is a very large type of application term (Breivold & Crnkovic, 2014; Chauhan & Babar, 2011). Many service vendors expect to sell their products according to the SaaS model thanks to the increasing popularity of such program. However, "licensing web apps is a fiercely competitive market with rampant risks. Software, as a service, must overcome several challenges in order to prove itself as a successful model" (Gagnon, Nabelsi, Passerini, & Cakici, 2011). Some of the very challenging options for IT administrators today is: to follow a cloud-based SaaS platform product package or to deploy applications in traditional on-site models? The administrator needs to take into account a wide variety of factors and expenses are probably the most relevant. The SaaS solution leads to a

small upfront investment; however, the IT department has little network leverage and is entirely dependent on the agreement with the SLA contract clauses. This study seeks to address the educational issue of defining variables and criteria for evaluating the benefits and drawbacks of going for SaaS rather than on-site applications for educational institutions.

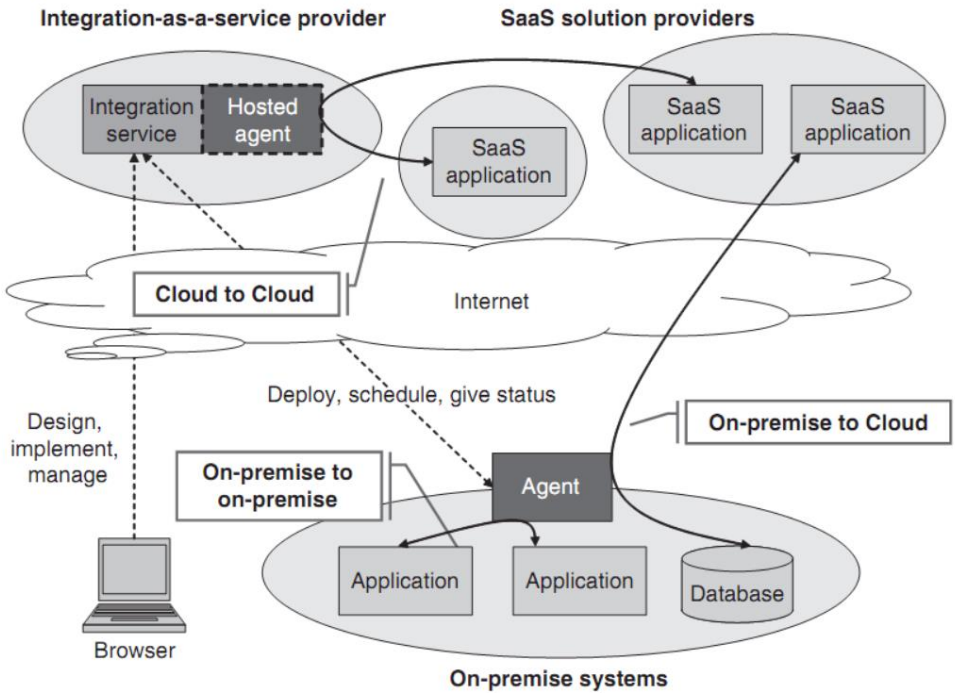
SaaS is seen by IT administrators as a tool that will help public institutions reduce capital spending while rising cash flow (Benlian & Hess, 2011). SaaS is typically targeted at supplying applications stored outside of the premises with online access with a monthly fee (Espadas et al., 2013). Built on cloud infrastructure, SaaS provides cloud services to provide applications (Park & Ryoo, 2013), Convert IT capital into an all-embracing utility (Susarla et al., 2010). In addition to SaaS, the Network as a Service (IaaS) and Platform as a Service (PaaS) are also common cloud computing tools. In comparison to SaaS, which involves applications, IaaS relates to network distribution as a service and PaaS to the application virtualization. (Misra & Mondal, 2011). In this study, we only concentrate on the distribution of SaaS at company level.

SaaS was developed as an improved application service provider (ASP) platform (Kim et al., 2012). This was the tech market 's reaction to the limitations of the ASP single tenant architecture. SaaS is a multi-locator architecture which enables educational institutions to use many software products on request (Benlian, Koufaris, & Hess, 2011). SaaS systems are commonly considered as easy to reach and use, feature-rich and adaptable (Zorrilla & García-Saiz, 2013). In comparison, SaaS' advantages include lower deployment costs, improved levels of product quality enhancement, and quicker implementation of new functionality relative to deployment product on site (OPIS) (Gonzálvez-Gallego, Molina-Castillo, Soto-Acosta, Varajao, & Trigo, 2015). SaaS is used mainly in tandem with educational institutions for the execution of value chain operations (e.g., departmental partnerships, human resources, electronic activity management) rather than as direct education software, based on a technology model that offers, manages, and facilitates information functions across the internet (Zorrilla & García-Saiz, 2013).

Educational institutions today have two choices in electronic decision-making. You may either buy it as a traditional OPIS or receive it as a service (e.g. SaaS). SaaS is distinct from OPIS in many ways. First, SaaS data is stored on the computer of the service provider unlike OPIS (Jula, Sundararajan, & Othman, 2014). This is seen as a factor that adversely impacts SaaS adoption, so safety issues are posed. The more vulnerable the user data, the more risk they are (Misra & Mondal, 2011). However, since many SaaS providers offer inherent options for disaster recovery (i.e. backup servers in a different geographical location) some schools consider this to be advantageous rather than risky. Additionally, SaaS offers contract bundling tools (Odom, Sellen, Harper, & Thereska, 2012). This program provides an extra advantage that is used as a strategic aspect when applied to the product distribution and leads to successful differentiated SaaS placement relative to OPIS. Finally, SaaS is not subject to high initial costs and is based on a subscription model (Choudhary, 2007). The educational system is thereby free from the high costs of introducing the OPIS, but charges in minimal amounts for the quality of its operation. By comparison to OPIS, there is no friction between current and future product releases because there is a better assurance that vendors can launch new apps and make them available to all the workers of educational institutions (Choudhary, 2007).

At the other hand, the local integration systems provide complex integration features, which cannot be supported by their counterparts at request. However, as with the SaaS technology implement trend in companies, smart enterprise customers often use these on-demand management services beyond an IT department's radar. This poses significant security issues regarding unwanted consumer apps that control company data streams. Finally, with these platforms being more advanced and educational organizations shifting more software to the

cloud, SaaS technology service providers can continue incorporating them into their services and have out-of-the-box connectivity between different SaaS apps on a single button. Figure 1 demonstrates the SaaS technology deployment scenario (Hai & Sakoda, 2009).



The Figure 1: The Integration Scenario of the SaaS Applications

3. SaaS Providers and Educational Institutions

Software as a service is a modern model of distribution which gives both the provider and training institutions a high degree of flexibility. SaaS offers support services for its teaching institutions on an ongoing basis and operates mobile applications (for example HR, Recruitment, e-mail, word processing, and spreadsheets). The cloud service customer requires basic interface tools such as a basic web browser, and the service provider requires optimized IT services to maximize their uses (Kim et al., 2012).

SaaS addresses customer questions about data servers, storage, creation of software and the associated IT problems. It also helps all customers to benefit from the new technical advancements of the service without interruptions and removes the burden of processes, servicing and repair of programs and device changes, enhancements and protections. Although the SAAS industry was initially dominated by low prices, SAAS vending companies today recognize that dependability, scalability and uptime are the main factors driving long-term customer loyalty (Bhardwaj, Jain, & Jain, 2010). SaaS has revitalized the tech industry and has offered client consumers additional options.

3.1 SaaS Provider's Responsibilities

Providers are responsible for managing and maintaining infrastructure, including power and cooling control, network connectivity, data center capacity etc. Some of these duties. Even, SaaS manage applications for the operating system, files, upgrade deployment, continuing backups, etc. In addition to delivering cloud-based apps to quickly offer consumer products on demand; usually provides a multi-tenant configuration development model; using virtualization technology (network, device, dev platform, server, storage). Confirming the access to highly trained and accredited security professionals, and technology that secure systems vulnerability and attacks; encouraging cloning systems in additional network instances; provide specific service level agreements with customers about 'availability of info' Centrally managed device deployment; You may collect detailed knowledge about problems, efficiency and habits of use to enhance the product. to continually improve your business and your customer care (Bhardwaj et al., 2010).

3.2 Benefits to SaaS educational institutions

- Taking on the philosophy of industry and using the tools of suppliers to execute the theory through tailor-made apps .
- Own development platforms, hardware and high supply level & platform maintenance, OS & hygiene facts such as space, power, etc .
- High usage-based operating costs rather than fixed costs upfront .
- Could be updated easily to new updates without the normal update issues .
- Software is licensed and not bought for an annual or a monthly charge and therefore no frontloaded expenses.
- Consistent little improvements and reviews which add up over time and upgrade the time and resources that customers need to put in place .
- Fast and faultless extension of the network, regional development and growth and trouble-free bandwidth .
- Improved reliability, productivity and performance .
- Improved efficiency and quicker usage.
- Login everywhere, anywhere to the on-demand program .
- May not require traditionally registering and maintaining the software .
- Does not have the software the program works to purchase and maintain.

4. Related Works

Although the literature discusses several studies concerned with the current state and development of cloud technology, few studies have addressed SaaS adoption. SaaS adoption (Wu, 2011b). When SaaS models are more prevalent, the literature on SaaS assessment and adoption increases. We carried out a literature analysis checking the terms Cloud computing, Adoption, SaaS, Structural Equation System, IAEE Exploring, ACM digital database and Science Direct, released after 2011. Also, in German. Science Direct.

Most papers deal with the implementation of SaaS purely from a technological perspective. There are few reports on the implementation of cloud technologies in this area. The existing framework (Sripanidkulchai & Sujichantararat, 2012) is helpful to compare network costs as services (IaaS) to data centers on site, and it offers instances where IaaS is not so cheap. Primitive approach to the neural network (Yuen, 2012) presents the updated version of AHP is introduced and is useful for choosing a service offer (SaaS) from a selection of product comparable suppliers.

The investigation in (Benlian & Hess, 2011) shows that cost savings are the biggest and most reliable consideration impacting potential SaaS deployment prospects, while protection risks

are primary risk factors and are accompanied by economic and efficiency threats. The review in (Lee, Park, & Lim, 2013) reveals Research findings performed in Korea, in the context of four measurements – learning and development, internal processes, and institutional success – to determine the implementation of SaaS and its related benefits to education institutions. The findings show that these four main factors for SaaS performance are intertwined and thus validate BSC 's core premise (S. Lee et al., 2013). The study in (Zardari & Bahsoon, 2011) Propose a protocol to test a cloud service based on Goals Oriented Requirements Technology (GORE).

In (Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011), The analysts described the capabilities, limitations, prospects and risks for the cloud market and the numerous problems faced by the different cloud computing stakeholders. The research in (Wu, 2011a) Introduction of Software Acceptance Model (TAM), aim to build an exploratory model exploring important factors influencing the acceptance of SaaS. (Wu, 2011b) applied theories to external elements such as strategic initiative, health and confidence. For most readers, protection is the big risk for SaaS adoption (Bayrak, 2013; Wu, 2011b), though the main expected gain is cost reduction (Gupta, Seetharaman, & Raj, 2013). Certain interesting software appraisal and usage findings include pricing schemes (Rohitratana & Altmann, 2012), Facets of cloud protection (Boampong & Wahsheh, 2012), selection of protection and privacy criteria related cloud providers (Mouratidis, Islam, Kalloniatis, & Gritzalis, 2013). The on-the-spot cost analysis against SaaS solutions is extensively discussed (Bibi, Katsaros, & Bozanis, 2012).

The study in (Garg, Versteeg, & Buyya, 2013) Used AHP to merge QoS attributes to solve a problem that differs from our problem of matching locally with SaaS solutions, by choosing a cloud-based provider. To our full knowledge, there was no research offering an overall SaaS rating among on-site applications that took cost and qualitative characteristics, including stability, into account.

Some SaaS research focuses on externalization (Benlian & Hess, 2011). They looked at drivers that affect SaaS adoption based on theories such as TCT, resource-dependent view (RBV), and expected action theory (TBP). The results show that one of the key factors affecting SaaS adoption is social impact. Nevertheless, their work does not provide more phases in the dissemination of technologies such as the pre-adoption period of evaluating SaaS 's capacity for progress in value chain efficiency (i.e.) and the reengineering cycle reintroduction step from department-wide deployment and value chain operation (i.e. routine).

Wu, (2011a) a research model to analyze critical factors shaping SaaS adoption has been developed and empirically evaluated. The thesis blends diffusion of the principle of invention with a TAM paradigm that is ideal for individual research. The review is restricted to the telecommunications sector and cannot be applied to all sectors enough. As an introduction to a case study concerning the DEMATEL approach to decision-making, Wu (2011b) the potential threats and benefits of SaaS were discussed. The analysis indicated that the economic gain in the SaaS implementation decision outweighs competitive advantages. In this report, however, it is not possible to recognize the value of technology, organization and the climate for SaaS adoption. Benlian and Hess (2011) The capacity and risks of that SaaS adoption is evaluated on the basis of an opportunity-risk model. We say that the key driver in SaaS adoption are health risks and cost advantages. The study focuses also on the dangers and advantages of SaaS, but the future environmental factors are not considered.

Susarla, Barua, & Whinston, (2010) optimal contract arrangements were examined for SaaS based on the economic cost of transactions (TCE). They proposed control systems for the SaaS expense tracking, but they did not separate SaaS from ASP. Kung et al. (2015) concentrated on environmental issues affecting SaaS 's intent, and Yang et al. (2015) in the SaaS company

readiness, a three-point readiness model was introduced to analyze the platform, organization and environments. However, no systematic study of diffusion (i.e. purpose, recognition and routinization) occurs in any of these research studies. The method of introduction of technology does not start or stop during the deployment period; it starts in the SaaS testing phase and continues onto its systematic implementation and eventually its practice. (Bose & Luo, 2011). The invention may never develop beyond purpose or never propagate throughout the enterprise, but it is a complex phase. As can be shown, previous SaaS studies give us only a small isolated interpretation of the diffusion process which is primarily linked to the implementation or purpose. Research will concentrate on all three levels to achieve an in-depth understanding of the entire diffusion cycle. The three levels of diffusion in the literature are not introduced.

5. Theoretical Framework and hypotheses

There has been strong empirical evidence for the importance of using these theoretical insights in order to research acceptance at organization level (Chan & Chong, 2013; Ciganek, Haseman, & Ramamurthy, 2014). The IS literature notes that incorporating the TOE and DOI paradigm increases the framework 's potential to clarify IT acceptance (Hsu, Kraemer, & Dunkle, 2006). The INT theory likewise enriched the TOE framework's environmental sense (Oliveira, Thomas, & Espadanal, 2014). Because INT (i.e. economic, cultural and mimetical pressure) structural pressures reflect external forces which affect the diffusion of SaaS, these factors are included in the environmental sense of TOE. We report the external influences that may influence SaaS distribution within a business (Yoon & George, 2013). The synthesis of TOE, DOI and INT theories thus provides a theoretical base for the assessment of technology, organizational and environmental features that affect SaaS dissemination.

We suggest a research structure that involves three popular frameworks used in company-level innovation analysis (Oliveira & Martins, 2011). In order to evaluate the drivers of SaaS diffusion, the integrated paradigm integrates proven theoretical lenses from the TOE system, the DOI theoretical and INT Theory. Figure 2 demonstrates the integrative theoretical structure for study. Based on IS literature on the diffusion of technical advancement in businesses, the structures are defined.

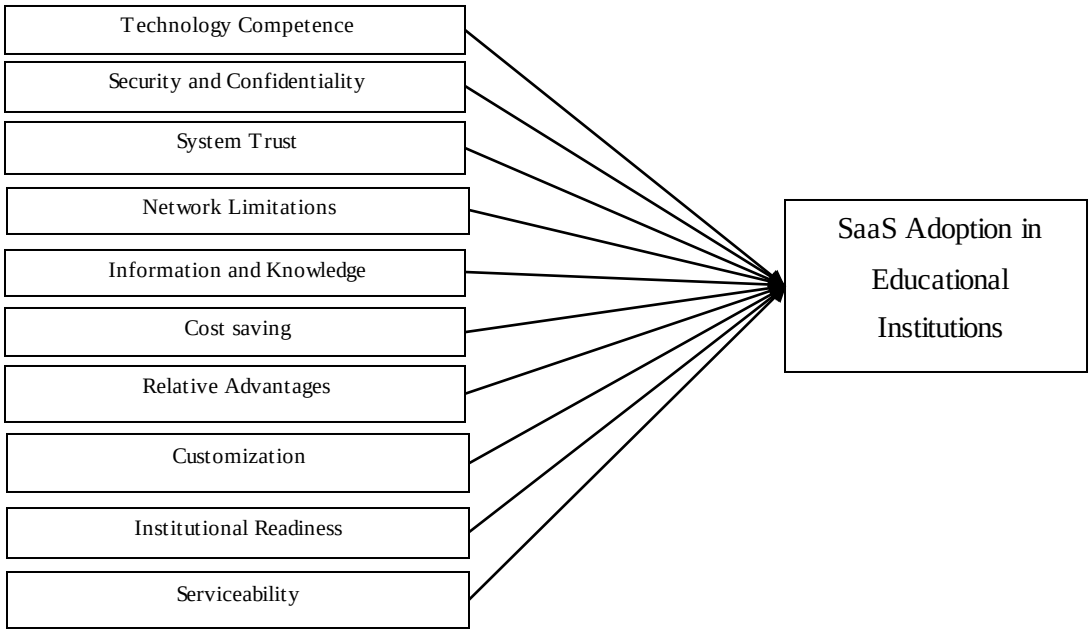


Figure 2: Theoretical Framework and hypotheses For SaaS Adoption

6. The Effected Factors of SaaS Adoption

Therefore, this analysis tests the impact of both variables in our study. Figure 2 shows the applied investigation structure that integrates the TOE, INT, and DOI theories. The main factors that may influence SaaS in this study to boost the output of educational institutes are (Technology Competence, Security and Confidentiality, Network Limitations, System Trust, Information and Knowledge, Cost saving, Relative Advantages, Customization, Institutional Readiness, and Serviceability).

6.1 Technology Competence

The technical expertise of the educational institutions relates to the technological features available, such as IT systems and IT professionals (Zhu & Kraemer, 2005). The IT infrastructure is hardware, devices and software deployed (Ngai, Cheng, Au, & Lai, 2007). IT experts have the skills to incorporate SaaS within the organization.

The competence of technology can positively influence the decision of the institution to take SaaS (Martins, Oliveira, & Thomas, 2016). As in many observational experiments, technical skills are defined as essential determinants of IT adoption. (Martins & Oliveira, 2010; Pan & Jang, 2008), The higher the level of technological competency of an enterprise, the more prepared the business is to implement SaaS. Within this report, we propose that SaaS adoption will benefit from development skills. Thus:

H1. Technology competence has a positive influence SaaS adoption in educational institutions.

6.2 Security and Confidentiality

Security and confidentiality affect the trust that schools readily put on the program (Al-Shqeerat et al., 2017). When it comes to program deployment, stability is still a problem (Ackermann 2014). Safety issues were posed to the SaaS model with many prospective users hesitant to rely on their data from third parties. Yet, (Cloud Security, 2012) argue there's no reason why cloud providers can't be as reliable as in-house IT systems.

The authors recommended the responsibility of SaaS vendors to ensure the protection and privacy of consumer information. This lack of awareness or comprehension of aspects of SaaS may influence the degree of safety confidence that users willingly put on SaaS. In fact, because protection concerns the credibility and image of the providers, they are potentially more closely controlled than many of their consumers (Chuchuen, 2016).

Thus:
H2. Security and confidentiality have a positive influence SaaS adoption in educational institutions.

6.3 System Trust

Trust is especially relevant as risk, alerts and uncertainty control the business deal climate and has been identified as a vital element for schools. (Burda & Teuteberg, 2014). Trust in SaaS suppliers is important as choosing a trustworthy provider must become a optimistic will, given potential adopters' uncertainty and risks (Luo, Li, Zhang, & Shim, 2010). Trust in a reliable,

competent and efficient vendor will mitigate risks and improve the optimistic intent of such IT technologies (Akhlaq & Ahmed, 2013). Therefore, we hypothesized that:

H3. System Trust has a positive influence SaaS adoption in educational institutions.

6.4 Network Limitations

The availability of the system concern is connected to the network limitation. Organization, in particular those such as SaaS systems that are deemed vital, also need a 100% availability (Kim, 2009). This is important to create infrastructure quality arrangements with the suppliers and consumers and ensure that the SaaS system itself and the network are accessible 100% or extremely similar to that (Kim, 2009). SaaS drivers vary according to the functionality of the SaaS outsourcing program. As SaaS systems are strategically important for educational institutions and not very standardized, they are one of the lowest SaaS adoption rates applications (Benlian, Hess, & Buxmann, 2009). Moreover, because of their existence, SaaS is not appropriate for other institutions (Mangiuc, 2009). Organizations who maintain classified or sensitive data on the grounds of their existence are not likely to adopt SaaS. Thus:

H4. Network Limitations has a positive influence SaaS adoption in educational institutions.

6.5 Information and Knowledge

Whereas participants seemed to understand what SaaS is and how it functions, the details of SaaS appear to lack knowledge. The SaaS knowledge can also have an effect on classrooms. It is difficult to take decisions if there is inadequate information about the issue. However, in terms of SaaS features, and how encryption functions, "dark areas" exist. The question of culture, of course, has to be dealt with at 2 levels as everyone inside the company will understand exactly what SaaS means in today's contemporary education, if we are to suggest this move. Thus:

H5. Information and Knowledge have a positive influence SaaS adoption in educational institutions.

6.6 Cost Saving

Cost reductions are also considered one of SaaS 'main advantages (Benlian & Hess, 2011), Enabling the educational institutions to deliver new opportunities. Where cost savings are taken into account through the implementation of the diffusion mechanism, the organizations affirm or express their initial perceptions of gain through greater technical expertise in their use. If cost reductions are verified, it may lead to expanded SaaS usage elsewhere in the classroom. Therefore, we hypothesized that:

H6. Cost saving has a positive influence SaaS adoption in educational institutions.

6.7 Relative Advantages

It refers to the extent to which an innovation can offer more institutional benefit (Sanders et al., 2012). This variable is a strong driver for IT innovation (Chen & Zhang, 2016). Literature indicates that the relation between relative profit and IT adoption is positive (Mndzebele, 2013). Some of the other benefits of SaaS is that the SaaS service provider participates in product development, servicing and upgrading, not being the responsibility of the organization which has taken SaaS (Polyviou et al., 2014). When these functions are transferred to the SaaS company, the

educational organization will rely on its core function. The benefits are a strategic advantage and a big drive to expand SaaS and create educational interest. Therefore, we propose.

H7. Relative Advantages has a positive influence SaaS adoption in educational institutions.

6.8 Customization

According to (Al-Khayat & Al-Othman, 2016), the perceived failure to customize SaaS affects the adoption of SaaS negatively. It is about the ability to meet curriculum needs not just in terms of possible cost changes. SaaS systems are not static as fast changes are always required to satisfy business needs (Akande & Van Belle, 2014). SaaS is known as static, in comparison. The high degree of change in a constantly evolving world has a detrimental effect on the cost savings benefit, which in turn impacts favorably the benefit generated by SaaS. Therefore, we hypothesized that:

H8. Customization has a positive influence SaaS adoption in educational institutions.

6.9 Institutional Readiness

It involves political, personnel and technical tools that play a key role in innovation adoption (Ahmadzada, Zayyad, & Toycan, 2016). Inadequate funding has been described as a major obstacle to IT growth in organizations, especially in smaller organizations with restricted investment capital (Colby, 2014). Private services are generated by established professionals with experience and expertise in an organization on specific invention (Choi & Ruona, 2011). This refers to installed network technologies and company systems that provide a platform for innovation (Lin & Chang, 2011). While thinking about SaaS, many companies are believed to postpone the implementation of software and continue to wait until they have the requisite capital (Loebbecke, Thomas, & Ullrich, 2012). We suggest the following hypothesis to examine this hypothesis:

H9. Institutional Readiness has a positive influence SaaS adoption in educational institutions.

6.10 Serviceability

While updates and system updates were performed seamlessly, users complained that the application failed occasionally, especially following updates and updates (Benlian & Hess, 2011). Consequently, contractual training agreements and updates must be defined using service level agreements. This provides a bottom line on the basis of services offered to users by providers. In addition to benchmarking, it is necessary to improve the quality of service provided to educational establishments and thus improve user satisfaction. Therefore, it can be hypothesized that:

H10. Serviceability has a positive influence SaaS adoption in educational institutions.

7. Research Methodology

The research utilized the survey method. This current research sampling structure comprise of individuals adopting SaaS in educational institutions in Iraq. Questionnaire survey It will allow us to study and detail the SaaS concept and thereby create a better understanding of potential factors for adopting SaaS in the educational institutions. All variables were measured using self-reported questionnaires. The questionnaire distributed for people who used SaaS already and also for people who consider or have not decided to use SaaS.

7.1 Reliability and validity

This study has, whenever possible, adopted validated scales and experimental procedures. The reliability and validity of all measurements were further checked. With Cronbach's alp has greater than 0.7 the scales in all perceptual research variables have good reliability. The main component factor analysis was also performed with ten separate variables and one dependent variable (perceived value) rotated VARIMAX. A total of 11 factors have been identified with a value of more than 1.0. All the variables loaded on each individual factor explaining 79.7% of the total variance. Most variables have shown convergent validity over 0.6. The items have been loaded most on their own factors when compared to each other. The findings of the factor analysis show, therefore, that the conditions were satisfactorily met for convergent and discriminating validity.

7.2 Data Collection

The sampling population is 250, with just 234 (93.6%) of the questionnaires were returned. From the 234 questionnaires received, 14 questionnaires were either not completed or offered erratic response, and consequently were discarded from being analyzed. Based on work by Chatman (2007), a response rate greater than 35% is positive. Hence, the 80 percent response rate is appropriate to be utilized for analysis. Certain items were utilized to gauge the entire determinants and for every individual item, a related Likert Scale with an array from 1 as "Strongly Disagree" and 5 as "Strongly Agree" was utilized. For every individual item listed, the respondents were required to indicate a choice from the 5 choices provided. This study focused on the factors and considerations that have influenced educational institutions decision to adopt SaaS system and its impact on performance. The questionnaire explained the purpose and scope of the research and our desire to share the results of the study.

8. Demographic Statistics

The utilization of statistical package for the social sciences (SPSS) was carried out in the data analysis. Six demographic factors were utilized in the compilation of information, Gender, Nationality, Age, and Education. The core objective in utilizing the demographic information was to assess the validity of the compiled information. Table 1 illustrates the descriptive statistics for every individual demographic variables of the research.

Table 1: Demographic Questions

Factors	Questions	Frequency	Percent
Gender	Male	146	66.3%
	Female	74	33.7%
Age (years)	18-25	11	5%
	26-30	29	13.1%
	31-35	64	29.1%
	36-40	55	25%
	Above 41	61	27.8%
Education	Diploma	24	10.9%
	Bachelor	33	15%
	Master Degree	94	42.7%
	PhD	69	31.4%

9. Hypothesis Testing

The structural equation modelling (SEM) was implemented to assess the hypotheses. The model fit was assessed. Three common indices of fit (IFI and CFI greater than 0.9, and RMSEA of less than 0.08 are perceived as pointers of a good fit) were utilized in the current paper. In this paper, the implementation of the hypothesis evaluation was based on the SEM between one dependent variable and independent variables. Arbnor and Bjerke (1997) argued that " certifiable or falsifiable hypotheses " are adequately informed (Arbnor & Bjerke, 1997). Hence, hypotheses are approved or dismissed with the objective of heightening the accuracy and generalization of a current theory that exists. The outcomes disclosed the entire hypotheses are approved. Hence, there exists a significant association between the Technology Competence, Security and Confidentiality, System Trust, Network Limitations, Information and Knowledge, Cost saving, Relative Advantages, Customization, Institutional Readiness, and Serviceability towards SaaS Adoption. The hypothesis assessment outline is indicated in Table 2 below.

Prior to the application of the SEM, the basic criteria like normality, missing values, and presence of outliers, were examined. The examination of the data distribution normality was carried out through the calculation of skewness and kurtosis (both must be within±2). Due to the establishment of normality and absence of missing values or outliers in the dataset, it was found to be acceptable for utilization in extended analyses. The Exploratory Factor Analysis (EFA) was next executed with the entire indicators possessing small communalities values of less than .4 (Yong & Pearce, 2013), were discarded. It had led to the elimination of one question. The KMO value of .855 showed significance, inferring that it is suitable to execute factor analysis.

10. Discussion

Outcomes gained from the current research are anticipated to add further knowledge to the pool of literature pertaining the acceptance of SaaS in the Developing Countries. Particularly, to link the disparities that exists in Iraq as a beginning point for more study. This investigation study furthermore is usually utilized by educational institutions to improve the education and services offered in these universities, alongside the determination of those variables which can result in the failure or accomplishment of the SaaS services which can be utilized for the outcome. The AMOS was employed as an analysis instrument through statistics. The researcher examines the ensuing hypothesis. The p-value is the standard technique in gauging the meaning of empirical analyses used by statisticians. Results showed in Table 3 that Technology Competence ($\beta = 0.258$, $p < 0.001$), Security and Confidentiality ($\beta = 0.312$, $p < 0.001$), System Trust ($\beta = 0.242$, $p < 0.001$), Network Limitations ($\beta = 0.247$, $p < 0.001$), Information and Knowledge ($\beta = 0.286$, $p < 0.001$), Cost saving ($\beta = 0.322$, $p < 0.001$), Relative Advantages ($\beta = 0.281$, $p < 0.001$), Customization ($\beta = 0.273$, $p < 0.001$), Institutional Readiness ($\beta = 0.277$, $p < 0.001$), Serviceability ($\beta = 0.390$, $p < 0.001$), was positively and significantly associated with SaaS Adoption. These results are in support to the hypothesis proposed in this paper. The findings indicate that interventions and programs designed to increase the SaaS adoption need to include a focus on the practice level that impacts on the decision making regarding the adoption of SaaS, in addition to help managers within educational institutions to change their workflow of most services, along with addressing privacy concerns. Furthermore, the research will recommend various educational institutions settings for the purpose of ensuring greater generalizability linked with the results.

Table 2: The summary result of the hypothesis

Hypotheses	Hypothesis Statement	β-value	Significant level	Conclusion
H1	Technology Competence has a positive influence SaaS adoption in educational institutions	Estimate = 0.258	p<0.001 level	Accepted
H2	Security and Confidentiality have a positive influence SaaS adoption in educational institutions	Estimate = 0.312	p<0.001 level	Accepted

H3	System Trust has a positive influence SaaS adoption in educational institutions	Estimate = 0.242	p<0.001 level	Accepted
H4	Network Limitations has a positive influence SaaS adoption in educational institutions	Estimate = 0.247	p<0.001 level	Accepted
H5	Information and Knowledge have a positive influence SaaS adoption in educational institutions	Estimate = 0.286	p<0.001 level	Accepted
H6	Cost saving has a positive influence SaaS adoption in educational institutions	Estimate = 0.322	p<0.001 level	Accepted
H7	Relative Advantages has a positive influence SaaS adoption in educational institutions	Estimate = 0.281	p<0.001 level	Accepted
H8	Customization has a positive influence SaaS adoption in educational institutions	Estimate = 0.273	p<0.001 level	Accepted
H9	Institutional Readiness has a positive influence SaaS adoption in educational institutions	Estimate = 0.277	p<0.001 level	Accepted
H10	Serviceability has a positive influence SaaS adoption in educational institutions	Estimate = 0.390	p<0.001 level	Accepted

11. Conclusions and further research

SaaS is a type of technology enhancement framework that provides software as a service rather than local software ownership and maintenance. SaaS concentrates on the delivery of services without transferring ownership of software to users. This research benefits from education and a comprehensive list of advantages, risks and challenges for adoption of SaaS. The advantages are easier IT control, no otherwise unavailable software facilities, and no installation and development cost. Certain risks arise as software and information are available on SaaS-providers' systems, while information is held by the user. In order to understand the importance of SaaS Systems in education institutions, and the factors that shape their successes, the research has examined the opinions of early adopters. Based on investigated evidence-based practice, research participants have reaffirmed the need for a theoretical framework for SaaS Systems implementation in Iraqi schools, which takes account not only of identified key success factors, but also of practical experience learned from SaaS Systems and current developments in this area. This study found 10 critical factors for the adoption and applied structural equation modelling (SEM) as the core analysis methodology, alongside the use of SPSS. As shown in Table 2, the hypotheses were substantiated through statistical evidence through the outcomes of the research. Although it is recognized that software companies need a complete paradigm shift, the research shows that the educational institution, the IT structure and the capacity required by governments for the use of SaaS are also changing substantially. There is a shift from the capacities to manage IT internally to the skills to manage and govern SaaS-provider relations. This framework will be developed by different stakeholders and will provide a strategy and recommendations on SaaS Systems implementation and use in educational institutions to enhance their performance.

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