



A Theoretical Framework for implementation of Cloud Computing in Malaysian Hospitality Industry

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ABSTRACT

Cloud technology has been widely adopted across the world in manufacturing as well as service sector. However, adoption of cloud in the Malaysian hospitality industry is limited due to the lack of investment in information technology (IT) and lack of understanding pertaining to the actions that are required to be taken for adoption of cloud in hospitality organization. The inability of the Malaysian hospitality firms to catch up with the technological learning curve of multinational hospitality chains have increased the gap between the competitiveness and subjected the Malaysian hospitality industry to lose potential customers to the multinational hotels. The inability of the Malaysia based hotels to attract the guests reduces the contribution that the industry can make towards enhancement of the economy. Therefore, the Malaysian Tourism Transformation Plan (MTTP) has been conceptualized by the Malaysian government. The objectives of MTTP lies in attracting 36 million tourists from global tourism market sources to generate RM168 billion by the end of 2018. Therefore, it was recognized by the government of Malaysia that empowering the local Malaysian hospitality firms will be essential to achieve the status of high-income country in the future. This study adopted a mixed research methodology by employing concurrent transformative research design. The limitations experienced by previous studies were addressed by offsetting the weaknesses of qualitative and quantitative methods. Sample population of 100 participants representing 10 Malaysia based hotels suggested that the low expertise and lack of experience with not only cloud technology, but also information technology in general. Moreover, low technological transformations in the Malaysian hospitality environment have contributed to the low rate of cloud adoption. Lack of strategic alignment between the objectives of hospitality firms and technological objective behind adoption of cloud reduces the IT investment budgets allocated by Malaysian hotels. Therefore, this study recommends a theoretical framework to encourage cloud adoption.

Key words: Cloud Technology, Malaysian Hospitality Industry, Theoretical Framework, Cloud Infrastructure, Cloud Adoption.

1. INTRODUCTION

This study was motivated from the objective of Malaysian Tourism Transformation Plan (MTTP) devised by Malaysian government to achieve the status of high-income country by 2020. Therefore, improvements in the Malaysian hospitality firms become a prerequisite for locally based national hotels to support the objectives of generating RM 168 billion revenue by attracting 36 million tourists by the end of 2018.

It was recognized that MTTP requires the local hotels to provide luxurious accommodation at affordable pricing, tourism for multiple purposes encompassing business, familial, and adventure. Problem statement of this study emerges from the identification that competitiveness of multinational hotels operating in Malaysia has outperformed the Malaysian hospitality firms due to the strategic use of cloud computing to achieve competitive advantage in the operating market of tourism and accommodation due to which it is essential for the Malaysian hospitality firms to adopt cloud computing in order to support the targets of MTTP.

It was recognized from the arguments made by Ayob [1] that a critical challenge experienced by the Malaysian hospitality firms lies within the lack of standardized framework that can provide a direction and roadmap for the management members of Malaysian hospitality firms to adopt cloud computing [1, 2]. Therefore, the Malaysian hospitality organisations are not only subjected to lack of awareness about the strengths, and weaknesses of cloud adoption, but also subjected to low competitiveness due to less engagement in technological transformations as compared to the multinational hotel chains as their counterparts [1, 3]. Hence, this study aims to overcome the gaps in literature on cloud computing adoption within Malaysian hospitality firms through presenting a comprehensive view of the perception held by members from 10 hospitality organizations of Malaysia, and develops a standardized framework encompassing the weaknesses of the previously designed cloud computing frameworks to assist the adoption of cloud computing in the Malaysian hospitality organizations.

The objectives of this study lies in evaluation of the benefits and challenges pertaining to cloud adoption by Malaysian hotels, to assess the cloud adoption benefits for MTTP, to

identify the cloud implementation challenges, and develops a new standardized cloud adoption framework to enable industry-wide application that can improve the competitiveness of Malaysian hotels against the multinational hotel chains, and improves the economic contribution from Malaysian hospitality sector to achieve MTTP targets.

The research questions explored within this study are (1) benefits and challenges of cloud computing adoption for Malaysian hotels, (2) benefits of cloud adoption for MTTP, (3) bottlenecks in cloud adoption for Malaysian hotels, and (4) identification of components that can enable development of standardized cloud computing adoption framework.

2. LITERATURE REVIEW

MTTP can be defined as a Malaysian Tourism Transformation Plan focused on improving the business processes, conduct, and competitiveness of the Malaysian hospitality firms. A critical advantage provided by MTTP to the local Malaysian hotels is the discontinuance on the incentives given to multinational hotels for development of new four-star and five-star properties. Therefore, it becomes a necessity for the Malaysian hotels to consider the technological transformation through adoption of cloud computing technology in order to develop competitiveness and overcome the competitive pressures exerted by the multinational hotel chains [4].

2.1 Introduction to Cloud Computing

Previous studies have defined cloud computing as an information technology model that enables networking with the use of on demand resources and ability to configure the computational resources [4]. The cloud computing has been further defined as a system wherein the organizational members utilized a virtual infrastructure consisting of virtualized storage, servers, and computing resources such as Central Processing Units (CPU) and Random Access Memory (RAM)[5]. It becomes important to consider that the cloud computing has not been defined clearly by the previous studies as a singular concept, as a consequence, the key decision makers from the hospitality firms in Malaysia are unaware and uninformed about the benefits and/or challenges brought forward by this technology.

Previous studies have further suggested that the cloud computing can be defined as a cloud based services wherein the need for existing infrastructure can be replaced with virtualization and virtual computing to develop capability of increasing the resources contingent to demand and reduce the cost as well as resources during the seasons with low demand from travellers[1].

2.1.1 Cloud Computing Architecture

Cloud computing technologies have emerged since over a decade. The commercial application of the cloud computing had been highest within the digital organizations. However, the understanding of the benefits and disadvantages posed by cloud technology, prompted, and encouraged the multinational hospitality chains to leverage cloud within the operations of the hotel chains[6]. Therefore, understand of cloud computing architecture is indispensable.

The cloud computing architecture uses virtualization which overcomes the limitations of the traditional architectures and enables reduction in the overhead server maintenance load which allows the cloud vendors to maximize the use of physical servers through virtualization and ensure that the cloud based data, applications, and systems experiences high degree of availability and faster recovery in disastrous instances.

The architecture of the cloud computing comprises front-end components, back-end components, middleware, and cloud-based storage [7]. The front-end components comprise the hardware and software which indicates a front-end computing architecture used by the clients. The front-end architecture further requires a network connectivity to ensure that users can access the cloud-based applications [8]. Back-end components of the architecture consist of the array of computing power at the premises of cloud vendor, storage systems for the servers and data along with a centralised firewall system to secure the data of users. The middleware elements of the cloud architecture are the central server wherein the cloud administrators are responsible for the administration of system, staff monitoring, and evaluation of the demands of client to ensure that the cloud computing service meets the client requirements. Middleware components of the cloud architecture consists of the software that are used for the control, monitoring, and security for the data [9]. Hence, the intrusion prevention system is positioned as middleware which enables the cloud vendors to protect the user information and ensure that the potential of any cyber-attack can be mitigated or minimized.

Figure 1 illustrate that the middleware segment uses virtualisation software wherein the different servers used by the vendors can be virtualized and the businesses are provided with either a private or shared cloud based on the needs, budget, and other requirements. The storage on cloud architecture provides a unique opportunity for the hospitality companies in Malaysia to increase the storage when the number of travellers increases and ability to overcome the fixed costs by reducing the need for additional storage during the lean seasons of tourism. It was further recognized from the previous studies that cloud computing storage can be categorized as private, public, and community based [10].

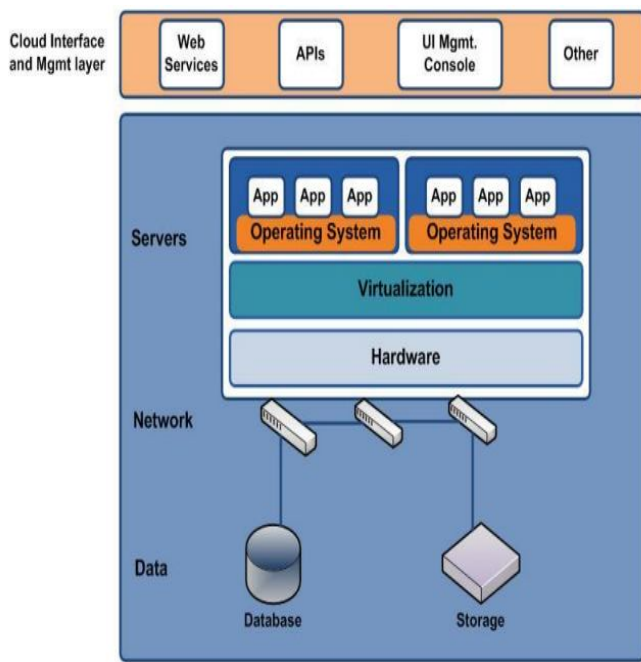


Figure 1: Simplified Cloud Infrastructure [9]

While, the private cloud storage implies that the hospitality business can pay for an individualized and separate cloud computing storage which can be separated from other users for a particular business, the public cloud storage indicates that cloud vendors creates virtualized separations between the data on a single cloud server in order to reduce the costs. It was argued by researchers that the while private cloud protects the data of hospitality firms from the attacks that are launched on other businesses that are subjected to use the same cloud vendor, the public cloud are subjected to use of heightened security by the cloud vendor due to the presence of multiple accounts on a single server [11].

Therefore, private and public cloud storage formats provide a considerably level of security despite the notion that the data is shared on public clouds and that data is more secured on private cloud [12]. Both form of cloud storage is provided by vendors with the use of virtualization due to which the primary difference is the degree of support and availability achieved by hospitality business from a particular type of storage. Understanding the community cloud becomes equally important as this form of infrastructure requires the different hospitality organisations to use a shared cloud storage that can be accessed by one another. However, the primary challenge with community cloud lies in the need for the complex interrelationship of organisations using a single cloud to be managed either by the group of hospitality firms or by contracting a third-party vendor.

However, it was recognized that the community-based cloud is most cost effective. Previous studies such as [13] argued that the less hospitality or other type of organisations adopts community-based cloud as the involvement of multiple organisations over a single cloud increases the risk of cyber-attack and loss of sensitive information [14]. The security concerns increases not only at the network level, but also at

the cloud interface and management layer as evident in the figure 1 since, the web services, and management user interfaces are subjected to use access control which can be detrimental to the security of data uploaded by Malaysian hotel chain on the cloud [9].

2.2 Benefits of Cloud for Malaysian Hotel Chains

A rigorous review of literature on the benefits provided by cloud computing to the key competitors of Malaysian hotel chains, it was identified that cloud computing provides an ability of transforming the IT infrastructure used by hotel chains and migrate the data, application, systems, and accounting software to the cloud servers [15]. The foremost benefit is the ability of hotel chain to reduce the costs by eliminating the need to upgrade, maintain, and sustain the IT infrastructure on-premises. The need for servers, storage, and additional memory to meet the growing demand of the consumers forces the hotel chains to deploy more IT resources which further require the IT staff to constantly support the infrastructure [16]. Moreover, the need for retaining IT support staff can be reduced as organisations move from on premise to cloud based infrastructure. The fixed cost reduction increases the amount that can be used by Malaysian hotel chains to develop the services delivered to the new incoming tourists and contribute to the Malaysian economy.

Second critical benefit of the cloud is that it can enable Malaysian hotel firms to become flexible and responsive to the domestic and international tourism needs which will enhance the competitiveness of the local Malaysian firms as supported by theory of competitive advantage [17].

Third benefit that holds an utmost potential to improve competitiveness of Malaysian hotel chains against Multinational Corporation (MNC) hotel chains is the ability to adapt the operational processes to ensure that the guest satisfaction can be improved [18]. Furthermore, it was found that the cloud computing provided a way to the MNC hotels to deploy technologies like big data by using the cloud computing resources to gain in-depth insight of the guest preferences. Moreover, the literature surfaced that the despite the contrary beliefs, cloud computing can enable emerging hotel chains such as the case of Malaysian hotel firms to develop cyber security capabilities by not only using the basic measures such as antivirus, and access control, but also intrusion protection system and network level protection. Therefore, the cloud computing provides key benefits for the Malaysian hotel firms aspiring to develop or expand the hotel chain by leveraging the cloud computing to achieve economies of scale [19]. However, there are multiply challenges that are required to be addressed for an informed development of cloud adoption strategy for Malaysian hospitality firms. Cloud computing vendor provides three distinct models of services. These models are based on the client requirements and readiness towards adoption of cloud computing technology in the operations of hospitality.

Figure 2 illustrates the connection between cloud application used and the three distinct service models used to support the hotel operations of Malaysian hospitality firms. Information as a service (IaaS) is the most basic model wherein the servers, cloud storage, virtual machines (VM), and network security among other capabilities are provided to the clients. The Malaysian hospitality firms that adopt IaaS will only be able to host the IT infrastructure [20]. However, the use of software, application, and other aspects will have to be managed by the organizational IT team. Therefore, the platform as a service (PaaS) introduces the ability to use web servers, development tools, and cloud-based database to manage the information about the guests, their billing details, and preferences for the future visits.

The most recent development in the cloud computing has been the commercial availability of the software as a service (SaaS) [21]. Under this model, Malaysian hospitality firms akin to the multinational hotel chain in Malaysia can use the cloud based property management system (PMS), room prices forecast system, and other applications that such as customer relations management system, and customer loyalty rewards application for efficient and effective guest satisfaction management without the on premise IT infrastructure.

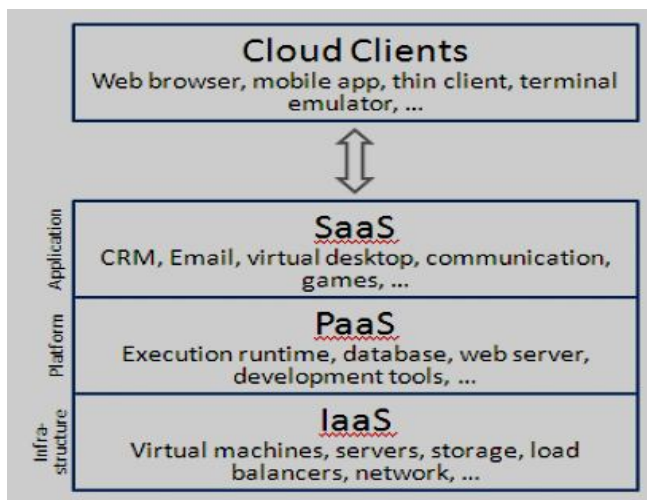


Figure 2: Cloud Computing Service Models [20]

2.3 Challenges of Cloud Adoption for Malaysian Hospitality Firms

The research on the key challenges experienced by the Malaysian hospitality firms have been characterized by the resistance to change inherent in the transition from manual and or on-premise IT infrastructure to the cloud computing environment.

It was brought forward by studies that the technological changes are like other changes that takes place in an organization [22]. This argument implied that the cloud adoption can be resisted by the employees due to the underlying uncertainty of whether they will be able to sustain

their performance with same levels of efficiency and productivity.

Hence, it was further supported by studies that the technological transformations are essential to be addressed with the application of an organizational change model that enables informed decision making about the investment as well as the outcome of the technological transformation [23].

Secondary challenges arising within the cloud adoption are the migration, privacy, and data ownership concerns. It was argued by literature that data security concerns function as a barrier in adoption to change as the control over data storage does not ensure a certainty over the protection of the information.

However, it was further argued by studies that cloud adoption entails not only successful migration of data to the cloud servers, but also the need to develop capability of informing the employees about the need of transformation, evaluate the pricing models of the cloud computing vendors, and comparing the vendors [13].

The previous studies pointed out that the primary pitfall for the organisations adopting cloud computing is the selection of vendor based on pricing [24]. Low prices do represent competitiveness. However, the low-cost vendors do not promise a higher level of cloud computing availability.

Moreover, the low costs can be subjected to fixed models of hospitality-based services which might be standardized for the industry [25]. Therefore, in order to develop competitive advantage from the use of cloud computing, adopting a cloud vendor that provides customizations and capability to modify the features of cloud computing to meet the customer needs.

The study suggested that lack of due diligence leads to entering into long contracts and hiring of unfavourable vendors because of inability to verify the service level agreements (SLAs). The SLA guarantees the cloud availability, overall downtime that can be expected by the hospitality firms, and extent of internal security measures taken by the cloud vendor [26]. The combination of these aspects severely affects the return on investment, as well as ability of the Malaysian hospitality firms to derive any benefit from the cloud computing.

Moreover, the previous studies have argued that the cloud adoption can incur heavy costs due to the need to consult the cloud vendor, a change management consultant and need for delivery of training on the new cloud based applications, and training of best security practices and measures that should be considered in accessing files over cloud[27],[28],[29],[30].

The migration and integration can be further challenging as the Malaysian hospitality firms that uses legacy systems to maintain their records and uses proper management systems that are developed by the in-house team without

consideration to the future migration can be required to export the entire data and upload on cloud manually.

The security and privacy concerns arise within the cloud adoption due to the involvement of a third-party cloud vendor who becomes responsible for the storage, maintenance, and accountability of the data [15]. Therefore, the data ownership has been pointed out by the previous studies with the notion that the data ownership can be enforced by contracts and service level agreements of cloud vendors due to which in-depth examination of cloud as well as due diligence in the options available within the local market with the close proximity to office is a critical concern [17]. Studies have argued that lock-in contracts can prevent the Malaysian hospitality firms from changing the cloud

vendor in the future by providing data formats that might not be feasible for data migration.

Cloud vendor provides three different models of services, infrastructure, platform, and/or software as a service. Therefore, the selection of model wherein the infrastructure, platform, and software can be provided in combination are essential for the Malaysian hospitality firms.

It has been further suggested by previous studies that the availability guaranteed by the service level agreement can impact the degree to which Malaysian hospitality firms can meet the customer needs and address the expectations of the customers during the peak time of the season [11].

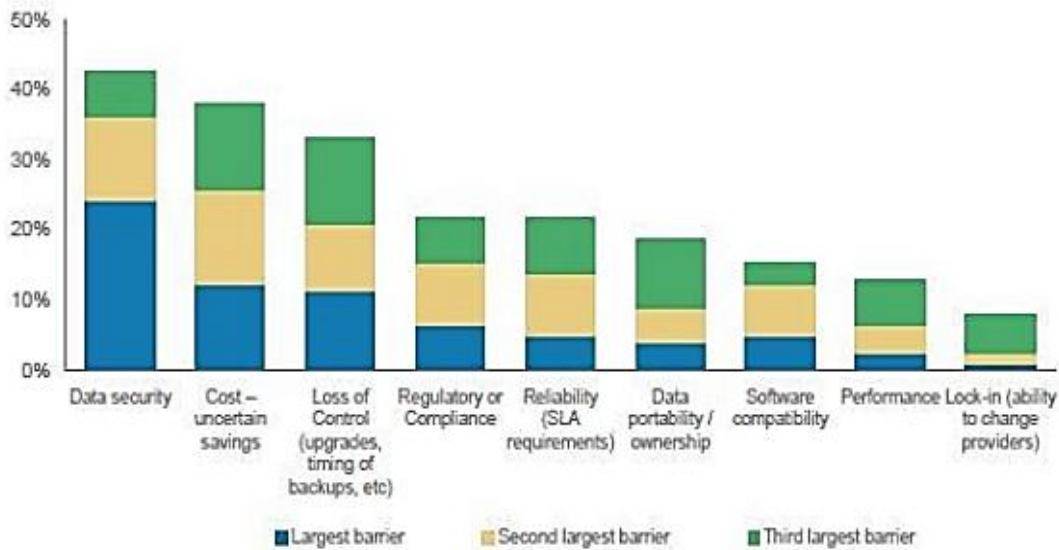


Figure 3: Challenges in Cloud Computing Adoption [17]

As illustrated by the Figure 3, loss of control on the availability during the peak time of guests booking requests can cause loss of potential business for the Malaysian hospitality firms. Therefore, critical consideration to the level of transparency, thoroughness, and accountability demonstrated by the cloud vendor in SLA is essential to make informed decision of selecting a cloud vendor.

Awareness of these challenges will enable the management of Malaysian hospitality firms to make informed decision of cloud adoption. Hence, the availability is an essential aspect to be considered in selection of the cloud vendor. This has been further emphasized as the availability can range from 99.9 percent to 99.9999999 percent. The difference lies in 3N to 9N which entails a variance of downtime greater than eight hours [19]. The 3N availability subjects the Malaysian hospitality firms to the highest level of downtime.

The existing multinational hotel firms have moved towards the prominent cloud vendors in order to ensure that high quality of cloud service can be leveraged to develop a competitive advantage in the Malaysian hospitality market against the local firms [20]. The cloud computing has provided

multinational hotel chain in Malaysia with the ability of understanding the key customer needs, ability to recognize changes in the preferences, and capability of developing local responsiveness.

Therefore, in order to develop competitiveness, Malaysian hospitality firms will require to ensure that suitable cloud vendors are selected that can meet the business needs and future objectives of the firm to enable realisation of MTTP targets.

2.3 Impact of Cloud Adoption on MTTP

Adoption of cloud by Malaysian hospitality firms will benefit the objectives and target of MTTP. Since cloud provides flexibility in the deployment of IT resources and ability of scaling the storage and computing resources based on needs, the Malaysian hospitality firms will be able to cater to larger number of customers [21]. For an example, the local Malaysian hotels will be able to utilize the transaction data and analyse the data using the big data analytics to determine the suitable price point that can attract

more customers and predict the flow of customers in the future.

Furthermore, as argued by studies the multinational hospitality firms have adopted big data analytics using the cloud computing technology to use the transaction data, customer feedback forms, and special notes made by the hospitality staff members to personalise the services and ensure that the key expectations of the customers are addressed.

A key implication of this finding is that the adoption of cloud by Malaysian hospitality firms will provide capability of leveraging the benefits provided by cloud and redirect the flow of guest to the local hospitality firms by using the big data analytics to not only understand and meet the needs of guests, but also to predict the demand for the hotel rooms and subsequently change the pricing.

2.5 Cloud Adoption Frameworks

It has been recognized that there are multiple cloud computing adoption frameworks that can assist the Malaysian hospitality firms in adoption of cloud computing [10]. Hence, seven different cloud adoption frameworks were reviewed.

Table 1: Review of Existing Cloud Computing Frameworks

No.	Existing Cloud Computing Adoption Frameworks
1.	Cloud Business Model Framework (CBMF)
2.	Return on Investment (ROI) for cloud computing (ROICC)
3.	IBM Framework for Cloud Adoption (IFCA)
4.	Oracle Consulting Cloud Computing Services Framework (OCCCSF)
5.	Technology, organization, environment (TOE) framework
6.	Hybrid ITIL Cloud Framework
7.	Cloud computing business framework (CCBF)

Table 1 provides a comprehensive list of seven frameworks that are suitable to be adopted by the Malaysian hospitality firms to adopt cloud computing [18]. However, many gaps were identified within the frameworks as these frameworks merely provides insight of the cloud computing function and the way in which the cloud can be used to support business objectives.

Despite the developments in the design of the cloud adoption framework, lack of consideration for the Malaysian hospitality industry was a specific gap identified from the literature as frameworks were designed to be applied by

wide range of companies [11]. Therefore, this gap will be addressed by this study as the primary research with participants will overcome the literature gaps pertaining to understanding of the challenges experienced by hospitality companies, and a new framework will be developed that can specifically meet the needs of Malaysian hospitality firms.

3. RESEARCH METHODS

Previous studies on research methodology identified that while the qualitative research theory requires adoption of inductive approach, the quantitative research makes deductive approach a prerequisite for the conduct of study.

Therefore, the arguments made by Creswell [12] were considered to adopt a mix of inductive and deductive approach through using the grounded theory of research and integrating the inductive method with deductive for exploration of phenomenon [12]. The challenges experienced by the Malaysian hospitality firms have been identified from the literature. However, this objective will be further addressed by obtaining direct responses from participants.

This study has adopted mixed research methodology. Six different mixed method research designs were reviewed, and the concurrent transformative design was selected for this study. The use of this design enables the study to collect both qualitative and quantitative data [12]. Survey questionnaire was used as a data collection instrument to obtain responses from the participants.

Survey questionnaire consisted of open ended and closed ended questions along with the Likert scale to collect both qualitative and quantitative data. Purposive non-probability random sampling method was used to recruit 100 participants from 10 volunteering Malaysian hospitality firms operating hotels across Kuala Lumpur, Johor, Malacca city, Subah and Penang.

Inclusion criteria for the participants was the awareness of organizational challenges in adoption of cloud, a clear perception about the organizational intentions of adopt cloud from managerial perspective, and the need for the participants to represent management roles to ensure presence of decision-making power [12]. 100 percent response rate was achieved as the employees recruited were from the management level of the 10 hospitality firms.

An information sheet and consent form were given to the 10 Malaysian hospitality firms and their 100 members individually to ensure that all participants comprehensively understand the purpose, nature, and voluntary participation of the members.

4. ANALYSIS AND RESULTS

Majority of the participants were the shift managers, followed by shift leaders, hotel managers, sales and marketing manager, hotel general manager, and sales

director of Hotel. The critical finding arising from the job positions of participants was that only two percent of participants were employed as IT team leaders.

Figure 4 illustrated that merely 2 percent of the participants represented IT roles due to which it can be considered that the extent of investment in IT is low [4]. Furthermore, it was recognized that while there were multiple positions for marketing and sales, there was lack of IT director or manager role in the sampled 10 Malaysian hospitality firms.

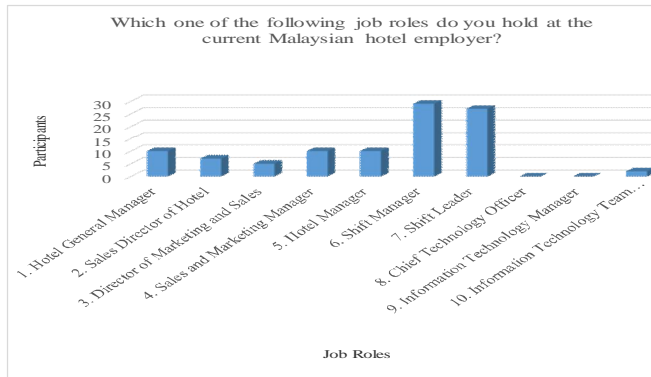


Figure 4: Job Role of Interviewees

Majority of the participants had experience of over ten years at the Malaysian hospitality firms [5]. Therefore, it can be ascertained that the participants with highest experience with the hotel managers. Hence, the responses collected by this study are representative of the perceptions among hotel staff about the cloud adoption.

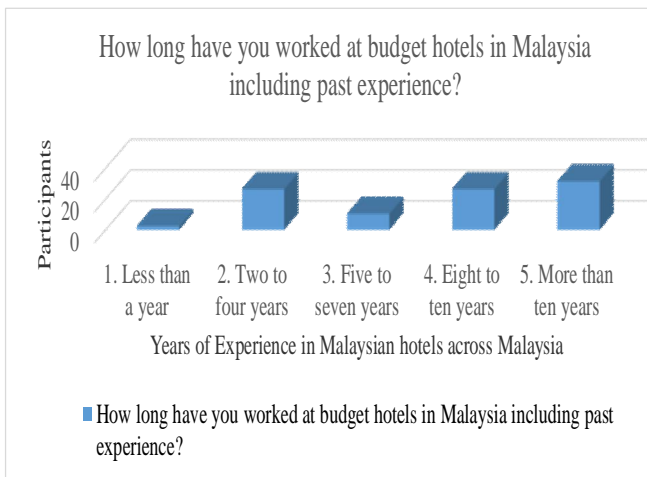


Figure 5: Experience of Participants

48 percent of the participants were aware of the MTTP. Overall 59 percent of the participants demonstrated that they had critical understanding of the measures that needs to be taken for achievement of MTTP.

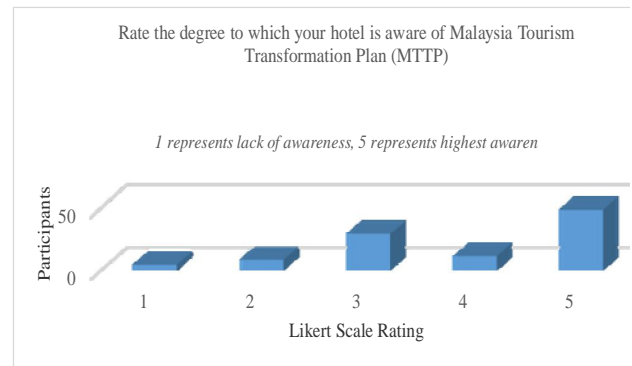


Figure 6: Awareness of MTTP

Figure 7 illustrates that the technological investments have been negligible by the Malaysian hospitality firms as compared to the other measures taken by the local hotels and investment made in marketing [9]. Therefore, it is essential that the factors preventing adoption of cloud in Malaysian hotels are identified.

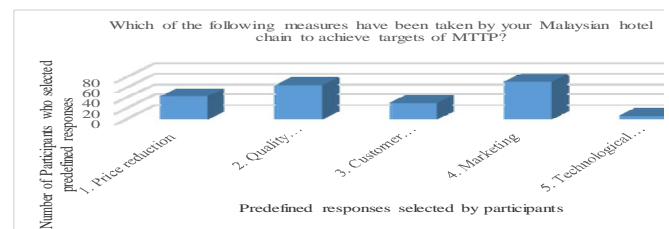


Figure 7: Measures taken by Participants

Figure 8 illustrated that the five key challenges are present that prevents the adoption of cloud computing among the Malaysian hospitality firms [19]. It was recognized that the perception of high implementation costs, low operational benefits of cloud, lack of support from the top management, and lack of frameworks that can guide the adoption of cloud computing prevents the management from supporting the cloud adoption [11]. Therefore, a new cloud adoption framework has been developed with consideration to key needs of the management members from Malaysian hotel chains in order to encourage adoption of cloud computing.

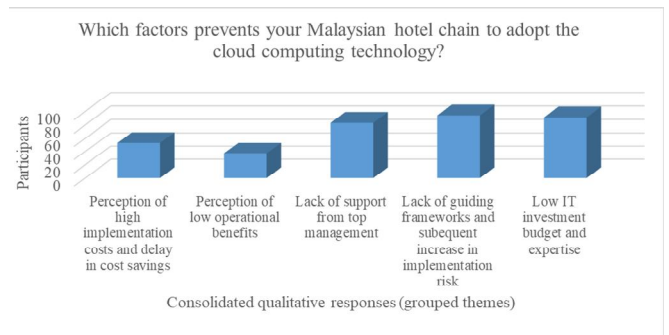


Figure 8: Challenges preventing Cloud Adoption

Another important finding that derived from the Likert scale used in the last survey question was the 92 percent agreement from the participants that their hospitality firms

will adopt the cloud computing technology given the key concerns are addressed.

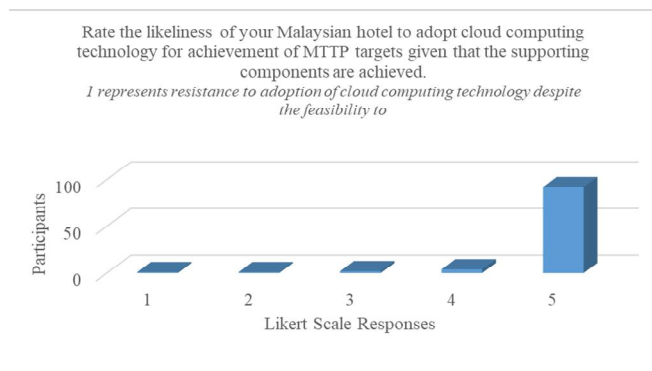


Figure 9: Likelihood to Adopt Cloud Technology

5. CONCLUSION

It was established in this research that cloud technology provides a potential for the Malaysian hospitality firms to develop competitive advantage over the multinational hotel chains in Malaysia to support the governmental objective of achieving the targets of MTTP.

The four research questions were answered by this research through identification of the key benefits and challenges posed by adoption of cloud computing for the Malaysian hotels [18]. The second question was addressed with the identification of benefits that improved competitive advantage can provide to the MTTP targets of government.

Adoption of cloud computing will enable the Malaysian hospitality firms to develop capability of understanding the changing guest needs and forecast the demand of the international tourists to ensure that the local hotels can maximise the revenue generation and increase the contribution to the Malaysian economy. The third objective was further addressed with the recognition of the challenges. Five major challenges were suggested by the participants that has prevented their Malaysian hospitality firms to adopt cloud computing. Perception of high implementation costs, perception of the low benefits from cloud computing, and subsequent lack of support from the top management reduces

the IT investment and budget. Moreover, 80 percent of the participants suggested that the lack of suitable cloud adoption framework prevented the management from supporting the cloud adoption initiatives. Therefore, this study has contributed to the literature on cloud adoption by Malaysian hospitality firms and developed a new cloud adoption framework that can be adopted by the local hotels in the hospitality industry to enhance the competitiveness.

The primary limitation of this study lies in the generalisation of findings. The challenges in cloud adoption identified by this study were representative of the problems and perceptions reported by the management members of the 10

local Malaysian hotel chains. Therefore, the findings cannot be generalised for the non-Malaysian hotel chains.

Although this study has addressed the gap in the literature pertaining to the lack of understanding about the challenges faced by Malaysian hotels in adoption of cloud and the perception of management member, future research will be required to explore the way in which the proposed 14-step cloud adoption framework (as shown in Figure 10 below) has been adopted by the Malaysian hotel chains. Secondly, it will be essential for the future research to determine the challenges experienced by Malaysian hospitality firms after the adoption of cloud computing.

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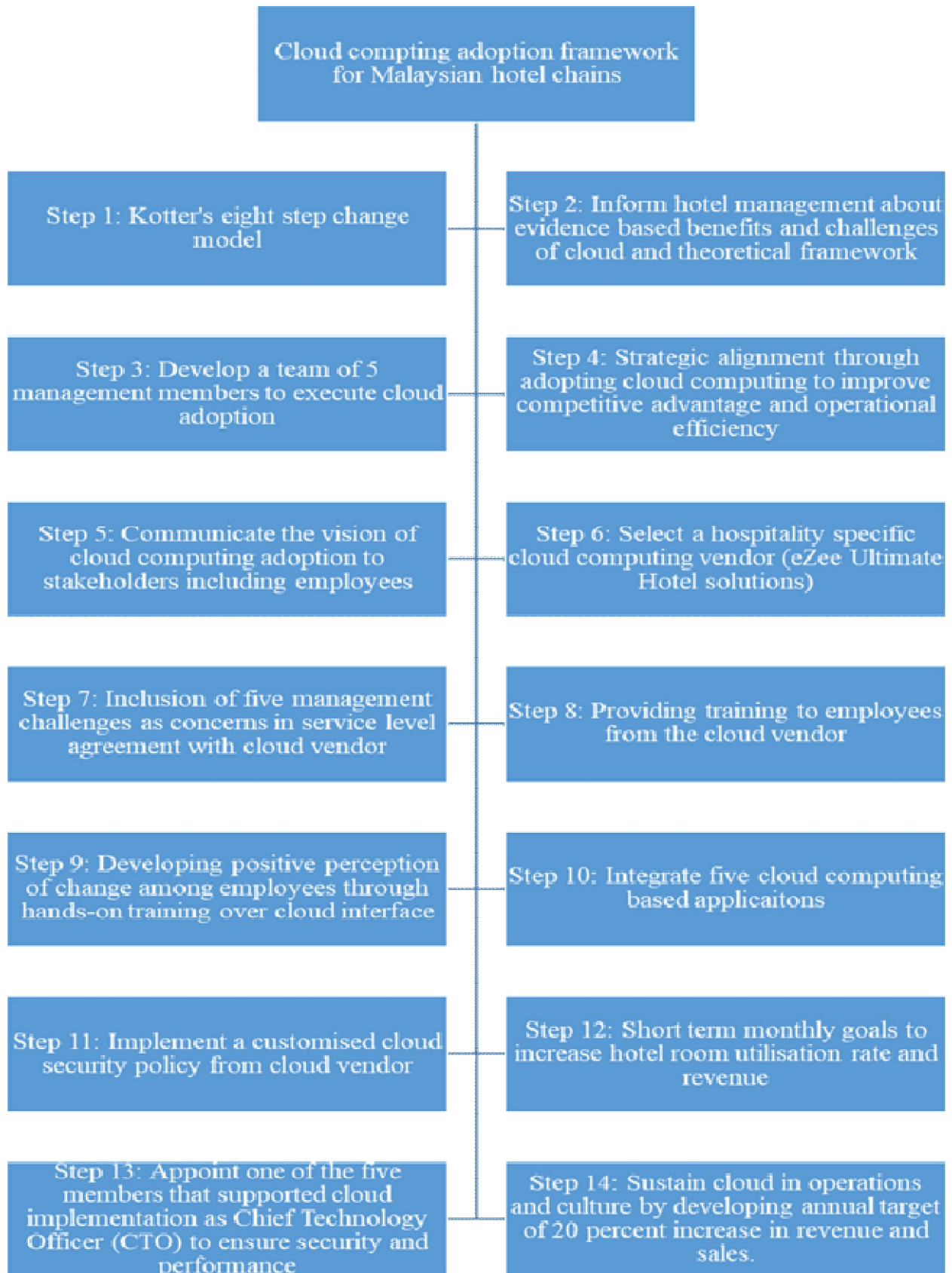


Figure 10: Proposed Cloud Adoption Framework