

# The future of cloud computing in improving employee productivity among Small and Medium-sized Enterprises (SMEs) in Johor

Nur Aliah Farzana Muhammad Azhar<sup>1</sup>, Shazaitul Azreen Rodzalan<sup>2</sup>

<sup>1</sup> Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia (UTHM),  
Batu Pahat, Malaysia, 86400

<sup>1</sup> Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia (UTHM),  
Batu Pahat, Malaysia, 86400

Email: [aliahfarzanawork@gmail.com](mailto:aliahfarzanawork@gmail.com)<sup>1</sup>; [shazaitul@uthm.edu.my](mailto:shazaitul@uthm.edu.my)<sup>2</sup>

## ABSTRACT

Cloud computing has been recognized as one of the digital transformations that play a vital role in the twenty-first century. With various benefits of the implementation in organizations, cloud computing has become a trend for international organizations. In recent years, the interest in migrating to cloud computing has been more emphasized due to the benefits and opportunities it offers in improving and enhancing the quality and productivity of an organization. Unfortunately, cloud computing is still new in Malaysia. There is lacking of previous studies mainly in the context of cloud computing in Malaysia. Thus, the main focus of this study is to identify the issues and drivers of cloud computing and to study the future trend of cloud computing in improving employee productivity among SMEs in Johor. This study was mixed-method research that used both qualitative and quantitative methods. For the qualitative method, STEEPV analysis was used to identify the drivers of cloud computing. A total of 147 drivers were found after STEEPV analysis, and 10 of the merged drivers found incorporated into the survey questionnaire. This study achieved the research objectives which are to identify the key drivers and to study the future trend of cloud computing in improving employee productivity among SMEs in Johor. The top two drivers were increase market and customer segmentation and flexible payment. Finally, this research gives significant benefits to future researchers and those organizations that implement cloud computing in business as this study provides evidence of the most influential drivers of cloud computing in improving employee productivity.

**Keywords:** Cloud computing, Productivity, Small and Medium-sized Enterprises (SMEs), Johor

## INTRODUCTION

Industry 4.0 and digital technologies have been common tools in today's world. Industry 4.0 is proven to overcome various technological challenges in organizations while improving sustainable business performance. Cloud-based manufacturing, various resource planning activities, IoT, social product progress are some Industry 4.0 features. Unlike others, cloud computing which was coined in 1961

by John McCarthy can be simply defined as a pool of computing resources that are delivered through the web with a unique feature which is flexible payment. The term "cloud" refers to different types of platforms for distributed computing. In another word, a cluster of servers, network, software, interface, etc. which require to execute a particular task. While "computing" refers to the delivery of this package as a service that users can utilize as they wish (Information Technology & Systems, 2017). Cloud computing can be adopted in public, private, and non-profit sectors and can be accessed anytime and anywhere. Meanwhile, productivity has often been measured as the achievement of the objective or goal for an individual or an organization. Productivity can be viewed as a key measure of success and can be directly influenced by the attitude and satisfaction of workers (Cook, 2017) and achieves over a specific period (Woldeyes, 2019). Cloud computing offers various benefits to any organization that implements it and has been proved as an innovative provider.

## Research Background

Attaran et al. (2018) has conducted several research with respect to cloud computing, the outcome of each research are quite similar. The outcome proved that cloud computing contributes to internal management. Simply said, cloud computing acts as a driver and platform used to perform a variety of functions while boosting productivity, saving time, improving workplace collaboration, opening job opportunities, and increasing internal strength. Cloud computing is delivered via six main service model architecture include Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Storage as a Service (SaaS), Desktop as a Service (DaaS) and Function as a Service (FaaS). There are four Cloud Deployment models which are Public Clouds, Private Clouds, Hybrid Clouds, and Community Clouds.

## Problem Statement

The urge to migrate to cloud computing is supported by the benefits offered while the technologies are advancing

every day. Previous studies agreed that cloud computing is convenient to use as it saves time, easy to use, requires less storage, and available everywhere as long as the user has an Internet connection. As a developing country, Malaysia has little information on cloud computing. More surprising, in Asia, only a few know about this cloud-based manufacturing. This is due to the fact that most companies do not have the courage and enough information to migrate to the cloud. Cloud computing is able to improve an organization's performance indirectly, increase productivity and efficiency. Thus, this study is to identify the issues and drivers of cloud computing and to study the future trend of cloud computing in improving employee productivity among SMEs in Johor.

### Research Questions

- (i) What are the key drivers of cloud computing in improving employee productivity among SMEs in Johor?
- (ii) What will be the future trend of cloud computing in improving employee productivity among SMEs in Johor?

### Research Objectives

- (i) To identify the key drivers of cloud computing in improving employee productivity among SMEs in Johor.
- (ii) To study the future trend of cloud computing in improving employee productivity among SMEs in Johor.

### Scope Of the Study

This foresight study was carried out keeping in view the time horizon of 10 years in the future specifically from the year 2021 to the year 2031. This study was mixed-method research that used both qualitative and quantitative methods. The population of SMEs in Johor is 98190, therefore by referring to Krejcie and Morgan (1970) table, the target respondents of this study are 382 respondents from SMEs in Johor by using a purposive sampling method.

### Significance Of the Study

As cloud computing offers various benefits and opportunities for organizations, especially SMEs, this study hopefully can contribute to organizations in improving employee productivity. This study might help widen any employer or manager ideas and perspective on the positive and negative issues of cloud computing in improving employee productivity.

## LITERATURE REVIEW

### Identification Of Issues and Drivers

Using the STEEPV method, a broad range of relevant issues and rivers have been found. The key issues and drivers are classified into Social, Technological, Economical, Environmental, Political, and Values.

### Key Terms of Issues and Drivers

All the keys that were developed through STEEPV analysis were tabled into a table consisting of Social, Technological, Economical, Environmental, Political and Values key terms. A total of one hundred forty-seven (147) key terms were found, the frequency of issues and drivers for Social (29), Technological (48), Economical (36), Environmental (2), Political (6), and Values (26).

### Merging Of Issues and Drivers

A total of one hundred forty-eight (147) key terms are merged into a single issue or driver. The outcome of ten (10) issues as shown in Table 1 was gained after the merging process and would be incorporated into an online survey questionnaire for the purpose of collecting main data which distributed to targeted respondents.

**Table 1 : Table with Merged Issues and Drivers**

No.	Drivers
1.	Increase business performance
2.	Top management support
3.	Ubiquitous computing
4.	Unlimited access over the Internet
5.	Reduce expenditure on technology infrastructure
6.	Flexible payment
7.	Increase market and customer segmentation
8.	Regulatory support
8.	Services and resource sharing
10.	Convenience

## RESEARCH METHODOLOGY

### Research Design

As for this foresight study, mixed methods were used to generate the key drivers and future trends of cloud computing in improving employee productivity among SMEs in Johor. For the qualitative method, STEEPV analysis was used to identify the predetermined lists of drivers while an online survey questionnaire as a quantitative method would be constructed by using STEEPV analysis and distributed to targeted respondents.

### Research Flowchart

This foresight study began by identifying the problem statement followed by the formulation of research objectives. Both qualitative and quantitative methods are used. The qualitative method used for this study was STEEPV analysis while an online survey questionnaire as an instrumental tool for the quantitative method was used to gather data and information concerning the objectives of

the study. The online survey questionnaire developed using the data collected from the secondary data. The data collected from the survey were analyzed using the IBM SPSS software and proceed to the conclusion, discussion, and recommendation of the overall research.

### **FORESIGHT PROCESS AND FORESIGHT STUDY**

Foresight primarily aims to explore and design the future. The foresight process gives priority to the future focus by exercising long-term thinking in the range of 5 to 10 years ahead to support the strategic decision. The foresight process in this study involves a few steps beginning with horizon scanning, analyzing data using the STEEPV method, and continuing with identifying the issues and drivers concerning the research objectives.

Horizon scanning is closely related to desk research that used to view the overall situations of the issues from various sources such as the internet, journals, government and non-government resources, and research communities. STEEPV method included a few steps which are data designing, data listing, data classification, data identification, theme comparison, data inspection, data revising, data merging, and final confirmation. STEEPV analysis was used to determine the key drivers and future trends which act as driving forces for future changes. Ranking of drivers or identification of the drivers were determined by using different tools consisting of impact-uncertainty analysis, s-curve, and future wheel. In this study, the drivers or future variables that influenced and changed the trend of cloud computing in improving employee productivity among SMEs in Johor were conducted.

### **Population And Sampling**

This foresight study aimed at cloud computing in improving employee productivity among SMEs in Johor, thus the target population was employees from manufacturing, services, primary agriculture, construction as well as mining and quarrying sector of SMEs around Johor. According to the 2019/2020 annual report of SMEs Corp. Malaysia, there are 98190 total SMEs in Johor alone. By referring to Krejcie and Morgan (1970) table, the sample size has been identified as 382 respondents. In addition, the sampling method used is a purposive sampling method that is also known as judgement, selective, or subjective sampling where anyone who meets the criteria and willing to participate in the survey were chosen.

### **Research Instrument**

The research instrument used in this foresight is an online survey questionnaire which divided into four parts. Part A is demographic analysis, Part B is the importance of the issues and drivers, Part C is the level of impact of issues and drivers, and Part D is the level of uncertainty of issues

and drivers of cloud computing in improving employee productivity.

### **PILOT STUDY**

This study applies a reliability test by examining the Cronbach alpha value using IBM Statistical Package for Social Science (SPSS) software. The outcome of the pilot test about the questionnaire used to improve the questionnaire that was distributed to target respondents.

#### **Pilot Test**

A pilot test was conducted to evaluate the feasibility, time, cost, risk, and performance around the research topic. Essentially, this test is performed by using reliability analyses which aim to determine whether the instructions and questions prepared by the researcher are valid or not.

- **Reliability**

The pilot test was performed by using reliability analyses which aim to determine whether the instructions and questions prepared by the researcher are valid or not. The reliability analyses were tested through Cronbach's Alpha coefficient to assess the internal consistency of each scale item. After distributing the questionnaire via email, LinkedIn, and social media, a total of 25 sets of questionnaires for the pilot test were returned.

As shown in Table 2 below, the Cronbach's Alpha coefficient for part B was 0.903 tested with 10 questions, part C was 0.896 tested with 10 questions and part D was 0.837 tested with 10 questions. According to Tavakol and Dennick (2011), the Cronbach's Alpha coefficient for parts B, C, and D was considered excellent and good respectively.

**Table 2: Results of reliability for parts B, C, and D**

Part	Cronbach's Alpha	Number of Items
B	0.903	10
C	0.896	10
D	0.837	10

### **Data Collection**

This study applies two types of data collection which are base data collection and main data collection. Base data collection (secondary data) is collected from diverse sources globally including the internet, newspaper articles, journals, company reports, government-related articles, and non-governmental organizations that correspond to the issues. Main data collection (primary data) is gathered and sorted from an online survey questionnaire that is distributed to targeted respondents.

### **Data Analysis**

In this foresight study, three types of analysis were used, for instance, descriptive analysis, impact-uncertainty, and scenario analysis were used to analyze the data collected from base data and main data correspondingly to achieve the research objectives.

### 1) Descriptive Analysis

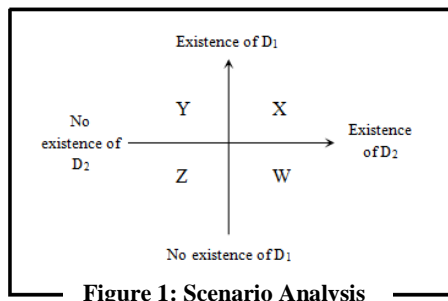
The collected main data from the online survey questionnaire was filtered and continued with IBM Statistical Package for Social Science (SPSS) software which used to analyze the data retrieved from the questionnaire to perform quantitative analysis.

### 2) Impact-uncertainty Analysis

In this study, the analysis investigated the uncertainty in determining the future trend of cloud computing in improving employee productivity among SMEs around Johor. The list of factors generated was shortlisted following its importance, impact, and uncertainty where the most influential drivers have been selected as the key drivers to develop scenario analysis.

### 3) Scenario Analysis

The combination of future trends and scenario analysis was used to design a scenario that is considered plausible which helps make sense in uncertain situations. Four different alternative scenarios were generated reflecting the future consequences of issues and drivers of cloud computing in improving employee productivity as shown in Figure 1.



**Figure 1: Scenario Analysis**

## DATA ANALYSIS AND FINDINGS

### Survey Return Rate

An amount of 382 sets of survey questionnaires has been sent online during the data collection process by mailing to the targeted respondents and through social media (Facebook, Twitter, and LinkedIn) in the form of developed Google form. Out of the 382 sets of questionnaires distributed, 197 sets of questionnaires were returned. Hence, the survey return rate was 51.6% and had been summarised in Table 3.

**Table 3: Survey Return Rate**

Population	98190
Sample	382
<b>Figure 2: Impact-Uncertainty Analysis</b>	
Questionnaire distributed	382
Questionnaire returned	197
Percentage	51.6%

### Demographic Analysis

Using the purposive sampling technique as a sampling method, 197 respondents were involved in this foresight study. Background information was collected mainly regarding company information and basic knowledge of cloud computing. The respondents' characteristics are shown as follows in Table 4.

**Table 4: Demographic analysis**

Demographic Information		f	%
<b>Gender</b>	Male	77	39.1
	Female	120	60.9
	<b>Total</b>	<b>197</b>	<b>100.0</b>
<b>Ethnicity</b>	Malay	77	39.1
	Chinese	71	36
	Indian	43	21.8
	Others	6	3.0
	<b>Total</b>	<b>197</b>	<b>100.0</b>
<b>Type of sectors</b>	Manufacturing	80	40.6
	Services	71	36.0
	Primary Agriculture	20	10.2
	Construction	20	10.2
	Mining and quarrying	6	3.0
	<b>Total</b>	<b>197</b>	<b>100.0</b>
<b>Size of the company</b>	Less than 30 employees	56	28.4
	31 - 75 employees	57	28.9
	76 - 200 employees	57	28.9
	201 and above	27	13.7
	<b>Total</b>	<b>197</b>	<b>100.0</b>
<b>Year established</b>	Less than or equal to 10 years	79	40.1
	More than 10 years	118	59.9
	<b>Total</b>	<b>197</b>	<b>100.0</b>
<b>Basic knowledge</b>	Yes	197	100
	No	0	0
	<b>Total</b>	<b>197</b>	<b>100.0</b>
<b>Intention to use cloud computing</b>	Yes	176	89.3
	No	21	10.7
	<b>Total</b>	<b>197</b>	<b>100.0</b>

## Descriptive Analysis

In this section, there are three aspects of analysis consists of importance, level of impact, and level of uncertainty discussed based on collected data in which issues and drivers were identified as the top with high impact and level of uncertainty.

### 1) Analysis of Statement Based on its Importance

Table 5 indicated the mean value of each driver corresponding to the merged issues and drivers table devised in previous chapter. Additionally, Table 5 was formulated with the arrangement of the mean value in descending order and tabulated in Table 6. This approach aimed to clarify the formulated table which issues and drivers carried the highest mean and ranked down according to the perception of respondents towards the future scenario building. Then, the first 5 leading mean values have been focused on and constructed in Table 6 which is used as a basis for the next two analyses.

**Table 5: Mean of Drivers in Descending Order on Importance**

No.	Drivers	Mean
1.	Increase business performance	4.07
2.	Increase market and customer segmentation	4.06
3.	Services and resource sharing	4.04
4.	Top management support	4.04
5.	Flexible payment	4.03
6.	Convenience	4.03
7.	Unlimited access over the Internet	4.03
8.	Ubiquitous computing	4.03
9.	Regulatory support	3.89
10.	Reduce expenditure on technology infrastructure	3.87

**Table 6: Mean of First 5 Leading Drivers on Importance**

No.	Drivers	Mean
1.	Increase business performance	4.07
2.	Increase market and customer segmentation	4.06
3.	Services and resource sharing	4.04
4.	Top management support	4.04

5.	Flexible payment	4.03
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### 2) Analysis of Statement Based on its Impact

The measurements on the level of impact have been examined and shown in Table 7 based on the determined top 5 drivers of importance. By according to the top 5 drivers obtained in the importance determination, the mean values calculated based on the level of impact for the relatively issues and drivers were tabulated into Table 7. This way of the application was based on the previous determination on the use of top 5 drivers as a fundamental to identify the corresponding impactful level. The mean values in Table 7 will then apply for generation impact-uncertainty analysis.

**Table 7: Mean of the First Leading Drivers on Impact**

No.	Drivers	Mean
1.	Increase business performance	3.43
2.	Increase market and customer segmentation	3.71
3.	Services and resource sharing	3.66
4.	Top management support	3.48
5.	Flexible payment	3.70

### 3) Analysis of Statement Based on its Uncertainty

The analysis for the level of uncertainty was proceeding after analyzing the level of impact. As the application used for the assessed level of impact, the correspondents mean value of uncertainty level to the predetermined top 5 issues and drivers were selected and tabulated into another table. Hence, Table 8 presented the mean of the first 5 leading drivers on the level of uncertainty.

**Table 8: Mean of First 5 Leading Drivers on Uncertainty**

No.	Drivers	Mean
1.	Increase business performance	2.90
2.	Increase market and customer segmentation	3.05
3.	Services and resource sharing	3.04
4.	Top management support	3.11
5.	Flexible payment	3.18

## IMPACT-UNCERTAINTY ANALYSIS

Table 9 shows the mean value of every statement which concerning cloud computing in improving employee

productivity. The mean value obtained for the level of impact and uncertainty is to describe clearly the difference between the two aspects before constructing impact-uncertainty analysis.

**Table 9: Mean of Drivers on Level of Impact and Uncertainty**

No.	Drivers	Mean	
		Impact	Uncertainty
1.	Increase business performance	3.43	2.90
2.	Top management support	3.48	3.11
3.	Ubiquitous computing	3.73	3.09
4.	Unlimited access over the Internet	3.87	3.03
5.	Reduce expenditure on technology infrastructure	3.74	3.10
6.	Flexible payment	3.70	3.18
7.	Increase market and customer segmentation	3.71	3.05
8.	Regulatory support	3.48	3.16
9.	Services and resource sharing	3.66	3.04
10.	Convenience	3.72	3.03

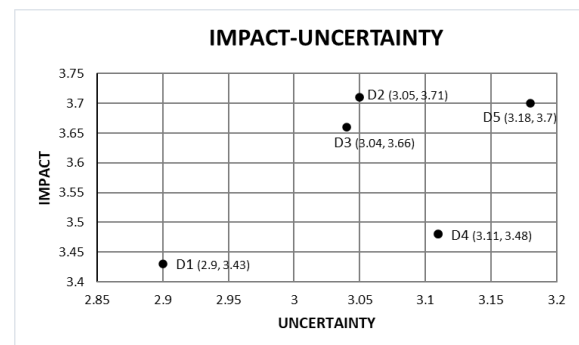
Table 10 was tabulated after completing obtaining the mean values for both impact and uncertainty to get a clear picture of corresponding means for each issue and driver before proceeding to build impact-uncertainty analysis. Afterward, the organized data was used to construct impact-uncertainty analysis as illustrated in Figure 2 which assisted in locating the highly significant effect in the future in terms of impact and uncertainty.

**Table 10: Mean of First 5 Leading Drivers on Level of Impact and Uncertainty**

No.	Drivers	Mean	
		Impact	Uncertainty
1.	Increase business performance	3.43	2.90
2.	Increase market and customer segmentation	3.71	3.05
3.	Services and resource sharing	3.66	3.04

4.	Top management support	3.48	3.11
5.	Flexible payment	3.70	3.18

As shown in Figure 2, D2 (increase market and customer segmentation) and D5 (flexible payment) have the highest impact and uncertainty where the plot is more on the left and the highest compared to other drivers with coordinate (3.05, 3.71) for D2 and (3.18, 3.70) for D5. Hence, these two drivers have been pointed out as the top drivers and would be used to develop scenarios building analysis. Besides, the driver that has the lowest impact-uncertainty was D1 which is increased business performance with coordinate (2.90, 3.43) respectively.



**Figure 2: Impact-Uncertainty Analysis**

## RESULT AND DISCUSSION

### Discussion On Findings

This section discussed the research findings for both research objectives which the first objective was to identify the key drivers of cloud computing in improving employee productivity among SMEs in Johor. Then, the discussions continued with the second objective which is to study the future trend of cloud computing in improving employee productivity among SMEs in Johor.

1) First Research Objective: To identify the key drivers of cloud computing in improving employee productivity among SMEs in Johor

The first objective was vital for determining the influencing factors which affected by different industry including manufacturing, services, primary agriculture, construction, and quarrying and mining decision making in relation to the implementation of cloud computing in the future. The two most influences drivers with the most impact and uncertainty on the topic studied have been identified and selected in subsequent impact-uncertainty analysis.

Referring to Figure 2, increase market and customer segmentation and flexible payment are the top two key

drivers that influence small and medium-sized enterprises (SMEs) in Johor to implement cloud computing in improving employee productivity. These two were identified using the impact-uncertainty analysis.

- **Increase Market and Customer Segmentation**

This driver was selected as the highest voted with the most important and most impactful in the future. The impact and uncertainty mean value was 3.05 and 3.71 out of the total score of 5.00. According to Gustafson Orrgren (2012), SMEs' adoption of technology improves their competitiveness and allows them to expand into new markets as new opportunities arise. Attaran (2017) stated the adoption of cloud computing enables organizations to accelerate time to market and boost business agility. Additionally, adopting cloud computing in organizations is able to eliminate some of the barriers for participating in global marketing which may help SMEs to have an efficient business and compete in the global market (Abdollahzadehgan et al., 2013).

- **Flexible Payment**

This driver was evaluated as the second-highest voted with a mean value of 3.18 and 3.70 out of the total score of 5.00 respectively. The findings are supported by Khan et al., (2011) which found that the implementation of cloud computing in organizations especially SMEs able to reduce the investment cost, the project risk, and the operation and maintenance costs since they only pay for the services and computing resources they used. While Hasan et al., (2015) believed the cost issue can be solved by adopting cloud computing in organizations. This referred to when companies in the United States (US) managed to save up to 70% of the operational cost since they have started adopting cloud computing services.

2) **Second Research Objective:** To study the future trend of cloud computing in improving employee productivity among SMEs in Johor

This objective is fundamental to understanding the trend of future evolution and how it could influence the future environment for the adoption of cloud computing in the future market. Therefore, there was four alternative scenario analysis has been constructed by referring to the top two drivers formulated in the impact-uncertainty analysis to aid in future trend evaluation. These four scenarios gave a foresight to four various possibilities that might encounter in a time horizon of 10 years in the future or in other words from the year 2021 to the year 2031.

The four possible scenarios have been illustrated and presented in Figure 3 which consists of driving growth, overdue payment, miscommunication, and customer dissatisfaction. All scenarios were discussed respectively regardless of the favorable or unfavorable outcome that could generate in the forecasted time horizon. By referring to the scenarios derived from scenario analysis, the

adoption of cloud computing will be common where organizations will start adopting the technology in their organization. This situation where big organizations adopt the technology will influence SMEs, micro and start-up businesses to adopt cloud computing as well raise the trend of adopting cloud computing mainly to increase employee's productivity.



**Figure 3: Development of four scenarios**

- **Scenario 1: Driving Growth**

In the first scenario, driving growth occurs when increase market and customer segmented captured by flexible payment to adopt cloud computing in the organization. Innovation could drive growth in an organization by embracing five essential principles into the organization's unique approach. One of those principles was innovation must be customer-centered (Tucker, 2002). Innovation here is referred to the organization's innovative to adopt cloud computing in organization. Jorgenson and Vu (2016) and Niebel (2018) indicated there is a positive relationship between ICT and economic growth. Furthermore, business usage of ICT has been found to increase labour productivity (Evangelista et al., 2014) and increase competitive advantage, productivity, and efficiency, thus becoming a stimulus for business growth (Ongori and Migiro, 2010). Those organization that adopts this technology also benefits company profits where the return on investment (ROI) can be improved while increasing the customer base. The moment the customer base grows, customer satisfaction increases as well. Hence, it would lead to the larger the potential pool of customers, the higher the profits are likely to be. Indirectly, the first scenario is not only to enhance company profits but to widen the customer base as well as increase customer satisfaction.

- **Scenario 2: Overdue Payment**

Late payment has long been a significant problem for SMEs around the world. The second scenario happens in the absence of inflexible payment coupled with increased market and customer segmentation to adopt the technology. This situation apparently occurs when customers take the convenience of payment for granted. According to Kiryakova et al. (2015), payments for cloud



services depend on the consumption which are determined by the level of user's activity in which users only pay the actual used resources. Cloud service providers frequently charge service fees on a pay-per-use basis. This strategy is applied for customers to pay based on the quantity used. However, the competition between cloud providers becomes intense, which led them to offer more valuable plans to attract customer attention. Then, more valuable plans with greater features will be offered along with the ease of payment. This convenience must be taken advantage of to the fullest extent possible. However, for some reason, some organizations will choose to continue to defer payments. This will create impact and cause problems such as the impact on cash flow, opportunity costs, and forced to channel precious resources in handling collection administrative tasks (Miller and Wongsaroj, 2017).

- **Scenario 3: Miscommunication**

For better or worse, technology affects communication because it is a part of our everyday lives. The third scenario in scenario building analysis discussed the future implication when there are flexible payments allocated while there is a decrease in market and customer segmentation to adopt cloud computing in organizations. It is proven by many that technology makes communications easier, quicker, and more efficient. While enjoying the benefits offered, some fear technology affects communications by hindering an organization's ability to form relationships with customers, resulting in brands becoming faceless. Shacaf (2007) indicated cultural and language barriers produced communications challenges. This situation could happen when the scope of the market and customer segmentation becomes smaller in which the organization lacks resources, equipment, or capabilities to serve clients.

- **Scenario 4: Customer Dissatisfaction**

Last but not least, the ultimate scenario deliberate about the consequences where the inflexible payment needs to deal with the decrease in market and customer segmentation. Kim et al. (2017), claimed a company's positive reputation and future profits are indicated by the level of customer satisfaction. This is due to the fact that the negative effects of customer dissatisfaction especially in service businesses may be worst than the positive effects of satisfaction, hence, it is vital to pay attention and understand the root of dissatisfaction. This scenario was caused by many factors but the most common factor was poor customer service, inaccessibility, bad communications, and limited resources. Those factors are the side effects of inflexible payment in which organizations need to deal with while confronting the small market and customer segmentation.

## **Research Limitations**

It is common for research studies to have limitations, hence it might take a while to deal with the limitations that occur in order to reduce the negative impacts on the process of conducting research.

- 1) **Sample Size**

While conducting the research, the population of SMEs around Johor was indicated for 98190 total according to the 2019/2020 annual report of SMEs Corporation Malaysia, hence the sample size has been identified as 382 respondents. However, due to some reasons such as time constraints, and lack of cooperation, there are only 197 respondents participated in this foresight study. Thus, it may result in sampling error because the number of respondents may not represent the whole population of SMEs in Johor.

- 2) **Time Constraints**

Generally, it takes a long time to obtain responses from the targeted respondents in completing survey questionnaires. However, this study ran out of time to achieve the sample size. Therefore, the number of respondents is only half of the sample size which is only 51.6%.

- 3) **Lack of Cooperation**

This is the most challenging factor in completing this research study. Since the targeted respondents are only from SMEs around Johor, the researcher needs to be careful in approaching the respondents. Any respondents from outside Johor that contribute to this study may result in sampling errors.

## **Recommendation**

After completing the research, future research should attempt to overcome the indicated limitations. Other than that, there are some ideas and suggestions to be recommended for researchers who intend to conduct future research on this topic. Firstly, they are advised to conduct on a larger population instead of SMEs in Johor in order to better represent the whole population of companies in Malaysia. Secondly, since this research only focuses on key drivers and future trends of cloud computing in improving employee productivity, there are some issues that need to be understood well in order to promote the technology widely in Malaysia. The issues consist of the barriers, information as well as resources of cloud computing since cloud computing is still uncommon here. Hence, it is advisable to conduct deeper research in Malaysia. There are six models architectures of cloud computing and four deployment models of cloud computing. Some might confuse the differences between both models. Hence, for the last recommendation, future research might want to further study the different types of cloud computing models while providing information on which types of models suit the businesses.



## CONCLUSION

Lately, the booming of industry revolution (IR) 4.0 is taking place and it was used worldwide. Cloud computing's future will see a larger transition away from traditional IT services. Cloud computing has changed the world's perspective on technology while easing business. As a whole, this research has been carried out to identify the issues and drives of cloud computing in improving employee productivity among small and medium-sized enterprises (SMEs) in Johor and to study the future trend of cloud computing in improving employee productivity among small and medium-sized enterprises (SMEs) in Johor.

For the purpose of identifying the future key drivers and how will it be brought in the future in SMEs, various foresight research methodology was applied which includes of foresight method, STEEPV analysis, SPSS statistical analysis, impact-uncertainty analysis, and scenario analysis. The finding of the top two drivers and four predictable scenarios of future trends showed the research objectives have been accomplished. It is recognized that flexible payment coupled with increased market and customer segmentation have shaped and transformed SMEs while using cloud computing to improve productivity in future times.

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