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The Readiness of Smart Office Interior Implementation in Malaysia

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Abstract

Covid-19 is the most trending indication that digitalization and generation Z's arrival into the labour supply -drive companies to reconsider traditional office space. Smart office interior is the future of today, which involves using technology to facilitate productive and effective working. As a consequence of this occurrence, researchers and industry professionals are focusing on the research and development of smart office interiors. This study aimed to emphasize the readiness of smart office interiors and the potential consequences of implementing smart office interiors in Malaysia. Descriptive statistics were obtained using the questionnaire survey responses from various industrial sectors. This study indicated the corpus of knowledge on Malaysia's current readiness for smart office interiors adoption. To summarise, Malaysia's everyday situations show that more strategies are needed to be introduced in Malaysia to reap the benefits of the smart office revolution, which will save energy, time, and money.

Keywords: Smart office; Smart interior; Readiness; Office interior; Malaysia.

1. Introduction

This article will discuss the readiness of smart office interiors in Malaysia by distributing a questionnaire survey, and the analysis was carried out using the SPSS software. In the past few decades, the interior design of offices has evolved with each generation, and this trend will continue. Many businesses are incorporating the most recent office interior design ideas into their operations to provide their employees with a stimulating and convenient working environment to perform their jobs. Two years after the beginning of the COVID-19 virus, 78% of Malaysians think that a lack of technology has hindered their capacity to learn new skills (*Malaysians Are Hopeful That Their Digital Skills Have Improved since the Pandemic Began, but Continue to Be Held Back by Fears of Job Security and Automation*, n.d.) The lack of technology could be because there isn't enough appropriate technology, or it could mean that Malaysian businesses need to act quickly to close the skills gap by implementing an excellent upskilling plan. As a result of their placement in potentially hazardous areas, sensors, actuators and routers are used in smart space technology solutions that provide a poor user experience (Jing Zeng, Laurence T. Yang, 2012). Aside from that, in 2016, approximately 83.8 per cent of Malaysia's total workforce put in 40 hours or more per week, representing a ten-percentage-point increase since 1990 and an estimated rate of growth throughout that time (*Kilm 7.0 Hours of Work*, 2016). This issue demonstrates that users have inadequate hands-on familiarity with the technology and still lack productivity in the workforce. Therefore, this research will focus on the readiness of smart office interiors and the potential consequences of implementing smart office interiors in Malaysia. The highest level of familiarity with technologies and the highest level of readiness for smart offices bring significance to the workforce to enhance productivity.

2. Literature review

An "office" refers to the tasks performed by a certain number of people rather than the position where clerical work is done; and the act of gathering, sorting, storing and transmitting information requires office functions (Dr. R.K. Chopra, 2015). Offices have been through an evaluation since the 1950s and changed every decade until the 2010s, as shown in Figure 1 (Aziz Amen & Nia, 2017; Chen, 2020). Depending on the size of the office, a different number of office staff members is employed there. So the office is crucial because it serves as a focal point of knowledge and provides information to those in the surrounding area relevant to market changes and developments.

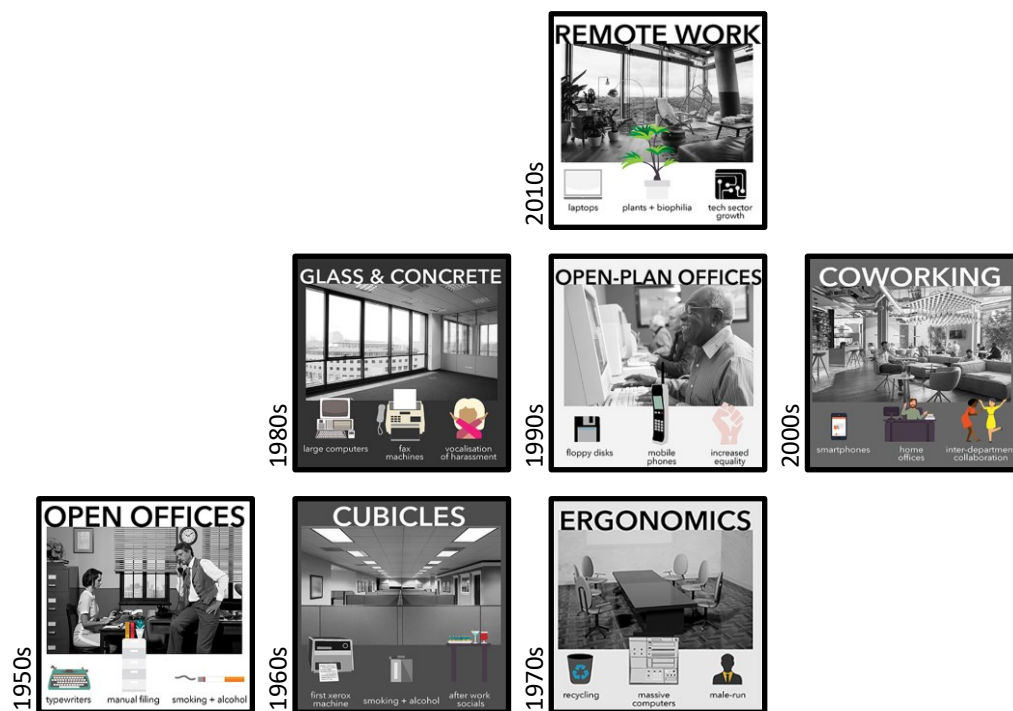


Figure 1. Evaluation of an office (Chen, 2020)

Over the years, the office has undergone a significant transformation, transitioning from a traditional office to a smart office. A smart office can be defined as a well-equipped office equipped with Internet of Things devices such as various sensors connected to the internet (Shinde et al., 2020). Besides, according to Tehseen et al. (2019), "Smart offices are also designed to combine physical equipment, people, and computing technology to provide employees with a safe, friendly, engaging, and smart environment." Nowadays, offices are getting more and more connected to our digital world with the assistance of smartphones and WIFI, which are becoming commonplace technology. The evaluation of smart offices began in 1996 (the first phase), introducing technologies such as mobile phones and the internet. Next, it continued until 2017 (third phase), with the integration of automated systems to make their offices super-efficient, reduce operating costs, and create a suitable and well-connected working environment for their employees.

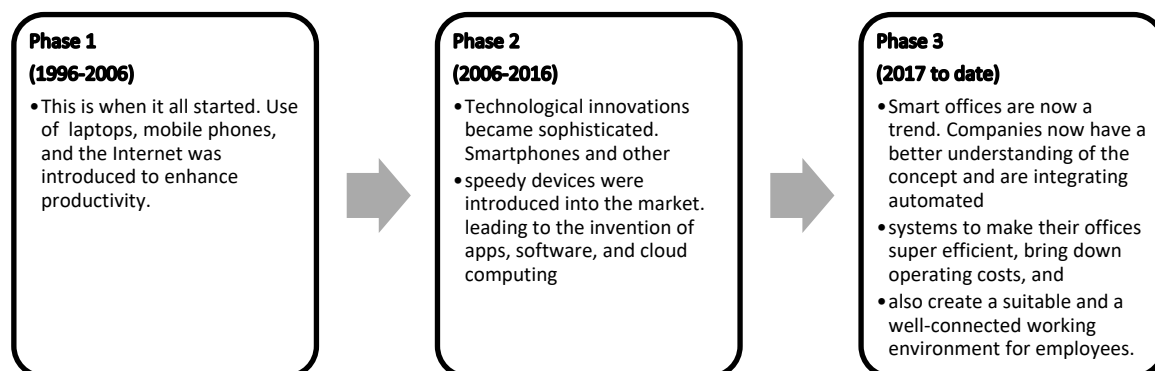


Figure 2. Timeline evaluation of smart office (*What Is a Smart Office? History, Benefits and Hot Desking Apps. — Do You Want To Optimize Your Workspace?* n.d.)

The way emerging technologies and systems have influenced how we live, work, play and communicate has shifted radically over the past few decades. In the past, technology and systems have been used to help people perform everyday tasks more efficiently. However, technology and systems have become the key to success in the business world. Furthermore, because the evolving activities involve specific technologies in offices made up of people who have come together for the same reasons, mainly the Y generation born between 1981 and 2000, the offices are becoming more diverse (Tuncel & Kayan, 2018). Technology is concerned with determining how information may be effectively used to organize issues requiring people and machinery to achieve long-term goals (Lane, 2019). Individuals use technology to perform their tasks in a well-organized manner and solve all the problems and challenges (Kapu, 2019). Technology plays

an essential role in the workplace and has created an ecosystem that has allowed for innovation and creativity. According to Allen (2019), "technology has also made interactive learning and collaborative, allowing people to better engage with the content they are learning and struggling with."

Implementing a smart office brings out many advantages to the employee nowadays. For instance, a smart office provides comfort to office workers by conserving energy and working more efficiently (Miraoui, 2018). Rather than that, the design of smart spaces is concerned with the various technological challenges that must be overcome to improve the overall quality of the experience (QoE) (Zeng et al., 2015). As a result, smart offices reduce the decision-making process by providing, for example, access from any location and by aggregating expertise and information sources (Ramos et al., 2010).

3. Material and Methods

The quantitative approach was used in this study to assess the readiness and significance of implementing smart office interiors. The primary data was gathered by distributing a questionnaire survey online. A non-probability sampling method, which is often appropriate for exploratory research, was used for sampling. In this research, convenience sampling of people who are easy to reach was chosen because it was a more convenient and cost-effective way to collect initial data. Responses to a questionnaire survey from several industrial sectors were used to generate descriptive statistics. Statistical methods such as descriptive statistics organize and summarise data by describing the relationship between variables in a sample or population (Kaur Parampreet, Jill Stoltzfus, 2018). According to Phoong Seuk Yen (2021):

"Descriptive statistics can be divided into several categories. There are several types of descriptive statistics, including descriptive statistics for a single numeric variable, descriptive statistics for multiple numeric variables, and descriptive statistics organized by group. The numeric variable is created through the use of a Descriptive procedure. Meanwhile, the frequency distribution should be used to look at categorical variables. Therefore, this is the case since it doesn't make sense to ask for means and standard deviations for categorical variables".

The descriptive statistical analysis was carried out using the SPSS software. The following subsection will interpret the statistical analysis results more broadly.

The survey area for the research was around the Selangor and Wilayah Persekutuan due to having been known as Malaysia's most developed and progressive state. These states are a beacon of abundance and prosperity, renowned for their highly skilled and innovative knowledge workforce and attractive cosmopolitan living standards. A set of questionnaire surveys has been distributed to several companies in Selangor and Wilayah Persekutuan to address a lack of hands-on familiarity with technology and a consequent lack of productivity. In addition, 130 respondents from 26 offices responded to the questionnaire survey, as shown in Table 1 above.

Table 1. The table summarizes the responses received from the designer's office

Location	Number of offices	Total designer	Number of respondents
Petaling	7	35	29
Gombak	8	49	42
Klang	3	10	10
Hulu Selangor	1	4	3
Kuala Lumpur	7	52	46
<i>Total</i>	<i>26</i>	<i>150</i>	<i>130</i>

4. Result and discussion

A total of 150 questionnaire surveys were sent out, with 130 responses from 26 different offices. The demographics of the respondents are shown in Table 2 below. The results revealed that the majority of respondents (n=57, 43.8 per cent) were from the interior design profession, followed by architects (n=43, 33.1 per cent), specialized designers (n=28, 21.5 per cent) and developers (n=2, 1.5 per cent). Aside from that, most respondents (n=124, 95.4 per cent) have less than five years of working experience, with only a few (n=6, 4.6 per cent) having 6 to 10 years of working experience.

Table 2. Respondent demographic (N=130)

General information	Categories	Frequency	Percentage (%)
Profession	Interior designer	57	43.8
	Architect	43	33.1
	Developer	2	1.5
	Specialized designer	28	21.5
Working experience	Less than 5 years	124	95.4
	6 to 10 years	6	4.6

4.1 Readiness of smart office

The readiness survey results for implementing smart office interiors in Malaysia are presented in Table 3. The survey results on respondents' experience in designing a smart office revealed that almost all respondents (n=126, or 96.9 per cent) had no prior experience in developing a smart office. Furthermore, when it comes to results familiarity with the technologies, only four out of eleven (4/11) received more than half familiarity with them. The smart door lock received the highest level of understanding across the entire profession (n=114, 87.7 per cent), followed by the lighting control (n=88, 67.7 per cent). The smart sensor (n=85, 65.4 per cent familiarity) and voice control assistant (n=82, 63.1 per cent familiarity) ranked third and fourth in the profession. According to Figure 3, eleven example technologies have been indexed from most familiar to least familiar to professionals. This demonstrated that most professionals are still unfamiliar with technological advances and that smart offices are not yet ready to be implemented in Malaysia.

Table 3. Result of readiness of smart office interior based on familiarity of technologies among the profession

Item	Categories	Frequency	Percentage (%)
Experience in designing a smart office	Yes	4	3.1
	No	126	96.9
Familiarity with technologies	Smart sensor	85	65.4
	Smart door lock	114	87.7
	Smart desk	26	20
	Lighting control	88	67.7
	Appliance control	18	13.8
	Smart air conditioner	25	19.2
	Recognition program	33	25.4
	Indoor maps	3	2.3
	Voice control assistant	82	63.1
	Smart entertainment	18	13.8
	Smart curtain	21	16.2

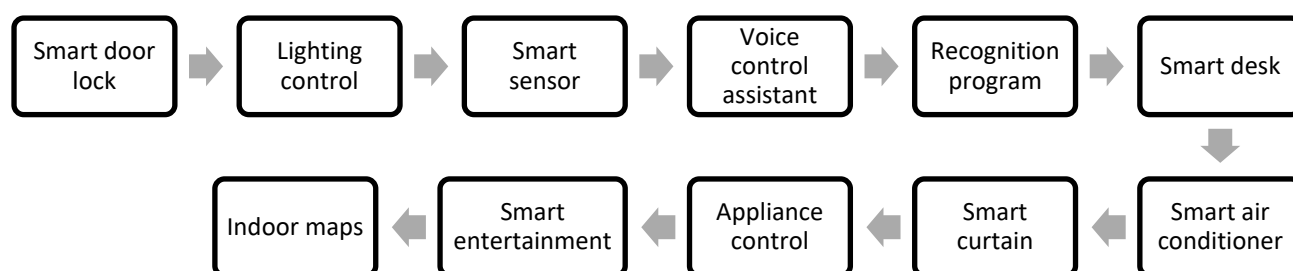


Figure 3. Ranking from the highest familiarity (smart door lock) until the lowest familiarity among the profession

Figure 4 depicts the results of a cross-tabulation of data among the various types of technology and professions to determine which professions are the most prepared for the transition to a smart office environment. Interior designers (blue line) and architects (orange line) are the professionals who are most familiar with smart office technology, according to the graph. Meanwhile, the specialized designer has the third-lowest familiarity with the technology, behind only the developer.

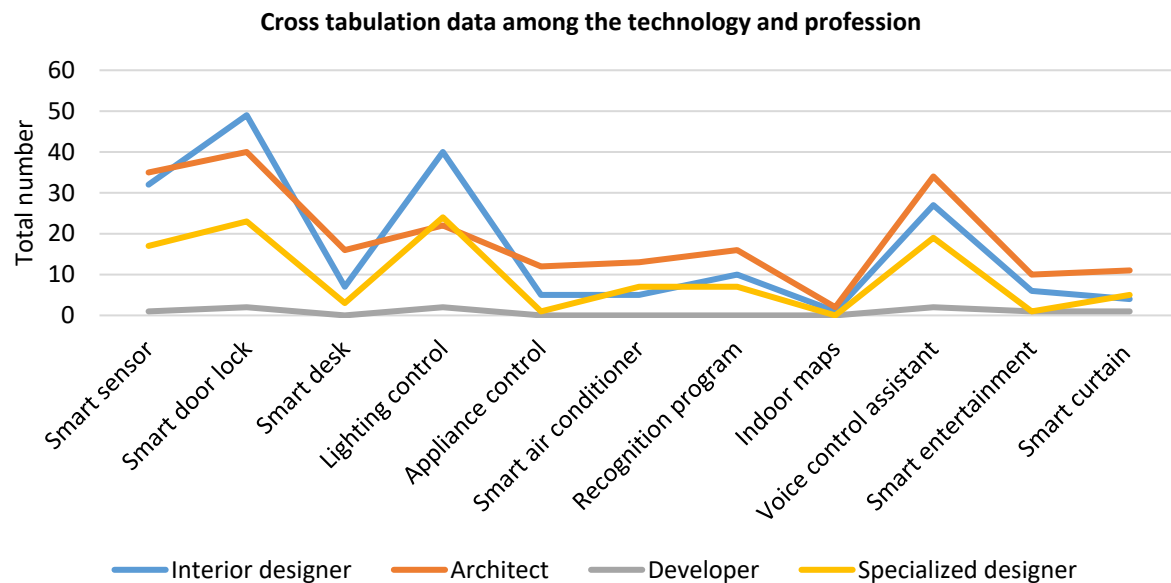


Figure 4. Cross tabulation data among the various types of technology and professions

4.2 Significance of implementing a smart office

There is significance to implementing a smart office interior, including energy savings, increased comfort level, reduction of all paperwork, improved productivity, increased workplace safety, and increased working efficiency. There are six significances of implementing smart offices, which are ranked from not at all important to extremely important. The outcome is depicted in the preceding Figure 5. Increased workplace safety received the highest number of responses from respondents, who rated it extremely important to their wellbeing. In addition, improving working efficiency received the highest number of responses and was extremely important to most respondents.

Meanwhile, improved productivity, increased comfort, and energy savings are all considered of moderate importance by the respondent. However, only a tiny amount of the paperwork was given a small amount of importance by the respondent. As a result, this demonstrates that having a smart office is extremely important among those who responded to the survey.

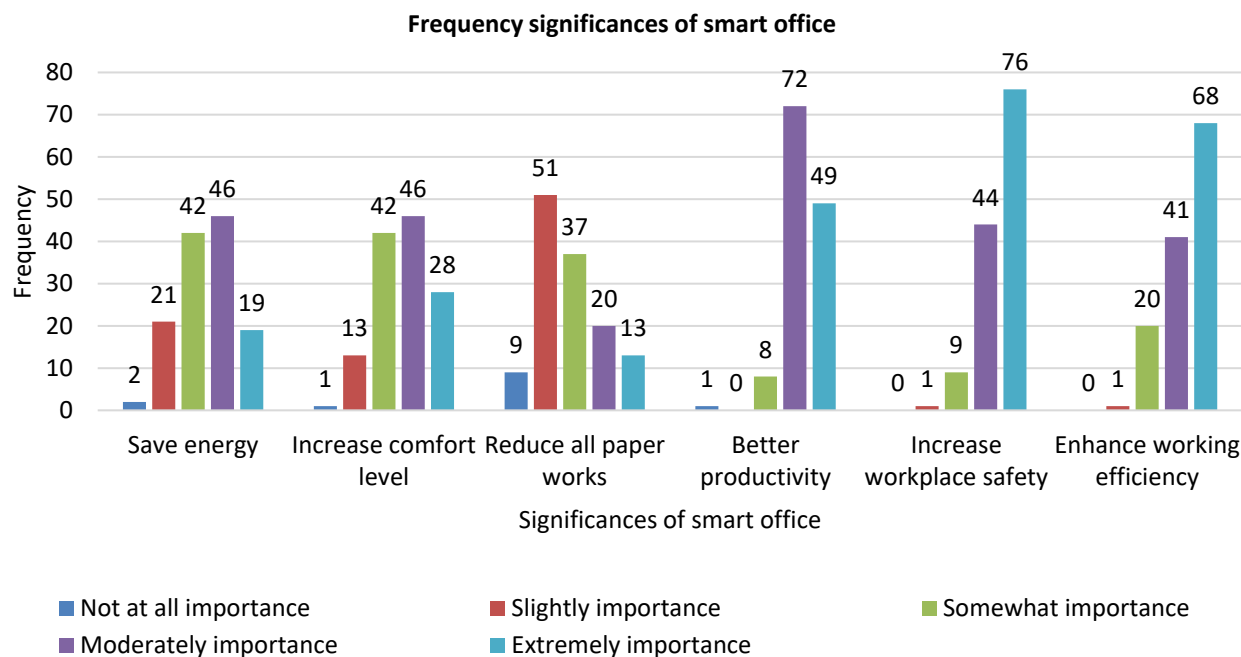


Figure 5. Frequency significance of smart office

A few steps can be taken to overcome the low level of familiarity with the technologies used in the smart office. For example, according to Elsey (2021), "to make the office ready to use a smart office, think about everything that could be smart and purchase the AI and sensors to increase smart office efficiencies." Examples of AI (artificial intelligence) include smart personal assistants such as Siri, Cortana, and Google Now and smart devices that adapt to users' habits and preferences. Aside from that, investing in user-friendly technology that requires little to no training empowers employees while simultaneously reducing administrative work on your end.

5. Conclusion

It is possible to conclude that Malaysia is not yet fully prepared to adopt smart offices because of the low degree of familiarity with technology in the professional sector. According to the survey findings, even if most individuals who participated understand the relevance of smart offices in today's world, they do not have adequate knowledge of the technology utilized to develop smart office interiors. As a result of this research, we have contributed to the existing body of knowledge regarding the readiness of Malaysia at present to implement smart offices and increased awareness regarding the significance of implementing smart offices in Malaysia. This research has also provided significant benefits by identifying areas requiring more extraordinary efforts to steer future research in a more concentrated manner. In addition, these areas have been identified as having considerable potential for further investigation.

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