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THE DIGITAL PRINTING TECHNOLOGY EXPLORATION IN COMMERCIAL PRINTING COMPANIES

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ABSTRACT

Printing products is a vital communication media for everyone. Nevertheless, the role and importance of printed materials have changed due to the rapid development of the internet, social media, and digital technology. This has impacted the printing industry globally. The Malaysia printing industry, particularly the commercial printing companies are also influenced by this scenario, whereby printing order has been reduced. This consequently affects the revenue of the printers and presents pressure to the commercial printers on how to sustain in the market. Ignoring this could lead to a further financial disturbance or closure of business. Thus, this study is proposed to explore the acceptance and importance of digital printing technology among commercial printing companies in Malaysia. Knowing the acceptance and understanding of the importance of digital technology could elevate the usage rate of the technology among the printers and could better help them to survive or improve their business. A qualitative approach (in-depth interviews) with approximately 7 printing companies with senior managers will be conducted. Data will be coded and analyzed for themes. The findings will be used to formulate a business model that is suitable for commercial printing companies as well as other relevant printing industries. This study hopes to assist the Malaysia printing companies generally and Commercial printing companies specifically to better understand the importance of digital technology adoption that can help to boost their business performance.

Keywords: Digital Printing; Commercial Printing; Technology Adoption

INTRODUCTION

The printing industry plays an important role in helping to develop the nation's civilization and supporting the nation in terms of economy, social development, and technology. The printing industry can be segmented into commercial printers, packaging, security, and publications. Commercial printing is the most significant segment in the printing industry, with an estimated 47.3% of total market value (Marketline, 2012). The growth of income is in line with the changes and development in the global printing industry in terms of customer demand and spending, new technology, and environmental concerns. The emergence of the digital printing movement and development is slowly changing the mindset of commercial printers in Malaysia. Digital printing has opened up new business opportunities for printers in the printing industry. The best approach for commercial printers to survive in the long run is to integrate digital printing applications for faster outcomes and client satisfaction.

Therefore, the trends in the Malaysian printing industry, showed that many commercial printing companies run businesses by combining the offset and the digital printing processes (Cavendish, 2015). Compared to two decades ago, very few printing firms offered and combined the two printing processes in one premise. Most printing companies specialize only in one printing process. Along with that, the printing company has a skilled workforce to operate the printing equipment and processes. The printing company also has the ability and capacity to handle the printing work undertaken. The use of new equipment and various printing technologies, particularly those with sophisticated software and applications, have assisted printing companies to reduce production times, reduce make ready times and minimize paper waste.

Despite being one of the important communication medium, printing products are gradually facing off. The role and importance of printed materials have changed due to the internet, social media, and the rapid development of digital technology (Gallagher, 2014; Shalida, 2018). The global print market is declining globally and Malaysia is inescapable of this issue. The print market trend has evolved in new printing segments such as Print on Demand (POD) and requires a fast turnaround (Gallagher, 2014; Shalida, 2018). Commercial printing companies especially, are experiencing the impact of the market shrink and perhaps need to embrace digital technology to remain competitive in the market. On top of that, scarce information or empirical research on Malaysia printing industries on technology adoption further limits the effort to sustain and improve the industry (Ali, 2019). Thus, the purpose of this study, which is to explore the acceptance and importance of digital technology in commercial printing companies is relevant and would be beneficial not only to commercial but also to other relevant printing companies as well. Knowing the acceptance level and the importance of digital technology could better help printers understand how to better deal with digital technology and grab the golden opportunity offered by the current market. Additionally, the proposed business model is also hoped to better facilitate the commercial printers to be more innovative in strategizing their business effort in boosting their business performance. This indirectly could assist the government in increasing the GDP in the printing sector and better lead the nation to achieve a High National Income.

LITERATURE REVIEW

Trends in Printing Industry

Trade liberalization and globalization have changed with the rapid internet development, increasing uses of new media, and development of new technology creating a new business environment both locally and internationally (Gallagher, 2014). The global printing industry that undergoes rapid development and becomes more competitive requires countries like Malaysia to have a clear understanding of the scenario to help commercial printers survive as well as to improve their capabilities in business performance (Ali, 2018). The question arises on the mechanism of how to keep the Malaysian printing industry, especially the commercial printing companies to survive, outperform and stay in the printing business. The Malaysian printing industry sales volume is decreasing due to the reduction of print orders and pressure on price war that shrink the profit margins (Ali, Azahari, and Sumarjan, 2015; Shalida, 2016). In addition, printing companies need capital to invest in the latest technology and equipment and manage production in effective and efficient ways. This is due to be remained competitive, managing surplus production capacity, handling the rising print production costs, and coping with the changing trend in customer demand.

There are many studies and reports which surveyed the challenges and pressures faced by commercial printing companies. Despite the slight revenue growth, the commercial printing companies faced the following challenges which are changes in customer demands and preferences, rapid development in digital technology as well as the growth of internet and social media users (Ali, Azahari, and Sumarjan, 2015; Romano, 2015; Rosnan, 2016; Susanto, Liana & Adhi, 2013; Thompson, 2013). Thompson (2013) further added that commercial printing companies are struggling to survive in the printing business. Commercial printers suffered due to the print market shrinking, customers reducing print quantity, alternatives in other media for communication as well as print production over-capacity (Ali, Azahari, and Sumarjan, 2015; Khairul, Adnan, and Salman, 2015; Lasomboon, 2012). For example, the printing companies are affected by the printing machine over-capacity which will give

price pressure on the print market to obtain printing jobs. Therefore, commercial printing companies are focusing on strategizing their existing resources and adopting new technology and market changes to remain competitive. With a better business plan, it will be able to contribute to the improvement of business performance to compete locally, regionally, and internationally.

Digital Printing Technology in Printing Industry

The Malaysian printing industry is diverse, and can be divided into six segments; 1) commercial printers, 2) packaging and labeling printers 3) Newspaper 4) Book printers 5) Security printers and 6) Digital printers. In addition, the printing segment can be determined based on the printing services offered by the printing companies. An offset Lithography is a printing process widely used in printing. The other printing processes include flexography, gravure, screen printing, and digital printing. Generally, printing companies use one or two types of printing processes to run printing businesses. The Malaysian printing industry also alerts and adopts the development of the digital printing era (Cavendish, 2015). Digital printing technologies continue to grow rapidly. The emergence of the digital printing process in 1990 created a new printing scenario and it affects the Malaysian printing industry. In early 2010, digital printing processes became more common and popular in the market. Many printing companies accepted and adopted digital printing technology to continuously offer better services to new and potential customers (Callagher, 2014). In addition, digital printing was regarded as allowing the printing industry to provide a cost-effective and better solution to customers. The capability of digital printing technologies provides better printing services through its applications (Watkins, 2012). Therefore, the development of equipment and new printing technologies has led to better and more innovative products and services that cater to customers changing demands. One segment which is seen as the fastest-growing in the printing industry is digital printing. The innovations and improvements that occur in digital printing technology make this segment more popular.

Based on the market report produced by Smithers Pira (2014), the total digital printing market will reach 225% by 2024. The rapid development of digital printing can help printing companies offer additional and better services to customers. Digital printing has developed new opportunities for conventional printing companies to explore and capture a new print market. In addition, according to a report produced by Romano and Broudy (2010) offset lithography printing has been replaced by digital printing several decades ago. The Digital printing process offers many advantages to customers, particularly to the publishing industry and corporate companies. Digital printing can print in a short time even for a single copy, on-demand print products, and variable data printing (VDP). There are also commercial printing companies that have invested in digital printing and are designed to make the company becomes more competitive in the market. There are two main areas in the digital printing business, namely electrophotography printing and large format inkjet printing. Generally, electrophotography printing produces print products such as books, invitation cards, posters, photo books, brochure financial statements, and trans-promotional items. Books printed using digital printing are growing especially giving advantages for the shorter print run and faster turnaround. Meanwhile, the large format inkjet printing focuses on the production of bunting, banners, stickers, backdrop, and others.

Through a literature search, the degree of acceptance or rejection of the adoption of technology is dependent on many factors. Based on the findings from several authors highlighted some of the challenges in the adoption of technology. The barriers are limited management capabilities and support, incentives and resources, the shortage of financial and human resources, lack of experience and knowledge, and the company's perception of wait and see (Gallagher, 2014, Khoon, 2013, Susanto, 2013). In addition, one of the important criteria that influence technology adoption is employee involvement. The employees should be incorporated as part of the organization in ensuring the success of the company. An employee of the organization must put an effort inconsistently to achieve the organization's goals (Khoon, 2013, Susanto, 2013).

The Advantages of Digital Printing Technology

Advances in digital printing technology have slowly changed perceptions and mindsets among commercial printing companies. The advantages that can be generated by digital printing have opened up opportunities for offset printing companies to make investments, whereas a decade ago, they depended solely on high-volume offset businesses (Ali, Azahari, Rosnan, & Sumarjan, 2019; Cheng, 2020; Pardiwala, 2016). One way for commercial printers to survive in the long run is to integrate digital printing technology. The applications of digital printing technology can ensure the production of can produce fast print products, consistent print quality, and achieve customer satisfaction. Digital offset presses, unlike traditional offset presses, can print on demand. In addition, the ability of digital printing technology to produce small print orders, quick production cycle, and able to contribute to cost-effective print runs.

Challenges and Opportunities of the Digital Printing Technology

Despite clear evidence of the advantages of adopting digital printing technology, there are also challenges faced by printing companies who intend to invest in it. Nowadays commercial printing companies face growing challenges from globalization. The print market needs a niche and innovations for print products. Therefore, the latest trends need printers moving in line with technology development such as the digital printing era and using high technology devices and machinery development (Cheng, 2020; Pardiwala, 2016). In addition, according to Yilmaz & Cavus (2018) have mentioned that the digital printing machine manufacturers have improved the capabilities of digital printing systems and technologies. Therefore, this development has implications for conventional and offset printing. Printed products that are usually printed using offset printing techniques can switch to digital printing. It is an alternative printing process apart from conventional printing techniques as well as offset printing.

Strategies in Implementing Digital Printing Production

There are numerous studies conducted to evaluate the effectiveness of adopting digital printing technology in the organization. Most of the studies were undertaken to seek the relationship between the principles of adopting digital printing and business performance (Ali, 2018; Cheng, 2020; Pardiwala, 2016 and Wang, 2016). There are a few questions that need to be understood first regarding the target customers and their wants. What do your clients require? who are your clients, exactly? You already have a solid understanding of the kind of content your customers desire and how many commercial print works are amenable to digitization. New printing trends have emerged in recent years as a result of the development of digital and Internet technologies, changing the printing business for all time. These developments in the printing industry have led to changes in the design and printing phases of company operations. The printing industry embraced these new printing trends as many businesses changed their workflow and production strategies to meet the new demands. On the other hand, many conventional commercial printing companies who did not make these essential changes have struggled as a result of the increased competition from non-print and internet media (Ali, 2018). In addition, the adoption of a digital workflow has further automated the printing process and freed the business from labor-intensive tasks that can interfere with production schedules. The commercial printing companies are still strong and long-lasting and constantly employs new strategies to be successful in the future, by adopting digital technology facilities in their print production. (Pardiwala, 2016).

RESEARCH METHODOLOGY

The research methodology used in this study is a qualitative approach. The interview was conducted with open-ended questions. The purposive sampling method was employed. Seven (7) printing companies have been contacted for an in-depth interview. The informants are among the top management staff of the commercial and digital printing companies that have been interviewed. They

are considered to have a lot of ideas and are knowledgeable in providing information. The questions that were asked during the interview session are specific in exploring the acceptance and importance of digital printing technology among commercial printing companies. The data has been transcribed, coded, and analyzed for themes.

RESULT AND FINDINGS

This case study applied a qualitative approach to explore the acceptance and importance of digital printing technology among commercial printing companies. Today, customers need a solution from the printing company with innovative ideas, high value, cost-effectiveness, and concern for environmental issues. Nevertheless, the factors of price, quality, and faster delivery are still the main consideration of customers. Changes to customer demand trends are influenced by the rapid technological change in the printing industry (Ali, 2019; Pardiwala, 2016). The rapid development of the digital printing process cannot be denied and become the forefront of the technological movement in the printing world. The advantages of digital printing processes such as fast, short production cycles, and cost economical are offered over offset lithography printing processes. Therefore, the digital printing process has become more popular compared to conventional printing processes.

The development of the technology was creating new demand among the customer and end-users. Digital printing offer on-demand printing and personalized that lead to satisfying customers' demand. Understanding the rapid developments of digital technology, the owner of a commercial printing company had responded to adapt to the technological changes in their organization. For instance, it becomes a trend where the commercial printing company has invested in new technology. The printing company strengthens its businesses by offering print-based offset printing and digital printing application to survive in the long term. "We will try to sell the old machine and replace them with new machines equip with high-tech features to make the company more competitive in the printing business" (Managing director BH Print). The developments in digital printing technology should not be seen as a rival to offset printing. Both printing processes offset and digital printing complements each other. The advantages of the digital printing process have opened up opportunities for printers and their customers. A decade ago, commercial printing products depended on the offset process and dealt with high volume print orders. Unlike the offset printing process, digital printing is more flexible in handling short print. Now, customers are given the option through the printing processes offered by the printing company.

The development of digital printing has changed the mindset of traditional offset printers in Malaysia. Many commercial printing companies in Malaysia are now integrating the offset printing process and digital printing process in their printing business. Commercial printers make investments in digital technology to complement the existing printing process as well as to better serve their customers. Therefore, it will create the opportunity to company in getting the biggest market share as well as give the selection of printing services to the customers. The company will gain customer loyalty and sustain itself in the marketplace. Commercial printers realized if they do not take the opportunities for the development of digital printing, they will be left behind. This will provide a competitive advantage to the company in the printing market.

The respondents have the portrayal of developments in digital printing (Senior Production Manager, Yamagata Sdn. Bhd.):

- a. "printing industry is a sunset industry when facing internet development. Digital printing will be used to print small quantity printing jobs, for costs saving" (Production Manager, Ultimate Print Sdn. Bhd.)
- b. "Our company also makes investments in buying the digital machine to fulfill the customer demand. Digital printing exists is to complement the existing offset printing process"

On top of that, technological developments in digital printing processes are associated with a reduction in the number of prints. The advantages of the digital printing process have provided an opportunity, especially for the book publishing market. Through this study, there is becomes a trend

when many offset printing companies are now combining their business operation with digital printing. For example, the content of the book is printed using the offset lithography process while the book's cover was printed using digital printing. Both parts book's text and cover were assembled during the binding process. Therefore, the trend has been towards the sustained relevance of commercial printing companies in the marketplace. One respondent shared their views on the contribution of digital printing to the book publishing industry. "In the current trend also shows the influence of digital printing. This printing process gives the option to publishers and printing companies to print the book's work. It is associated with fast print production of book creating from start to completion." (Sales Director, company Percetakan Nasional Malaysia Berhad). Furthermore, the future of digital printing is very bright. Research and development of the digital printing process are continued. Parallel with the changes in customer demand we generally need short-run printing and times for producing with fast turnaround. Malaysia printing companies have seen and experienced the effects of technology and digital printing. The development of digital technology has spurred many commercial printing companies towards investment in digital technology for the current as well as in the near future.

One respondent comments on the future of the digital printing market:

- a. "In the future, digital printing can dominate the market in the printing industry. At present, there is still a lot of research and development done in this printing process." (Managing Director, BS Print).
- b. "The trend towards digital printing also affects the largest printing exhibition, which is Drupa 2020. Probably there is no new model of offset printing machines will be introduced and what is expected of digital printing machines and its development." (Head of Print Department, UiTM)

On the other hand, with the development of new technologies such as high-speed offset presses, there are advantages promised that can be gained from the investment especially improve on the product produced, increase productivity, cost economical and efficiency. The owner of the printing companies would consider the investment if they believe that investments are given good returns. Printing companies are very careful in making investments it will give an impact on company survival, especially on the big investment. One respondent gives a positive comment on the issue of investing in new technology. "Technology innovation is absolute will bring benefits and advantages to the printing industry, for example in improving productivity, make-ready time can be shortened, waste can be reduced and a better quality print product can be produced."(Managing Director Giga Wise). In the context of Malaysian printing companies, printers understand to buying a new printing technology will cause a lot of money including the impact of currency fluctuations, training programs, and maintenance. New investment means new liability and overhead for the company. For example, micro and small printing company are not all may be unable to invest in new technology like digital printing technology. Even though it is a good advantage for the company to tell the customer about the new technology that they have as well as get the customer's trust and confidence. In addition, new technology has offered in increasing productivity and reduced the use of workers. Most of the latest technology was equipped with an automation operation system that required fewer people.

To remain competitive that is essential for printing companies to establish a long-term business plan without affecting their investment in technology improvement. Therefore, the company can market itself by telling the customers that they have a new printing press that is capable to print high-quality jobs and is faster in delivery. Despite rapid technological developments in the printing industry, there is some advice given by some respondents to ensure that commercial printing company is sustained and competitive. "should have willingness and courage among printing companies to make investments to get the best equipment, machines, and technology. Thus, must ready to bear the burden of debt and give a commitment on new liability to survive in business" (Managing Director, D'Fa Print). "It (technology) will be a liability to the company. The approach should be considered ... at first...the company must understand the scope and requirements of customers targeted by the company" (Managing Director Giga Wise).

Whatever technological challenges are faced ahead, the printing company still needs to strategies its resources to keep the company aloft. Not all commercial printing companies can invest to equip

themselves with new equipment and technology. The cost of new technology becomes a major issue among printers. The printing industry is still relevant and supports other industries. Despite the rapid development of the internet and digital technology has changed the demands and requirements of customers and markets. One quotation from the respondent, "printing industry cannot consider a "sunset industry" (Managing Director, Cekat Cetak).

CONCLUSION

The printing sector is generally experiencing economic challenges, which have an impact on the survival of printing companies, particularly in the commercial printing market. Several recommendations have been developed in light of the study's findings. It is advised that commercial printing businesses adopt a successful business strategy and adapt it to meet the demands of their present clients. To survive, they must adopt a new mindset and be prepared to consider a new business strategy. Everyone, for instance, is aware that the large volume of print order is declining, customers want printed products fast and personalized. Since it is obvious that technology and digital development can improve, commercial printers would be wise to adopt this change and win more clients.

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