


# JomMachineLearning: Bringing Artwork Nearer With DesignLab

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## ABSTRACT

When a user intends to custom make a name card, the very first step that the printing service provider would ask for is their name card design artwork, yet users do not have their name card design artwork. The client would feel frustrated with the designer to create artwork that does not meet their requirements. The designer would also feel the same as the artwork has been rejected regularly by the client. From the primary data survey result, most respondents agreed that they have a clear idea in mind but have difficulty expressing their idea to the designer. The opinions concluded from the interviews would there be another choice for the user to design an artwork besides hiring a designer. This study has proposed a designer matching platform to match the client's preference and designer's talent and an online artwork design editor as an additional option for the user.

## KEYWORDS

Decision Tree Algorithm, Designer Matching Platform, Freelance, Machine Learning, Name Card Artwork Design, Native Advertisement, Online Artwork Editor, Printing

## 1. INTRODUCTION

### 1.1 Printing e-Commerce Platform

E-commerce, in simple words, is buying and selling goods/ services online. Print companies individuals who want self-service and more convenient way to purchase items or products in their daily life. As more and more business apply the O2O approach to satisfy their customer's procurement needs, so must printing companies to follow the trends otherwise would fall behind the times. The capability to offer effective online-services for ordering online could significantly bring the printing companies business ahead than other competitors (Collins, W. et al., 2018).

### 1.2 Graphic Design Sector

Graphic design is one of the important elements of the printing company. Basically, graphic design is the creative visual arts that encompass in many areas. It could be applied to typography, art direction,

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page layout, advertisement and other creative aspects (Ambrose, G., et al., 2019). Without the graphic design artwork, it would be impossible to print the necessary item or products based on the user's need.

Nowadays, an innovative advancement in the digital age has revolutionized and comprehended the processes of print production. Merchants, for instance, typesetting and artwork preparation have fallen behind the times, whereby the job could be replaced by a graphic designer. As a result, the graphic design sector has formed into a multifunctional role that the designer could be playing certain roles in the creation procedure.

This job requests the need to communicate adequately with a wide range of experts. In that capacity, the job scope of a designer's responsibilities now includes print purchasing, website programming, photography, materials selection, art direction, freehand illustration, computer-generated illustration (CGI), project management, client account management, storyboarding, editing and pre-press production (Ambrose, G. et al., 2019).

## **2. ISSUE AND PROBLEM STATEMENT**

In this thesis, with cooperate with a PrintingLab.my, a Malaysia online printing startup, as the demands for the printing request has increased; the problems with design artwork appear to be a difficult issue for them.

### **2.1 Low Design and Process Efficiency**

In the design process, often have the issues that the designer's work been rejected by the client. This is mainly due to the client have no idea what they want, and the designer also does not know the style of art that the client would like. Therefore, results in a longer time taken to complete a design that the client like and lead to lots of time wasted.

### **2.2 Poor Customer Experiences**

The client who does not have a proper artwork for print often request whether have the ready-print template design for them. While PrintingLab.my does not provide any sample or ready-print template to convenience the client, they would assign a designer to design for their client. The process of design and being rejected would keep the cycle until the client is satisfied with the designer's work.

### **2.3 Operation Costs Increased**

Most of the time the clients do not have a proper artwork that is ready for print due to this printing industry was a bit complicated. As a simple vector and bitmap types of artwork would produce a different kind of finishing, yet, and often hard to explain to the clients their differences as these are the terminology often used in the industry. This result in the cost of communication with the client increased. Besides, it is time-consuming to check the artwork of the client which does not fulfil the requirement of the printing standard and communicate with the client.

## **3. LITERATURE REVIEW**

### **3.1 Printing Industry**

Printing Industry is the establishment that primarily involves printing text and images on paper, apparel, mug, and other materials. There are huge ranges of products that are produced in the printing industry such as books, bunting, banner and other daily printed products like T-shirt, business form, and packaging label. According to Global Opportunities in Publishing by Printing and Marketing & Commercial Printing (WWMP), states that France, the US, UK, Germany, and China are the five largest marketing & commercial printing markets (Print & Publishing, 2018). Asia-Pacific is the fastest-growing region, with India, Indonesia and Vietnam leading the way.

Due to the growth of the digital transformation, the commercial printing industry confronting the progressions of innovations, they tend to pivot to print on demand (POD) model (Gallagher, K., 2014). In research by Hviid, the youngster was pointed out as the main users of the internet who lean toward digital media over the printed media (Hviid, M., et al, 2016). Thus, the printers need to adapt their business strategies to meet the youngster's print on demand requirements to overcome the low volume printing (Shao, D., 2016).

Gogoprint, one of the Thailand-based printing startup, recently had expanded their business to Indonesia which the director has expressed Southeast Asia's printing market is worth US\$25 billion and expected to grow about 2% each year (Marzuki, Y, 2018). They achieving the results by offering a wide assortment of products and configuration, transparency in terms of the pricing and provide best customer service. According to the Malaysia Investment Development Authority (MIDA), paper, printing and publishing industry recorded a tremendous jump in growth as compared with its 2017 performance. A total of 30 projects were approved with investments of RM5.4 billion in 2018 or a massive 1,463 percent increase over 2017's figure of RM347.9 million (MIDA, 2018). This shows the incredible growth in the printing industry due to the increasing demands and more and more people tend forward for personalized prints either in individual level or enterprise level. This part of the manufacturing sector has continued to assume a key role in the economy, turning Malaysia into a major player in the global value chain as the nation marches towards industrialization.

From the advertising perspective, they tend to dominate in the global digital production printer market in 2018. There is a forecast by Fortune Business Insights that graphic, catalogues and transactional are the segments that anticipated growing at a CAGR of more than 10% in 2018 – 2025 (NewsNetwork, V. C, 2018).

### 3.2 Competitors Analysis

#### 3.2.1 Gogoprint SWOT

Gogoprint, a Thailand online-printing company who grow and become one of the biggest online printing company in Southeast-Asia. Recently it has pulled \$7.7 million investment to prepare to expand its business in the Asia Pacific (Russell, J., 2018). There is no doubt about the potential they expand their business with the help of capital (Table 1).

#### 3.2.2 Vistaprint

VistaPrint is the Cimpress company based on the UK which operates for 18 years in the market (Vistaprint, 2019). It helps small business owners create expertly designed, up-to-date custom marketing – the assortment of products they need to look and feel professional, prepared and plugged in (Table 2).

Table 1. Gogoprint SWOT comparison

Strength	i. 4 years' experience in the printing industry. ii. Have various of products iii. Low price, fast delivery.
Weakness	i. No image confirmation after checkout ii. Confused upload artwork process iii. Template restriction, could not add on another icon or shape change
Opportunities	i. Expanding its business to the Asia Pacific. ii. The demand for printing is increasing as there is an increasing demand for the printing industry
Threats	i. Future advance technology to analyze client preferences. ii. The possible competitor from press manufacturers

**Table 2. Vistaprint SWOT comparison**

Strength	i. 18 years' experience in the printing industry. ii. It provides product diversification. iii. Expanded its customer base in a short span
Weakness	i. Too costly. ii. Lots of upsell attempt (Muchmore, M., & PC Magazine.,2018). iii. Limited template design Muchmore, M., & PC Magazine.,2018) iv. Internal management issue. (Bārdaw, & BI Developer.,2019)
Opportunities	i. Expand and strengthen overseas businesses & operations ii. Working on a new brand called "Own the Now" to help small businesses enhance their marketing.
Threats	i. Threat from other full-scale printing and publications competitors ii. Rising postage and material cost

### 3.2.3 PrintingLab

PrintingLab is a startup online printing platform in Malaysia that started in 2019. Currently, focus on name card business which the user could customize their design on their website. They are aiming to make great design available to everyone by combining professional design with the accessibility and reach of the web (Table 3).

### 3.3 Design Sector

Along with the printing sector growth, the design sector also booming as printing requires artwork where the design sector takes an important role. As the audience's preference shifts toward relevant, valuable and engaging graphics of content, business owners demand new and effective graphics to grab the attention of the audience is growing.

In order to grab users' attention, advertiser tends to spend more money on advertising. One of the effective ways is through native advertising. Native advertising is the buzz term that used to describe the ads that look like the content that the ad is placed within]. Most media administrators are 76% positive toward native advertising as this had become a new digital storytelling method in the modern digital environment (Laursen, J., & Stone, M. 2016). One of the pioneers reported on Forbes Media, that 30% of the company's revenues under native advertising (Laursen, J., & Stone, M. 2016). As the growth of social media, demand for ads content is growing and drive the demand for the design sector.

**Table 3. PrintingLab SWOT comparison**

Strength	i. Fast delivery ii. Instant price list iii. A group of young people that could pivot and make a decision to adopt new things or technology
Weakness	i. Limited manpower ii. Limited capital
Opportunities	i. Working on core competencies and strengthen the brand image ii. There is a gap in enhancing the design editor sector iii. No users preferences are being analyzed on design artwork among the competitors
Threats	i. Big companies could fast adopt the new technology as they have sufficient resources and capital ii. High competitions to get the major market share among local and online printing competitors

The design sector, or in more precise is the graphic design industry, is using visual concepts by handwritten or using computer software to communicate ideas, craft brand images and captivate consumers. The output of this field produces and designs layouts for advertisements, brochures, magazines, etc. This sector's demand is also driven by the downstream markets, which include consumer goods manufacturers and advertisers.

Recently, there is a rising global per capita income and consumers spending have led to increasing corporate expenditures. According to the internet trends 2019 by Mary Meeker, there is a huge increase in time spent in media from 8% to 33% from 2010 to 2018. The internet ad spending is also increased with 21% year-over-year growth (Meeker, M., & Wu, L. 2018). This, in turn, has bolstered demand for graphic designers, as industry operators are commonly hired to create a brand image for new products and services.

According to a web designer and UX strategist, Lexie Lu, millennials nowadays are more interested in freelancing than having full time (Lu, L. 2019). There are more than 250,000 graphics designers in the US and 25% are self-employed (T. Zier, 2019). The number of self-employed graphic designers would keep the rise in the coming year as the desire of the millennials want a more freelance lifestyle and ditch the corporate culture.

### 3.4 Machine Learning

Machine learning, in a simple explanation, is computer learning from the past paradigm to improve future performance. Learning in terms of computer science refers to improvement or modification of the algorithms based on the previous data and process without any additional assistant from the human. It includes additional consideration regarding the effectiveness of algorithms to perform the data process, learning tasks and compounding it to the measurable performance (Das, K., & Behera, R. N. 2017).

The process of the computer takes the approach to the next level by modifying and process the new data is known as training. It focuses on extracting the information from the large set of data and identifies the patterns with a mathematical approach to generate much more effective outputs.

The idea behind machine learning is to collect data for our problem and learn how to solve the task. This could assist us in solving the complex tasks, and adapt to a new situation. To let the machine learning know the real-world problem, all the problem could be formulated into inputs and output. For example, the input and output of a certain scenario could be summarised in Table 4.

#### 3.4.1 Learning Method

We know the machine learning would collect the bunch of the data and predict the output. But the question is, how does the machine learning learn from it?

To answer that question, normally there are three learning methods that machine learning would know whether they have predicted the output correctly. The methods are supervised learning, unsupervised learning, and reinforcement learning.

Table 4. Example of inputs and outputs in machine learning examples (Lison, P. 2015)

	Input, <i>i</i>	Output, <i>o</i>
Spam filtering	An email	{spam, non-spam}
Face recognition	An image	Identified faces
Speech recognition	A speech signal	Text sentence

### 3.4.1.1 Supervised Learning

Supervised learning is data points or samples which are predictive variable or features and a target variable. The aim of the supervised learning is to predicting the target variable with given the predictor variables. Example of the algorithm used to predict the output is the decision tree algorithm.

- Decision Tree Algorithm

The idea of the Decision Tree Algorithm is to create a training model which used to predict the results by learning the past training rules from the training data. To explain this concept, assume there is a single binary target variable  $Y(0 \text{ or } 1)$  and two continuous variables,  $X_1$  and  $X_2$  which is also from 0 to 1. The decision tree is illustrated as *Figure 1*.  $R$  is the output of each decision made from the variable  $X$  and  $Y$  (Song, Y. Y., & Ying, L. U., 2015).

The concept of machine learning is to develop the *classification rule* that used the objects in any attributes to predict the output. In order to visualize the concept of the training set, a decision tree with objects been classified as shown in *Figure 1*. Leaves of the decision tree been known as a class, other nodes act as the attributes with the possible outcome.

*Figure 2* shows the sample space view of the decision tree. The values of the outputs are divided and place into a segment based on the final outcome of the decision rule. Each of the data is allocated into a segment which is also known as a *leaf node* (Song, Y. Y., & Ying, L. U., 2015).

### 3.4.1.2 Unsupervised Learning

Unsupervised learning, in essence, is the machine learning task of uncovering hidden patterns and structures from unlabeled data. For instance, the business may wish to group their customers into distinct categories based on their purchasing behaviour without knowing in advance what the categories would be.

Unlike supervised learning, there is no explicit training phase in unsupervised learning. The machine learning should find out the patterns in the input data. Normal unsupervised learning tasks include cluster analysis and feature extraction (Wang, L. 2016).

*Cluster analysis* divides the input data into several groups based on certain measures of similarities. *Feature extraction* finds the low-dimensional representation of the dataset while still keeping the fundamental attribute of the original data.

Figure 1. Decision Tree example based on variable  $X$  and  $Y$  (Song, Y. Y., & Ying, L. U., 2015)

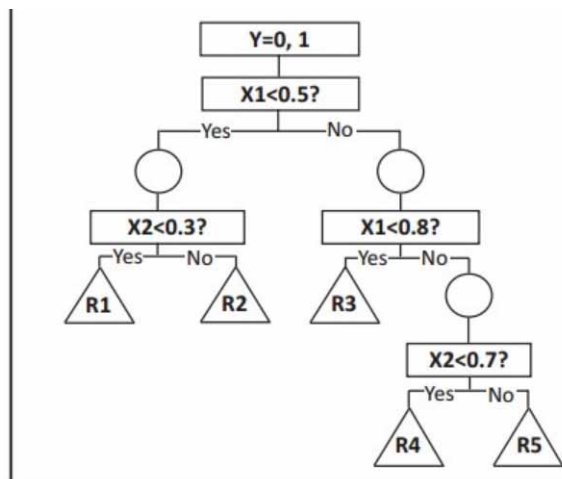
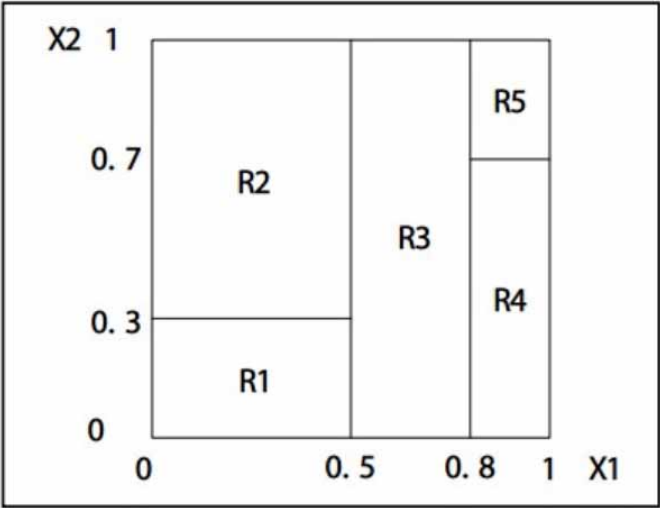


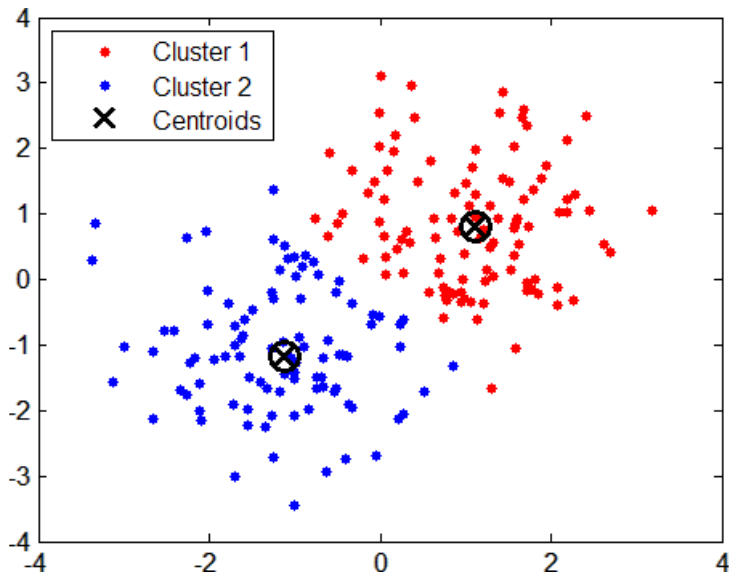
Figure 2. Decision Tree illustrated with sample space view (Song, Y. Y., & Ying, L. U., 2015)



- K-Mean

K-mean is the clustering technique used in unsupervised learning. Initial K is the constant, it could be the user-specified parameter, name or the number of clusters desired. Each of the points is then assigned to the closet centroid, and the collection of the points is known as a cluster (Arora, P., & Varshney, S., 2016). The centroid of the clusters, then updated based on the points given by the cluster. The process would keep on looping, assign and update until the centroid remains the same (Figure 3).

Figure 3. Example of cluster and centroid in K mean (Raghupathi, K., 2019)



### 3.4.1.3 Reinforcement Learning

Reinforcement learning is learning what to do, how do analyse and classified the situation and maximize the numerical reward signal Sutton, (R. S., & Barto, A. G., 2018). The machine was not told what action it should take, but the problem was given the reward that they would need to accumulate the reward points. There are two characteristics in reinforcement learning which are trial and error search and delayed reward.

One of the challenges that occur in reinforcement learning is a trade-off between exploration and exploitation (R. S., & Barto, A. G., 2018). To maximise the reward, the machine should find a way that is effective in the past. In order to achieve this, it should try actions that it has not tried before. It should exploit what is experienced in the past, and also explore to make a better choice in future to maximize the reward.

- Q-Learning or Value-Iteration Methods

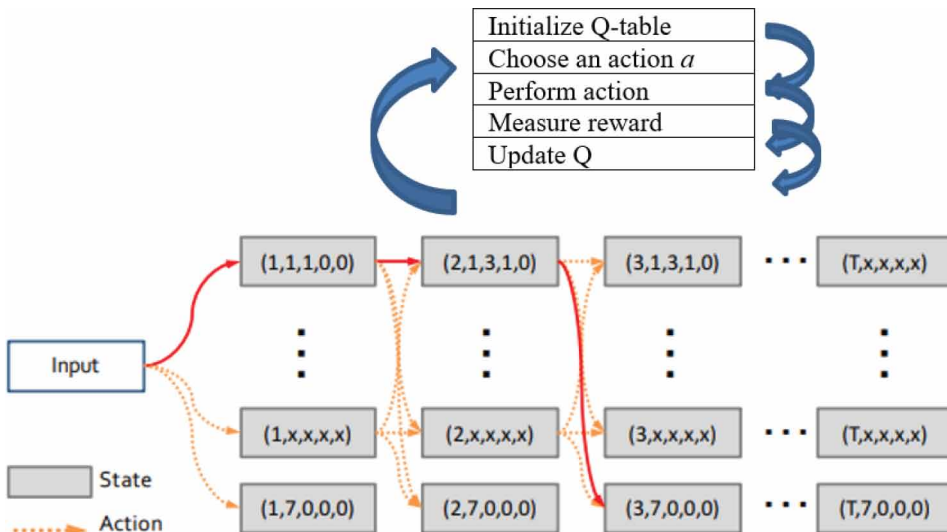
Q-learning (Hausknecht, M., & Stone, P., 2015) is the simulation-based variant of the value iteration algorithm. “Q” in Q-learning stands for quality. Quality act as how good a certain action is gaining the reward. The action takes two inputs which are “state” and “action”. It returns the expected future reward of that action at a state.

To act, an agent was used to transform one state to another state. It performs by maximizing the reward from the future states and will affect the current action. The machine learns the action-value function  $Q(s, a)$ . In simple words, is how good to take the action at a particular state. Normally a scalar value is assigned over action with a state  $s$ . The process to obtain the Q-table is summarized in Figure 4.

Figure 4 show the state transition process  $(s_t, a(s_t)) \rightarrow (s_{t+1})$  where  $t$  refers to the current layer. The structure of the block is considered as an “action”, also known as a sequence of Network Structure Code (NSC). To optimize the reward over all the possible action,  $R_\tau$  :

$$R_\tau = E_P \left( \tau a_{1:T} \right) [R]$$

Figure 4. Q-learning process (Zhong, Z et al, 2017)





where  $[R]$  is the cumulative reward (Zhong, Z et al, 2017). As a summary, to train this model, a set of structure code is needed to build the block architecture. The model would then trained with a certain task and check the accuracy, at the same time; the reward would be given to updating the Q-value.

In this study, machine learning is implemented to perform the role of identifying the preferences of the customer and hence based on it; the results are generated to match the customer needs. This paper aims to answer the research objective via the research question in Table 5.

There are 3 research questions determined to examine the value creations. To concentrate on the scope area, the investigation will be conducted at UCSI university only. Each research question will be answered by each research objective in Table 6.

**R01:** To solve the issue where there are lots of times the need to communicate with the client about their inquiry and checking their artwork whether to fulfil PrintingLab’s format. It is time-consuming to manually to alter the client’s artwork files. Hence, the solution is to standardize the artwork submission process to speed up the file checking.

**R02:** To solve the issue where the client has no idea what they want on the design artwork and results in an increase in the chances of rejecting the artwork done by the designer. Thus, the solution would be to undergo analysis with the client to understand their preferences. By analyzing their preferences, the designer could create artwork based on it and hence reduce the chances of being rejected by them. Besides, the platform provides another option where the client could select and edit the template they like.

**R03:** To solve the issue where the client could not see the differential of a new brand. Thus, to add values to the client, PrintingLab is simplifying the artwork design process with two solutions which are lower down the rejection rate and provide the additional option of artwork design.

**R04 and R05:** To develop an online artwork template editor and matching system based on the client’s preferences to assign a suitable designer to them and finally evaluate the performance of the system to increase the efficiency of creating artwork.

## 4. METHODOLOGY

This study will apply the mixed method to answer how and why questions from the target audience more effectively. Survey and interview will occur during the data collection. The data is to be collected via the following methodology as summarized in Table 7.

**Table 5. Research questions**

RQ1: What are the preferences of the client to speed up the design process?
RQ2: What are the options that the client could select if they do not have ready artwork to print?
RQ3: How to reduce the communication time with the client and lower the operational cost?

**Table 6. Research Objective**

R01: To increase the revenue by standardizing the sales workflow.
R02: To increase the efficiency of the design process with preferences oriented designer and simple artwork editor.
R03: To enhance enterprise brand by providing simplify services
R04: To develop an online artwork template editor and matching system.
R05: To evaluate the performance of the online artwork template editor and matching system.

**Table 7. Research methodology (JosephNG et al., 2016c; 2016d; 2016e)**

Research Dimension	Explanatory Sequential Design
Research Methodology	Mixed Mode of Qualitative and Quantitative Reasoning
Research Methods	Survey and Interview

Based on Table 7, the research dimension will be explained in the sequential design that will explain each step on data collection. Mixed-mode or mixed-method is applied by doing a random survey and interview as its primary data collection. To elaborate on the steps of data collection, the sequential design will illustrate as shown in Figure 5.

Surveying the quantitative data collection, the generalized information will be gathered. The survey will be done by randomly choose people at UCSI University. After the generalized explanatory analysis is identified, it will be followed with the qualitative data collection which is the interview. The interview will be done by questioning people who require artwork design shortly or past client. From the interview, the depth analysis and reasoning behind the quantitative research will be accumulated. Finally, all the information will be characterized and concluded together to meet one conclusion.

Preliminary data collection is conducted first beforehand to test if the questionnaires are understandable for the respondents. There are 5 respondents for the survey and 3 respondents for interview. Small changes in survey and interview questions are occurred due to there are some irrelevant answers from the respondents. In the actual data collection, there are 57 respondents for the survey and 7 people asked for an interview. For the survey, random people were selected around UCSI University to fill in the questionnaire.

## 5. RESULTS AND DISCUSSION

According to out of the research have been found, there are different concerns when a person wants to hire a designer to get their name card design done. Figure 6 summarizes the responses.

As illustrated in Figure 6, most respondents are concerns about the cost of hiring a designer (73%), followed by the artwork type they might interest (56%), portfolio (40%), then the delivery time (38%).

Based on the interview resulted, 71.4% of respondents agreed on the new element to concern which is the quality of the name card before consider to hire a designer. Based on the conversation,

**Figure 5. Sequential Design (Joseph et al., 2013; 2014; Joseph et al., 2015; Joseph Ng et al., 2016; JosephNg et al., 2016b; JosephNg, 2018; JosephNg et al., 2019)**

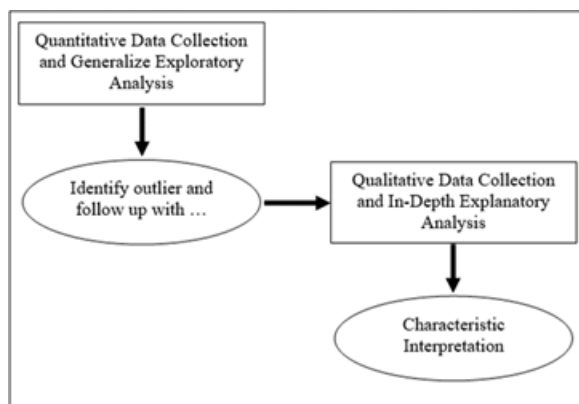
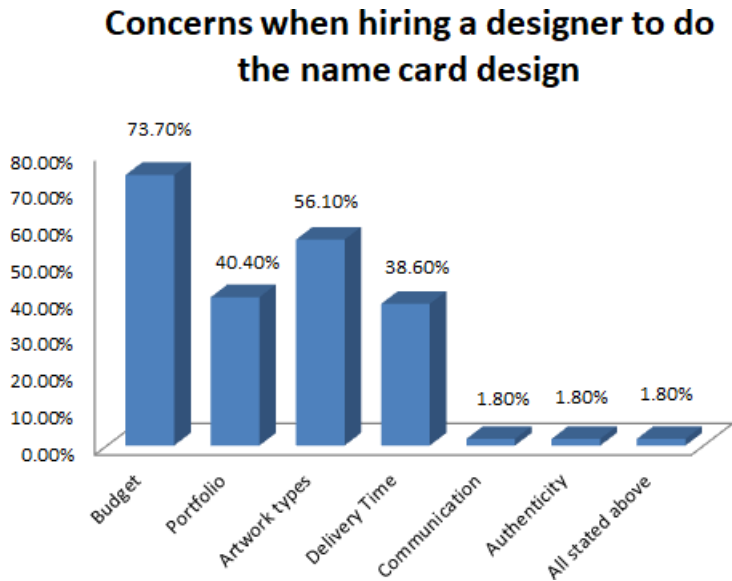


Figure 6. Concerns when hiring a designer to do the name card design



they will consider the quality of the name card first when the designer from the printing services has the option to design and print straight away.

Figure 7 summarizes the responses from the survey regarding the comprehension of its design idea.

Based on survey results, 58% of respondents are agreed that they have a clear idea in mind when hiring a designer and just want someone to execute their idea. However, there are 42.9% of respondents from the survey agreed that they have difficulty expressing their idea to the designer. This will increase the possibility of rejection from the client towards the designer's artworks as shown in Figure 8.

On the other hand, 47% of respondents from the survey agreed that they will find an online name card template and request to change it based on their requirement as shown in Figure 9. Here shows the potential of the name card template design as a guideline or alternative way to communicate with

Figure 7. Comprehension of own design idea

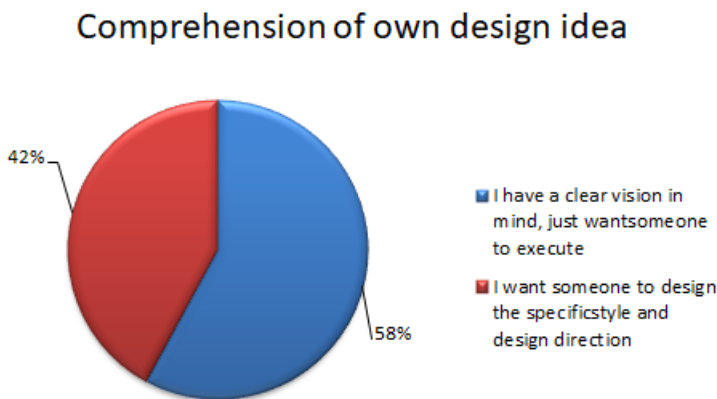


Figure 8. Difficulty to express ideas to the designers

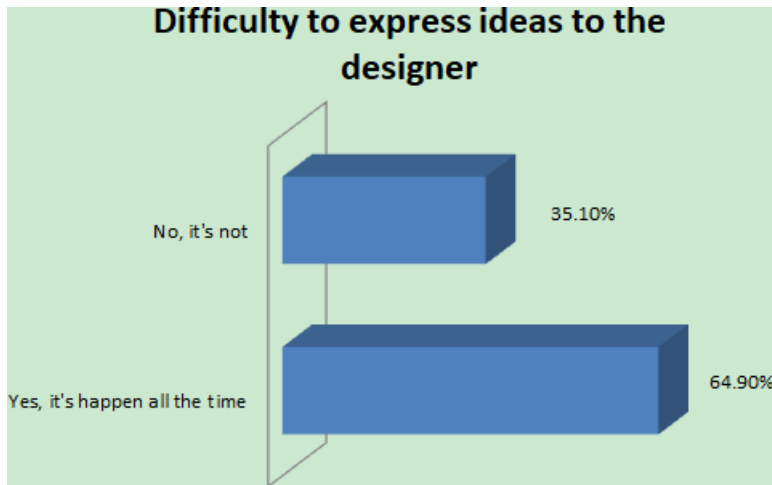
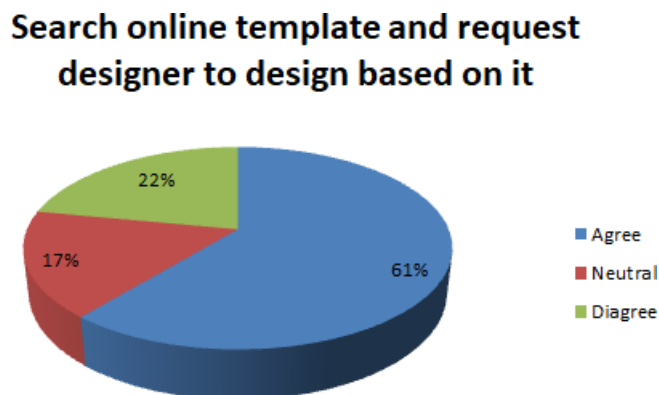


Figure 9. Search online template and request designer to design based on it



the designer. Likewise, it shows the online template as another option they could select if they do not have ready artwork to print the name card.

All the interviewees have different backgrounds, working experiences, education standard and business sectors. Based on the interview's result, some of them have different requirement on the name card design; they would have different actions based on it. For instance, there are options where some respondents would rather design their own, and some of it would hire the designer to do the job for them.

However, the differences in the background lead them to have a different perspective on the need for name card design. In the hire designer analysis, they would consider the cost, the creative design and duration the name card delivered to them. Thus, in the prototype system, the three points stated must be considered.

In the self-design analysis, some of the respondents would consider designing the name card themselves. This action happens probably due to budget constraint, and they do have the design knowledge to explore the name card part themselves. Thus, in fulfilling their needs, and online template editor would meet this requirement.

In the last part of the interview, the majority of the respondents agreed that machine learning could be a good thing to help the designer to know more about the client. This action could reduce the chances of clients reject the designer's drafts as the system helps to analyzed client's preferences. The designer could follow the suggested preferences and increase customer satisfaction.

## 6. PROJECT SOLUTION

This research focused to understand the needs of the client toward name card printing services. After that, a designer matching platform and name card template editor was developed. The platform used machine learning to analyse the client's preferences and suggest the designer based on their preferences. At the same time, the client has an option to design own name card artwork with the online template editor.

*Figure 10* shows some of the name card designs with different name card features. The features include name card styles, layout and typography. When client swiping left and right on name card design, machine learning would start to analyses the possibility of client liking on a specific feature. *Figure 11* shows the suggested name card design style based on the user's preferences and suggested the designer with this design style. This fulfils the first objective of this study which increases the efficiency of the design process by analysing the client's preference.

Figure 10. Swipe left and right to analysis the user's preferences

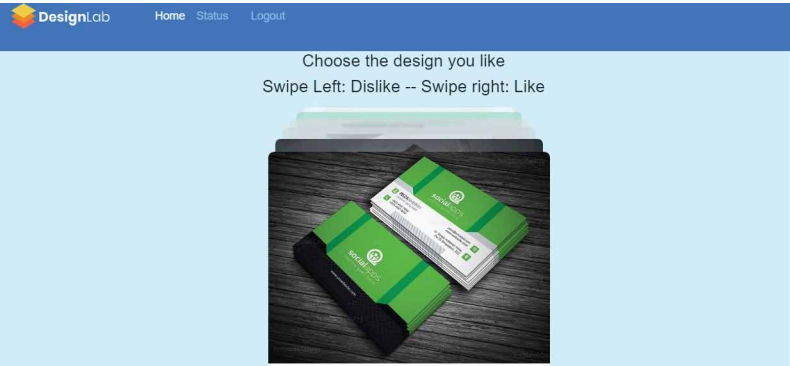


Figure 11. Suggested Design style based on user's preferences

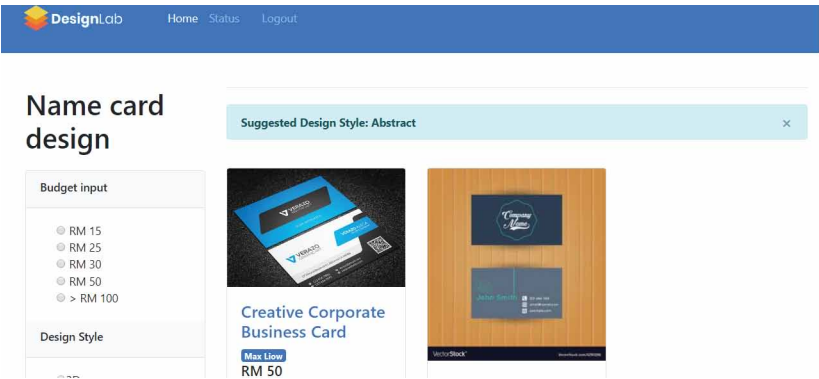


Figure 12 shows the name card online template editor for the client to design their own name card design. This gives an alternative option for the client who lacks of budget to hire a designer and willing to design their own name card. This fulfils the second objective of this study which increases the option for the user to choose a design template with the editor.

Figure 13 shows the two services in the platform, whether is searching for a designer or choose from a template. It shows the only two services where the user could select at this platform. At the same time, the name card artwork file is standardized through the cooperation with the designer and the standard size on the template editor. This helps to reduce the files error when submitting to the printing shop which fulfils the third objective of enhancing enterprise brand by providing simplify services.

The fourth and fifth of the objectives are to develop and evaluate the designer matching system and online template editor. Both of the objectives are achieved. The platform which took more than 3 months to develop and Table 8 shows the evaluation results of both systems.

## 7. CONCLUSION

In conclusion, there are two solutions for the user who intended custom made a name card when they do not have the name card design artwork. One is hiring a designer and another is to find an online name card template. However, there are concerns when hiring a designer and different users have a

Figure 12. Name card online template editor

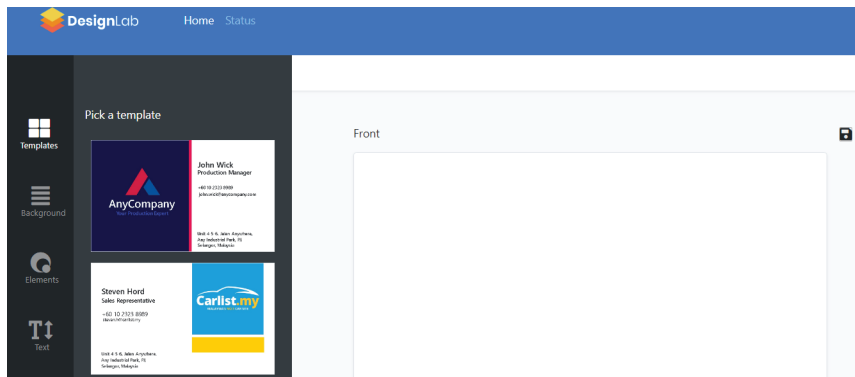


Figure 13. Simplified services in the platform

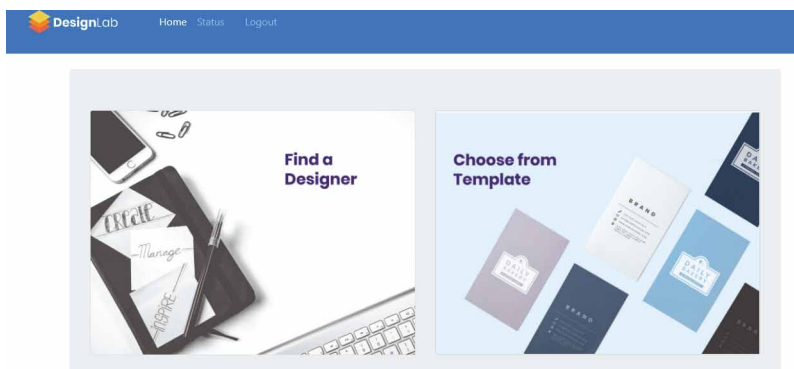


Table 8. Evaluation summary

	Find a Designer	Template Editor
Efficiency	4.29	4.29
Learning Curve	3.94	4.10
Practically	<ul style="list-style-type: none"> <li>- Add in progress checking</li> <li>- Zoom in option at the product details</li> </ul>	<ul style="list-style-type: none"> <li>- The object moves as other object being editing</li> <li>- Add in save or bookmark feature</li> </ul>
Satisfaction	4.00	4.00

different perspective on it. Some are on time and knowledge constraint who seeking for a talented designer that can truly understand what they want and some are on a budget constraint, hoping to solve the design artwork in a low-cost method but with different preferences on the design. There is a gap to fulfil the market's need.

In this paper, the aim is to provide a solution to match the designer design style with the client's preference to reduce the possibility of the designer's artwork being rejected. If the design process could be reduced, it would greatly increase the user experience of the user. Likewise, the development of a name card template editor would benefit the user who wants to design on their own and also give them the name card idea they would like. As this digital era, a platform system is needed on digital infrastructure. It refers to the results of individual yet interdependent systems evolving in relation to each other (Fürstenau, D. et al., 2019). By extension, digital infrastructure creates benefits to the economy and quality life of a modern nation.

This platform is not only restricted to only name card artwork designs, but there is also a huge potential to extend the application. It can be further derivative to other sectors such as video making, banner ads, menu design and any other requirements. As this would greatly better understand clients' need by analyzed their preference. Based on research, 70% of the world population have worked as a freelancer at least one (Thabassum, N. F., 2013). With the help of technology, lots of people could benefit from the platform and increase the growth of the economy.

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