

Developing an Interactive Augmented Reality to Promote the Products of Local Entrepreneurs

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Abstract—The implementation of Augmented Reality (AR) seems to be expanding gradually so that more retail business owners used this AR technology for marketing their online shopping as a tool to help the customers simply make their buying decision in the future and this research paper introduced an Interactive Augmented Reality model to promote the products of local entrepreneurs by creating their business cards for the customers to update the information and shop the products via their smartphones. Practically, the customer could immediately interact with their devices through the user engagement function. After that, there would be an evaluation on the local entrepreneurs' satisfaction to see if it was possible to connect them to new product design. Finally, all comments and problems were collected for further development.

Index Terms—augmented reality, shopping online, local entrepreneurs, innovation process

I. INTRODUCTION

Nowadays, the methods of retail business has been changed and many business owners are looking for more opportunities to sell their products online via websites or smartphones, as well as creating different ways of an e-payment to support more consumers that prefer an online shopping. In this regard, the survey indicated that more than 1 in 3 consumers are using a mobile phone for an online shopping [1]. Accordingly, business organizations are rushing to change their strategies to catch up with the consumer's behavior changes.

After the success of the One Village One Product (OVOP) in Japan in encouraging the local entrepreneurs, the Thai government has started the One Tambon One Product (OTOP) project to promote the local products into the Thai markets in all 7,255 Tambon (sub-district) and up until 2017, the total sale of the OTOP has surprisingly made 153,000 million Baht. Then, the government aims to make totally 200 – 300 million Baht a year [2]. Similarly, Maha Sarakham province is joining this project by promoting 268 types of 1-5 star OTOP products and 56 types of 5-star OTOP (premium) products. Furthermore, the interview with the local entrepreneurs indicated that they still could not meet their goal and this fact activated the researcher's interest in promoting the digital economics or marketing to present

the OTOP products of Maha Sarakham province as a new experience for the customers.

Augmented Reality (AR) technology is being popularly used since it has already been blended into an individual's daily life and it can be broadly implemented in different types of industries. On this matter, Digi Capital expects that the global investment in the AR market would be as high as 90,000 million dollars by 2020 and another highlight is that ASIA would be the leader in this market [1]. This strongly affirms a trend of this technology in the future that would be a key business tool to serve the customers. Accordingly, the retail business needs to seek a guide to an innovation development by engaging this AR technology to create photos, sounds, videos, 3D model or the interactive functions for the use's engagement. Besides, this AR is being popular amongst the retail business owners e.g. IKEA, one of the leading business using the AR technology to help the customers shop their furniture's and Amazon that recently started using the AR shopping, etc.

Due to the abovementioned features of AR technology, the retail business owners prefer using AR to expand their online shopping market and help the customers make decision to buy the products in the future. Moreover, this AR technology is helpful for both online and offline retailers and reduce possibility of product claiming due to the mistakes in size, color, appearance, or other damages on the products. Therefore, this technology recently becomes a good solution for the customers demanding to know the information and see the photos as well as a good opportunity for the OTOP manufacturers or entrepreneurs to put their products in the online market.

II. METHOD

The development of an Interactive Augmented Reality to Promote the Products of Local Entrepreneurs was based on the idea of UK Design Council [3] that proposed a design thinking called the Double Diamond Design Process (Fig. 1) consisting of Discovering, Defining, Developing, and Delivering that could be describe step by step as follows.

- Discovering is a step of seeking a problem that both designers and stakeholders agreed that it needs to be solved. In this regard, the researcher visited and interviewed the individual participants as well as observing and talking with the owners

and customers at the local shops to define a problem that could be solved and developed for an online shopping. However, one disadvantage of online shopping was that a customer could neither see nor touch the product before deciding to buy it and that product was eventually returned. Likewise, a report by Market Watch indicated that the value of the returned products around the world currently reaches 6.5 hundred thousand dollars per year while the United States is still a nation with the highest rate of product return reaching 2.2 hundred thousand dollars. Besides, a website of Business 2 Community [1] found that 30% of the online products were returned whereas only 8.9% of the products sold at the shops were returned.

- Defining is a step of profoundly understanding and interpreting the problem as well as planning a project. This is similar to the first step. Explicitly, a survey by Retail Perceptions on the user's interactions affirmed that 61% of the customers preferred shopping at the shops with AR devices rather than the non-AR shops. In the same vein, 71% of the customers revealed that often buy the products from the retailers with AR devices in order to gain a new shopping experience.
- Developing is the use of creativity and different perspectives to gain more ideas to construct clear insight for product development. These ideas should be tested.
- Delivering is a step of product giving to test and see the feedback from the participants. Then, this innovation will be finally introduced to the market or practically implemented.

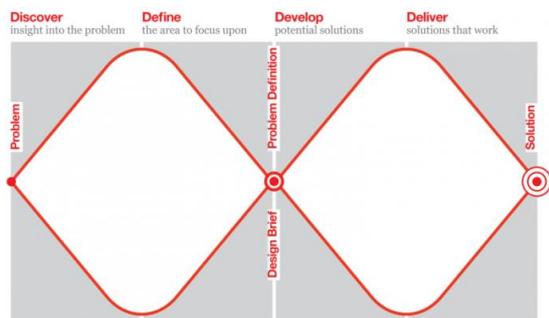


Figure 1. Double diamond design process [3]

III. STUDY RESULT

Based on the individual interview with 26 OTOP manufacturers or entrepreneurs (by purposive sampling) including 8 males and 18 females, it was found that 76.92% of their products could not hit the goal. More details were described in the Table I below.

TABLE I. INDIVIDUAL INTERVIEW WITH OTOP ENTREPRENEURS

Questions	I do (%)	I don't (%)
Have you ever sold your own products at the other places?	76.92	23.08

Do you know how to use the internet to promote your products?	84.62	15.38
Have you ever sold your own products abroad?	11.54	88.46
Do you want to do an online marketing?	92.31	7.69
Do you want to sell your products online?	76.92	23.08

The individual interview with the OTOP manufacturers or entrepreneurs indicated that 92.31% of the informants wanted to do an online marketing and 76.92% of them wanted to sell their products online (Fig. 2).



Figure 2. Samples of hand-made products from local entrepreneurs or One Tambon One Product (OTOP)

According to the study for better understanding and interpretation, 84.62% of the OTOP manufacturers or entrepreneurs know how to use the internet to promote their products but still lacked knowledge and skill for an online marketing so the researcher suggested that using the AR technology would help creating an online shopping to support the customers in their future buying decision because they typically look for the information and photos of products.

Table II shows the results of the survey using Likert scales to determine the motivational factors for purchasing OTOP products from 40 consumers (by purposive sampling). To analyze the reasons and factors that makes the purchase. This is and will be a future preparation for entrepreneurs and researchers for further design.

TABLE II. MOTIVATION TO PURCHASE OTOP PRODUCTS OF CONSUMERS

Questions	\bar{X}	Interpretation
Product		
Quality OTOP products meet the needs of consumers	4.70	Very Good
The brand is reliable and universal	4.35	Good
Products are developed with the product model	4.01	Good
The product is innovative and modern	4.48	Good
The product is local wisdom and Thai Conservation	4.10	Good
Product packaging indicates the identity of the product	4.35	Good
Price		
The price is right for the quality of the product	4.87	Very Good
Multiple price levels	4.50	Very Good
Display price tag clearly in 2 languages (Thai, English)	4.25	Good
Easily check prices through the website	4.58	Very Good
Product discounts are available	4.64	Very Good
Fair price does not take advantage of consumers	4.33	Good
Place		
Convenience stores	3.97	Moderate

Backed by government agencies to provide distribution channels	3.98	Moderate
Placement of Consumer Motivation	4.14	Good
Comprehensive distribution channels	4.52	Very Good
Distributed through agents	3.80	Moderate
Promotion		
Advertising through the media regularly	4.45	Good
Promotional Event (Reduced Giveaway)	4.79	Very Good
Can be paid in many ways such as cash, credit card	4.25	Good
Product information is disseminated	4.46	Good
Delivery Service	4.24	Good
Easily find information on the Internet	4.66	Good
Average	4.36	Good

From Table II, questions asked by consumers, the researcher used the 4Ps questioning approach, which has the following results. Based on the average analysis, it was found that Consumers have a high level of overall opinion. However, there are some interesting issues at the highest level, Quality OTOP products meet the needs of consumers, the price is right for the quality of the product, multiple price levels; easily check prices through the website, Product discounts are available, Comprehensive distribution channels and Promotional Event (Reduced Giveaway) and The average consumer opinion was as follows; Convenience stores, Backed by government agencies to provide distribution channels and Distributed through agents. It is found that the place of sale is a factor that consumers generally have a moderate level of opinion. It shows that OTOP product has price factor in product and promotion its use in advertising shopping experiences has recently been embraced by advertisers due to its novelty and engaging potential [4].

Developing an Interactive Augmented Reality Model Based on the data searching, there were 268 types of 1-5 stars OTOP products mentioned in this study. At this phase, the researcher developed the interactive augmented reality for 56 types of the 5-star (premium) products including 1) 6 dishes of local foods; 2) 49 pieces of clothing and costumes; and 3) 1 kind of local herbs. Then the product data was collected including price, all products, shop information, personal information, and sample photos of the products. The researcher purposively developed the interactive augmented reality using Zappar Application (<https://zap.works>) with 3 instruments for effective content creation including Widgets, Designer, and Studio in order to help the user gain the experience from the AR features e.g. images, VDO, sound, 3D interactive and contact, etc. Additionally, the local entrepreneur's business cards was designed and offered to the customers so they could see the update information and select the product via the Interactive Augmented Reality for promoting the Products of Local Entrepreneurs or OTOP

This was the phase of product delivering for practical implementation, seeing the participant's feedback, and introducing an innovation to the market or practical implementation. The researcher also designed the local entrepreneur's business cards with zipcode for the customers to scan to check up the updates and shop the products online. This was initially tried out with a small sample group of 5 people by explaining them about the

AR features before allowing them to try it. Practically, this AR features was not complicate and easy for use and a user could start with downloading a zappar application for free your app store, scan a zapcode aiming at a business cards, and finally watch it come to life (See Fig. 3).



Figure 3. The screen of a mobile phone with the interactive augmented reality for the products of local entrepreneurs promotion

IV. DISCUSSION AND SUGGESTIONS

Thai government started the One Tambon One Product (OTOP) aiming to promote the products of the local entrepreneurs and it was resulted as a huge number of startup business owners while many local products have been broadly introduced to the public. To manage this project, several governmental organizations have been assigned to supervise the product rankings or the trademark for the OTOP to guarantee the product quality. The digital economics or marketing is also necessary. Accordingly, the researcher was interested in seeking a guideline for this new trend of business in order to offer the customers with a fantastic experience. Indeed, the use of Augmented Reality technology (AR) is broadly expanding so that more of retail business owners prefer using this AR technology to expand their market for online shopping to help their customers decide on buying the products in the future. Likewise, the survey on the OTOP manufacturers or entrepreneurs strongly affirmed they needed an online market and to sell their products online and most of them already know how to use the internet. Unfortunately, they still lacked knowledge and skill in doing online marketing and using a strategy to approach the buyers. However, from the survey found that, the place for the sale of goods is the factor of purchase; the purchase is moderate and price, product quality, and promotion at the high level, so, the promotion to the customer to create new experiences this is another interesting way for entrepreneurs, such as consumer behavior [5] who prefer to buy online frequently were more likely to try Augmented Reality.

As mentioned before, the consumer's rational assessment of a product's quality, which leads to product purchase, has been complemented with the effects of the shopping environment on hedonic aspects of experience and consumer behavior, the shopping experience involves

consumer processes and responses to the shopping environment, situation, and consumer characteristics [6]. And Augmented Reality (AR) has the potential to reshape the mobile shopping experience and create more meaningful consumer-brand relationships [7].

Therefore, this study was specifically looked for a guideline to get over those limits by developing the interactive augmented reality and the local entrepreneur's business cards for the customers to simply check the updated information and buy their desired online products. the traditional way of promoting and trading in physical retail stores has been challenged. To increase sales, retailers have spent an enormous amount of resources to maintain the attractions of traditional physical store in a digital shopping behavior dominated world [8].

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REFERENCES

- [1] K. Denwitthan. (September 25, 2017). Opens an augmented reality shopping experience. [Online]. Available: <https://www.pwc.com/th/en/pwc-thailand-blogs/blog-20161222.html>
- [2] W. Supoj, "Villages go all out to charm tourists," Bangkok Post, May 15, 2018.
- [3] Design Council. (September 25, 2017). Double diamond design process. [Online]. Available: <http://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond>
- [4] J. Stoyanova, R. Gonçaves, A. Coelho, and P. Brito, "Real-time augmented reality shopping platform for studying consumer cognitive experiences," in *Proc. 2nd Experiment@ International Conference*, 2013, pp. 194-195.
- [5] S. Chakraborty and D. Gupta, "A study of the factors impacting the adoption of augmented reality in online purchases in India," in *Proc. 2nd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology*, 2017, pp. 1526-1529.
- [6] K. Kapusy and E. Lógó "Values derived from virtual reality shopping experience among generation Z," in *Proc. 8th IEEE International Conference on Cognitive Info Communications*, 2017, pp. 237- 242.
- [7] J. Scholz and K. Duffy, "We ARE at home: How augmented reality reshapes mobile marketing and consumer-brand relationships," *Journal of Retailing and Consumer Services*, vol. 44, pp. 11-23, 2018.
- [8] J. Li, J. Liu, and S. J. Wang, "In-store shopping experience enhancement: Designing a physical object-recognition interactive renderer," *Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering*, vol. 229, pp. 105-115, 2018.



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