

Metaverse; Virtual World Challenges and Opportunities for Digital Business

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Abstract—Metaverse makes it more connected, transcending the constraints of the real world, doing more activities together. Metaverses are used to generate monetization benefits through activities, trade trades, exchange goods and services, or use them to connect them with others, possibly by collaborating. Learn important points, communicate, exchange and express yourself in ideas. This article would like to present new way of immersive customer experience. The aims of this research were (1) to synthesize and develop the business model canvas of Metaverse; virtual world for digital business (2) to evaluate the business model canvas of Metaverse; virtual world for digital business and (3) to study the results of implementing the model. The research process was therefore divided into 3 parts. The evaluation of the developed model was carried out by 7 experts in related fields and the implementation of the model was carried out by a sample of 48 user.

Index Terms—Metaverse, digital business, multi-technology, business model canvas.

I. INTRODUCTION

A McKinsey survey found that gaming metaverse searches increased by 4,500% from 24 months [1]. Metaverse is an innovation that creates and integrates the real-world environment in which we live with the virtual world, becoming a “virtual world community” that can combine objects around us and environments into one. Based on AR (Augmented Reality) and VR (Virtual Reality) technology, it connects seamlessly into the same world space [2]. Metaverse uses decentralized technologies such as Blockchain, Cryptocurrency, and NFT (Non-Fungible Token), etc., allowing users to exchange products and services in Metaverse quickly and without having to go through intermediaries [3]. Metaverse uses decentralized technologies such as Blockchain, Cryptocurrency and NFT (non-fungal tokens), etc., allowing users to quickly exchange products and services in Metaverse and without having to go through intermediaries [4]. Tax policy and intellectual asset protection are another factor that encourages any innovation to happen in the country. In this Decentralized world, entrepreneurs Investors and workers, especially with digital and creative lines. You can choose which country to do business in. Whereas the person can be in any country [3].

II. LITERATURE REVIEW

A. Metaverse

Metaverse is a virtual space created by the collaboration of

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VR (Virtual Reality) and AR (Augmented Reality) under intermediaries like 5G [5], creating a real-world and virtual world combination in real-time. This allows you to interact with each other in the digital world. Without physical limitations [6]. Metaverse is like a 3D internet connection that may have more than just 3D glasses used to view ordinary virtual reality, but it also offers a new digital world where users can create Avatar identities to do activities in the virtual world [7]. Developing **fast-paced 5G Internet** networks to use them in real time, fast and uninterrupted.

Spatial.io is platform of helping creators and brands for own spaces in metaverse virtual space [8]. Entrepreneurs can be used is platform for sell on your business (Fig. 1).



Fig. 1. Virtual Space (Create by author).
<https://app.spatial.io/rooms/61aef632c9bee60001433d74>

B. Key Characteristics of Metaverses

The consist of Metaverses **1) Always active** ; even if you give up entering the virtual world, but things in the virtual world continue to move and continue, **2) Exists in real time** ; Metaverse has Timeline moments that coordinate real-world moments, **3) Players have individual agency**; People who enter the Metaverse world do not need to interact or do activities together, but can share the virtual world together, **4) Self-contained and Fully Functioning universe**; Metaverse is a virtual world where users choose to create things owned, traded or invested, as well as doing real-world activities such as investing in technology blockchain to own digital property, **5) Mix platforms**; Apply items from one game to another, **6) User-generated content**; Users can create content in the form of User-Generated Content so that others can participate in comments and activities.

C. Metaverse for Digital Business

1) For matching the lifestyle habits of the new normal era

New Normal has become a lifestyle we're used to. Ordering online, meeting on screen, or even Work From Home is a change that everyone faces and even through this crisis. But new normal lifestyle habits remain [9], [10].

2) Reduce physical restrictions on business

Metaverse reduces such restrictions without worrying about location, consumer location or construction period,

because in the virtual world, just having resources and knowledge to use is easy to increase business opportunities [9], [10].

3) *New dimensions of payment system with Smart Contract*

Today, payments through ‘cryptocurrencies’ are soon becoming part of the business world. The main advantage of cryptocurrencies is that they can easily contract through smart contracts located on blockchain and reduce currency restrictions on trading. It eliminates different currency problems and gives people around the world the opportunity to use the same currency [9], [10].

4) *Add promotion channels with Game Marketing*

The development of technology and the Internet today This gives everyone access to the game in any area around the world and makes Game Marketing another popular brand promotion channel [9], [10].

5) *Creating a unique immersive customer experience*

Immersive experiences are caused by multiple yard interactions from individuals who provide services to service providers towards the management, system, or area of the brand. The brand designs creative experiences, stimulating feelings of doubt, freedom, and happiness between customers and employees that lead to emotional connections [11], [12].

D. *Augmented Reality (AR)*

3D Object Simulation Technology Apply virtual objects to the real world by using visualization devices such as glasses, monitors, smartphone monitors. Combining real environments with virtual objects at the same time, virtual objects can be visual, video, audio, information processed from computers, smart mobile, tablets, or small wearables

and make them possible to respond to the simulator [6], [13]-[16].

E. *Virtual Reality (VR)*

Technology replicates a place into a virtual world (separate from the real world). Users can interact with the simulation location through keyboard equipment, mouse, gloves, shoes. It simulates a real environment into virtual reality. Through the perception of vision, sound, touch, even smell, it cuts us off from the current environment to access simulated images, for example, google street view location simulations [13], [15]-[17].

F. *Mixed Reality (MR)*

Mixed Reality brings together reality and digital elements, so we can interact with things and environments in the real world and virtually using touch technology and creating a new era of images. Even when interacting with virtual environments with our own hands without removing our glasses. This technology allows one foot (or hand) to be placed in the real world and placed on the other in the virtual world [15]-[18].

G. *Extended Reality (XR)*

Extended Reality or XR is a virtual reality technology that combines a wide range of dimensions, whether it's a real-world environment. Digital environments, including human-machine interactions arising from computer or wearable technology [15]. Reality technology is currently commonly used in practice for the sector and education, as it can reduce the costs and risks that can arise in training. Specifically, skill training with expensive or dangerous equipment in action [19], [20].

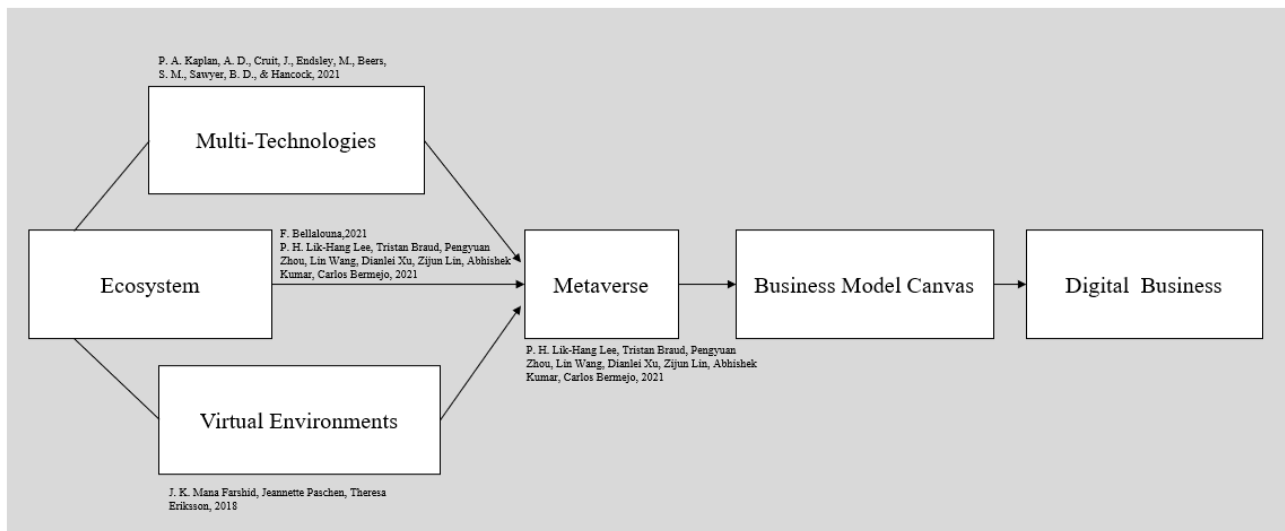


Fig. 2. Research Framework.

H. *Business Model Canvas*

It is a tool for helping design basic business models. Make details visible of the whole business, the strength, the weaknesses. Advantages and disadvantages the main activities of the business, or even who partners, and customers are, help to see the business that goes in the same direction. As a result of business model canvas, the team can easily and quickly strengthen their strengths and adjust weaknesses as well as adjust their business marketing

strategies [21]-[23]. Elements of Business Model Canvas as follow; 1) Customer Segments (CS), is the target group of customers who will offer a service or product. Customer segmentation must be clear, 2) Value Propositions (VP) is the Value to be delivered to customers, 3) Channels (CH) is channels to reach customers which brands can use as a space to communicate, present products and connect with customers, 4) Customer Relationships (CR) is relationships with customers Either regular customers or regular customers, 5) Revenue Streams (RS) is the main income of the business,

6) Key Resources (KR) is the Business Core Resources in business, sales of products, member ,lending or renting goods and services, 7) Key Activities is Main activities that help drive business. It should focus on creating value for customer. access to customer groups Maintaining good relationships and generating income, 8) Key Partners (KP) is our partners or partners in running a business and 9) Cost Structure (CS) is total cost of business in terms of production costs to help in the matter of cost reduction various expenses.

I. Multi Technologies

Technology has a systematic interaction in scope and collaboration connected under the same environment [24]. The factors related digital business consist of multi technology includes of ; Artificial Intelligence, Blockchain Cryptocurrencies, Computer Vision, Network (5G), Edge Computing, User Interactivity, IoT & Robotics, Augmented Reality, Virtual Reality, Mixed Reality, Extended Reality, Automation Human, ecosystem, virtue environments, Metaverse Platform, Business Model Canvas. [5], [13], [15]-[17], [21]-[23] Show the correlation of this research as shown in Fig. 2.

III. PURPOSE OF THE STUDY

The purpose of the study is 1) to synthesize and development of the model of Metaverse; virtual world for digital business 2) to evaluate the business model canvas of Metaverse; virtual world for digital business and 3) to study the results of implementing.

IV. METHODOLOGY

The research methodology designing Metaverse; virtual world for digital business were as follows;

A. Part 1: Synthesize and Development

This involved combining the complete a review of related literatures on the Metaverse; virtual world for digital business. (1) Sysnthesize documents and develop Metaverse model; virtual world for digital business and (2) Create conceptual framework of the model. Next step was to develop a model focused on Metaverse, virtual world for digital business, Multi-Technology, Ecosystem and Virtual Environments. (3) Assessment of suitability was analyzed using means (\bar{x}) and standard deviation (S.D.) in accordance with the following criteria: 1.00-1.80 mean lowest, 1.81-2.60 mean low, 2.61-3.40 mean medium, 3.41-4.20 mean high, and 4.21-5.00 mean highest (4) Develop the business model canvas of Metaverse; virtual world for digital business.

B. Part 2: Evaluation the Business Model Canvas

To evaluate the business model canvas of Metaverse; virtual world for digital business by 7 experts in related fields in digital business the suitability of the model using the questionnaire. The data were then used to calculate the means and standard deviation. The results were used to develop and improve the model which was then presented in the form of a diagram.

C. Part 3: Study the Results of Metaverse; Virtual World for Digital Business

To study the results model of Metaverse; virtual world for digital business applied and carried out by 48 undergraduate students in IS field. Evaluation was measured on a pass and failed. The activity was carried to the steps in applying the Metaverse; virtual world from spatial.io the first for develop and design step 1) to Create Virtual Landscape, 2) Create Avatar, 3) Create Content for Business (example ecommerce web sites, AR for more information by seller), 4) Create Security & Privacy and 5) Create Trust & Accountability. and reflecting and improving. The Metaverse; virtual world for digital business was then evaluated by their teacher or coach.

V. RESULT

A. Part 1: Synthesize and Development

The document synthesis in the factor of Metaverse; Virtual World and Multi-technology for Business, following show in Table I

TABLE I: SYNTHETIC THE METAVERSE; VIRTUAL WORLD FOR DIGITAL BUSINESS

Factors	Digital Business							
	[5]	[13]	[14]	[6]	[7]	[16]	[17]	[18]
Multi-Technologies								
Artificial Intelligence	✓	✓	✓	✓	✓	✓	✓	✓
Cryptocurrencies	✓	✓	✓	✓	✓	✓	✓	✓
Blockchain	✓	✓	✓	✓	✓	✓	✓	✓
Computer Vision	✓			✓	✓			✓
Network (5G)	✓	✓	✓	✓	✓		✓	✓
Edge Computing	✓					✓		
User Interactivity	✓	✓	✓		✓	✓	✓	✓
IoT & Robotics	✓							
Augmented Reality	✓	✓	✓	✓	✓	✓	✓	✓
Virtual Reality	✓	✓	✓	✓	✓	✓	✓	✓
Mixed Reality	✓	✓	✓	✓	✓	✓	✓	✓
Extended Reality	✓	✓	✓	✓	✓	✓	✓	✓
Automation Human	✓	✓		✓		✓		✓
Factors	Digital Business							
	[5]	[13]	[14]	[6]	[7]	[16]	[17]	[18]
Ecosystems								
Avatar	✓	✓	✓	✓	✓	✓	✓	✓
Content Creation	✓	✓	✓	✓	✓	✓	✓	✓
Virtual Economy	✓	✓	✓	✓	✓	✓	✓	✓
Social Acceptability	✓	✓	✓		✓	✓		✓
Security & Privacy	✓		✓	✓			✓	
Trust & Accountability	✓		✓	✓	✓	✓		✓
Virtual Environments								
Text	✓	✓	✓	✓	✓	✓	✓	✓
Image	✓	✓	✓	✓	✓	✓	✓	✓
VDO Game		✓	✓	✓	✓	✓	✓	✓
Camera	✓	✓	✓	✓	✓	✓	✓	✓
Smart Mobile	✓	✓	✓	✓	✓	✓	✓	✓
Personal Computer	✓	✓	✓	✓	✓	✓	✓	✓
Accessory	✓	✓	✓	✓	✓	✓	✓	✓

B. Part 2: Evaluation the Business Model Canvas

To evaluate the business model canvas of Metaverse; virtual world for digital business by 7 experts in related fields in digital business the suitability of the model using the questionnaire and found to be at the highest appropriate level, as shown in Table II.

TABLE II: RESULT OF EVALUATION THE BUSINESS MODEL CANVAS

9 Elements	(\bar{x})	S.D.	Suitability
1. Value Propositions	5.00	0.00	Highest
2. Customer Segment	4.71	0.49	Highest
3. Channels	4.86	0.38	Highest
4. Customer relationship	5.00	0.00	Highest
5. Revenue Streams	4.71	0.49	Highest
6. Key Resources	5.00	0.00	Highest
7. Key Activities	5.00	0.00	Highest
8. Key Partners	5.00	0.00	Highest
9. Cost Structure	5.00	0.00	Highest
Total	4.92	0.15	Highest

From the Table II, the suitability criteria are 1.00 - 1.80 mean lowest, 1.81 - 2.60 mean low, 2.61- 3.40 mean medium, 3.41 - 4.20 mean high, and 4.21- 5.00 mean highest. The separate suitability of each input factor for

Element 1: Value Propositions (\bar{x} =5.00, S.D.=0.00) consist of Connect with your customer B2C, Discover & Learn Experience Reach, Relevance, Immersive Customer Experience use multi-Technologies, personalized and social experiences social distribution payments.

Element 2: Customer Segment (\bar{x} =4.71, S.D.=0.49) consist of 15-45 years as primary are segmentation, Internet User, Developers and Advertisers and Marketers.

Element 3: Channels (\bar{x} =4.86, S.D.=0.38) consist of online

website, eCommerce, eMarketplace, social media, Mobile app and VDO Game.

Element 4: Customer relationship (\bar{x} =5.00, S.D.=0.00) consist of Maintaining seller relationship with seller zone service, Maintaining buyer relationship with promotion event 24 hours customer service, warranty of payment system.

Element 5: Revenue Streams (\bar{x} =4.71, S.D.=0.49) consist of Revenue from seller commission, Ad Revenues, Payment Revenues.

Element 6: Key Resources (\bar{x} =5.00, S.D.=0.00) consist of Multi-Technology, Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), Extended Reality (XR), Automation Human, Physical Assets.

Element 7: Key Activities (\bar{x} =5.00, S.D.=0.00) consist of Platform, Development, Data Center, Operations Mgmt, Marketing and Promotion Strategy and Customer Service.

Element 8: Key Partners (\bar{x} =5.00, S.D.=0.00) consist of Vender, Seller, Supplier, Media Partners, Delivery, Payment and Connection for reliance on distribution or public relations.

Element 9: Cost Structure (\bar{x} =5.00, S.D.=0.00) consist of Data Center Costs, General and Administrative, Marketing and Sale Cost, Research and Development and Employee Cost.

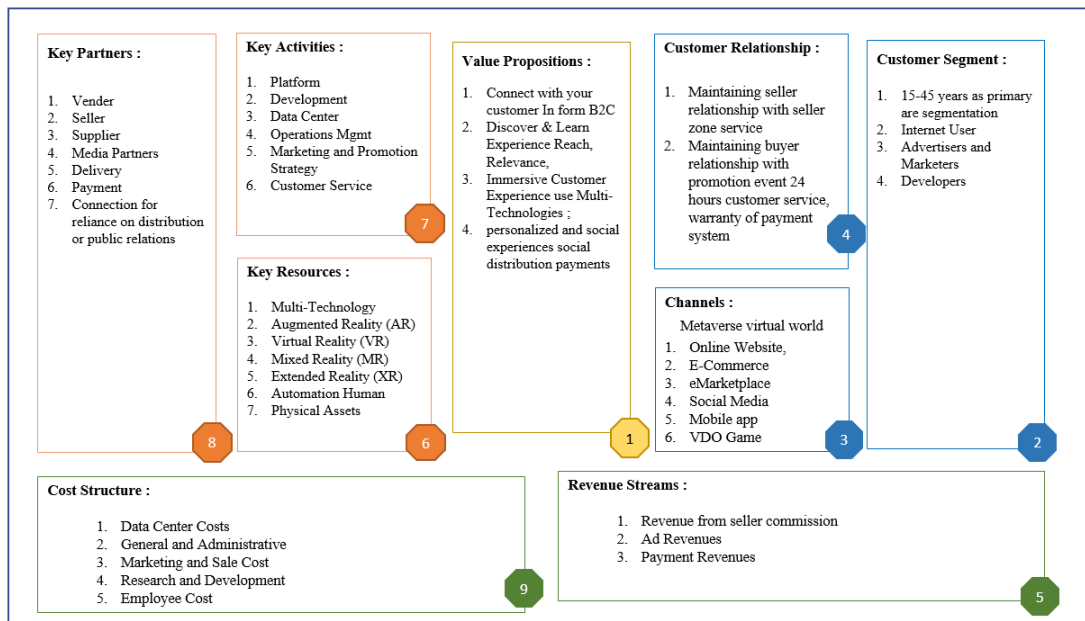


Fig. 3. Framework of Business Model Canvas for Business Online (by author).

Fig. 3 The Researcher Review of related literatures on the digital business and synthesize paper in field of business model canvas [5]-[18]. From elemental show detail information to present in Business model canvas and evaluate the business model canvas of Metaverse; virtual world for digital business by 7 experts with in-depth interview. Using a structured query and techniques of context Analysis for the result as an element in business model canvas the detail shows in result of Table II.

C. Part 3: Study the Results of Metaverse; Virtual World for Digital Business

From the Table III, carried out by 48 undergraduate students to create Metaverse; virtue world using Spatial.io. Evaluation was measured on a pass and failed and

implementation on a scoring rubric. The sample was able to successfully create Avatars 79.17%, Create Content Creation successfully 72.92%, Create Virtual Economy successfully 83.33%, Create Social Acceptability successfully 70.83%, Create Security & Privacy successfully 75% and Create Trust & Accountability successfully 79.17%.

TABLE III: RESULTS OF IMPLEMENTATION

Subject	Pass	Failed	Percent
Avatar	40	8	79.17
Content Creation	38	10	72.92
Virtual Economy	35	13	83.33
Social Acceptability	40	8	70.83
Security & Privacy	34	14	75.00
Trust & Accountability	36	12	79.17

(N=48)

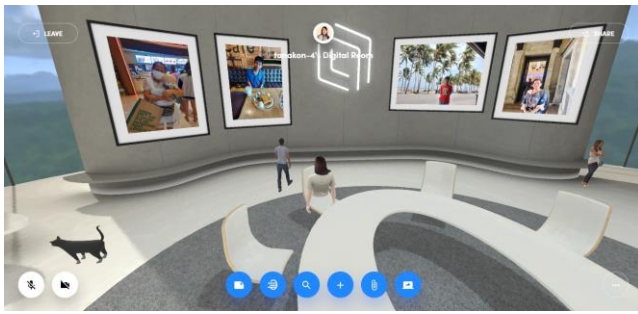


Fig. 4. Activity Create Metaverse, virtual world.

Fig. 4 show an example of works from sample group. For create metaverse, virtual world uses the spatial.io platform.

VI. DISCUSSION

Lik-Hang Lee, Tristan Braud, Pengyuan Zhou, Lin Wang, Dianlei Xu, Zijun Lin, Abhishek Kumar, Carlos Bermejo, Pan Hui [5] published research on the subject “All One Needs to Know about Metaverse: A Complete Survey on Technological Singularity, Virtual Ecosystem, and Research Agenda” They found that showed The Six Pillars of Metaverse Ecosystem. Huansheng Ning, Hang Wang, Yujia Lin, Wenxi Wang, Sahraoui Dhelim, Fadi Farha, Jianguo Ding, Mahmoud Daneshmand [25] Construction characteristics of Metaverse use Multi-technology, Social, Hyper Spatiotemporal on as a virtual world in conjunction with 5G and 6G future [25]. A new analytical framework was therefore derived from theoretical perspectives, and this represents a new direction for digital business in research. Research should now focus on the most important outcomes of digital business, creating an immersive customer experience affects business. such as Metaverse; virtual world challenges and opportunities for digital business, deep understanding According to customer's requirements create an exciting experience freedom to spend money at any time you want.

VII. CONCLUSIONS

Based on the results of the study, Metaverse; virtual world challenges and opportunities for digital business by using Business Model Canvas for business online. The results of the evaluation of experts in the digital business field. Total of 48 user is a test implement Metaverse; virtual world using Spatial.io. It is popular remote collaboration platform support technology 3D NFT AR VR interactive environment. Flexible multiple operating systems. Those who come to platform can buy products as if they came to the real place. Supports business or working many ways which users can design and develop their own stores according to the format to be consistent with the business model that can be done as well Nowadays, artists who have paintings bring their own paintings to sell more widely. In conjunction with NFT technology, the sale of paintings, images have various copyrights. Trading with Cryptocurrency Technology, MetaMask, Coinbase wallet. Metaverse; virtual world to improve the business online and immersive customer experience. in future it is necessary to constantly monitor or collect data and analyze results from customers who are in

Metaverse; virtual world, to analyze the purchase behavior. Usage Habits Data access behavior in the virtual world by tools and methods of virtual technology. They may develop systems that exchange information with digital platform from industry experts for digital business automation.

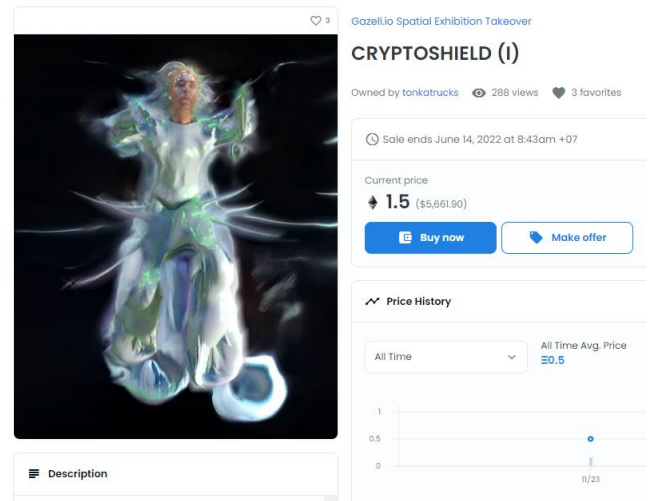


Fig. 5. OpenSea is the world's first and largest NFT marketplace. <https://opensea.io/>

Understand and prepare for this big change seriously. It may be a new important opportunity. to some businesses and it could be a serious crisis for some businesses as well if they can't adapt in time. Businesses have almost the same direction, which is to increase convenience for users. Create a virtual world and Ecosystem or various ecosystems to prepare for the world of Metaverse. It combines the real world with the virtual world by using technology. Develop into a virtual community through Mobile & Web Platform, Digital & Virtual Commerce, Chatbot, Interactive & Retail Innovation.

VIII. FUTURE WORKS

The future researchers are recommended to using immersive technology for Marketing Technology or Digital Marketing Automation for Active Campaign, Email Marketing Automation or Customer chat and NFT design for metaverse.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

T. Meepung conducted the research, analyzed the data, and wrote the paper; P. Kannikar the research consulting; all authors had approved the final version.

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