



Article

Augmented Reality Marketing in Malaysia—Future Scenarios

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Abstract: Augmented Reality (AR) marketing is a novel and creative way to market products and services. However, there are concerns about its marketing effectiveness as it is still immature to take over the place of traditional marketing method. Hence, this study was aimed to identify the issues and drivers of employing AR, in marketing, and to study the future trend of AR marketing in Malaysia. Foresight methodology tool, the Social, Technological, Environmental, Economic, Political, and Values (STEEP) method was used in identifying the issues and drivers of employing AR in marketing. Furthermore, an impact–uncertainty analysis was used to identify the top two drivers of the subject. The top two drivers identified were the “need for interrelation between the virtual and the real world” and “technological knowledge generation” with the highest statistical mean vote for impact and uncertainty, respectively. The development of scenario analysis was constructed in correspondence with the top two drivers which gave insights into the four alternative possibilities in the time horizon of 5 to 10 years. The drivers must coexist in order to generate potential scenarios for the development and sustainability of AR marketing in Malaysia.

Keywords: augmented reality (AR); STEEP; marketing; foresight

1. Introduction

Augmented Reality (AR) is the integration of computer-created objects, such as a picture or video overlay, in a real world image, through technological devices such as a smartphone, a desktop, and eye-glasses (Imbert et al. 2013; Lazim and Rahman 2015). It enables augmented stimulation by tracking the real-world objects or environment and registers the virtual contents onto them which provides the user with a stimulating experience and the ability to observe, in a distinct environment (Huang and Hsu Liu 2014; Ng et al. 2013). The AR technology allows the presence of the user in two different spectra, the real and the virtual world, at the same time. Another technology which shares almost the same domain with AR, is Virtual Reality (VR). It is an artificial, computer-generated simulation or recreation of a real life environment or situation. AR enhances experiences by adding virtual components such as digital images, graphics, or sensations, as a new layer of interaction with the real world. Contrastingly, VR creates its own reality that is completely computer-generated-and-driven (Virtual Reality vs. Augmented Reality 2015).

AR in marketing has many advantages as a newly emerging technology. First, it is conceivably cheaper than VR marketing, while adding a playful and enjoyable element to marketing (Huang and Hsu Liu 2014). It enables the marketers to provide specific, field information that meets the user’s individual needs. Additionally, AR is an effective tool to aid in brand-interactive, innovative marketing and in events which allow organisations to gain competitive advantages. AR, in marketing, gives the organisation an advantage in promoting their product and service, through an interactive experience of a real-world environment. It usually helps in making the user to be more interested in the product,

hence, increasing the chances of purchasing the service or product (Huang and Hsu Liu 2014). While it is good for the consumer's understanding of the product, it also helps organisations to receive feedback and evaluation of service or product easier. Furthermore, taking advantage of the growing usage of smartphones, organisations can provide a more aesthetic image of the product. While the cost of employing some AR technology is expensive, it can reduce the cost and time of product evaluation in marketing management process (Arbeláez-Estrada and Osorio-Gómez 2013). As AR uses a virtual object in the real world, it can increase the value of the visual presentation of the product, on the field of human vision, which increases the user's impression of the organisation's image (Buhalis and Foerste 2015; Zulkifli et al. 2016). Research has proven that AR marketing will give the customer a higher incentive and motivation to search and get to know the product better by visiting the organisation or the manufacturer website.

While AR is believed to be a perfect choice to support the objective of marketing being the modern way of advertising, which increases the consumer's value perception of the product (Zulkifli et al. 2016), it does have various disadvantages as a marketing tool. AR, in general, is not popular enough as compared to VR, with only 44% of people in Malaysia knowing of its existence, due to the lack of a knowledge report. Moreover, it is relatively high in cost, compared to traditional marketing. (Lazim and Rahman 2015). Issues on privacy and security are being brought upon as some AR uses location-based data, such as GPS, in order to identify the user location, for the application to activate (McPherson et al. 2015). AR marketing is dubbed as not mature enough to replace the power of two-dimensional advertising method as the retention of factual and technical information by the user is lower compared to the traditional marketing, even though AR marketing is able to capture the attention of the customer (Connolly et al. 2010). Furthermore, little research has been done on the social aspects of AR, which largely focuses on the technical aspect of the technology. While the role of AR in marketing lacks empiricism and is lacking in fulfilling a meaningful function, it is utilised for the sake of using the technology which induces more questions on the discipline of AR marketing.

Evidently, the application of AR technology in marketing has its advantages and disadvantages. This causes uncertainty in the future of AR marketing. However, business leaders believed in the need to digitalise their strategies, so as to compete in the globalised era and in the future. The advertisement, marketing, and devices that we have today will become too boring and bland in experience, in the future. Hence, AR is predicted to have a significant role in the future with a broad and potential implementation in marketing (Seeling 2015). Therefore, the main objective of this study was aimed at analysing the future trend of AR marketing by evaluating its issues and drivers in the marketing sector, in Malaysia.

2. Literature Review

AR became the centre of media attention with the release of Pokémon Go, a mobile game that uses AR, in more than hundred countries (Bradford 2017). Additionally, there exists a hype around the iPhone X that features AR technology, which according to Apple Inc., is the next big thing. AR and Pokémon Go had garnered both positive and negative reaction in a short time due to the healthy and harmful effects to the player, at the same time. Pokémon GO application can offer great possibilities for the development of spatial abilities, such as improving spatial orientation (Carbonell Carrera et al. 2018). The application not only encourages the players to walk but also distracts the player from the real-world, as has been proven by the many accidents and crimes, occurring after the launch of the game. Despite the criticism, it is undeniable that this application is the one that brought AR to the eyes of the world, by breaking five Guinness World Records (Swatman 2016) and breaking the record set by Apple Inc. (Cupertino, CA, USA) (Kelly 2016). Moreover, like the domino effect, a number of start-up companies have been receiving funding, amounting to millions, for their work on AR, while the big players of AR, such as Google, Disney, Samsung, and more, are reaping profits from their investments in and creation of AR (Anderson 2015). The market size has been forecasted to be USD 60.55 billion, through which AR would take over VR (USD 34.08 billion), in the year of 2023 (Market and Market 2016), while Asia is predicted to lead the market, in 2020 (Capital 2016).

Application of AR varies in terms of the usage and impact in various industries, such as military, medical, education, urban planning, etc. (Mekni and Lemieux 2014). AR had brought a major change in many industries, including that of marketing. It will affect the way the consumer views the brand and will change customer experience by helping them to decide on what to buy (Javornik 2016), with the ability to augment the consumer's reality surrounding, with new pictures, videos, or information. Traditional marketing tools, such as brochure and business cards are given a new flair with AR, by allowing simple marketing tools to have a greater impact on the consumer perception (Zulkifli et al. 2016). Applications with the AR element, enables the organisation to have a heavier brand impact on the consumer and increases the interaction between the brand and the consumer. Top brands, such as IKEA, McDonalds, and more are implementing AR in their advertisements and applications designed to increase the customer convenience. For example, the IKEA visualisation application allows the user to imagine how the furniture would look like in their house, hence, increasing the user interaction with the brand (Ridden 2013). Starbucks, on the other hand, had taken a different approach of using AR by celebrating Valentine's Day with 'Every love on Every Cup' which increased the purchase of Starbucks card (Wasserman 2012).

Malaysians are usually slow in adopting different technologies but they certainly cannot deny the relevance and benefit of technologies, such as AR, VR, and Artificial Intelligence (AI). Malaysia is slowly adapting the AR technology in gaming, tourism, retail, and more (Lazim and Rahman 2015). One of the biggest usages of AR in Malaysia is on the field of marketing and entertainment. International companies are exposing Malaysians to AR technology by applying their marketing strategy in the Malaysian branches. Furthermore, emerging Malaysia-based companies in AR-related fields, are multiplying each day. Malaysian companies are starting to market their service and product using AR, as well. Unfortunately, due to the slow uptake of the technology by the society of Malaysia (Wafa and Hashim 2016), establishment of AR in the field of marketing has been to a much lesser degree than in other industries, such as medical, military, and education. Malaysia can be left struggling economically if the industries are not ready to embrace The Fourth Industrial Revolution, which incorporated AR as a part of the nine pillars. Additionally, due to the adoption of VR that overshadowed the advantage of AR, the adoption of AR has been affected due to users not fully understanding the potential of AR, before indulging in VR. Hence, VR is much more well-established in the users' knowledge and perception, compared to AR, in Malaysia.

AR marketing enables the organisation to reach the consumer effectively and efficiently, while enlarging the market size. Furthermore, the steady growth of AR-adoption rate, among users in Malaysia, and the number of research work being conducted on AR, in marketing (Arbeláez-Estrada and Osorio-Gómez 2013; Wafa and Hashim 2016), has put AR in a higher status. The technology of marketing is changing in line with the consumer behaviour, such as the increase of smartphone users (Aluri 2017). Hence, marketing sectors in Malaysia must adapt to the change, as well, in order to not be left behind by the fast-paced trend aligned with The Industrial Revolution 4.0.

3. Methodology

3.1. Social, Technological, Environmental, Economic, Political, and Values (STEEPV)

STEEPV which is an acronym for Social, Technological, Environmental, Economic, Political and Values is an internationally-recognised tool for brainstorming, used in conducting Technology Foresight, worldwide (Minhas 2011). This method is also known by a number of different acronyms; PEST (Political, Economic, Social, Technological), STEP (Social, Technological, Economic, Political), PESTELV (Political, Economic, Social, Technological, Environmental, Legal, Values), and SEPTED (Social, Economic, Political, Technological, Ecology, Demographics) but generally they all follow a similar framework and identify similar issues. The STEEPV analysis is very useful as it offers a wide-ranging framework from which to identify the main drivers and build scenarios (Foresight: Methodology and Techniques 2010).

3.2. Brainstorming

Panels representing stakeholders closely related to AR marketing from academia, industry, research, and development organisations, in private and government sectors, were approached periodically during a period of about nine months. The stakeholders were identified through their e-portfolio and face-to-face meetings, in their respective organisations. The number of stakeholders that participated in this research were twenty-two, including F&N, IKEA, and PepsiCo. The panel assessed the current situation and identified key opportunities for Malaysia, in the existing scenario. The standard method of STEEPV, was used by panel members for the brainstorming sessions, to identify a number of issues and drivers, policy recommendations, future viable projects, and key areas of technological intervention. Various suggestions were recorded and very positive comments were observed, during this session. The key issues or drivers are shown in Appendix A.

3.3. Voting Based on Importance

After having a very productive brainstorming session, most of the issues or drivers merged due to their similar content. Each stakeholder was asked to vote the merged issues or drivers which were believed to be most important in shaping the pattern of development, for the topic at hand. At this stage, the statistical means for the most voted issues or drivers were recorded. Based on the statistical mean and the stakeholders' point of view, a consensus was reached in selecting the most important or voted issues or drivers, for further analysis.

3.4. Impact and Uncertainty Analysis

"Impact" in this circumstance means, the degree of effect each issue or driver has, in shaping the future of AR marketing. Whereas, "uncertainty" means that incomplete and ambiguous information about each of the issues or drivers could evolve, in the future, as relevant to AR marketing. Once the most important issues and drivers were selected, the impact–uncertainty process began. The stakeholders were given a task to vote again on the selected issues and drivers, based on the impact and uncertainty. The statistical mean of the votes, for each issues or drivers, were recorded. These statistical means of impact and uncertainty would play the role of the Cartesian coordinate and, therefore, each issue or driver were plotted or arranged, accordingly, on a Cartesian plane. This arrangement led to the process of selecting the top two issues or drivers with a high impact and uncertainty.

3.5. Development of Scenarios

The top two issues or drivers from the impact–uncertainty analysis, which significantly affect the AR marketing, were analysed for the scenario development. Four different alternative scenarios were generated, reflecting the future consequences of the events and the trends of AR marketing, regardless of a favourable or an unfavourable outcome. These scenarios gave an insight to the four possibilities that can occur in a time horizon of 5 to 10 years, i.e., 2023–2028. In the case of possible negative consequences, a strategic management system would be planned or structured to contain and treat the negative effect. A strategic management system would be planned by incorporating the full-advantage of the positive effect, in the case of the positive consequences. Based on the strategic planning method, recommendations were proposed for the sustainability of AR marketing, in the future.

4. Results

4.1. Statistical Means of Importance for the Merged Issues or Drivers

The stakeholders had merged the issues and drivers in Appendix A into thirteen issues or drivers, due to similar content. These issues and drivers were voted by the stakeholders, based on their importance in shaping the future trend of AR marketing, in Malaysia. Table 1 shows the thirteen merged issues or drivers, with their corresponding mean vote.

Table 1. Mean vote of the merged issues or drivers on the level of importance.

Issues or Drivers	Mean Vote
1. Government policy on digitising	4.4091
2. Microelectronics advancement	3.4545
3. Digitalisation era	3.8636
4. Market demand	3.9091
5. Awareness in adoption of AR	4.1364
6. Development of alternative marketing strategies	4.1818
7. Experience Economy phenomenon	4.1818
8. Commercialisation of augmented reality	4.1818
9. Investment in the application of AR	4.1364
10. Technological Knowledge Generation	4.2273
11. Modernisation lifestyle	4.3182
12. Industrial Revolution	4.0000
13. Need for the interrelation between the virtual and real world	4.4091

The stakeholders achieved a consensus on the identification of the top seven issues or drivers, based on their mean vote value for AR marketing in Malaysia, derived from Table 1. The top seven issues and drivers are shown in Table 2.

Table 2. Top issues or drivers for AR marketing in Malaysia.

Issues or Drivers	Mean Vote
1. Government policy on digitising	4.4091
2. Need for the interrelation between the virtual and real world	4.4091
3. Modernisation lifestyle	4.3182
4. Technological Knowledge Generation	4.2273
5. Development of alternative marketing strategies	4.1818
6. Experience Economy phenomenon	4.1818
7. Commercialisation of augmented reality	4.1818

4.2. Statistical Means of Impact and Uncertainty for the Top Issues and Drivers

The stakeholders voted again by focusing on the top seven issues or drivers, selected in Table 2, based on their impact and uncertainty, relevant to AR marketing in Malaysia. Table 3 shows the mean vote of impact and uncertainty for the top issues or drivers.

Table 3. Mean vote of impact and uncertainty for the top issues or drivers.

Issues or Drivers		Mean Vote	
		Impact	Uncertainty
D1	Government policy on digitising	4.1818	3.3636
D2	Need for the interrelation between the virtual and real world	4.3636	3.6364
D3	Modernisation lifestyle	4.2727	3.6818
D4	Technological Knowledge Generation	4.2273	3.9091
D5	Development of alternative marketing strategies	4.2727	3.3636
D6	Experience Economy phenomenon	4.2273	3.6364
D7	Commercialisation of augmented reality	4.1364	3.1818

4.3. Selection of the Top Two Issues or Drivers

The data in Table 3 were used to generate the impact–uncertainty analysis to find the issues or drivers with the highest significant outcomes on impact and uncertainty, in terms of future prospects. The results from this analysis is presented in Figure 1.

The decision of the top two issues or drivers, with a high impact and uncertainty, was made. D2 and D4 were selected as D2 had with the highest level of impact while D4 had with the highest

level of uncertainty. D2 and D4 represented the “need for the interrelation between the virtual and the real-world” and “technological knowledge generation”, respectively. These two issues or drivers were used to generate the scenario-building analysis.

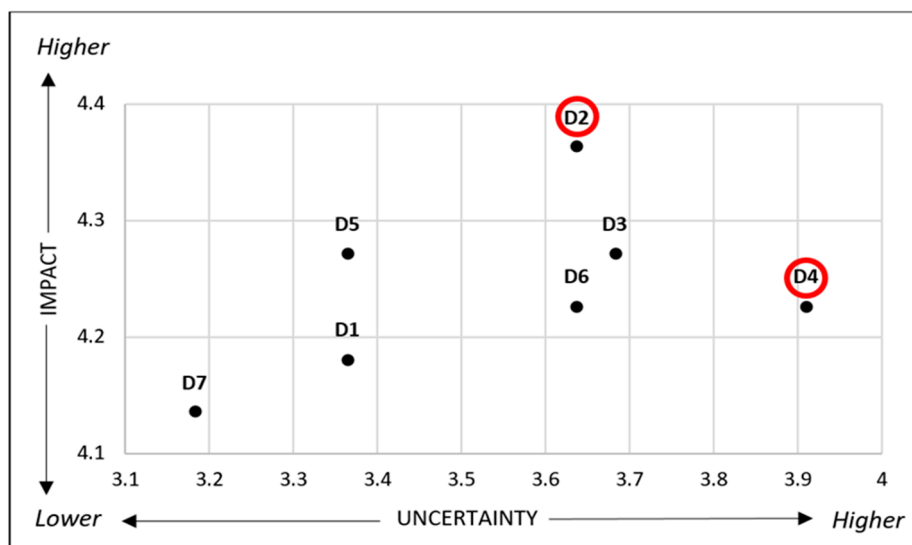


Figure 1. Impact—Uncertainty analysis.

4.4. Impact of Issue or Driver

The “need for the interrelation between the virtual and the real-world” was the most impactful issue or driver, from the perspective of the panels, as AR was the best choice for this interrelation, as users are able to get in touch with the virtual world, without losing a grasp on reality. The impact is related to the consumers’ motivation in AR marketing. According to the Maslow’s Hierarchy of Needs, human behaviour and their decisions are based on the needs of physiology, safety, social needs, self-esteem, and self-actualisation. While different people have different needs, it directly relates to the demands for AR marketing, in Malaysia. In the view of the economist, demand or the need for AR marketing will naturally increase the supply of AR marketing. In other words, realising the needs for AR marketing, be it for social or self-esteem (Kwik and Bahana 2015), would definitely cause a rise in the supply. The society’s needs and wants would dominate the market view of AR marketing where it would only prosper with the support of the public. This clearly indicates that the need for interrelations between the virtual and the real world plays a significant role in the industrial AR marketing in Malaysia.

4.5. Uncertainty of the Issue or Driver

The panels have perceived “technological knowledge generation” as the most uncertain and unpredictable issue or driver, in the future development of AR marketing. The technological knowledge generation is equipped with knowledge management, knowledge economy, knowledge production, and more, on which intellectuals have a more prominent effect, in the industry, compared to that of labour. While technology has been a part of the world’s evolution, the extent to which the society is moving towards technological knowledge generation, compared to the old industrial age, is still vague. The existence of a technological knowledge generation would be much beneficial for the high-tech industrial sector. Research and development departments in the workplace would be the best platform to nurture technological knowledge generation by focusing on the effort of exploitation of the existing technology and resources. The emergence of a technological knowledge generation is important, however, uncertain it is, as it is related to the willingness of the enablers to increase their knowledge and motivation, to develop the technology further.

5. Scenario Development

Future trends of AR marketing act as the pushing force for the future development and how it would change and shape the future environment of AR marketing. It is achieved by generating scenarios in four different alternatives, based on the top two drivers selected from the impact–uncertainty analysis. The four possible scenarios have been illustrated in Figure 2. There was an emergence of a new normalisation, a stagnant society, a boom and bust, and a disruptive innovation.

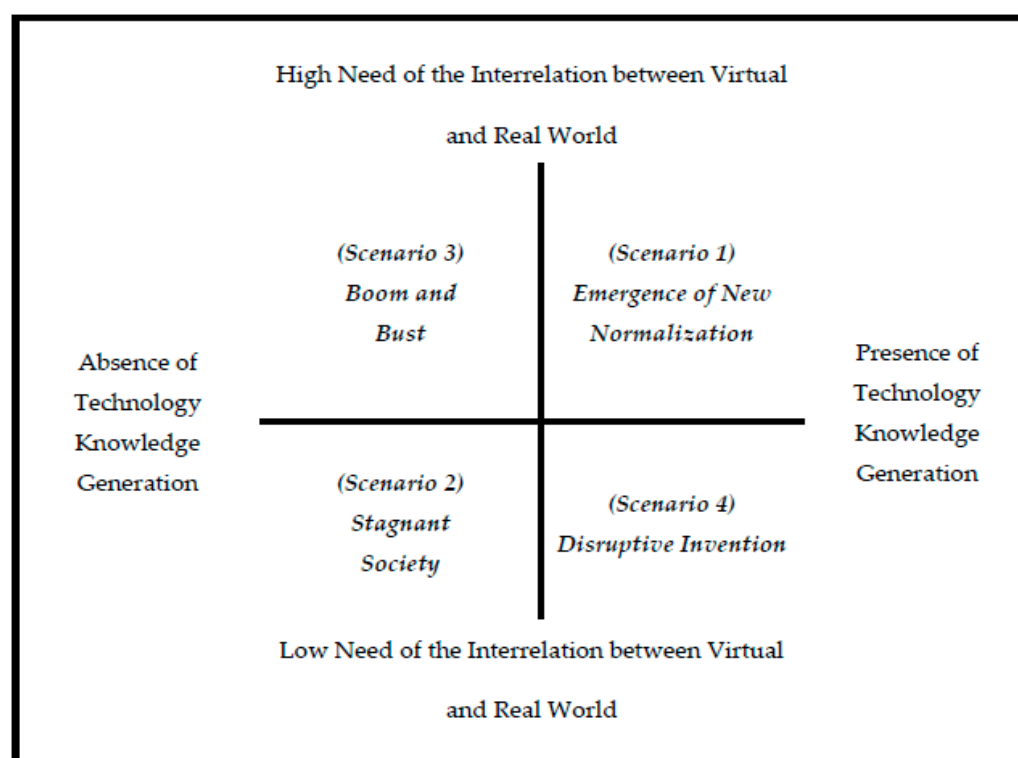


Figure 2. Impact–Uncertainty analysis.

5.1. Scenario 1—Emergence of New Normalisation

The first scenario occurs when there is a high need for the interrelation between the virtual and the real-world, in the existence of technological knowledge generation. It will give birth to a new type of normalisation where AR marketing prospers and thrives, as the main medium of marketing. “New normalisation” refers to a situation in which AR marketing is seen as a normal, everyday occurrence. AR marketing is no longer a shiny new technology and will be considered as a norm, in the future, compared to the present time, where the conventional medium is the primary choice for marketing (Olalde and Guesalaga 2013).

This scenario is the ideal scenario for augmented reality marketing where both the need and generation continuously improve and develop the industry. When the society perceives that there is a high need for the interrelations between the virtual and real world, the technological knowledge generation will be willing, motivated, and encouraged to develop and discover new types of AR marketing. The experience of AR in marketing, will be obvious compared to the non-AR ones, when the complexity intensifies and the time spent on AR proliferates (Wolf et al. 2016). Most of the AR technology consists of a high-end technology specification. This naturally leads to the need of highly-skilled labour with better technology-capabilities knowledge, in order to ensure AR marketing can be enjoyed by consumers. Essentially, Malaysians need the drive to improve and develop in terms of skills and technology, in an effort to know about AR (Lazim and Rahman 2015).

Moreover, for augmented reality to be truly adaptable, other technologies used for augmented reality, such as user interface, storage, processing power, and space of memory card should be developed to a higher specification for a generation highly-knowledgeable about technology. The need for hyper internet connectivity will be a necessity for future generation as the Internet of Things is a trending technology, following the fourth industrial revolution. Once the technology reaches their full capabilities, due to the need and demand from the consumer, only then the society will embrace augmented reality marketing where it will take over the market position of conventional marketing. As the society's acceptance and adoption of AR technology increase, it will also assist the diffusion of AR marketing technology in industrial sectors (Rese et al. 2017). It is also estimated that the cost of using AR in marketing, in a time horizon of 5 to 10 years, will decrease due to economies of scale and increase of resources such as knowledgeable labour. The lower cost will encourage more AR marketing users (Kurz and Benhimane 2012).

Furthermore, technological knowledge generation will ameliorate the retention of information by the user, due to their abilities to operate the technology without being distracted as AR marketing will be an accustomed phenomenon (Javornik 2016). Hence, one of the biggest criticism of AR marketing was overcome while increasing the user's experience economy. Companies will be able to customise for each consumer, without further agonising whether the users are able to fully immerse in the marketing medium. Social concerns such as privacy and safety will decrease due to knowledgeable users and better technology security (Lucas et al. 2017). Technological equipment needed for AR marketing will become accessible to every household due to the lower price and routine occurrence (Puyuelo et al. 2013).

In the existence of technological knowledge generation, AR marketing will be able to provide what the consumer wants—new experience and integration of new technology, in marketing. It is an excellent medium of marketing and will benefit the industrial sector through a user interaction where magazines, newspapers, and books can integrate AR as part of their marketing strategy. It is able to produce an ideal scenario setting of texture, while promoting user control and aesthetic marketing, with ubiquitous computing integrated into almost anything, in the future. Consequently, AR marketing will be the main medium of marketing, replacing the traditional and conventional marketing modes.

5.2. Scenario 2—Stagnant Society

This scenario explains a stagnant society where there will be a low need for the interrelations between the virtual and the real-world, in the absence of technological knowledge generation. In this circumstance, the society perceives that there is no need for AR marketing, while the generation is not willing to contribute to technology. This is the worst scenario in terms of development in AR marketing, as the society does not have the resources or knowledge to innovate a new technology replacing the traditional marketing method. Hence, the marketing sector will remain stagnant and constant in terms of the technology used.

The society itself, or the enablers of the technology, is not interested in expanding their knowledge of AR and continuously ignores any chances to learn more about AR. If this scenario persists to exist, little will be known about innovations and improvements, in the value and process of AR. Consequently, there will be a lack of demand and supply of AR marketing, as the companies will not have enough resources, in terms of skilled workers. Failure to capture the need of society will cause any commercialisation to result in failure, as well. Moreover, it will incur high cost in the usage of AR, in marketing, due to the lack of resources. Apart from this, the complementary products or devices, such as AR glasses that are needed to fully experience AR marketing, will be difficult for consumers to have access to. There is also hardly any evidence that the consumer wanted AR glasses, as technologies related to glasses seems to have failed to take-off, such as the 3D-glasses. This is mainly due to the lack of technological knowledge generation.

A domino effect may occur in which the society will be reluctant to use AR marketing, after several social issues arise, hence, the company will cease to produce AR marketing (Lucas et al.

2017). However attractive AR is, it will be placed under the same plane of media platform as other media (O'Mahony 2015), when the society will still continue to use other marketing alternatives. The marketing sector would be a low-technology sector, in which only common technology will be used, such as the conventional media in marketing, due to the generally low-level knowledge, of the society, about the technology. At the end of the day, marketing is used to reach the target market, hence, there will no point for companies to use the sophisticated technology in marketing when the target market is unable to perceive and operate it, as the technology diffusion process will slowly occur. The society will stray away from technologies, in general, when it comes to marketing as the society will take a long time to master a technology, due to the low-level knowledge about the technology.

Complicated computation and computer vision algorithms of AR will only discourage the use of AR marketing as the society will not possess high technological skills and knowledge. Hence, the adaptation pace will be slow as the society will have a low-exposure towards AR marketing, while the adaptation pace for alternative media marketing will be relatively fast. AR marketing will lose their market position and also the initial attractiveness for marketing. When the marketing sector is unable to develop, due to the preference of the consumers for the conventional media as compared to the augmented reality marketing, the marketing prospect for augmented reality will become stagnant.

5.3. Scenario 3—Boom and Bust

The third scenario occurs when there is a high need for the interrelations between the virtual and the real-world, in the absence of technological knowledge generation. The scenario would be an initial boom in AR marketing, due to a high need for the interrelations between the virtual and the real-world, as perceived by the consumer. However, it will not have lasted to a sustainable market as the society will not have the skills and ability to apprehend the technology, while lacking in the willingness to do so. In this scenario, AR generally possesses a short life-cycle which contributes to the failure of the research and development and the commercialisation effort. Hence, there will a boom and bust in the application of AR, in marketing.

The society will perceive a high need for the interrelation between a virtual and the real-world, where the traditional marketing is inadequate and will crave for a more interesting and a new characteristic of medium for marketing (Javornik 2016). However, the generation will be without the knowledge and understanding of the technology, where the users are not interested to learn and increase the knowledge on AR marketing (Lazim and Rahman 2015). This scenario is the second-best scenario for AR marketing as there are still chances for AR marketing to flourish, in future, as there is still a high need for the interrelations between the virtual and the real-world. It will have to depend on the research and development effort and a proper commercialisation method.

As there is no technological knowledge generation, there will be a lack of resources for skilled labour and technology-capabilities, which would increase the cost of developing AR marketing. Hence, the technology diffusion would be a slow process, due to the high cost of the technology. Consumers are unable to purchase complementary products, such as handheld devices, in order to experience the AR marketing which causes the adoption-rate to slow, as well as become difficult, due to the scarce nature of the product. Marketing strategies are unable to reach the consumer as it is limited to consumers who owned such devices (Buhalis and Foerste 2015). The scarcity of resources is caused by the absence of technological knowledge generation. Hence, AR marketing would be exploited by the companies which had the resources to produce and purchase the technology, while equipped with the willingness of the technology enablers.

Thus, would begin the reality stage where companies are unable to provide a revolutionary or complex AR marketing which provides value for the end-user, as they lack the knowledge to do so. Hence, they can only provide a basic function of AR, in marketing. At this point, the companies which produce the AR marketing can apply two types of strategies. They can either charge a high price for the technology, in order to monopolise the market, or a low price in order to penetrate the market. It would result in a high cost of adoption which would cause a high cost of marketing. This, in turn,

might increase the price of the product as companies might resort to increasing the price of the product. Companies that are unable to afford it would utilise the alternative marketing media. Charging low prices might encourage companies to adopt AR marketing. Either way, both of the strategies will result in technology failure, as the generations are unable to operate and, hence, unable to fully immerse themselves in the technology.

Consumer reception towards the technology will be balanced with their functional and experiential qualities (Kourouthanassis et al. 2015), wherein the case of, both, technology and their skills would hinder the expected experience and consumer satisfaction (Jung et al. 2015). It is also an established fact that the intention to reuse the technology is indirectly related to the quality of the technology (Kim and Hyun 2016). Subsequently, the marketing sector would be competitive in terms of the tools used and technologies employed in the effort of marketing. AR marketing will then slowly lose its initial attraction as the reality sets in, due to the fact it is unable to hit the market where companies would abandon the notion of augmented reality (Gupta and Bharadwaj 2013). However, AR marketing would not be completely obsolete as there is still a need for the interrelations, which means that the technology would make a comeback whenever the society is equipped with the necessary knowledge and is ready for it.

5.4. Scenario 4—Disruptive Invention

The last scenario was generated by the presence of technological knowledge generation and a low need of the interrelations between the virtual and the real world. Generally, with a highly knowledgeable generation in technology but a low need for AR marketing, would lead to new innovations that are able to replace and disrupt the market positions of AR. This scenario is favourable for the technological development, but not precisely for AR marketing. In this scenario, the consumer feels there is no need for AR marketing which indirectly indicates that AR marketing is unable to reach the market. The generation is highly knowledgeable about the technology, where they are encouraged and motivated to learn and develop their knowledge, while the relatively lower accuracy of positioning for AR marketing might bear the current technology-savvy generation.

A phenomenon of social marketing will occur in order to change the behaviour of society and to push the economy and the stakeholder to improve the social and individual benefits and the current well-being of the society (Carrigan and Dibb 2013). It would promote initiatives outside of AR and invent other technologies, in order to satisfy the society. In doing so, companies would implement other marketing tools with other innovations, which would be more cost effective and have more user information retention. The attention of the society would go on to another new technology, as the competition would be intense in the industry, due to the technological knowledge generation. Hence, a new alternative would appear in order to replace AR, as the generation would be able to adapt to the technology development, due to the possession of skills and knowledge to operate and experience the technology.

However, some companies might still opt for AR marketing, due to the low existence of the need for the interrelations between the virtual and the real world. For example, companies might still utilise 3D rendering in marketing their product but only in a niche market. Therefore, the market for AR marketing would be segregated and would not be a common technology used in the time horizon. This would slow down the growth of AR marketing in the technology's life-cycle, with the emergence of new technology and a lack of demand by the market. This clearly implies that AR marketing would simply be unable to compete without a need and demand from the society.

6. Conclusions

In essence, this research was carried out to identify the issues and drivers of employing AR marketing and to study the future trend of AR marketing in Malaysia. While AR has gained fame and recognition in the gaming industry, it has been spreading its influence in manufacturing to other industries and now towards the field of marketing, in which is termed as AR marketing.

The objectives of this study has been successfully accomplished by identifying four alternative scenarios which indicated how the need for the interrelations between the virtual and the real-world and the technological knowledge generation would impact and shape AR marketing, in the future.

The “need for the interrelations between the virtual and the real-world” and a “technological knowledge generation” must co-exist in order to achieve the best favourable scenario of an “emergence of new normalisation” for the betterment of market development and sustainability. Otherwise, it would lead to a negative implication in terms of marketing development and technological development of a “boom and bust”, a “stagnant society”, and a “disruptive invention”. In the case of any of the unfavourable scenarios, it is best to employ strategic management so as to reverse the scenarios into a scenario with a better prospect of development and sustainability, towards AR marketing. The government and advocates should take major responsibilities to encourage the technology-enablers and spurt the need among society, simultaneously. Intensive strategy of market penetration, product development, and commercialisation effort should be applied rigorously, so as to push AR marketing into the attention of society and stimulate acknowledgement amongst them.

Naturally, a high need for the interrelation between the virtual and the real world and a technological knowledge generation would result in a positive future development of AR marketing, in Malaysia. The need for the interrelations directly reflects the acknowledgement and attention given to the technology. On the other hand, technological knowledge generation would have the skills and knowledge which would promote the development and innovation of AR in marketing. Hence, it would have a better user information retention, experience, and creative marketing practice, while lowering the concerns which AR faces today. AR marketing will be normalised in the favourable scenario, in which it would no longer be a shiny new technology but a technology which is optimised and utilised, significantly.

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Appendix A

Table A1. Key issues and drivers of AR marketing.

Social	Technological	Environmental	Economic	Political	Value
1. Change in marketing style	1. Combination of virtual and real world	1. Environmental awareness	1. New phenomenon	1. Regulations on privacy and piracy content	1. Unify people
2. Increase of smartphone user	2. Innovation for friendlier usage	2. Spurt awareness and promote products that help to remove waste	2. Pressured by Experience Economy	2. Privacy policies need to be implement	2. Enhance social interaction
3. Experience oriented marketing	3. Reduce cost while improving quality		3. Increase Experience Economy	3. Plans to ban AR while driving	3. Easy dismissal of new technology
4. Willingness to try AR application	4. Accurate evaluation of product		4. Customer feedback not fully considered	4. Malaysian government focus on digital economy	4. Increase of user valuation
5. Smart usage of AR	5. Ideal scenario setting		5. Potential ineffective AR marketing	5. Legal and policy issues	5. Accessibility to high-speed internet
6. Unrestricted user movement	6. Camera mapping		6. Increase of target market	6. Malaysia's commitment towards digital economy	6. AR usage intention based on values
7. Commercialisation of AR	7. Wide usage of AR technology		7. Customisation of information to user's demand		7. Customer's gives information based on trust
8. Advice marketing	8. User control technology		8. Marketing strategies effect performance		8. Overestimation of media quality
9. Growing demand of global trend	9. Inability to replace traditional method		9. Rising of interactive market		9. Internet centrality in the lives of consumer
10. Rising of brand identity value	10. Potential growth of AR in marketing		10. Implementation in advertising strategy		10. Enhancing life
11. Technologies support product life cycle	11. Aesthetic appeal of AR		11. Experience remembered by consumer		11. Trending of on-the-go users
12. Interaction of advanced technology	12. Advances in microelectronics		12. Improved retention of product information		12. Enhancing wellness
13. Social context mobile marketing	13. Outdoor usage		13. Lower product information retention compared to print		13. Resistant due to privacy
14. Future significant role of AR	14. Complexity		14. Increase value of AR in retail settings		14. Consumers become immersed
15. Personal information drawback	15. Dynamic imaging technology		15. Growth of AR application		15. Increased interest
16. Increase usage by end-user	16. Visual sensory stimulation		16. Less innovative marketing for static market		16. High number of AR users
17. AR role in communication	17. Slow adoption of AR		17. Economic vandalism caused by marketing		17. Millennials do research prior to their decision
18. User's skills improvement	18. New possibility in content delivery		18. AR contribution in product life cycle		18. Desperate to be engaged in captivating ways
19. Higher product revelation	19. Increased utility and relevance		19. Stimulates consumer's buying intention and impressions		19. Brands want to help consumer to truly experience
20. Generate higher trust and attitude	20. Critical computation		20. Long-term commercial relation		
21. Unique sensory capabilities	21. System quality influence user retention		21. Marketing controlled by user		
22. Quality of AR on decision	22. Novel application in diverse contexts		22. Little knowledge on implementing effectively		
23. Digitalisation era	23. Precise augmentation of object		23. AR integrated offline marketing		
24. Rise of long-hours smartphone user	24. Possibility to overthrow singular communications		24. Relevant technology in marketing		
25. Shift of advertisement platform	25. Effective commerce through 3D rendering		25. Consideration to provide high level AR quality		
26. Ambiguity limits range	26. Value and accessibility		26. Shifting to web 3.0 generation in advertising in Korea		
27. Limited studies on AR role in society	27. Limitations of AR technology		27. Mobile marketing opportunity		
28. Unconvinced of the need of greater information	28. Filtering of information		28. Growing interest of MAR		

Table A1. Cont.

Social	Technological	Environmental	Economic	Political	Value
29. User expect not share personal information but to use the AR	29. Lower level of accuracy needed in marketing comparatively		29. Growing number applications		
30. Mobile marketing part of AR product	30. HAR do not answer to the needs of users		30. Differences in characteristic of consumer		
31. Riskier transaction	31. Enhancing users' perception of reality		31. Unknown consumer perception		
32. Developers concern of privacy issue	32. Maintaining sufficiently high quality of experience		32. New marketing venture		
33. AR attackers	33. Ubiquitous computing		33. AR short life cycle		
34. Physical threat	34. Lighting changes the shape of product produced by AR		34. Using AR for the sake of using it		
35. Distractive virtual content	35. Variety media representation		35. Enhanced marketing communication		
36. Potential ethical problem among user	36. Application in other senses		36. AR direct marketing opportunities		
37. New avenues for cyber-bullying	37. Accurate positioning of virtual objects		37. Broader application over television and the internet		
38. Little studies on user acceptance effectiveness			38. Marketing tool coexist with AR in the future		
39. Congruent opinion on early adoption	38. Connectivity to internet		39. New needs in infinite area and market		
40. Struggles for exciting experience	39. Additional details		40. Prototypes visualisation for advertising		
41. Importance of interaction	40. Architectural flaws		41. Adding value to the brand		
42. Lack of knowledge	41. Varieties of AR technology		42. Maximise impact of advertising		
43. Audiences weren't ready	42. Immaturity at current stage		43. Marketing beyond physical store		
44. Change in B2C communications	43. Ability to augment from another dimension		44. Instant marketing		
45. Screen time impact on young children	44. Synchronisation between reality and virtual object		45. Future of emotion measurement marketing		
46. Support from stakeholders	45. Not functional without camera and GPS location		46. Increase value of investment		
47. Tangible development	46. Technical challenges faced		47. Low adoption		
	47. Facilitate realistic experiences		48. Increase user's certainty		
	48. Maximise effects of reality		49. Market choose a brand based on quality		
	49. Innovative, novel changes, mobile revolution		50. Reluctant to invest		
	50. Appealing features		51. Short attention-span		
	51. Bridge cyber and physical world information		52. Inappropriate practice cause failure		
	52. Support functionalities of AR		53. Digital flyers as competitors		
	53. Lack of standard		54. Increase product price		
	54. Facilitate showcase of product		55. Improve marketing effectiveness		
	55. Deficiency of standardisation				
	56. Flat experiences of technology today in future				
	57. Urgency in embracing 4th Industrial Revolution				
	58. Clickable and measureable				
	59. Harder technical challenge than VR				
	60. Unprecedented access				

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