



THE IMPACT OF THE INTERNET OF THINGS ON VALUE ADDED TO MARKETING 4.0

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Summary

The evolution in the field of information technologies that has taken place in recent decades has transformed the world. The marketing sector has undergone similar changes. At present, the internet as a groundbreaking achievement resulting from the evolution of information technologies is being integrated with marketing activities. Thanks to this we can witness a new generation of the activities referred to as the age of Marketing 4.0. It is urgently needed as today customers demand something more than just products that meet their basic needs, satisfy their desires, and soothe their anxieties. Clients are now looking for products that will allow them to fulfil their creativity and find the values defined by Marketing 3.0, however, they want to be able to become a part of the product, that is, to contribute and interact with the product, and then, harnessing information technologies - to share their experiences and verify if the product is actually fulfilling the task that it was meant to. This is also why marketing no longer focuses on the product - just like the internet no longer centres around data. At present, both marketing and the internet focus on clients and enhance the interactions between the client and the product; while doing this, they are based on the values of the users and offer them more data. This article presents the key elements of Marketing 4.0., discusses its relationship with the Marketing 3.0 concept and explains the extent to which next generation marketing is an extrapolation of the concept of Marketing 3.0. At the end, some examples of technologies from the Internet of Things, which facilitate interaction between the user and the products and the internet have also been provided.

Keywords: marketing 4.0, marketing of things, digital marketing, marketing

1. Introduction

The world has changed as a result of the technological development that has taken place over the past decades. Marketing too has developed but the requirements of users have also been transformed and marketing has started to be perceived negatively in certain environments. This was driven by the actions of some of its representatives who were blinded by the vision of profits and who decided to ignore the principles of ethical conduct instead of focusing on meeting customer expectations, which led them to make empty promises and to unethical incidents in the valuation and packaging of products. Hence, the evolution of next generation marketing that is more sensitive to clients was inevitable.

The age of client-centred marketing starts within the concept of Marketing 3.0. It treats clients as searching, creative and active individuals. Clients are people that are demanding the calming of their greatest anxieties and the satisfaction of their deep and profound needs, but they also want to play a bigger part in creating the value of the product. Thus, marketing no longer concentrates on the traditional view of satisfying needs and desires.

What is more, in order to satisfy this human aspect better and take into account the needs of the soul, heart and feelings of the client, this marketing relies on values, which can clearly be seen in the actions of production businesses or suppliers who emphasise the importance of the domain of public relations, social involvement, and enhancing their image through pro-social actions.

The new functions of the product lead the client to change the way they perceive the brand and to extend it beyond the product itself. This may also be linked to social involvement in the field of sports, improving the environment, promoting sustainable development, or assisting humanitarian efforts.

In this new age of the consumer, clients have their own aspirations, their voice to express their opinions and can also be involved in the final product experience. This is why, regardless of whether we are talking about advertising or the field of public relations, we should strive to establish a personalised dialogue with the client. To this end, we should promote their freedom of opinion about the producer by giving them a medium that will facilitate this.

Thanks to social networks, user experiences with products are becoming increasingly important nowadays, and the internet has become a medium through which comparisons and approvals can be made, and checks of the experiences of other clients who purchased a given product occur; it's also a place for expressing opinions about the reputation of a brand and assess whether the product fulfils the promises made by the producer.

This is also why large-scale integration can be observed between users and the internet via social networks, and virtual social environments show the direct consequences regarding products through opinion-forming platforms like Foursquare or youpping.

These solutions do have certain limitations, which is why they cannot be widely used:

- 1 — They are based on internet platforms that are not available to all clients;
- 2 — They are usually intended for very specific users and sectors; Users do not discuss every product, just the most significant ones;
- 3 — Information on the internet comes from users, which is why the reasoned opinions of retailers are not always taken into account there.

This is why we are proposing for an age that concentrates on and is enriched by a new dimension, which is more focused on interactions with the product, to come into force with Marketing 4.0. This interaction will have two advantages: the chance to find out what other client's experiences are like and the opportunity to confirm, verify and check the features that the product is meant to have.

For this reason we are extending the internet to the product in the sense that we are introducing a direct, physical integration of products, in the areas of the internet, thanks to which the internet and the product are driven to cooperate and we can, therefore, resolve the limitations mentioned earlier:

- 1 — Use of internet-supported platforms is no longer required since the data can be checked directly in relation to the product;
- 2 — Clients can become familiarised with the experiences and comments of other customers in relation to a given product;

3 — Clients can access evidence presented by producers and retailers concerning the product and brand characteristics, which allows them to verify the integrity of the brand.

The placement of products on the internet is made possible through its new generation, that is, the Internet of Things and the Things Network. The Internet of Things is growing tremendously — it is estimated that over 50 billion devices will be connected to it by the year 2020.

The Internet of Things is defining a new dimension of accessibility to all stakeholders — at any time and any place. Our goal is precisely this ubiquitousness and flexibility as it is happening on a global scale.

The most important technologies used in the devices connected to the Internet of Things and to identify products include the barcode system and new technologies like Radio Frequency Identification (RFID) and its smartphone equivalent — Near-Field Communications (NFC). These technologies are ancillary to the new communication solutions of the internet of the future with IPv6 connections over low-power networks (6LoWPAN) and GLoWBAL IP.

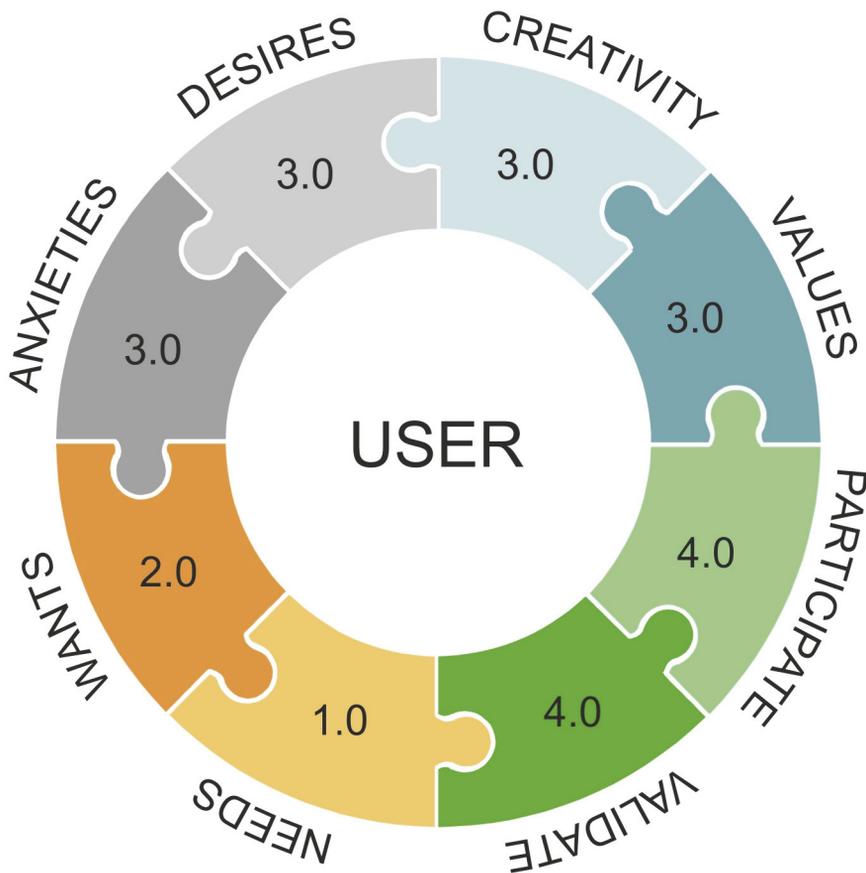
The Internet of Things is seen to propose a viable solution because it presents a vision for the new generation of services and communication. The Internet of Things is extending the internet to all the parties involved in a transaction, starting from the most elementary, that is, the clients and producers and their products, through a description and pro-social (value-driven) activities lending it integrity, as well as the quality of the product provided by the manufacturer, including client opinions and experiences.

The Things Network is enhancing the capability of the Internet of Things by integrating it with the World Wide Web through network services. This enables products to be integrated with a flexible solution. The Things Network allows product to be connected directly to the service through a URI or URL.

The Internet of Things and the Things Network afford the necessary flexibility to enhance market diversity. On the one hand, they enable products to be identified, on the other, because of their connection to internet platforms, they allow clients, products and the internet to be integrated and for interactions to occur between them.

The following chapters in this study have been arranged as follows: Chapter II analyses the evolution from Marketing 1.0 to Marketing 4.0 in terms of user requirements, Chapter III presents the characteristics of Marketing 4.0 and considers it in relation to customary marketing, analysing experience and interactions, Chapter IV presents the architecture of Marketing 4.0 and the interaction model based on identifying measures provided by the Internet of Things to facilitate interaction between clients and products. The paper concludes with a summary and a presentation of the next steps to take.

Figure 1. User requirements in relation to every generation of marketing



Source: Own study.

2. The evolution of marketing from 1.0 to 4.0.

Marketing 1.0

The first stage of marketing took place in the industrial age. Back then, marketing focused mainly on the sale of product without taking into account the needs and desires prevailing on the target market. This approach can be characterised as Marketing 1.0.: focused on the product, centred mainly on the art of increasing sales.

Marketing 2.0

The approach to marketing radically changed as a result of a significant increase in the product offer. Consumers could pick and choose from a range of offers and started to be well informed and capable of comparing offers between similar products thanks to the flow of information and the communication possibilities that arose. In this approach, it is the consumer who defines the value of the product and precisely this is deemed as Marketing 2.0, that is, the age of the client. It is characterised by in-depth studies of the needs and expectations of clients in order to find new target markets and reap further benefits.

Marketing 3.0

Prof. Kotler recently defined the concept of Marketing 3.0, that is, marketing of the age of the human being. In this approach, consumers are active, searching and creative individuals, aware of the humanist dimension of a given brand and its impact on the environment, that is, its corporate social responsibility, and the social and environmental dimension of its activities.

The expectations of clients for their concerns to be eased and their desires to be satisfied — instead of focusing on traditional needs and desires, as well as the fact that the client can have a creative impact on products — changes the mutual relations between the client, producer and product.

These new requirements are the direct consequence of the success of the internet and mainly of new generation social media, where users post their opinions, have numerous contacts with other signed-up users, and also have access to opinions from public websites, and to product users who post comments and opinions.

As can be seen, we are moving away from Marketing 2.0 which relied heavily on information, towards the age of participation which harnesses technologies based on the involvement of other people. In this age of participation, people are both creators and consumers of ideas, novelties and entertainment.

There is more: these interactions are not just limited to social networks or online platforms as they can be expanded thanks to the new features of the Future Internet, the Internet of Things, the Things Network, but also due to the interconnections between these three technology mechanisms, and all this using cheap and ubiquitous computers, cheap and equally universal internet connections as well as open source software standards.

Therefore, the internet gives unlimited connection and collaboration opportunities not only with corporations and individuals. The internet also enables interactions with products and objects, which moves us up to the level of Marketing 4.0, that is the age where the user and his/her interaction with the product allow the three previous embodiments of marketing to be combined. This new age of marketing is still centred on needs and desires defined in the first two embodiments of marketing actions. Apart from this, it satisfies desires, alleviates concerns, caters for creativity and reflects the values that underlie Marketing 3.0. In addition to this, it also provides opportunities to participate through internet platforms and to interact with the product directly. This is exactly what Marketing 4.0 is. This participation allows people to become more aware of the values driving companies and their pro-social initiatives, that is, the reputation of the brand, which provides the medium through which the characteristics or action promised by the manufacturer and drawn from the declared values can be verified. Clients can check all this while doing the shopping thanks to the direct interaction function.

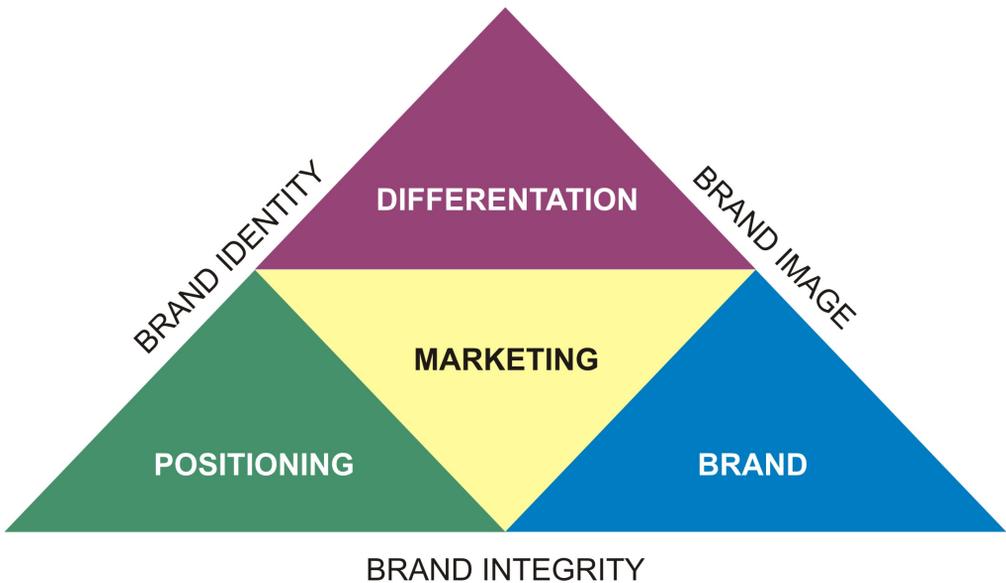
The fundamentals of Marketing 4.0 and its technical support facilitating interaction between the client, the product, and the internet have been set out in the following chapter.

3. Marketing 4.0: the internet of things/the age of the product in marketing

This chapter describes the characteristics and the main differences between the postulated Marketing 4.0 and traditional marketing.

Let us first analyse the present state of marketing by looking at the *positioning — differentiation — brand triangle* (see Fig. 2) and the ways of expanding it with an additional dimension zeroing in on consumer experience by the interactions observed between the clients and the products (see Fig. 3).

Figure 2. Positioning — differentiation — brand triangle



Source: Own study.

Brand Identity

The brand has a clear-cut position and a distinct identity in the mind of the consumer. For the strong brand positioning of your brand to be bolstered by a sense of integrity, it is essential that it is decisively differentiated. The identity of the brand involves positioning it in the minds of consumers. This positioning should be unique and brand-specific so that your brand can be noticed and heard in a crowded market. It should also be in tune with the legitimate needs and desires of consumers. This is how positioning enhanced by strong differentiation will lead to the creation of a strong brand image.

Brand Image

The brand image is, in a certain sense, capturing the mind of the consumer. The value of your brand should tap in to the emotional needs and desires of consumers and extend beyond the functionality of the product and its features. This is why actions based on professed values will also constitute a part of the brand image.

Brand integrity and reputation

Integrity, also referred to as brand reputation, consists in fulfilling the very essence of brand positioning and value, and this is done by continuously building differentiation. The point is to be reliable, make good on one's promises and build consumer confidence in the brand. Brand reputation focuses on the spirituality of consumers.

Brand interaction

Marketing 4.0 has been extended by a new dimension that consists of the customer experience (see Figure 4).

The dimension linked to experience is based on:

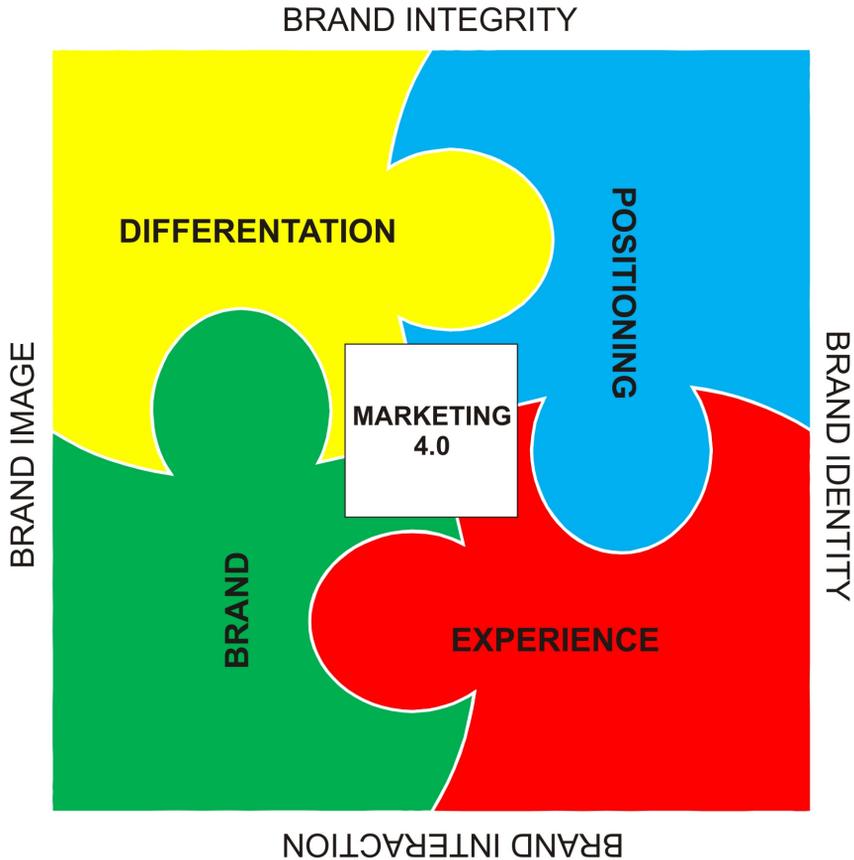
- 1 — Direct interaction between clients and products
- 2 — The possibility of checking if the given product meets consumer needs and desires
- 3 — The possibility to confirm that the actions being taken are rooted in professed values and the opportunity to check how the given brand is conducting inversion. By way of example, it will be possible to check which places are being transformed to conduct pro-social actions and see which research project and its outcomes utilised research grants.
- 4 — Defining the integrity and reputation of the brand based on the evidence obtained, that is, the actions stemming from the declared values and all the experiences of across clients. This is why the impact of the brand values on the client and emphasising to consumers the value-based actions conducted in different parts of the world is taken into account in this new dimension.

Marketing 4.0 shifts towards the idea of cooperation and collaborative value creation where the client will be able to check, verify and become more aware of the true dimensions of the brand. Hence, conformity between the actual state of affairs and the promises made build a positive brand reputation.

The reputation of the brand is created by way of reaching a compromise between the quality of the product, the quality of the experiences of customers using the product, and the quality of the actions carried out on the basis of the values professed by the producer.

This last dimension, meaning values-based action and participation opportunities for users, are central to acquiring a share in the market at the expense of international brands who have products of similar quality but at comparable or even lower prices. This stems from the fact that other firms fail to reach the client through a participating identification with their own brand, values-based action or by comparing product experiences between friends and other clients. Thus, it is evident that it gives added value to the product, thereby enhancing consumer confidence in it compared to an alternative product which has not been enriched with these additional values and does not have this transparency.

Figure 3. Proposed marketing matrix

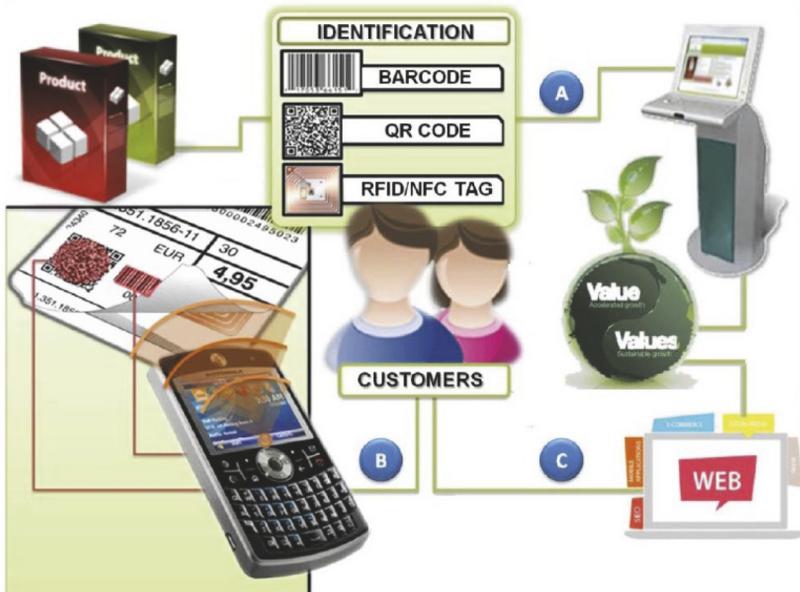


Source: Own study.

4. Marketing 4.0 scenario and interactivity module

Figure 4 shows an example of a scenario of how a client can interact with a product using a reader in a shopping centre (see Figure 4.A), a personal device like a smartphone, and the device illustrated in (see Figure 4.B), or the internet (see Figure 4.C).

Figure 4. Marketing 4.0 Scenario



Source: Jara, A. (2012). *A New Value Added to the Marketing through the Internet of Things*.

In order to interact with a product, the first step has to be taken in the form of identifying the product . Technologies like the barcode system, matrix codes or RFID/NFC tags are used for this purpose. The next subchapter will go on to describe each of these identifying technologies in detail.

Once the product has been identified using one of the technologies mentioned above, the client can go on a social networking platform, to the area designated by the producer where the detailed descriptions of product characteristics, additional information about value-based conducted actions, as well as the comments of other users can be found.

Product identification technologies

We took the broad range of technologies from the field of the Internet of Things into account, starting from good old barcodes, which provide us with the current product identification, up to new era technologies based

on RFID/NFC tags. An additional method that can be considered is the system of matrix codes which is located between the era of barcodes and RFID/NFC tags.

1) Barcodes

GS1 barcodes can be found on every single product, allowing them to be identified, and most mobile phones also have a built-in camera. This allows barcodes to be scanned and for the product to be identified, particularly in the GS1-13/EAN-13 system which is widespread in Europe and is used to mark articles put up for retail sale. We use a 12-digit code in this system (the last being a check).

2) Matrix codes

Apart from a one-dimensional barcode, we can also consider QR-codes, which are the most popular two-dimensional matrix codes. Compared with ordinary barcodes, they offer more information storage possibilities. Here, not only do we have the product identification number but we can also provide a product description or a URL, which will take us to the web page.

This kind of code consists of modules (pattern of black squares) arranged in a square grid on a white background. The information encoded in it can consist of four standard data types (numeric, alphanumeric, byte/binary, and Kanji), and the extensions introduced can contain almost any kind of data.

The amount of data that can be saved within a QR code depends on the type of the data, the version (ranging from 1 to 40, which indicates the general symbol dimension) and the error correction level. 40-L codes (version 40, error correction level L) have the maximum storage capacity and look as shown below (where the character refers to the individual values of the input mode/data type), for example, for a numeric-only code up to 7089 characters, and for an alphanumeric code up to 4296 characters. This offers broader possibilities and options than a simple 12-digit barcode.

3) RFID/NFC tags

RFID is the main technology harnessed in the Internet of Things, and, consequently, there also is a version of RFID that is integrated with smartphones, namely, NFC. The NFC/RFID tags and cards used for identification purposes stem from a new generation of solutions based on

the Internet of Things. However, since RFID/NFC-equipped devices are not that widespread, the solution also considers the use of older technologies like barcodes since every product is tagged with them.

NFC enables contactless communication, also referred to as proximity communication, based on magnetic induction technology. It works at 13.56 MHz. The theoretical distance from the standard antenna (built into the card, reader or mark) is around 10 cm. The bandwidth/data transmission rate is 424 Kb/s. This also allows matrix codes to store greater amounts of data like product descriptions and URLs.

The main advantage of NFC compared to the matrix code is the size to capacity ratio, which is better in the case of NFC, making it easier and quicker to read the data within close proximity and not requiring precise camera alignment as in the case of QR codes.

Therefore, NFC is easier to use and better adapted for clients to implement it in the discussed solutions. The cost of a NFC/RFID tag is higher than QR codes printed directly onto the product.

5. Conclusions and future work

This paper presented a preliminary concept for the application of the Internet of Things and the Things Network to expand marketing through the introduction of more participative and trust-imbued relations with products based on universal product identification technologies like RFID/NFC tags and QR codes.

We use the Internet of Things to identify the product and connect it with the URI, which allows us to include in-depth product information and information about the actions taken based on the declared values like where and how the company delivers on its social commitments. Accounts of other client experiences can also be incorporated in this way. Therefore, this reveals a whole new dimension that would allow us to build and verify brand integrity and its reputation based on customer experiences. We also have the chance to verify and check if the declared promises and brand equity are true-to-life. This gives us more integrity, boosting consumer confidence in the brand.

This last feature is especially important because marketing — due to the activities undertaken by numerous profit-hungry marketers who instead of centering on the clients resorted to unethical selling techniques, making false claims about products — started to have negative connotations.

Marketing 4.0 is in the implementation works phase, with on-going work on creating a brand reputation platform where consumer experiences can be evaluated by harnessing the potential of the new dimension of participation and interaction with the product.

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