

MEDIA INNOVATION AND BUSINESS MODELS: THE CASE OF IMMERSIVE CONTENT DISTRIBUTION PLATFORMS

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ABSTRACT

This paper analyses how innovation and business models are related in the case of immersive audiovisual services, with a focus on three distribution platforms: HTC's Viveport, Facebook's Oculus Home and Google's YouTube VR. To do so, it first briefly discusses the issues at stake in terms of media innovation, in particular the fact that content innovation is often neglected or misunderstood. After briefly summarizing relevant previous work, it then applies the Business Model Matrix (Ballon, 2009) to these three cases. In particular, the cases are compared in terms of vertical integration, customer ownership, interoperability, revenue model, positioning, user involvement, and the role of content innovation. The paper concludes with a comparison of the cases. It expands the rapidly growing literature on media innovation by using a business model methodology, providing the first instance of an in-depth, structured comparison of immersive audiovisual services from a business point of view. It aims to fill a knowledge gap by dealing with a sector almost ignored by business or economic academic literature.

KEYWORDS

Immersive Experiences, Media; 360 Video, Omnidirectional, Virtual Reality, Interactivity, Business Models, Media Innovation

1. INTRODUCTION

Immersive audiovisual services – characterised by features such as omnidirectional video, interactivity and multi-screen output– have been around for quite some time. However, recent technological advances in various parts of the production chain (from capture, stitching and coding to low-latency transmission and, of course, the rise of Head Mounted Displays for output) have been at the basis of a market surge which, beyond the hype cycle, could prove to be a disruptive factor in the way audiovisual content is produced, distributed and consumed. As with many of these evolutions, new players try to enter the market while established

majors choose between focusing on the traditional business model and product line, fully engaging with the new technologies or choosing a hybrid model by entering into strategic partnerships.

Virtual Reality (VR) now has the potential to become one of the next big computing platforms, as we saw with the PC and smartphone (Goldman Sachs, 2016). This is visible in investments made (Digi-Capital, 2017). It is expected that the market will grow rapidly in the coming years (Goldman Sachs, 2016; Digi-Capital, 2016), in particular for devices. While gaming is considered the leading application of VR (Gopal, 2016) and the early driver of uptake of high-end VR headsets (Clarke, 2016), video will also drive adoption of this technology (CC Insight, n.d.). Immersive AV content notably has a potentially positive impact on viewers' engagement. (Chambel, Chhaganlal, & Neng, 2011) However, such impact may also be due to the character of novelty, and therefore may not last when VR has become mainstream.

Since immersive audiovisual experiences – at least in the way they are delivered nowadays, are a relatively new phenomenon, stakeholders involved are still defining the right business model for these services. They innovate in how they produce and deliver content, and how they use it to capture value. Therefore, the main research questions in this paper are: 1) how do companies innovate in VR? 2) what are the design choices they made in articulating a business model for their innovative services? 3) can patterns be discerned in these design choices, thereby characterising distribution platforms of immersive services?

The paper is structured as follows: first, the research questions above are grounded in existing insights and theory concerning media innovation on the one hand, and business models on the other hand. This results in a practical framework for analyzing and comparing different immersive services. Subsequently, the new immersive audiovisual market is delineated and a generic value network is outlined, providing insight in what provisioning immersive content signifies in this context. Relevant previous analysis, which focused on end-to-end immersive services (covering all or most of the outlined value chain) is briefly summarized. Then, the three cases studies are presented. The paper concludes with a discussion of the case studies and some avenues for future work.

2. MEDIA INNOVATION AND CHALLENGES FOR IMMERSIVE SERVICES

Media innovation shares most of the main features of innovation, while also having a few specificities (Lindmark, Ranaivoson, Donders, & Ballon, 2013). Innovation concerns the introduction of something new with an element of valorisation (or utilisation) within it (OECD & Eurostat, 2005; Schumpeter, 1942). In other words, innovation involves putting an invention into practical use. For media innovation as for innovation in general, the discussion on the level of novelty (Freeman & Soete, 1997) and the opposition between product and process innovations (Cave & Frinking, 2007) are recurring issues.

Specifically with regard to media however, Lindmark et al. (2013) argue that the articulation between product and process innovation should be discussed in more detail, notably because content innovation is at the crossroads between the two. Content innovation is usually not well understood by academics, policy-makers and professionals (Bleyen, Lindmark, Ranaivoson, & Ballon, 2014). In contrast, this paper argues, following Ranaivoson

et al. (2017a) that content innovation is crucial to ensure the adoption of 360 video.¹ The importance of content innovation has started being taken into account by other market observers, e.g. Goldman Sachs (2016). Immersive AV content requires new storytelling with different writing and producing techniques (Clarke, 2016), e.g. with more long takes, since cutting may make give nausea to users. One can draw a comparison with 3D technology. For VR even more than for 3D, it is not possible to simple port a film over. VR also faces some of the same challenges that hindered 3-D, namely viewers need to buy special equipment to view the broadcast, making the cost and convenience of such equipment an important additional factor (Ranaivoson et al., 2017).

Another challenge, of economic nature, relates to the lack of a sustainable model for the creation of content and a clear pathway to monetization (Clarke, 2016). Content distributors and device manufacturers are aware of such challenge, and develop different strategies, including producing content themselves and attracting content producers. For example, as of Sept 2015, 200,000 developers had registered to create games on Oculus' VR platform. Oculus expected 100 games will be available in 2016 (including 20 developed internally) (Goldman Sachs, 2016). CCS Insight believes that although augmented reality and virtual reality are two very different technologies, they each have the potential to deliver transformative experiences. (CC Insight, n.d.)

3. BUSINESS MODELLING

In order to empirically analyse these strategies, we propose a business model framework allowing to analyse what design choices 360 video companies have made in order to create and capture value, with a particular focus on the role of content innovation in their overall strategy.

The origins of the term business model are found in the writings of Peter Drucker (2006). Drucker asked about the customer, what is valued and how to earn money. Although present for over half a century, the concept has only gained prominence in the last decades, especially during the dot-com revolution of the 2000s (Sawy & Pereira, 2012). As Ballon (2009) explains, with the progression of digitization, the concept gradually shifted from mainly dealing with the 'logic of creating and capturing value' (Keen & Qureshi, 2006; Magretta, 2002) towards 'the development of an unambiguous ontology that can serve as the basis for business process modelling and business case simulations' (Haaker, Faber, & Bouwman, 2006). As a result, business models developed towards encompassing a complex set of design choices concerning a specific value network, functional architecture, financial models, and eventual value propositions made to the user. Since a lot of choices are involved, the notion of control became as important as the concept of value in analysing business models (Ballon, 2009).

The specific analytical framework used in this paper, The Business Model Matrix, is based on exactly such conceptualisation. This approach emphasizes roles and relationships between different actors within one ecosystem, rather than confining to processes within single businesses. The matrix combines four parameters of business models: (1) the value network showing how actors and roles, resources and capabilities are distributed in the value network,

¹ Ranaivoson et al. (2017) puts the availability of means of display, in particular diverse head-mounted displays, at the same level of importance. They are out of scope for this paper due to its limited size.

(2) the functional architecture showing how elements thereof contribute to the value creation process, (3) the financial construction containing revenue streams and revenue sharing models, and (4) the value proposition referring to the product or service offered to the end user. Not all elements of the matrix are of equal relevance for this paper and information on some parameters proved impossible to find. We therefore focus on a subset of parameters, which are further defined.

Table 1. Business Model Matrix

CONTROL PARAMETERS		VALUE PARAMETERS	
Value Network Parameters	Functional Architecture Parameters	Financial Model Parameters	Value Proposition Parameters
Combination of Assets	Modularity	Cost (Sharing) Model	Positioning
Vertical Integration	Distribution of Intelligence	Revenue Model	User Involvement
Customer Ownership	Interoperability	Revenue Sharing Model	Intended Value

Level of vertical integration: Vertical integration relates to the scope of tasks one firm takes over in the value creation process. The higher the level of ownership and control over successive stages of the value chain, the higher the vertical integration. *Customer ownership:* This aspect relates to the relationship with the end customer, examining, amongst others, the access to key information of the customer, the type of contact (direct or intermediated), the level of intensity and proximity to the customer. *Interoperability:* Interoperability refers to the ability of technological systems to directly exchange information and services with other systems, and to the interworking of services and products originating from different sources. *Revenue model:* The main specification of this aspect is to examine the business model in question of income stream (direct/indirect). *Positioning:* This aspect deals with the question whether to position a product or service as a complement to a particular set of existing products and services, or rather as a substitute to them. It is not least a question of marketing issues including branding, identifying market segments, establishing consumer trust, detecting competing products or services, and identifying the most relevant attributes of the product or service in question. *Customer involvement:* Customer involvement refers to the role of users in the business model and the scope of their integration possibilities. ‘Prosumers’ are enabled to produce and consume content and services in parallel in the network.

The BM Matrix is applied to the analysis of three cases: Viveport, Oculus Home and YouTube VR. Information was gathered using mainly online sources. Results benefitted from the feedback of experts within the EU H2020 project ImmersiaTV.

4. CASE STUDY SELECTION: PLATFORMS DISTRIBUTING IMMERSIVE CONTENT

4.1 The Immersive Value Chain

In general, two main Value Chains can be distinguished within the value network for immersive audiovisual services: Hardware & Software on the one hand, and Content on the other hand. To generate immersive content, such content needs to be captured, then stitched together and then produced; the resulting product is distributed before being displayed. Every step of this content chain relies on specific hardware and software: 1) Cameras for capture; 2) Software to ensure the processing (i.e. stitching) of the captured content; 3) Software allowing to edit the processed content (selecting scenes, adding graphics and subtitles, sound engineering etc.); 4) Content delivery networks, specific codecs, players etc. to ensure distribution, and 5) Various devices for displaying and controlling the experience. Figure 1 provides an overview of the immersive audiovisual service value network.

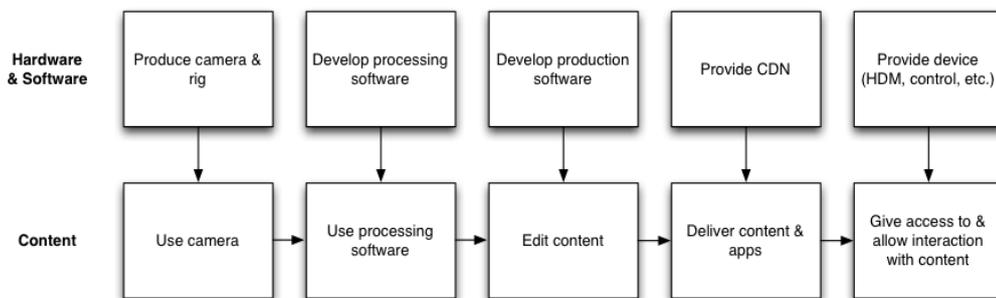


Figure 1. Immersive audiovisual service value network

4.2 Previous Work: End-to-End Platforms

The overall value network for immersive audiovisual services as described above, consists of many small players, contributing specific assets to VR products (e.g. producers of cameras, production companies, Head-Mounted Devices providers etc.). Our analysis started, however, by choosing three end-to-end platforms for analysis, i.e. providers of immersive experiences and/or of solutions covering production, distribution and sometimes even display aspects of immersive audiovisual content. This included platforms giving access to live events since this implies an integration of activities from capture to production or distribution. At the moment, there are already several providers of such experiences², three of which - Jaunt, NextVR and Immersive Media- we evaluated in an earlier paper (Ranaivoson & Delaere, 2018). They were chosen as they provide interesting cases when all steps in the value chain can be touched upon rather than focusing on one aspect of production and delivery of immersive audiovisual content.

² Other examples include Condition One, LiveLike, LiveSphere, Perfant, Reality Lab, Scratch VR, Specular Theory, Teradek, Total Cinema 360, VantageTV, Vahana, Voke VR, VRCade and Vrtify.

Our analysis demonstrated that Jaunt, NextVR and Immersive Media show significant similarities in the design choices made. First, they are all vertically integrated; this is to be related to the fact that their revenue model is, at least mainly, indirect and that they have a high user involvement. Actually, all three features point to the importance of partnerships for the three companies. These partnerships are more than a mere commissioning of content. They take place with different types of stakeholders, including broadcasters, organisers of live events, brands, etc. They rely on various configurations: with one or several partners, for content that is available for free or only for subscribers. Reasons for such partnerships from these companies' point of view include that they are a source of income, but also that they reinforce their reputation.

The cases differed as far as interoperability and positioning are concerned. Interoperability seems less of a must for NextVR, maybe because it represents an additional cost. Jaunt's positioning is rather substitutional because the experience they offer could replace what traditional media is offering. On the other side, NextVR and Immersive Media propose services or products complementary to the way media (and events) are currently functioning. This is consistent with the analysis currently made that VR will succeed thanks to its complementarity, with fans still mainly watching the event on their television sets, but using VR for enhancements: game recaps, highlights of a particular play, features, brief forays into watching a certain portion of the action live, etc. (Clark, 2015; Zeitchik, 2015).

These business model features analysed in this earlier work already clearly point towards the now acknowledged importance of content innovation. This is particularly the case for vertical integration, which includes content production in different manners. This integration is a recent evolution for Jaunt and Immersive Media.

4.3 Focusing on Distribution Platforms

A particular group of entities not covered by our previous analysis yet gaining importance as end-to-end players – and potentially even obscuring the more original 360 actors – are the distribution platforms, which extend their reach and make use of the network effects of their large installed base to gain impact. That is why we want to analyse the business model of these players in this separate paper. As in the previous paper, we chose three different, popular distribution platforms, all of which were not originally focussed on 360 video but added it as a feature to enhance the attractivity of their hardware (HTC Viveport), social network (Facebook's Oculus Home) or video distribution platform (Google's YouTube VR) (Ranaivoson et al., 2017). The rest of this paper will focus on the business model analysis of these services.

5. EMPIRICAL ANALYSIS

5.1 Viveport

Viveport is a VR distribution platform developed by HTC, a Taiwanese consumer electronics company which was founded in 1997 and currently mainly manufactures Android smartphones and tablets. In April 2016, it launched HTC Vive, an integrated PC-based VR headset. Both headset and hand controllers provide room-scale tracking on 360 degrees of motion.

From its launch, HTC Vive has been supported by Steam VR. Steam, founded by video game developer and publisher Valve Corporation, is regarded as the largest digital distribution platform for PC games with 125 million active users worldwide (Saed, 2015). SteamVR is built directly from the Steam platform, and is the first-party virtual reality platform supported by Valve (Brown, 2017). Since the launch of HTC Vive, SteamVR has been functioning as the gaming content distribution platform for the device.

In August 2016, HTC announced their own content distribution platform Viveport, in order to provide diverse VR content and experiences beyond gaming. Viveport is an official app store, offering consumers different categories of content across social media, news, sports, health etc. (VIVE, 2016). Where Steam exclusively provides video games, Viveport extends the experiences of consumers to more traditional entertainment content and thus reaches larger groups of potential consumers. For HTC Vive users, the two official stores, Steam VR and Viveport are both accessible. (Brown, 2017) In November 2016, HTC has launched Viveport M, a mobile VR content platform, in an attempt to enlarge the mobile VR user base.

5.1.1 Value Network

Since HTC is a hardware producer, its position in the value chain tended to be constrained to device manufacture. The partnership with Valve Corporation, which brings Steam platform's gamers to HTC Vive and the development of Viveport, expands its role to content distribution. (Harding-Rolls, 2015)

HTC also aims at integrating content creation into their business. From an early stage, the company has invested in VR content development, e.g. by acquiring Steel Wool Studios. (Lang, 2016b) Viveport is open to VR content creators and encourages them to develop or upload their works, also by providing them with creation tools. For example, HTC set up Vive Studios to develop content and cooperate with other external studios. Vive Studios is focused on games, but also develops other content on educational content, social, sports and other themes. (Lang, 2016c) Furthermore, Viveport M is supported by companies such as YoukuVR and its large library of 360 degree videos, or Taobao Buy+ with its VR shopping application. Another example of engaging with content creator is Vivepaper, which engages consumers in a VR/AR reading experience (Vive, 2016). At the end of 2016, HTC Vive entered into a partnership with the China National Tourism Administration. This aimed at applying Vivepaper to improve the sales experience in travel agencies by offering an immersive experience of potential travel destinations (Vive, 2017).

To sum up, HTC is getting more and more vertically integrated, as it not only provides VR devices, but also invests in content distribution through its own platform and the partnership with Valve's Steam VR. Besides, HTC makes efforts to attract content providers creation and develops first-part content in their own studios.

Regarding Customer Ownership, Viveport can reach its customers directly, just like HTC with its devices.

5.1.2 Functional Architecture

Viveport is available only for HTC Vive users, which makes it moderately interoperable. This stands in contrast with the hardware: since HTC is a producer of Android phones, the Bluetooth connectivity of the HTC vive headset is compatible with any Android device.

5.1.3 Financial Model

Viveport's revenue model is mainly direct. It notably relies on subscriptions. Since 2017, Vive users can get access to the VR games on Viveport with a monthly subscription fee of USD 6.99. Revenues are shared between the content providers (70%) and Viveport (30%). (Lang, 2016a)

5.1.4 Value Proposition

In terms of positioning, Viveport can best be described as a complementary platform of SteamVR for HTC Vive users (Grubb, 2016). Steam VR mainly serves the gaming content, and Viveport focuses on traditional entertainment for education and families. Besides, since Viveport is available only for HTC Vive users, it does not directly compete with other VR distribution platforms.

Viveport's User Involvement is high, with users including end-users and developers. Viveport community is a platform that enables interactions between users. It is composed of three blocks: Forums, Developer Forums and Viveport Blog.

5.2 Oculus Home

The Oculus Rift is a virtual reality headset originally developed and manufactured by Oculus VR through a Kickstarter campaign launched in 2012 (Durbin & Hamilton, 2017). This campaign proved successful, raising US\$2.5 million within two months. In March 2014, Oculus was acquired by Facebook for \$2 billion. The Oculus Rift was released on March 28, 2016. Oculus has stated that the Rift is built for a better gaming experience. Furthermore, the variety of gaming content available for Rift has benefited from the introduction of the Touch controllers.

Introduced in August 2013, Oculus Share was the first VR portal to aggregate content created by developers worldwide. After running for three years, Oculus Share was shut down in May 2016 (Hamilton, 2016) and replaced by Oculus Home. Oculus Home is a platform for mainly VR video game distribution dedicated to the Rift headset. Oculus provides exclusive content to attract people to buy its headset rather than competing systems.

5.2.1 Value Network

As the previous section highlights, several steps of the Value Chain are covered by Oculus, from display (Oculus Rift) to distribution (Oculus Home) to content production. The latter is considered particularly crucial, especially for video games. With the announcement of the Oculus Rift in June 2015, Oculus announced that it was fully supported by more than 20 second-party high production value games made exclusively for the Oculus Rift. The Oculus promised impressive game content launches. Several game titles have been developed either exclusively for Oculus VR, or with VR as the primary platform, including the famous "EVE: Valkyrie". Unlike HTC Vive, the biggest games on Oculus Home were not the same titles previously available on desktop PCs. Finally, it has also developed its own content. To sum up, Oculus Home has a high degree of vertical integration.

Oculus Home is the official VR content distribution platform, and for this reason Oculus Home has a direct customer ownership.

5.2.2 Functional Architecture

The Oculus Home compatible headsets include Oculus Rift, HTC Vive (Hawkins, 2016) and Samsung Gear VR (SAMSUNG, n.d.). Thus, the exclusive content on Oculus can be played on other headsets, and “Oculus exclusive” implies exclusivity to Oculus Home, not to the device. Besides the obvious support from Facebook, it also makes an effort to collaborate with other platforms like Steam and Microsoft Xbox One. Such cross-platform cooperation enables it to significantly extend its reach.

5.2.3 Financial Model

Oculus Home’s revenue model is direct, as various VR game titles and VR content can be purchased through Oculus Home. Unless “negotiated otherwise”, Oculus takes 30% of app income as a platform fee (Oculus, n.d.).

5.2.4 Value Proposition

Oculus Home can be considered as a substitute to other VR distribution platforms. At the time of writing of this paper, the platform offered 192 apps, 152 of which are games (Strategy Analytics, n.d.). Steam also provides Oculus Rift compatible game titles; by now there are 145 games that players can get access to with the Oculus headset.

As a Facebook-owned VR company, an advantage of Oculus Rift is its close interaction with the dominant social network. Consumers can share their live streaming via the Facebook (Durbin, 2017). With Oculus Events, a Facebook user can find public events and interact with others in within their VR environment. They are also able to find the highlighted events in Oculus Home. Therefore, User Involvement can be labeled as very high.

5.3 YouTube VR

YouTube is Google’s massively popular online video-sharing service. In March 2015, it launched YouTube VR, its platform dedicated to 360 video. This launch took place at around the same time as its other main VR products and services. Google’s Head-Mounted Device, the Cardboard, was launched in 2014; by 2017 more than 5 million of them had been shipped worldwide. At the end of 2016, a new version of the headset, named Daydream View, was launched for a longer and more comfortable VR experience (Robertson, 2016).

5.3.1 Value Network

In 2015, Google Jump was introduced as a platform for VR filmmaking, enabling people to create immersive videos. It allows to capture content with specific camera technology (the Jump camera rig consisting of 16 GoPro cameras) and edit it with image stitching technology.

According to Aaron Luber, head of content partnerships for Google VR, “the next step for YouTube VR is to use the technology to figure out what is the next format, what is the real way of people to create content and make the new format”. (Luber, 2016) YouTube VR also tries to drive growth through building partnerships with various content providers, such as the New York Times, Netflix or NBA, to enrich the different categories of VR videos. Besides, YouTube VR is attracting different brands to the platform to do their campaign with 360 video, e.g. the 360-degree TrueView Ads for advertisers in 2015. (Tadana, 2015) Therefore, we can say that YouTube VR is vertically integrated.

Regarding customer ownership, YouTube VR directly reaches the audience. Consumers can get access to the immersive content, either with the Cardboard/Daydream headset or through the mobile phone/desktop.

5.3.2 Functional Architecture

YouTube VR is available through Daydream's app, initially only on Android and now also on iOS. One can also get access to the content through mobile phone or desktop in various browsers, if one does not have the headset (YouTube, n.d.). YouTube VR is therefore highly interoperable.

5.3.3 Financial Model

YouTube VR's revenue model is indirect as it relies on advertising. Many leading brands, such as BMW, have been attracted to upload 360 video to market their products. When users have watched more than 30 seconds or browse the brand's landing page, YouTube charges advertising fees. In order to increase the engagement of the advertising, interactive elements such as interactive cards have been integrated into ads. It is believed that the click rates of TrueView ads will be lower than other regular forms of ads provided by Google, since the viewing behavior is still not close to the final purchase behavior (Tadena, 2015).

5.3.4 Value Proposition

YouTube VR aims to be a substitute for other new platforms, and they expect to become the leader in VR Video. With YouTube's 2 billion users, the chance of VR video content to reach large audiences will be increased (Rowell, 2015). By now, YouTube does not have a real competitor in the VR video industry in the sense that no other company is providing the same suite of tools, notably for creators.

User Involvement is high in a comparable manner to YouTube since it relies on user-generated content. Viewers have the possibility to like and comment. Once logged in, it is possible to subscribe to channels and have playlists. (YouTube, 2016)

6. DISCUSSION

The following table summarises the main business model features of our three cases. The cases show significant similarities in the design choices made. First, all three platforms are vertically integrated, from aggregation to distribution to consumption (Head-Mounted Device provision). Viveport and Oculus Home are more directly involved in first-party production while YouTube VR, via Google Jump, provides technologies to help VR content creators. They all have direct customer ownership and rely on high user involvement although arguably it is even higher for YouTube VR since it relies on user-generated content. The cases differ as far as revenue model, interoperability and positioning are concerned.

Table 2. Comparison of Viveport, Oculus Home and YouTube VR's business models

	Viveport	Oculus Home	YouTube VR
Vertical integration	Yes (including content production)	Yes (including content production)	Yes (including tools for content producers)
Customer ownership	Direct	Direct	Direct
Interoperability	No	Yes	Yes
Revenue model	Direct	Direct	Indirect
Positioning	Complement	Substitute	Substitute
User involvement	High	High	High

Viveport does not aim at interoperability, being designed only for HTC Vive users. Oculus Home and YouTube VR are interoperable, although the latter arguably more than Oculus Home. In fact, YouTube VR does not even require to have a Head-Mounted Device. This directly relates to the positioning: Viveport is first seen as a platform designed to support the HTC Vive whereas Oculus Home and particularly YouTube VR aim at being leading platforms -the latter to watch 360 videos, Oculus home for various types of immersive experiences.

The differences in terms of revenue models may be traced back to each platform's parent company. YouTube relies mainly on advertising, hence so does YouTube VR. Viveport is provided by HTC, whose main revenue model relies on selling its hardware. The case of Oculus Home may look contradictory since Facebook's services are free for end-users, whereas Oculus Rift itself relies on a direct revenue model, just like Oculus Home. The type of hardware provided is consistent with such strategy: HTC Vive and Oculus Rift are expensive, high-quality, Head-Mounted Devices, as opposed to the Google Cardboard.

7. CONCLUSION

This paper has highlighted the main business model features, and has derived the analysis of the articulation of media innovation in the case of the emerging VR market. To do so, it has first provided a value network of the production and distribution of immersive audiovisual content. It has then provided an in-depth analysis of three companies providing VR distribution platforms.

Taking immersive audiovisual services as a case, this paper has demonstrated how content innovation is crucial for media, and how it becomes apparent in the business model features of end-to-end platforms. This does not exhaust the topic of how to ensure such innovation is sustainable from the content producers and distributors' point of view. In particular, it raises questions in terms of how such innovation could be promoted by innovation and media policies.

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