Capturing the XR Market: Examining Strategies to Reach the Broader Market

An exploratory study of commercialization of XR enabled by 5G

Terese Hilmersson & Ebba Lindström

Faculty of Engineering (LTH), Lund University
Department of Production Management

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Advancements in enabling technologies have brought us closer to the realization of a blended reality, where the virtual and real worlds seamlessly merge. This thesis investigates the commercialization prospects of extended reality (XR) technologies in the consumer market by mapping the ecosystem, analyzing interdependencies, and examining value-capturing possibilities. By exploring the factors that drive and hinder the commercialization of XR, this thesis finds the keys to unlocking its immense potential.

Introduction and background

XR technologies hold vast possibilities of extending our everyday lives by blending the real world with the digital one seamlessly. However, to ensure a captivating user experience, seamless interaction between the real and virtual worlds is crucial. Challenges like motion sickness caused by unstable and high latency and limited mobility hinder the diffusion of XR and in extension, the commercialization of it (Andrews et al. 2019; Gao et al. 2021).

The deployment of 5G networks is one promising solution, offering reduced latency, extended coverage, and improved battery usage (de Almeida et al. 2019). As the ecosystem around the developing XR technologies is evolving, sustainable business models and value-capture strategies become essential. This thesis aims to explore the journey of XR head-mounted displays (HMDs) toward reaching the broader consumer market.

The study

Through the overarching research question on how XR technologies can be commercialized to reach the broader market and the two sub-research questions concerning the ecosystem and value-capturing, this thesis sets to close both academic and practical research gaps.

By studying the understudied area of commercialization of high-tech and disruptive innovation (Chiesa & Frattini 2011; Datta, Reed & Jessup 2013; Nieto Cubero, Gbadegeshin & Consolación 2021), this thesis aims to contribute to closing the found research gap. The study provides valuable insights to XR actors and stakeholders by mapping the evolving ecosystem and interdependencies and viewing value-capturing possibilities.

The ecosystem

The evolving XR ecosystem comprises a diverse range of actors who play critical roles in developing and commercializing

extended reality technologies. Although there is no consensus regarding who the actors are, this thesis contributes to the understanding of the ecosystem by attempting to map it in the Ecosystem pie model (Talmar et al. 2020).

Some important actors are HMD developers, key hardware component suppliers, content creators, software development tools providers, operating system developers, key software tool providers, content store providers, system integrators, communication infrastructure providers, CSPs, cloud and edge infrastructure providers, and end-users. However, one notable discrepancy in the findings is that connectivity is deemed crucial only within the connectivity segment, but not beyond it.

Each actor contributes to the ecosystem by providing essential components, services, or experiences. The interdependencies between the actors can be described through complementarities and network ties (Jacobides, Cennamo & Gawer 2018; Ahuja, Soda & Zaheer 2012). One especially important complementary is the two-way strict complementarity between the HMDs and content.

The evolving ecosystem opens up opportunities for new actor segments to enter the system. Two possible areas that may play a crucial role going forward are actors specializing in the privacy domain and advertisement in a new way.

Value capturing

While the identification of the key consumer value proposition remains a challenge, the immersive experience emerges as a focal point of interest. Once the key value is identified, the killer app will be easier to distinguish, leading to clearer value-capturing opportunities.

Despite the lack of consensus regarding the key value proposition in the XR ecosystem, this thesis has identified multiple potential revenue models. Some revenue models with especially promising potential are the technology-as-a-service model, sales of physical goods through XR environments, innovative approaches to advertising, and device-embedded connectivity.

However, it is important to adapt the revenue models to match XR's unique characteristics and requirements. Integrating multiple revenue models may also be important.

Commercialization

Successful commercialization of XR technologies is complex, with no single formula for success. Nonetheless, key insights from this thesis include the need for a complete and seamless XR solution aligned with the mainstream market, supported by a mature adoption network.

In addition, timing and whole-product configuration are crucial, along with active collaboration with early adopters. To reach the broader market the solution needs to be complete. Among the barriers to reaching this mass market are optics, user-friendliness, aesthetics, user attitudes and social acceptance, as well as price.

By mitigating these barriers market acceptance can be increased. Focusing on trialability and technical barriers, addressing compatibility and observability is of particular importance.

Finally, by prioritizing the development of a compelling "killer app" that showcases the distinct benefits of XR technology, a wider user base can be attracted, leading to increased adoption. This approach opens up a multitude of valuable opportunities for commercial success in the market.

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