**Source: Xiaomi, Apple Inc., Qualcomm Inc.**

**Title: [FS\_Beyond2D] On market relevance**

**Agenda Item: 3.8**

**Document for: Discussion and Agreement**

# 1. Introduction

During the SA4#127-bis-e meeting, a first set of scenarios has been presented and eventually noted since, mostly, it was not possible to find an agreement about market relevance of these scenarios.

This simply shows that different companies have indeed a different understanding of what market relevance actually means for a beyond 2D format and stresses the need to develop a common understanding here.

The technical report [TR 26.956](https://www.3gpp.org/ftp/TSG_SA/WG4_CODEC/TSGS4_127-bis-e/Docs/S4-240825.zip) includes the following two objectives:

1. Identify and document beyond 2D formats, that are market-relevant within the next few years, generated from established and emerging capturing systems (including cameras for spatial video capturing), contribution, and usable on display technologies (smartphones, VR HMDs, AR glasses, autostereoscopic and multiscopic displays).
2. Prioritize the scenarios and the associated formats based on market relevance for further evaluation.

It is well understood that device manufacturers, service operators or others have different opinions on market relevance. In order to develop consensus and progress these two initial objectives, this contribution presents which indicators are used by several device manufacturers to evaluate market relevance of a content format and offers a way forward on the matter.

# 2. Market relevance indicators

First, it should be understood why in our point of view the following two indicators used by proponents of beyond 2D scenarios are deemed to be irrelevant:

* Availability of Proof of Concept (PoC) prototypes of the technology,
* Work or endorsement of the technology in other standardization bodies.

The existence of prototype implementations is indeed important. It demonstrates some level of implementability of the technology and is a required first step towards productization. Without such evidence, market relevance could not even be discussed. Nevertheless, such prototypes do not bring any indication regarding potential use in future markets, especially when device manufacturers and/or service operators are not involved in their development. Another significant weakness of a PoCs is that they do not provide concrete evidence if a product based on it can be developed on scale. In a nutshell, in our opinion, implementability of a technology is a pre-requisite to market relevance and not a market relevance indicator.

Regarding endorsement or development of the technology in other standardization bodies, it is difficult to understand how this can indicate any form of market relevance. There are numerous examples of standardized technologies that failed to reach market. This only demonstrates how much market relevance is important when considering a technology. Would 3GPP support a technology only because it has already been endorsed or developed by another standards organization, it means we defer other organizations to decide for us where our own market relevance is. Additionally, when endorsement is done by local organizations, often due to regulation decisions, it is difficult to understand how 3GPP, a global initiative, could take this into consideration.

While it may be difficult to achieve consensus on what market relevance is for a beyond 2D content format, we strongly believe that it is essential to capture the position of device manufacturers (hence the present contribution) and service operators who are together the key stakeholders to bring the technology to market. Our intention is not to block any particular technology for the study but to make sure the study is aiming, in priority, at market relevant technologies that could eventually lead to future normative work.

In our opinion, in order to move towards productization of a content format technology, the following market relevance indicators are considered:

* Has the technology been pre-evaluated by device manufacturers or service operators yet?
	+ Are there already indications of future services or devices supporting the technology?
	+ Are there concerns regarding the scalability potential of the technology in supporting devices? What are the limitations, if any?
* Are there content production tools available such as capturing setups, productions tools (or plug-ins to existing tools), and well-defined contribution formats? Or indications of such tools being developed?
	+ For professional content, are there already content creators or enough professional tools to ignite interest for future content creators?
	+ For User Generated Content (UGC), are there applications or tools to allow users to create content?
	+ Does for example SMPTE or ITU-R define a contribution format that is endorsed by service providers?
* Which content distribution systems are likely to be used? Are there content distribution tools and formats available yet, or in development?
	+ How many distribution tools / encoder solutions exist?
* What are the content decoding solutions existing today or in development?
	+ Does the technology require hardware support?
	+ What kind of software support is required? How many SW providers exist already or are emerging?
* Does the technology have compelling real-world examples that could attract a large user base over time?
* What is the expected market size and growth potential of the technology?
	+ Are there already indicators of an emerging or growing market?
	+ If it is starting as a niche market, what are the potential growth directions?

# 3. Proposal

For each proposed scenario, the following information shall be added into the template to provide indications of market relevance and help with topics prioritization for the study.

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| Technology evaluation on the market  | Indications of evaluation by service providers, device manufacturers, network vendors and operators |
| Industry activities | Relevant work in 3GPP MRPs and industry forums, evidence of industry collaborations |
| Production tools/companies | Capturing setups, production SW, representation, contribution, compression, storage formats, content creators, … |
| Delivery solutions | Delivery type, transport formats, SW/HW support and providers, … |
| Content decoding and rendering | HW, SW, providers, … |