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## **BUT IS IT ‘AUGMENTED REALITY’? BOUNDARY WORK OVER THE NAMING, DEFINITION, AND CATEGORIZATION OF AN EMERGING INFORMATION TECHNOLOGY**

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### **Introduction**

Augmented Reality (AR) applications and devices have increasingly garnered public attention, a couple years ago with Google Glass and most recently with Microsoft Hololens. These technologies, which promise to bring the internet off our computers and directly onto our physical perception, are the latest artifacts that attempt to move toward the digital imaginary of ubiquitous wearable computing.

Although AR is still in its emergence, many scholars have begun examining the ways early creators are deploying AR to re-counter and re-appropriate space (Author, 2014; Graham, Zook, & Boulton, 2013; Sheller, 2012), the ways AR could help people explore their surroundings (Hoffman & Mosemghvdlishvili, 2014), and the ways AR could transform industries like journalism and print media (Pavlik & Bridges, 2013).

While these are often referred to as a class of ‘augmented reality technologies,’ in actuality there is no device that is inherently an ‘AR technology.’ For example, a mobile smartphone is not necessarily an AR device, but it has capabilities that might allow for an AR experience. AR is a convergence of many enabling technologies which may enable certain augmented features and applications.

Although the term ‘AR’ has been a valuable one in organizing and mobilizing different types of organizations and constituencies, the recent rise in commercial AR possibilities has started to raise questions over what ‘counts’ as AR. For the past several years, different stakeholders within the community have been engaging in a fierce debate over what should and should not be considered AR.

This battle is taking place over definitions, which has long been recognized in information and organization science as an incredibly difficult task, one that is fluid and constantly being enacted with tremendous implications. Definitions at the most fundamental level describes what something is, but within that simple act there are values and politics enacted in the work of classifying (Bowker & Star, 1999; Busch, 2011). With categories involving people, the material consequences of those definitions

are evident when people try to ignore categories or standards (Bowker & Star, 1999; Busch, 2011), when people exist in the residual space between particular definitions (Star & Bowker, 2007), and when those categories materially affect how individuals are treated (Bowker & Star, 1999).

With emerging technologies these names are often abstractions, referring “not to a specific homogenous product but to a more or less heterogeneous collection of artefacts (software, management techniques) which then went onto link a community (or, rather, several overlapping communities) of suppliers, intermediaries, and adopters (Pollock & Williams, 2011, p. 195).” This is the case with AR, but now different stakeholder groups are trying to carve out interpretations of AR in an effort to expand their authority over the technology, monopolize resources, and exclude others from the community.

This article is based on over three years of fieldwork and participation observation in the AR community. Participant observation is particularly useful when the research examines interactions that take place in specific, physical locations (Lofland et al. 2006), and there were several places where the AR industry gathered – industry conferences, standards meetings, and academic conferences. From 2011-2014, I attended industry conferences in San Francisco, London, Munich, and New York, academic conferences in Atlanta and Adelaide, and standards conferences in New York, Barcelona, Rome, Redlands, and Crystal City. I attended over 12 conferences spanning 6 different countries. I supplemented this with 48 in-depth interviews with leaders in the community.

An analysis of how people were defining the term AR and what they envisioned for the future of the technology revealed deep rooted disagreements over how to define AR, motivated by historical and organizational commitments but challenged by new technological developments. Academic actors had originally defined AR to break away from virtual reality (Milgram & Kishino, 1994), and clarified certain criteria (mixes real and virtual, 3D and real-time, interactive) for AR (Azuma, 1997). These criteria were debated and contested around emerging developments like the 1<sup>st</sup> and 10 line, and further challenged by mobile AR browsers (Layar, Wikitude, etc.), and finally Google Glass. These developments brought new stakeholders to the AR space, but also sparked dispute as some members in the community did not think these were AR.

With these artifacts, there has been significant debate over the Azuma criteria itself and how to apply it, and some began to add criteria to the definition in an effort to privilege their work as ‘hard AR’ versus ‘soft AR.’ ‘Hard AR’ supporters dismissed mobile AR as frivolous, preferring to focus on head worn displays for hands free applications (medical, maintenance, etc.). Other actors feel that these developments warrant consideration and support broadening the definition to include them (along with their commercially oriented use cases like entertainment and advertising), sparking new rounds of contestation. A number of new industry actors have deemed this debate to be so loaded that they’ve either avoided the term completely or started advocating a colloquial definition as any technology that ‘augments’ our perception of ‘reality.’ Each subset of definitional supporters have different goals and motivations for pushing certain

definitions and classifications, each with their own social, technical, and moral agendas that “valorizes some point of view and silences another” (Bowker and Star 1999, p.5).

Much of this debate is indicative of what Gieryn (1983) describes as ‘boundary work’ to distinguish work and centralize authority. These definitional battles are proxy battles for 1) who gets to participate in the community, 2) who has authority to speak for the technology, 3) what the important problems are for the technology, 4) what the exemplars of the technology are going to be, and 5) what future imaginary the AR community should work toward. This definitional boundary work has implications across all those levels of community participation, which shapes what the technology becomes and how we come to understand it.

As internet scholars examine the relationship between the technology and the digital imaginaries, we have to consider the people who construct those digital imaginaries as well as how they contest those digital imaginaries. In this case, several groups with different visions of the future are attempting to shape it through definitions.

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