Digital technologies and the spatial organisation of exhibitions: How augmented and virtual reality enhance interactive digital interfaces?

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The phenomenon of using digital materials provokes a democratization of access to primary sources, transforming museums' relations to the public. Digitization does not have an impact only on the access to artworks through digital collections but is also related to the emergence of new art forms known as "digital-born media art". Both phenomena – the artworks' democratization due to the proliferation of digital collections and the emergence of various forms of digital-born media art – foster new demands in the design of art museums. The paper examines these new demands, diagnosing the current tendencies concerning the aforementioned phenomena, which are related to the trend of appointing "digital directors" in art museums, and to the overgrowing role of digital curatorship in museum studies. The common denominator of the new demands related to these phenomena is the intensification of interactivity.

Since the mid-1990s, digital technologies such as tracking and mapping have been used not only in the spatial organisation of exhibitions, but also in media art, making interactive media a commonplace. Interactive digital interfaces are major components of this reorientation in the design of art museums. The design of interactive interfaces has contributed to the enhancement of art gallery experiences, as it becomes evident in cases as ARTLENS Gallery at the Cleveland Museum of Art (CMA) (2017-), Asymptote's Guggenheim Virtual Museum (GVM) (1999-2002). The latter was conceived as a virtual museum dedicated to the display of internet art, providing an online digital archive for all the forms of new media art as well. is A recent case where Augmented Reality (AR) plays a major role is the over 107,000 square feet "Mori Building Digital Art Museum: TeamLab Borderless" in Tokyo's Odaiba district, which opened on 21 June 2018. Thanks to the use of 520 computers and 470 projectors, which produce various simulations, "Mori Building Digital Art Museum: TeamLab Borderless" offers to its visitors a multisensory experience (fig. 1).

Space syntax methods, such as Bill Hillier's theory, are useful for understanding the implications of the use of interactive digital interfaces in the design of art museums, and for analysing the spatial patterns that emerged due to the interactive digital interfaces. Bill Hillier and Julienne Hanson, in *The Social Logic of Space*, aimed to present a general theory of how people relate to space[1]. In *Space is the Machine: A Configurational Theory of Architecture*, Hillier's objective was to "outline a configurational theory of

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[1] Bill Hillier, Julienne Hanson, *The Social Logic of Space*. Cambridge; New York: Cambridge University Press, 1984.

architecture and urbanism"[2]. Bill Hillier claims that "[c]onfiguration seems in fact to be what the human mind is good at intuitively, but bad at analytically"[3]. Taking as a starting point the incorporation of the space syntax concepts in the museological studies, my aim is to shed light on how the interactive digital interfaces have influenced the way the exhibition spaces are experienced. Regarding this issue, Kali Tzortzi, in her paper entitled "Spatial concepts in museum theory and practice", has reflected upon the case of the "interactive experience model"[4], drawing upon the space syntax theory. Sharon Macdonald, in "Interconnecting: Museum Visiting and Exhibition Design", analyses the different trends in the so-called museum visitor research. She focuses her analysis on the so-called "directed behavioural studies", which focus on the investigation of "specific aspects of visitor behaviour in exhibitions"[5].

Useful for comprehending how space syntax research can serve as a tool for explaining the ways in which the incorporation of interactive digital Interfaces in exhibition design affects the visitor's perception are the most recent studies on how "the visitor's perception is 'staged'"[6]. A topic that the space syntax analysis has not addressed comprehensively is the impact of interactive technologies on how the visitors experience exhibition spaces. The paper examines the implications for exhibition design of a new direction for the space syntax research concerns the investigation of "how physical spatial layout—and perhaps matters such as the perceived boundaries of an exhibition or its sequencing—might be mediated by technologies such as interactive computer guidebooks"[7]. The concept of "spatial configuration", which is central for the space syntax approach, is pivotal for better grasping the relationship between new media art and the architecture of exhibition spaces, and their respective use of augmented and virtual reality. The paper explains in which sense an analysis of exhibition spaces based on space syntax theory would focus on the connectivity of the different spatial components and the use of patterns concerning the ways of experiencing the 'spatial configuration' of the exhibition spaces.

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[2] Bill Hillier, *Space is the Machine: A Configurational Theory of Architecture*. London: Space Syntax, 2007, p. 28. Original edition: Bill Hillier, *Space is the Machine: A Configurational Theory of Architecture*. Cambridge: Cambridge University Press, 1996.
[3] Ibid.
[4] Kali, Tzortzi, "Spatial concepts in museum theory and practice", Proceedings of the 10th International Space Syntax Symposium,13-17 July 2015, London, p. 1-14.
[5] Sharon Macdonald, "Interconnecting: museum visiting and exhibition design", *CoDesign*, Vol. 3, Supplement 1, 2007, p. 149-162.
[6] Ibid.
[7] Ibid.

Figure 1. The Mori Building Digital Art Museum: TeamLab Borderless (Source: https://borderless.teamlab.art/ (retrieved 16 May 2019))