Chapter 13
The Digital Enterprise as an Emerging Landscape for Universities and Their Operation

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ABSTRACT

This chapter presents a framing discussion around the notion of a digital enterprise in the context of higher education. The chapter makes the assumption that a university like a commercial enterprise can draw significant benefit from acting as a digital enterprise. The discussion indicates that some of a university's existing and historical activities are in line with notions of a digital enterprise. The chapter proposes a framework for assessing the readiness of a university with respect to its actions as a digital enterprise recognising the complexity of domains residing within the confines of a university environment. Critically, the chapter argues that such a future systems project should not only consider positive use cases but also recognise that a digital enterprise may have unplanned and unintentional consequences. Hence, this chapter argues that new forms of governance may also be required alongside the planned journey to a digital enterprise world.

INTRODUCTION

There is a case for arguing that we are in the throes of a paradigm shift as organizations adopt the practices of so-called Digital Enterprises. As in the case of the steam engine and electrification from the 18th Century onwards, the technologies underpinning the digital enterprise: mobility, big data, artificial intelligence, social media and cloud services are beginning to significantly transform the industrial and public sector landscape. The current shift is different from the earlier e-business cases where transactional systems or aspects of a business were technology enabled for the Internet. Now, a digital enterprise represents a wholesale change in the modus operandi of an organization through sensor based data collection and real time modification to core business processes as a response to changing business drivers.

Figure 1. Digital twin, key components and types
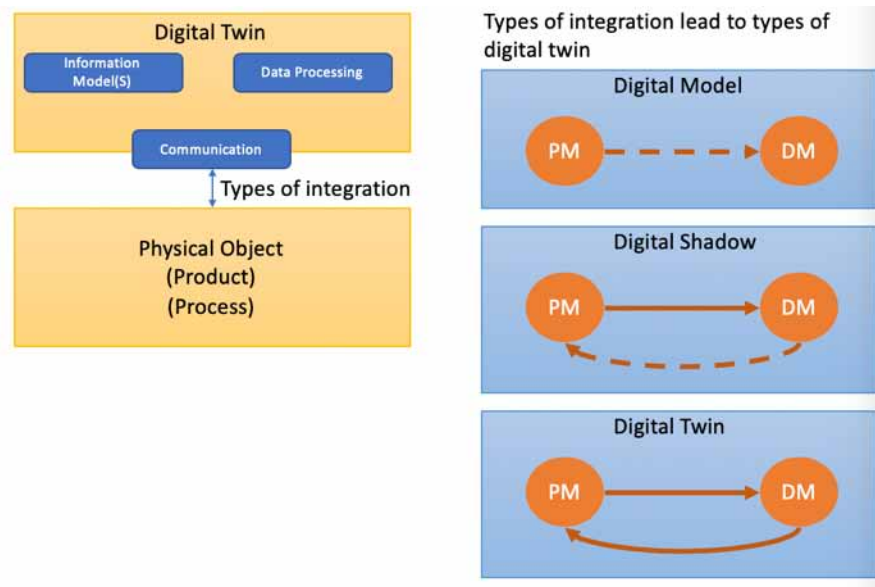
The notion of a digital enterprise is difficult to pin down and definitions are hard to come by. Academic literature is a particular lacuna with respect to a viable definition. Definitions that are generally available are sourced from commercial organisations and often present a platform specific notion of a digital enterprise. A typical definition found is: "A digital enterprise is an organization that uses technology as a competitive advantage in its internal and external operations." (Rouse, 2011). Other definitions follow a similar theme. "A true digital enterprise will integrate information, processes, work and people so that the entire organisation can collaborate more efficiently and effectively, and therefore produce more valuable products and services." (Rossi, 2015).

Digitalization is the dominant antecedent for large-scale and sweeping transformations across business. It is not simply a matter of IT investment, instead, operating models need to be re-thought, processes by which new talent is recruited are needed and if necessary new digital business models (that may require cannabilisation of existing products) are required (Matt et al. 2015). Georzig and Bauernhansl (2018) note transformation changes the paradigm of doing things and propose that digital transformation is a fundamental change process in enterprises initiated by new competitive advantages through the evolution of IT into an essential part of the value creation.

Part of the digitalization agenda is the role of *Digital Twins*. Such a technology, albeit guilty of being annotated as a silver bullet, is critical to the realisation of transformational change anticipated through digitalization. Digital twin technology enables a near real-time view of key products and processes in an organisation. However, like the digital enterprise, digital twins also suffer from a lack of precise definition. Two recent systematic reviews (Lu et al., 2019, Kritzinger et al., 2018) providing coverage of digital twins indicate some convergence to a definition:

Digital Twin refers to a description of a component, product, system or process by a set of well-aligned, descriptive and executable models:

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