Governance framework for digital transformation in higher education

Pekka Kähkipuro[1]

[1]Brunel University London, Kingston Lane, Uxbridge, UB8 3PH, United Kingdom, pekka.kahkipuro@brunel.ac.uk

1. ABSTRACT

In most business sectors, the role of information technology is rapidly changing from a supporting function into a strategic asset, and higher education is no exception. Information technology can be used almost anywhere in an organisation and, consequently, a common approach for addressing digital transformation is to structure it as a collection of business capabilities across the board. This way, the organisation can adopt digital concepts without the bias of single digital programme or a narrowly managed digital slice of the business.

While business capabilities can provide structure and clarity to the implementation projects, there is an element that hasn't been addressed sufficiently: IT governance and decision-making in the digital world. Complex sectors, such as higher education, cannot continue with traditional IT governance practices if they want to reach the full potential available through digital transformation.

In this paper, we propose a governance framework to address the underlying complexities of the digital world. The idea is to group digital capabilities into four clusters with sufficiently similar governance requirements. *The technical cluster* combines the IT infrastructure and similar new capabilities under a governance style that is close to existing IT practices. *The mainstream digital cluster* consists of capabilities that form the organisation's official digital agenda, and the governance model is often driven by business growth and differentiation. *The evolving digital cluster* represents non-mainstream capabilities with the potential of moving into the core business, and the governance style is often similar to project or programme governance. Finally, *the opportunistic cluster* represents the first stage of the digital innovation pipeline and is a critical element for those organisations that are using digital transformation for their competitive advantage.

We present the governance framework through examples from the higher education sector. While the model has been designed with this sector in mind, it can also be used in other similar complex and multifaceted organisations independent of the underlying business.

2. DIGITAL TRANSFORMATION AND BUSINESS CAPABILITIES

Higher education is increasingly using information technologies for supporting and transforming various aspects of the business. Kähkipuro (2015) provides an overview of the different possibilities, including business model disruptions, student experience improvement, digital education, digital research, improved administrative processes, and underlying enablers such as mobility support.

When trying to understand the implications of digital transformation, business capabilities have been successfully used to provide a structured view of the required changes. A *business capability* defines elements that are needed for an organisation to perform a given business activity. It is typically a combination of processes, tools and competences. Within the enterprise architecture practice, business capabilities are often used to bridge the conceptual gap between the business and the IT.

Hentrich & Pachmajer (2016) have proposed a generic business capability model for digital business. Their model divides the identified 46 business capabilities, *d.quarks*, into five tracks: technology-enabled, transaction-oriented, customer experience focused, solution-oriented, and open digital. To be successful in the digital business, the organisation needs to start from the outer tracks and work

its way towards the desired capabilities on the internal tracks. Capabilities on different tracks are interrelated and there is often a way to implement a capability on one of the internal tracks by implementing only a subset of the capabilities on the outer tracks.

A similar model for higher education IT capabilities has been proposed by Kähkipuro (2017). In this model, the identified 38 capabilities have been divided into three layers. The first layer, basic capabilities, is essential for an organisation to operate in a digital world and often represents best practices in traditional IT service provision. The second layer, standard capabilities, is needed for an organisation to stay in the mainstream and, consequently, does not provide any competitive advantage. The third layer, advanced capabilities, is a source of competitive advantage and is often related to the organisation's strategic aspirations.

To illustrate the capabilities, we use a simple framework adopted from a model initially suggested by Gartner Inc. for classifying IT organisations (Gartner, 2014). The 'Orientation' dimension shows how much a capability is part of running the business-as-usual versus how transformational it is. The 'Focus' dimension is about visibility and how much internal or external exposure it gets. Figure 1 shows how a subset of the higher education digital capabilities identified in (Kähkipuro, 2017) can be placed into the framework. Traditional IT capabilities are typically placed at the lower left-hand corner; capabilities for the full digital transformation may fall in any one of the four quadrants.
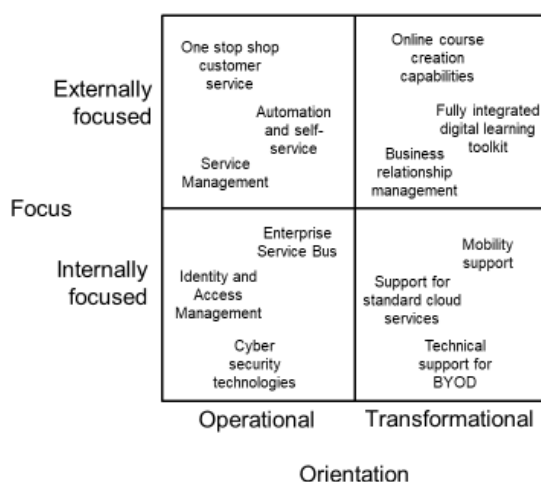

Figure 1. A selected set of higher education digital capabilities (Kähkipuro, 2017).

The above models are well suited for representing the complex set of the required skills, processes and tools when implementing technology related changes in an organisation. The models can also help to build a digital strategy. Understanding the relationships between the capabilities provides a good foundation for planning the digital journey for the organisation. There is often a logical order for the required improvement projects, and capability modelling can help in the planning work. The target state for a group of interrelated capabilities can be set at the desired "track" or "layer" (depending on the model used), and the model indicates the prerequisites for reaching the target state.

3. CHALLENGES FOR IT GOVERNANCE IN DIGITAL TRANSFORMATION

While business capabilities can provide a good insight to the digital journey, there is an additional element that needs to be addressed: IT governance and decision-making. Increased use of information technology changes in the role of the IT organisation and, consequently, the related decision-making model should reflect this change.

Business innovation is one of the main motivations for organisations to engage in digital transformation. Traditional IT governance style has not been designed for promoting innovations and, consequently, a second, more exploratory style could be introduced to complement the traditional one. This leads to a *bimodal* approach, where one mode is intended for running and

developing traditional and predictable elements within IT, while the other mode addresses areas where innovation and closer collaboration with the business is needed. See (Mingay & Scott, 2017) for a discussion.

The bimodal approach has been successfully used to take the first steps towards a digital future. Within the higher education sector, however, the picture is more complex and a straightforward extension of the current IT governance model with the bimodal practice will not be sufficient. There are at least three reasons for this.

Firstly, higher education institutions are often using outdated IT practices and, consequently, there is an additional task to catch up with modern IT practices. As a result, there is a need to manage both the catching up work and the forward-looking development work in parallel.

Secondly, independent of the technical drivers, the higher education sector is undergoing radical changes caused by several other factors. They include internationalisation, financial pressure, student mobility, and new emerging priorities (University of Oxford, 2017). Digital transformation in higher education coincides with an even bigger business transformation and both must be managed together. Consequently, methodologies that work well with other sectors may not be sufficient for higher education.

Thirdly, the combination of the flexible academic working style with the more rigorous IT practices often implies the need for non-traditional collaboration models across the organisation. Well-functioning solutions have been created over the years, and they will probably be needed also with digital capabilities. Again, the governance model will have to take these peculiarities into account.

4. TRADITIONAL IT GOVERNANCE

Traditional IT governance models have been structured around different areas of decision-making, such as the finances and the architecture, with different roles for IT and the business. A typical framework, consisting of five different types of decisions and five different types of governance archetypes, has been introduced by Weill & Ross (2004). The framework is illustrated in Figure 2.

Governance archetype	Decision									
	IT Principles		IT Architecture		IT Infrastructure Strategies		Business Application Needs		IT Investment	
	Input	Decision	Input	Decision	Input	Decision	Input	Decision	Input	Decision
Business Monarchy										
IT Monarchy										
Feudal										
Federal										
Duopoly										

Figure 2. Traditional IT governance framework (Weill & Ross, 2004).

The governance archetypes model how decisions are made in the organisation. *Business and IT monarchies* correspond to a situation where the responsibility lies on one party only. The *feudal model* refers to a situation where each business unit holds the full responsibility for its own decisions, and the *federal model* combines the central and the distributed units in joint decision making. In a *duopoly*, IT and some other group make decisions together.

This and other similar governance frameworks are well suited for traditional IT organisations operating in the lower left-hand corner in Figure 1 – the forces affecting the decision-making are sufficiently similar for the different underlying capabilities. However, there are significant differences between the lower left corner and the other three quadrants when it comes to business

requirements and the involvement of non-IT stakeholders. Consequently, a more elaborate framework will be needed for designing the governance model for digital transformation, especially in a complex operating environment such as the higher education sector.

5. GOVERNANCE FRAMEWORK FOR DIGITAL TRANSFORMATION

To support the complex nature of digital transformation, we propose a governance framework founded on digital capabilities. The idea is to group capabilities into several *clusters* based on their similarities on governance requirements. To measure this, we use the two previously proposed dimensions: the amount of external focus as opposed to internal focus, and the degree of transformation as opposed to business-as-usual. Figure 3 illustrates the approach. The diagram can be compared with Figure 1 where several individual capabilities are shown in the same framework.
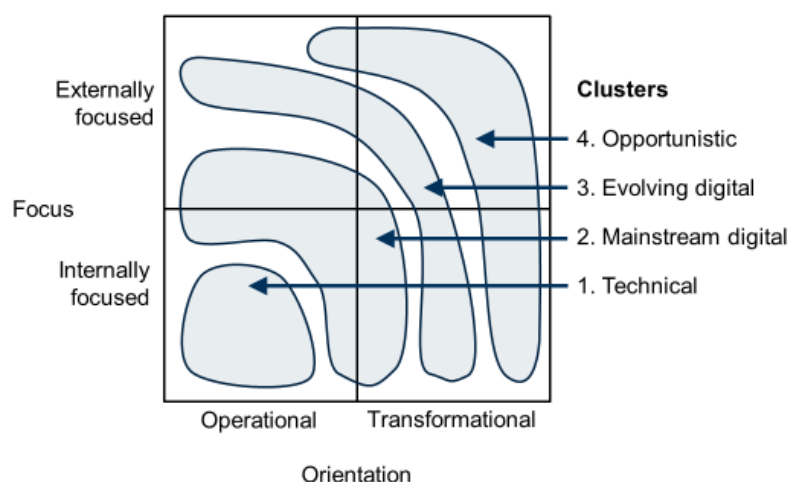

Figure 3. Four capability clusters for digital transformation.

The first group, *the technical cluster*, is created around traditional IT capabilities. The aim for this cluster is to operate and develop the digital infrastructure, and the usual driver for these capabilities is to look for value for money. In addition to traditional IT infrastructure, this cluster often contains digital enablers that are best managed through a similar approach. For example, the cyber security capability is usually part of the technical cluster even if its visibility has grown significantly due to the increased digital exposure of the organisation.

The second group, *the mainstream digital cluster*, combines capabilities that aim at implementing the organisation's official digital agenda, often derived from the main strategy. The primary value driver is either business growth or differentiation. Value for money is still important but it often remains a secondary consideration. This cluster is typically populated by several obvious digital initiatives and related capabilities, such as supporting automation and self-service in administrative processes or enabling the use of common cloud services like Office 365.

The third group, *the evolving digital cluster*, is used for turning non-mainstream prospects into core business. This cluster might not be needed in a stable environment, where important capabilities have already been collected into the mainstream and non-core capabilities are often outsourced. But it is an essential part of a transforming organisation using technology as a source of growth and change. The value of these capabilities is usually found in innovation and differentiation – the value-for-money aspect is often missing, at least initially. The most popular approach is to address these capabilities through a project organisation. Once mature enough, some of them may enter the mainstream digital cluster, but others might stay in this cluster and remain in use only for a small part of the organisation.

The fourth group, *the opportunistic cluster*, consists of capabilities that need more exploration before they find a proper place in the big picture. Some of them may even be in full use in small pockets of the organisation, but they are usually driven by individuals rather than by the

organisation. In a developing organisation with a continuous inflow of new capabilities, this cluster represents the first stage of the innovation pipeline. The value for these capabilities is often in the growth of the organisational knowledge, and many of them are relatively short-lived. The important thing is to be able to identify and develop those capabilities that may bring value beyond the initial exploratory phase.

By analysing the full set of higher education digital capabilities proposed in (Kähkipuro, 2017), it is easy to see that all of them fit well into the proposed four clusters. The detailed mapping, however, will depend on the institution, as the actual location for each capability depends on the institution's strategy and digital maturity.

6. APPLYING THE FRAMEWORK IN HIGHER EDUCATION

In this section, we analyse the proposed framework from several perspectives. We identify similarities, differences and links between the four clusters. Examples from higher education will be used to illustrate the framework in practice.

In the technical cluster, the decision-making process is often led by the IT organisation for practical reasons, this is where the expertise is. However, to be successful, it is often wise to include other parts of the organisation into decision-making, leading into a federal model or a duopoly for most decision types. The main driver in many cases is still the optimal service provision and value for money. In higher education, this model gets often implemented through a financial process where the IT organisation can operate freely within the given IT budget. While the model often works satisfactorily, there are still ways to improve the governance of the technical cluster. Often, the rest of the organisation is not aware of the full value of the seemingly invisible digital infrastructure, and the governance model can be used to engage the rest of the organisation and to increase such awareness. Another typical issue in higher education is the lack of an organisation wide approach for driving value for money. People work in siloes. This can often be addressed by using the governance model to harmonise procurement as this often represents 50% of the spending.

In the mainstream digital cluster, the control is typically on the business side. Business monarchy is often the first approach organisations take, as traditional IT organisations are seldom eager to support disruptive business initiatives. However, experience has shown that cooperation across the organisation yields better digital capabilities and, consequently, a typical approach today is to build a federal model or a duopoly with a clear involvement of IT. Bimodal practices on the IT side are often used to reduce the friction. The main driver for the mainstream cluster is business demand, often manifesting itself in the form of growth and differentiation. The main challenges in the governance of the mainstream digital cluster are related to new role play in the organisation. For example, IT needs to be involved in a successful large-scale implementation even if a pilot has been possible with a home-grown solution. In a similar way, the business/academic side needs to understand the full scope of digital opportunities to reach the full potential of a given capability. A typical example is the use of digital tools in education – a conservative implementation project might result in a solution where only a fraction of the full functionality gets used.

From the governance perspective, the first two clusters are quite similar, as both have a well-defined underlying agenda. There is usually a clear understanding of the goals, and the required links across the organisation are well understood. Consequently, the related governance models are often identical except that the leading role is either on the IT or the business side.

The evolving digital cluster is clearly different from the two previous ones, as the underlying capabilities are in a transitional state. Consequently, a typical approach is to use a project organisation for managing the capabilities even if they are already in business use (with the unfortunate consequence of having long multi-year projects). Depending on the scope and the expected impact of the capability, the governance archetype is often feudal ("silo approach") or federal ("broader participation"). One of the key issues with this cluster is to manage the interplay between the different projects. For example, they may be competing for the same resources or there might be synergies between them. Another typical issue is to ensure that all these projects/capabilities get sufficient support from IT even if the implementation projects are not part of the official digital agenda. A typical approach is to establish a programme (or several programmes) to provide high-level coordination across the projects. The approach may also include an enterprise project management office (EPMO) for providing additional support for individual

projects. In higher education, typical examples are projects for adopting new technologies, such as lecture capture solutions, digital assessment tools, group-based learning spaces, attendance monitoring technologies, digital learning environments, etc. These projects often start with a limited pilot and, if the organisation finds the initial results useful, the scope gradually extends to the entire institution. At some stage, they may become part of the mainstream.

Finally, the opportunistic cluster presents a different kind of challenge for most organisations. To be able to use digital technologies to their full potential, organisations must find a way to foster digital innovations and to capture the results. Such innovations often emerge from the interplay between digital opportunities and business needs. Both formal and informal structures can be used to pave the way for such innovations. In higher education, for example, funding can be made available for "innovative teaching projects" and often it turns out that such initiatives are using digital technologies underneath. Similarly, IT business relationship managers could spend part of their time with academics to support them in finding new ways to address teaching and research. Border-crossing ambassadors often play an important part in the innovation process.

Once a new digital capability has been identified, there is also an issue in converting it into an asset for the entire organisation. Again, both formal and informal structures can be used this. Higher education institutions do not typically have R&D organisations, but funding should be made available for R&D projects in all areas. For example, a research infrastructure created by a single researcher may have the potential to become a useful platform for a broader group of researchers and, consequently, the institution's governance model should make it possible to extend the scope and to find additional funding. In the same way, it should be possible to extend individual performance improvements techniques in administrative work to the entire organisation. Again, the governance model should allow such initiatives to get funding and support.

Cluster	Purpose	Typical implementation	Value drivers	Typical improvement needs
Technical	Running and developing the digital infrastructure	Driven by IT, input and participation by business, often federal or duopoly	Value for money, digital enablement. Driven by service provision.	Improved awareness of the value of the infrastructure, better procurement and supplier management
Mainstream digital	Implementing the organisation's digital strategy	Driven by business, input and participation by IT, often federal or duopoly	Business growth, differentiation. Driven by service demand.	Sufficient involvement of IT, better technical awareness within the business
Evolving digital	Turning digital non-mainstream prospects into core business	Case by case project organisations, mainly feudal and federal	Innovation, differentiation. Driven by projects.	Managing interaction between individual projects, ensuring sufficient IT support for projects
Opportunistic	Finding new opportunities outside the known space	IT and business ambassadors both ways, internal risk funding	Gaining knowledge. Driven by the need to understand the future.	Innovation friendly culture, support for R&D initiatives across the organisation

Figure 4. Summary of the proposed governance framework.

Figure 4 provides a summary of the four capability clusters. There is also a clear evolutionary path between the clusters. Typically, a capability starts its life in the opportunistic cluster. If it has enough potential, it may move over to the evolving digital cluster to become a development project. Once the results of the project have been adopted by most of the organisation, the capability moves over to the mainstream digital cluster. This is often the end state for business-led capabilities. However, if the capability is of technical nature or if it becomes a commodity, it may end up in the technical cluster as well.

7. SUMMARY

Most business sectors are in the middle of a digital transformation where key business elements are affected by information technology. Higher education is no exception, and we are seeing changes at all levels ranging from the business model to the fundamentals of education and research.

To better understand digital transformation, the required new processes, tools and competences are often combined into digital capabilities. Both generic and sector-specific capability models have been proposed, and they can help organisations to understand the required changes in different areas. They can also assist in structuring the work into projects and programmes. However,

traditional IT governance models are not well suited for the required decision-making in the increasingly complex digital world. This issue is even more acute in the higher education sector with its multifaceted nature and inherent complexities.

This paper proposes a governance framework where digital capabilities with similar governance needs are grouped together. This way, the differences between the capabilities are taken into account while the number of different governance styles is still manageable. *The technical cluster* collects traditional IT capabilities (and similar new capabilities), *the mainstream digital cluster* represents the organisation's official digital agenda, *the evolving digital cluster* collects capabilities that may one day move in the mainstream, and *the opportunistic cluster* represents the first stage of the digital innovation pipeline. The governance style and the required structures are different for each cluster.

The proposed framework has emerged from the requirements and the underlying capabilities of the higher education sector. However, the overall concepts are sector neutral and can be applied to other types of businesses as well.

8. REFERENCES

Gartner, Inc. (2014). *The Four Futures of IT When Digital Business Makes Every Budget an IT Budget*. CT: Stamford, Gartner, Inc.

Hentrich, C., Pachmajer, M (2016). *d.quarks: The Path to Digital Business*. Hamburg, Germany: Murmann Publishers.

Kähkipuro, P. T. (2015). Case Aalto University – Digital Transformation in Higher Education. In *Collin, Hiekkanen, Korhonen, Halén, Itälä, Helenius (eds.), IT Leadership in Transition, The Impact of Digitalization in Finnish Organizations*. Aalto University publication series, SCIENCE + TECHNOLOGY 7/2015, 81-88.

Kähkipuro, P. T. (2017). Essential IT capabilities for a successful digital transformation in Higher Education. *European Journal of Higher Education IT, 2017-1* (http://www.eunis.org/erai/2017-1/).

Mingay, S., Scott, D. (2017). *Scaling Bimodal – Fusing IT With the Business: A Gartner Trend Insight Report*. CT: Stamford, Gartner, Inc.

University of Oxford (2017). *International Trends in Higher Education 2016-17*. Oxford, United Kingdom: University of Oxford International Strategy Office.

Weill, P., Ross, J. W. (2004). *IT Governance: how top performers manage IT decision rights for superior results*. MA: Massachusetts, Harvard Business School Publishing.

9.   AUTHOR'S BIOGRAPHY

Pekka Kähkipuro is Chief Information Officer at Brunel University London since 2016. He is heading the Information Services Directorate responsible for ICT, Media, and Library services. Prior to joining Brunel, Pekka was Director of IT at Aalto University in Finland in 2010-2016 and, before that, he held various senior roles in the private sector including Nokia. He was EUNIS board member in 2011-2015 and the President in 2015. Pekka obtained his Ph.D. in computer science from the University of Helsinki in 2000.