

Understanding the Role of Business – IT Alignment in Organisational Agility

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Abstract: Extant research shows business-IT alignment to be both an enabler and inhibitor of overall organisational agility and has pointed to the need for finer grained perspectives to fully elucidate the relationship. This paper posits the view that, firstly, current approaches to reasoning about where rigidities are present that are preventing organisational agility are lacking in both granularity and sound ontology. Secondly, that in order to obtain the necessary granular view, the socio-technical dimension of the business-IT relationship must be examined. An initial conceptual model behind ongoing research into this topical problem area is presented.

1 INTRODUCTION

Modern organisations are more reliant on IT than ever. In the modern, dynamic business environment much is made of the need for organisational agility and the role IT plays as a contributor to this attribute (e.g. Sambamurthy, Bharadwaj and Grover 2003; Zammuto et al., 2007; Weerdts et al., 2012). However, modern organisations are also faced with an ever burgeoning IT applications portfolio, both in size and complexity (Rettig 2007). This intrinsically creates problems for organisational agility as there is an increasing need to respond to environmental change and at the same time redeploy (or deploy new) IT functionality from the existing complex IT applications portfolio. In doing this, organisations are faced with not only technical challenges involving application architecture, but also socio-technical issues that go to the heart of how technology is used operationally in organisational processes to deliver the new or changed capability. How easy or otherwise it is for the organisation to make changes across these “layers” is a significant research problem.

There is a significant quantity of research that substantiates the idea that IT produces value for the organisation (Melville et al., 2004; Avison et al., 2004; Wang et al., 2012), and that, in particular, the strategic alignment of IT produces business value (Oh and Pinsonneault 2007; Tallon 2007).

The relationship between IT alignment and

organisational agility is not so clear cut however. Researchers have made the case, on the one hand, for IT alignment enhancing organisational agility (e.g. Sambamurthy et al., 2003) as well, on the other hand, impeding it (e.g. Rettig 2007). This has been called the “alignment paradox” (Tallon 2003). Whereas extant research has established empirical evidence that goes some of the way to identifying the circumstances giving rise to each perspective (e.g. Lu and Ramamurthy 2011; Tallon and Pinsonneault 2011), it is short on elucidating the mechanisms involved that would better inform both business and IT strategic decision making.

As Tallon puts it: “The critical alignment lesson for companies is this: Increased strategic alignment will improve IT's value to the business, but only if the company is wired flexibly enough to react to sudden business change” (2003, p.2).

So the question we ask is how we can better understand this “*organisational wiring*”, especially as it relates to IT: what are the *contingencies* that determine the ability of the organisation to adapt to business change?

We suggest that there are four key ingredients that need to be integrated to provide an adequate reasoning model for understanding business-IT alignment, and that so far, existing research has fallen short of bringing all of these elements together. The elements are:

- Organisational Dynamics. Understanding how organisations respond to change.

- Granularity. Understanding organisational components at a fine grained level in order to be able to reason about the mechanisms by which IT influences the organisation's agility.
- The socio-technical dimension. Understanding the technology-in-use within the organisation.
- Ontology. Disambiguating a minefield of multi-disciplinary terminology.

We posit that a more granular conceptual model of the organisation's business-IT landscape is required to understand "what is really going on" when we talk about alignment of IT to business and how this enables or inhibits the agility of the organisation. This paper explores these four areas in more detail and then goes on to outline current research towards a new theoretical model that seeks to integrate them.

2 ORGANISATIONAL DYNAMICS

Prompted by need to understand the role of the organisation and its relationship to this dynamic business environment, research in the management and organisational sciences have, over the last decade or so, developed ideas such as dynamic capabilities (Teece et al., 1997; Teece 2007; Teece 2012), organisational routines (Pentland and Feldman 2005; Pentland et al., 2012) and evolutionary theories of the organisation (Volberda and Lewin 2003; Rivkin and Siggelkow 2007; McKelvey 1999) among others. These theories have identified the need for organisational agility, and have looked at how organisations achieve this.

The incorporation of this dynamic element into the business-IT alignment literature has, however, been mixed, showing some evolution since this research area was as initially formalised in 1980's, but still falling short of satisfactorily accommodating the need for change as a natural state. Earlier viewpoints tended to model, for example, the structural alignments between IT and business (Ein-Dor and Segev 1982); or the more complex structural and strategic relationships as in the Strategic Alignment Model (SAM) (Henderson and Venkatraman 1993), but in a relatively static way that made the assumption that once set, a particular alignment perspective could be regarded as fixed. Notwithstanding attempts to add a more dynamic element, such as in the punctuated equilibrium model (Sabherwal et al., 2001), the SAM has been criticised for being too deterministic and lacking a perspective on how the business-IT relationship co-evolves over time (Peppard and Breu 2003).

In a departure from the previous orthodoxy, co-

evolutionary models of the business-IT relationship have emerged (Benbya and McKelvey 2006; Merali and McKelvey 2006) These approaches, based on adaptive systems theory, promise to shed a new light not only on the dynamics of the organisation, but also on the role played by complexity (e.g. of the inter-relationships).

3 GRANULARITY

"What looks from a distance like no change masks more granular change close up" (Helfat and Winter 2011, p.1246).

Research in the organisational and management sciences have analysed organisations in terms of several types of granular elements, such as routines, capabilities, roles, services and competencies. Notwithstanding the ontological difficulties that have arisen (discussed separately below), these have served to add a fine grained understanding to our knowledge of how organisations actually work.

Research has, however, been notably short on elucidating the mechanisms involved such that one may reason about causes and effects. The classic positivist empirical research approach that tends to equate causality to statistical correlation, provides little insight into mechanism.

In addition, studies that have found empirical relationships between business and IT concepts (e.g. Reich and Benbasat 2000; Wang et al., 2012; Chan et al., 2006), have tended to be coarse grained – often at the firm level. There is a lack of finer grained models which would explain mechanisms of business-IT alignment in more detail and thereby assist in identifying where the rigidities lie and under what conditions.

In order to provide an adequate basis for reasoning about the relationships between alignment and agility, we therefore suggest there is a need for a fine grained view of the appropriate organisational elements in which relationships can be interpreted in terms of mechanisms that underpin the behaviour.

One organisational perspective that is attractive is proposed by Helfat et al. (2007), which uses the idea of "capabilities" (a granular organisational element), representing what the organisation does to earn its living. Capabilities are measured in terms of both evolutionary fitness and technical fitness, where the former is the viewpoint exogenous to the organisation and the latter is endogenous. This presents a way to link the external environmental pressure for organisations to adapt and be agile with internal pressures demanding increasing efficiency

and effectiveness. By conceptualising technology as one of the building blocks of organisational capability, there is a foundation for a granular business-IT model. This offers the potential for reasoning about the role of IT at the organisational capability level, and thence its role in any adaptation of that capability, whether exogenously or endogenously induced.

4 SOCIO-TECHNICAL DIMENSION

Researchers have approached the issue of conceptualising the human behavioural element of organisations and its interaction with technology across a spectrum of positivist, interpretivist and critical realist perspectives. This is underscored by the “clash” of the modernist and post modernist world views evident in this multi-disciplinary research field. It is a given that any item of research carries with it a philosophical position whether explicitly stated or not.

The inadequacy of the research to date in incorporating technology into the study of the organisation has been noted (Pentland 2013; Orlikowski and Scott 2008; Volkoff, Strong and Elmes 2007). Even within the organisational sciences, theoretical developments in this area have variously placed human intentionality at the centre and ignored technology as with structuration theory (Giddens 1984); regarded the human and technology agencies as an inseparable duality, as with Actor-Network theory (Latour 1987) or sociomateriality (Orlikowski and Scott 2008); or looked at technology as a material agency that plays a role in moderating the relationship between the performative and ostensive aspects of organisational routines (Volkoff et al., 2007). A common theme that arises is viewing social and technology elements in *relational* terms where behaviours are emergent from the interaction. This could be summarised as the technology-in-practice viewpoint (Feldman and Orlikowski 2011). This can be contrasted with the more orthodox IS perspective where roles, processes, technologies are characterised as stable, independent entities with simple unidirectional relationships (e.g. Tallon and Pinsonneault, 2011; Melville et al., 2004; Henderson and Venkatraman, 1993).

The relational perspective is exemplified by the emerging area of technology affordances (Zammuto et al., 2007; Majchrzak and Markus, 2012; Leonardi 2011; Yoo and Boland, 2012). An affordance

represents the perception of what can be done with an item of technology by a user with a particular goal – i.e. the potentiality of a technology feature. According to Leonardi (2011), the flexibility of organisational routines as well as technologies will determine how the affordance will be realised by virtue of the way the human and material agencies become “imbricated” or intertwined. In other words, the affordance (or constraint) posed by an item of technology may prompt a change to either the routine or the technology depending on its flexibility and on what has happened in the past. This is a useful concept that extends the idea of the performative routine (Feldman and Pentland 2003) into the business-IT space.

We believe this not only offers an important new perspective on the role of IT in organisations, but that it also offers a naturally granular way of conceiving of the business-IT relationship. What remains is to examine how these granular interactions play in the wider context of the organisation’s agility.

5 ONTOLOGY

This problem domain is remarkable, not least because of the plurality of theories that have been developed across the intersecting disciplines involved. These theories have invoked various units of analysis as a means of decomposing the organisation and understanding the concepts relevant to the specific objectives of the researchers. Over time some “generally understood” common definitions have emerged that have allowed strands of research to cross-fertilise and propagate. Similarly, however, inconsistency and confusion have also arisen in some of the concepts and terminology. If we set aside the philosophical differences mentioned previously, there are still some difficulties with getting to a consistency of usage and meaning with some basic terminology.

The observation made by Dosi *et al.* is illustrative: “The term ‘capabilities’ floats in the literature like an iceberg in a foggy Arctic sea, one iceberg among many, not easily recognized as different from several icebergs nearby” (2000, p.3). This could equally apply to the “routines”. In fact capability and routine are the terms most frequently used in the organisational sciences to describe *what* it is the organisation does and *how* it does it, including how it uses IT. It is therefore important in the context of understanding this problem domain, which implicitly attempts to connect the two, that

there is a firm definitional foundation for them. Despite the progress in the development of the ontology of the routine (e.g. Feldman and Pentland 2003; Pentland and Feldman 2005; Leonardi 2011), there is still a schism with the IS world where the term is scarcely used and it is more common to talk about “business processes” (e.g. Hammer and Champy 1993; Weske 2012; Trkman 2010). Disambiguating this area by explicating the interrelationships of these seemingly disparate but related terms is a worthwhile objective in its own right.

6 TOWARDS A NEW FRAMEWORK

In our research, we seek to develop a new theoretical framework for understanding business–IT alignment and organisational agility. In attempting to address the issues discussed, we posit the high level conceptual model depicted in Figure 1. Underlying the model are the concepts of evolutionary and technical fitness of capabilities, inspired by Helfat et al., (2007).

There are two types of coevolutionary landscapes represented in Figure 1. The first (evolutionary fitness) is participated in by organisations and represents, for example, competition in a marketplace. Here there are ecosystems of two or more organisations where evolutionary selection is based on *capability* within a given ecosystem. This concept provides the first level of granularity to describe the organisation. The organisation’s ability to deploy a capability will determine its “fitness” (i.e. competitive advantage) in this external landscape.

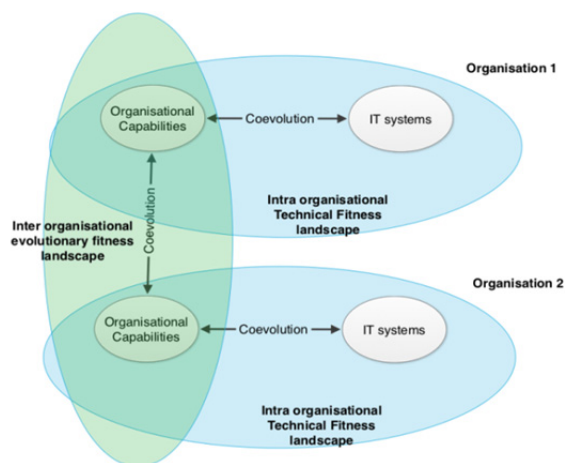


Figure 1: Framework Conceptual Model.

The other (technical) fitness landscape is internal to the organisation and represents the same organisational capabilities in a coevolutionary relationship with the information technology systems that enable them.

Thus, we have the exogenous market force (or another organisation) creating selection pressure on a capability and at the same time the endogenous landscape says how well we can support it or indeed how quickly it can be pushed to the background in the favour of another capability – thereby capturing essence of the organisation’s agility. The interlinking of both internal and external landscapes captures the tension that exists between the two. Casting these two fitness concepts into a systems-theoretic context creates the opportunity for applying a complex adaptive systems treatment to how they adapt and evolve in a situation where there are potentially conflicting fitness goals.

We note at this stage the simplification we have made in figuring the exogenous landscape as a purely competitive one. There are obviously different types of organisation (such as customers, suppliers or regulatory bodies) which are not in this type of relationship with the organisation of focus. As our research progresses we expect to establish the scope of applicability of our model across these organisation types.

Given this high level model, there is then the opportunity to decompose the building blocks of capabilities to further identify the locus of inflexibility in the business-IT coevolutionary relationship. Here the theory of organisational routines is attractive, especially incorporating recent developments of technology affordances and imbrications (Zammuto et al., 2007; Leonardi, 2011) as they naturally seek to address the socio-technical relationship and also fit an evolutionary paradigm (Pentland et al. 2012). Our ongoing research is exploring this further.

7 CONCLUSION AND FURTHER RESEARCH

Understanding the role of IT within the modern organisation is highly topical and has been the subject of much research across multiple disciplines. We have identified four areas of deficiency in the extant research that in our view need to be addressed if we are to satisfactorily develop an integrative theory that assists our understanding business-IT alignment and its relationship to organisational

agility.

Firstly, we must build dynamics into the heart of the model: we suggest an adaptive systems perspective. Secondly we must adopt a more granular view, seeking to analyse the organisation at a fine enough grain to reveal circumstances and mechanisms that contribute to or inhibit agility. Thirdly, we must understand the technology-in-practice as against the technology-as-designed. Lastly, any attempt at theorising in this domain must be aware of the plurality of philosophical positions that exist and carefully design their ontology accordingly.

We believe an approach that addresses these elements would provide a new insight into the mechanisms at play within the organisation that determine the contingent conditions for organisational agility, especially as they relate to the role of IT alignment.

In particular, the dual aspects of technical and evolutionary fitness of capabilities (Helfat *et al.* 2007) allows the need for agility (evolutionary fitness) to be related to the need for IT enablement (technical fitness). Thus the idea of "IT alignment" must serve both aspects if a capability is to remain relevant and produce value for the organisation.

Our ongoing research in this area is following a design science paradigm. We are seeking to define a research-based theoretical framework and then evaluate it using empirical data drawn from a variety of case study organisations.

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