Organisational Studies and Innovation Review

Vol. 1, no.1, summer, 2015

Leveraging Human and IS Capita

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Abstract: Organizations are multilevel systems composed of interdependent elements. Two major elements are people and information systems (ISs) – both forms of intangible capital that organizations invest in with an expectation of future returns. People increasingly rely on ISs and vice versa, yet despite their interconnectedness there has been comparatively little research on how their interdependencies affect their functioning and complementarity. This paper discusses how viewing human and IS resources from intellectual capital and systems perspectives can yield a better understanding of how to leverage their interdependencies for organizational benefit.

Keywords: Information systems; intellectual capital; human and IS resources; interdependencies; value

Introduction

People and information systems (ISs) represent important forms of capital – resources that organizations acquire and develop with an expectation of future returns in the form of profits, competitive advantage and development of long term capabilities. From a systems perspective people and ISs are interconnected and interdependent organizational elements that must work together for their value be realized (Kozlowski and Klein 2000).

Despite the evident reliance by people on ISs and ISs on people there has been relatively little research conducted into the nature of these dependencies and how they affect business performance and returns to organizational investors (Wade and Hulland 2004).This paper aims to show how a better understanding of the dynamics of people-IS interdependencies involved in value creation and appropriation (value maximization) can help organizations improve returns on their human and IS investments.

The paper starts by exploring the notion of people and information systems as forms of capital and of concepts of value. This is followed by a review of the literature on interdependencies and its relevance to people and ISs. The nature of the interdependencies that occur between people and ISs in the process of value maximization is then examined, followed by a suggested architecture for value maximization that combines HR and IS perspectives. The paper concludes with an analysis of the implications for theory and practice.

Literature Review

In this paper 'people' refers to the members of an organization's workforce including developers, suppliers, managers, support staff and users who use or support the use of its ISs. 'ISs' refer to artifacts, typically computerized, that provide symbolic representations of some domains in the world. Most organizations rely on a wide variety of ISs, including office productivity software, networking applications, and enterprise wide systems. The development and use of ISs is seen as dependent on both technological artifacts (infrastructure and applications) and people (Melville, Kraemer and Gurbaxani 2004).

The notion of human capital came to prominence in macroeconomic theory in the 1960's (Schultz 1961; Becker 1962). Whereas at the macroeconomic level the dynamic and heterogeneous aspects of human capital, in particular intellectual resources, are 'averaged out,' at the microeconomic level these differentiated and dynamic features are critical to firms' existence and competitive advantage (Barney 1991; Grant 1996; Spender 1996). Firms invest in people with a view to maximizing returns for their shareholders and people work for firms with a view to maximizing returns to themselves (Von Krogh and Wallin 2011). The tensions inherent in this situation imply a need for organizational strategies to ensure that benefits from the value people create flow as far as practicable to firms and their shareholders and are not lost or misappropriated (Coff 1999)

The idea of information systems as capital emerges mainly from the intellectual capital tradition, which classifies types of intellectual/knowledge capital as human, social and structural/organizational, (Subramaniam and Youndt 2005). According to such typologies ISs are a type of organizational capital. All forms of intellectual capital are ultimately based on human knowledge; IS capital investments thus depend on human capital investments. Given the heavy reliance by people on ISs in modern organizations the converse also applies. Understanding IS-people interdependencies in organizations is therefore critical.

Methodology for Theoretical Analysis

Motivated by the lack of attention to interdependencies between people and information systems as distinct but complementary forms of capital, the aim of this paper is to provide concepts and a framework to guide future work to address this problem. From a methodological perspective, therefore, my aim was more analytical rather than empirical (Gregor 2006). Accordingly, the methodology followed in the paper was one of detailed analysis of relevant theories from the human resources and information systems literatures rather than collecting and analyzing data from the field.

My starting point was to examine general theories of interdependencies in organisations (Thompson 1967; Victor and Blackburn 1987; Malone and Crowston 1994). These works suggest three generic types of interdependencies that involve people and ISs in organizations: interdependencies among people, tasks, and resources. In the following sections, I examine the results of my theoretical analysis regarding these different types.

Results of Theoretical Analysis

I begin by describing the relationship between interdependencies and value creation and appropriation. I then build on these insights to examine strategies for value maximization.

Modeling People-IS Interdependencies in Value Creation and Appropriation

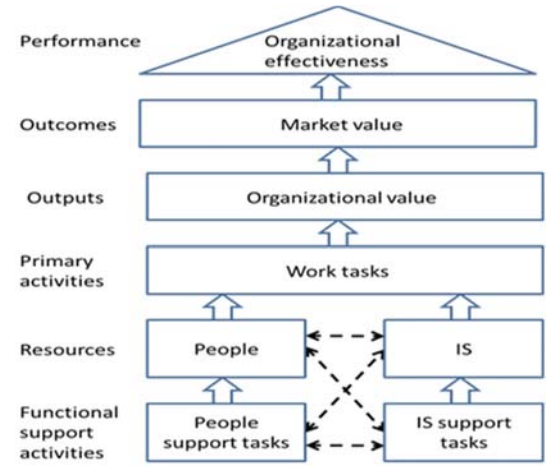
Figure 1 depicts a model of people-IS Interdependencies. Two types of resources are shown: people and systems and two types of activities: functional support activities and primary activities. 'People' refers to the firm's workforce, excluding those associated with people and IS support activities. 'Systems' refer to the IS infrastructure and applications in use. 'Functional support activities' refers to the tasks performed by HR and IS personnel in procuring, developing and maintaining the workforce and ISs. Four types of dependency are shown: IS - people; people - IS support; IS - people support; people support - IS support (Burton-Jones and Burton-Jones 2011) which are discussed in the paper.

Definitions of value include use/utility value, scarcity value and exchange value. Utility value is a matter of individual or organizational perception whereas scarcity and exchange value can be objectively determined (Bowen and Ambrosini 2007; Lepak, Smith and Taylor 2007). Transactions involving exchange value occur within organizations when, for example, organizations pay their employees in exchange for labour, and in the market when for example customers pay firms for their products. This latter type of value is defined as 'market value' (see Figure 1). 'Organizational value' represents the contributions to market value expected to flow from the outputs of organizational resources -in this case, people and ISs. Some elements of organizational value may be readily consumed in the market, for example finished goods. Other elements of organizational value, such as organizational capabilities, may be reinvested or reused as capital to produce market value (Teece, Pisano and Shuen 1997).

Following Porter (1985), work tasks in Figure 1 are defined as the primary value activities for which people and information systems are obtained and used. Outputs from these value activities generate organizational value, which influences market value that in turn influences organizational effectiveness. Organizational value is created and appropriated through outputs from work tasks. In modern organizations organizational value derives mainly from ideas, lessons learned and other intellectual outputs from task activities. Value is thereby created continuously – value capture or loss following closely on its creation. For example a valuable lesson learned on the job may be hoarded by individuals for personal benefit, forgotten, or recorded for the benefit of the organization – in such situations value creation and its capture or loss may occur virtually simultaneously.

In modern organizations work tasks typically involve people constantly interacting with ISs, with the result that the speed and complexity of value creation and capture has massively increased compared to previous methods. These factors in turn increase the risk that value may be lost, underexploited or misappropriated. Integrated HR and IS strategies are required to address these contingencies so as to maximize value for the organization – as will be discussed next.

Fig I: Interdependencies among Resources and Activities



Contributions

Interdependencies

People and IS strategies for value maximization

(a) Creating and Appropriating Value from People

Value creation in organizations depends to a significant extent on individuals' willingness to contribute the benefits of their human capital (Burton-Jones, 1999; Hislop 2003). Organizations need to encourage people's willingness to contribute to value creation while avoiding overreliance on individuals so as to maximize value appropriation. To achieve these twin goals strategies are required to ensure that people inter alia, volunteer ideas, disseminate information, record lessons learned, acquire organization specific knowledge, comply with organizational rules and routines, mentor subordinates, plan their successors; develop long term commitment to the organization; perform their tasks effectively and efficiently and provide value for money (Organ and Ryan 2001; Grant 2002; Hislop 2003; Rothwell 2005.)

The measures outlined above need to be applied so as to fit individuals' varying human capital characteristics. For this purpose four broad categories of people can be distinguished, based on their levels of human capital rarity and utility (Lepak and Snell 1999, 2002):
Core employees: people with high levels of rarity and utility, typically senior managers and specialists in core functional areas
Other employees; people with moderate to low levels of rarity and moderate to high levels of utility, typically middle and junior managers and operations staff
Alliance contractors: people with moderate to low levels of utility and high levels of rarity, typically specialists in noncore functional areas that organizations needs to call on from time to time

Other contractors: people with moderate to low levels of rarity and utility, a pool of contingent workers that organizations can call on as required supplementing their internalized/employed workforce.

(b) Creating and Appropriating Value from ISs

Two IS strategies used by organizations to create and appropriate value from ISs are *informating* and *automating* (Zuboff, 1988). *Informating* strategies enable people to make better decisions by providing them with the IS infrastructure, applications and content they require for communicating, problem solving, planning and decision making. Such strategies enhance organizations' human and social capital by supporting and empowering individuals and groups. *Automating* strategies improve organizational productivity and efficiency, thus organizational capital, by codifying and embedding knowledge in routines and procedures so that tasks can be performed with minimal human intervention, as in computer controlled production processes (Zuboff 1988; Bresnahan, Brynjolfsson and Hitt 2002; Burton-Jones 2014).

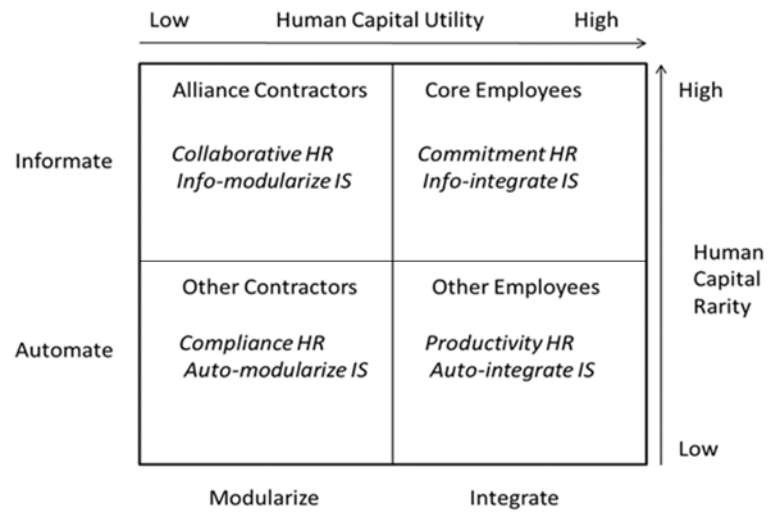
Two further IS strategies involve *integration* and *modularization* (Sanchez and Mahoney 1996; Schilling 2000; Schilling and Steensma 2001, Samaranayake 2009). *Integration* strategies are used to tightly couple systems and functional applications, such as sales, production and finance in order to realize processing efficiencies, share common data and provide real time enterprise-wide access to information, thereby enhancing organizational, human and social capital. *Modularization* strategies increase organizational flexibility, thus organizational and social capital by reducing product knowledge specificity, thereby permitting greater use of people and ISs from outside the organization.

Figure 2 presents a conceptual model that integrates IS and HR strategies for maximizing value. The model builds on existing people-centric architectures (Burton-Jones 1999; Lepak and Snell1999, 2002, Burton-Jones and Burton-Jones 2011) to show how IS-based and people-based strategies can be combined and aligned with the human capital value of an organization's internal and external workforce. Each of the strategy combinations shown in the model yields a different configuration of IS and people dependencies, supports value creation contribution differently, and provides different means for organizational value appropriation. Given the space constraints of this paper these configurations are briefly sketched below.

Informating involves providing people with tools and access to information content to enhance their productive capacity. Integrating involves linking and combining organizational systems and information resources to enable people to maximize the value of their disparate specialist knowledge.

Informate-Integrate (Info-Integrate) strategies focus on supporting the core group of employees whose knowledge is most strategically valuable. Combining an IS Info-Integrate strategy with an HR commitment strategy ensures that the core group of employees are maximally incentivized and supported to record, share and apply what they know for the benefit of the organization. Embedding value appropriation policies and procedures into ISs and into the support provided to core employees can limit the scope for 'star performers' to bargain for a disproportionate amount of the rents resultant from their activities (Coff 1999).

Fig. 2: Integrated IS-HR Architecture



Automation involves codifying and routinizing tasks. Combining automation with integration improves linkages between tasks and across activities thus improving workflow. Automate-Integrate (Auto-Integrate) strategies are designed to leverage the value of employees whose value to the organization is largely based on their ability to perform routine tasks. HR practices require IS infrastructure and applications that support job/task specific training, team work and close monitoring of outputs. The effectiveness of IS support in turn depends on staff knowledge of user and HR support needs. Combining an IS Auto-Integrate strategy with an HR productivity strategy leverages opportunities for value creation and appropriation from job-based work.

Modularization strategies are designed to deconstruct processes into separate, standardized and simplified task components so that they are more readily performed by an external workforce and also by other organizational stakeholders such as customers and suppliers. Informating, as noted above, provides people with tools and access to informational content. Info-Modularize strategies aid value maximization by offering the IS infrastructure and support needed to ensure alliance contractors and similar supplier types are able to comply with organizational rules and routines, acquire the firm specific knowledge they require to provide their services effectively and communicate and share their knowledge with employees. Such strategies complement and reinforce HR strategies aimed at collaboration.

Automate – Modularize (Auto-Modularize) strategies combine automation strategies designed to routinize tasks, with modularization strategies designed to simplify tasks thus minimizing skill requirements and enabling maximum workforce utilization. Combining an Auto-Modularize IS strategy with an HR compliance strategy ensures that the organization can use low skilled and low cost external contractors for routine tasks on a flexible basis thus maximizing efficiencies. Such strategies may also enable organizations to externalize routine operational tasks to other stakeholders including customers. When aligned, the IS and HR components of these strategies complement each other.

Conclusion

In today's economy organizational value increasingly derives from use of intellectual resources and their outputs; creation and capture or loss of value occurring continuously during task activities. While HR management practices can be used to train and motivate individuals to contribute value and aid organizational value appropriation, such practices increasingly rely on complementary IS resources and strategies and vice versa. Developing an integrated IS - HR management strategy is therefore essential for value maximization.

This paper complements prior research by exploring the role of people- IS interdependencies in value creation and appropriation. It also extends the literature on human capital and organizational effectiveness by showing the importance of resource dependencies, as well as fit, for maximizing value. Contributions to research and practice include showing why a unified approach to evaluating performance effects of organizational investments in human and IS capital is needed and offering a conceptual framework for integrating and improving the effectiveness of HR and IS management strategies.

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