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Firm boundary decisions in solution business: Examining internal vs. external resource integration

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ABSTRACT

This paper examines the drivers that lead manufacturers to choose between an internal versus external resource integration approach as they transition to solution-based business. We emphasize product-based resources and examine drivers for the choice of resource integration approach through four distinct firm boundary conceptions – identity, competence, efficiency, and power. These boundary conceptions are applied to an empirical investigation of two global manufacturers, Wärtsilä and Kone, which have chosen opposite strategies to integrate product-based resources in transitioning to solution business: one opted to internalize the required resources, while the other works with a network of external partners. We develop research propositions to explicate how internal vs. external resource integration approaches in solution business represent distinct paths for manufacturers to grow their underlying product businesses; derive value from integrated resources; manage interdependence between solution components; and position themselves as central integrators of complex solutions. This paper contributes to the existing research by providing a systematic and theoretically inclusive analysis of alternative approaches to organizing solution provision. Previous contributions on these issues are very few and predominantly focus on examining manufacturers' organization of service provision. This paper provides a complementary view focusing on product-based resources and incorporates a wider range of explanatory theories.

1. Introduction

Commoditization pressures and heightened competition have increasingly prompted manufacturers to transition to solution-based business (Nordin & Kowalkowski, 2010; Tuli, Kohli, & Bharadwaj, 2007; Ulaga & Reinartz, 2011). Providing solutions involves integrating a broad set of product- and service-based components into a seamless whole that meets customer-specific needs (Biggemann, Kowalkowski, Maley, & Brege, 2013; Hakanen & Jaakkola, 2012), requiring considerable changes in the organization and its resources (Ferreira, Proença, Spencer, & Cova, 2013). Understanding how manufacturers manage different aspects of this necessary yet challenging transformation has been emphasized as a key area of research (Evanschitzky, Wangenheim, & Woisetschläger, 2011).

To effectively transition to solution-based business, manufacturers need to secure access to an expanded set of resources (Raddats & Easingwood, 2010). In doing so, they can choose between two distinct approaches: internalizing the required resources or seeking access to them through an external partner network (Davies, Brady, & Hobday, 2007). However, we currently lack a clear understanding on how firms choose between internalization and externalization approaches as they transition to solution business. While there are rich research traditions addressing firm boundary decisions, very few studies have addressed this issue in solution or servitization contexts where the need for resource expansion is critical. Some initial attempts have been made to explore manufacturers' externalization vs. internationalization decisions with regard to service-based resources (Kowalkowski, Kindström, & Witell, 2011; Paiola, Saccani, Perona, & Gebauer, 2013). The expansion of product-based resources has garnered comparatively less attention, although we know that some solution transition paths place relatively high importance on product-based resources, for instance in the form of tailored systems (Matthyssens & Vandenbempt, 2008).

To address these gaps in the existing research, *the purpose of this paper is to analyze the drivers that lead manufacturers to choose between internal vs. external resource integration approaches as they transition to solution-based business*. In doing so, we emphasize product-based resources to complement prior contributions' emphasis on service-based resources (Kowalkowski et al., 2011; Paiola et al., 2013). We analyze the drivers behind these resource integration approaches by applying

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four distinct, but interrelated, firm boundary conceptions initially introduced by Santos and Eisenhardt (2005, 2009): identity, competence, efficiency, and power. These boundary conceptions draw upon a rich set of established theories and enable us to develop a more theoretically inclusive analysis of the internal vs. external resource integration approaches in solution business. Thereby, we also respond to the critique that much of solution business research lacks grounding in more generic theoretical frameworks (Nordin & Kowalkowski, 2010).

The four boundary conceptions provide the analytical framework to examine the resource integration approaches of two global manufacturers, Wärtsilä and Kone, which operate in the metal engineering sector. The studied firms have chosen opposite strategies to integrate product-based resources in transitioning to solution business: one chose to internalize the required resources, the other works with a network of external partners. By examining these polar types of cases through multiple theoretical lenses, we provide a holistic understanding of the ideal conditions that favor internal vs. external resource integration approaches.

This study extends the current knowledge on the organization of solution business (Davies et al., 2007; Gebauer, Paiola, & Saccani, 2013) by identifying drivers for alternative resource integration approaches, specified in a set of research propositions. We also problematize the tendency of the existing research to focus on service-related resources, while neglecting consideration of how access is gained to product-based resources.

The paper is organized as follows: we first establish the conceptual basis by explaining how resource integration approaches in solution business can be analyzed as firm boundary decisions. Subsequent sections present methods and data, findings of the empirical study, discussion, and conclusions.

2. Conceptual basis

2.1. Approaches to resource integration in solution business

Solutions have been defined as "individualized offers for complex customer problems that are interactively designed and whose components offer an integrative added value by combining products and/or services so that the value is more than the sum of the components" (Evanschitzky et al., 2011, p. 657). Thus, at the very center of solution business initiatives lies the provider's ability to integrate a wide range of resources, both product- and serviced-based, either within or between organizations, into value-creating responses to customer problems (Evanschitzky et al., 2011; Jaakkola & Hakanen, 2013).

From prior studies we know that different transition paths exist with implications for resource configuration. For instance, Matthyssens and Vandenbempt (2008) note that manufacturers can transition to solution business via two dimensions: technical application integration or business process integration. The former implies developing tailored systems whereby the supplier adds value by modifying the technical solution to fit the customer's needs. This solution transition path is consistent with the early contributions in systems selling (Hannaford, 1976; Mattsson, 1973) and places relatively higher importance on the role of product-based resources. The latter transition path is in line with the servitization stream of solution marketing research: it involves developing service concepts and process management that integrate with the customer's value chain, thus emphasizing service-based resources (Matthyssens & Vandenbempt, 2008). As noted by Kowalkowski, Windahl, Kindström, and Gebauer (2015), much of the recent research has emphasized the servitization perspective. This has led to a lack of insight on product-based resources in solution business.

In transitioning to solution business, providers can choose between two distinct approaches: the "systems seller" where the firm primarily uses resources based within the organization, and the "systems integrator" where the firm integrates resources residing outside its boundaries (Davies et al., 2007). A firm operating as a systems seller is responsible for developing and delivering the entire solution, comprising activities such as designing the system, interface, and component specifications; developing products; producing and integrating components into a system; and providing services to operate and maintain a system over its life cycle (Davies et al., 2007). We term this the *internal resource integration approach*. A systems integrator is a prime contractor for the customer, coordinating and integrating the components and resources provided by external suppliers and partners (Ibid.). Instead of mastering all the activities and resources internally, the systems integrator identifies, selects and manages suppliers across different supply chains, integrating the components into a customer-specific solution (Gebauer et al., 2013). We term this the *external resource integration approach*. In practice, firms may also adopt a hybrid solution in which they combine both approaches (Kowalkowski et al., 2011).

2.2. Firm boundary conceptions in solution business

Choosing between opposing approaches to resource integration requires choices regarding firm boundaries. While multiple theories can be utilized to analyze this crucial aspect of organizational design (Jacobides & Billinger, 2006), the overwhelming majority of prior studies have adopted the transaction cost economics perspective conceptualizing firm boundary decisions as comprising discrete make-or-buy choices with the minimization of governance costs as the guiding principle (Santos & Eisenhardt, 2005, 2009). While resulting in powerful insights, such an atomistic view neglects to consider other boundary-setting mechanisms that, when analyzed together, form patterns of strategic action (Ibid).

In making boundary decisions, firms need to address a set of basic organizational issues that can be captured through corresponding boundary conceptions: identity (coherence), competence (growth), efficiency (cost), and power (autonomy). These boundary conceptions are based on Santos and Eisenhardt's (2005) interpretations of different but at times interrelated theories of the firm. Each is grounded on well-established theories of the organization but none is a direct application of an individual theory. The boundary conceptions form the analytical lenses through which we investigate choice of resource integration approach in solution business, as illustrated in Fig. 1.

Next, we briefly explain how each boundary conception approaches the firm boundary decision, outline the theoretical basis of each view, and identify a key question driving firm boundary decisions in the context of solution business.

2.2.1. The identity view

The identity view, as defined by Santos and Eisenhardt (2005), focuses on how members of an organization define the organization with boundary decisions being guided by a sense of what constitutes an appropriate sphere of activities for the organization as a whole. This view draws on the literature concerning managerial cognition that strives to understand how managers act and interpret the world (e.g., Weick, 1995), and from the organizational identity literature that examines the origins and roles of shared values and norms (e.g., Albert & Whetten, 1985; Dutton & Dukerich, 1991) (see Santos & Eisenhardt, 2005).

Kowalkowski et al. (2015) note that since Oliva and Kallenberg's (2003) seminal article on the service transition process of manufactures, scholars have tended to conceptualize service-led growth strategies, including transition to solution business, as shifts on the product-service continuum, implying a unidirectional movement from product business to service business. While the aspect of organizational identity is seldom explicitly addressed in the extant solution business research, a servitization perspective implies a shift in organizational identity from product manufacturer to service provider. At the same time, particular solution transition paths (e.g. provision of tailored systems as noted by Matthyssens & Vandenbempt, 2008) place relatively high importance on product-based resources. Furthermore, few if any studies

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