



The impact of physician-hospital integration on hospital supply management

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ABSTRACT

This study examines how organizational alignment between professionals—who act as surrogate buyers—and the organizations in which they work, influence the supply management efficiency of the organization. Based on a cross-sectional sample of hospital data, we estimate random effects regression models to investigate the association between physician-hospital integration mechanisms and hospital supply efficiency. The results suggest that either professional hierarchy or bureaucratic pressures can improve supply management efficiency. In a sector of the economy characterized by escalating costs and uncertainty, the findings provide potential guidance for professional relationship strategy design to improve sector performance.

1. Introduction

As modern economies become increasingly knowledge-based, professionalization of the workforce is a dominant trend. Based on data from the U.S. Bureau of Labor Statistics (2016), employment in professional and business services has seen a compound annual growth rate of over 10% in the past decade. Thus it is not surprising that a recent special issue in the Journal of Operations Management examined “Professional Service Operations Management”, emphasizing the intersection between operations and supply chain research and the professional services context (Harvey et al., 2016).

Modern professionals perform their tasks in two different organizational settings, professional and nonprofessional (i.e. bureaucratic) organizations (Wallace, 1995). A physician practice is an example of an organization that is closely aligned to the “professional service firm” classification (Von Nordenflycht, 2010). A hospital, on the other hand, is generally viewed as a bureaucratic organization that depends on a professionalized workforce to carry out its core operations with bureaucratic control mechanisms at its disposal (Dobrzykowski et al., 2016; Heineke, 1995; Sorensen and Sorensen, 1974). Using the physician-hospital relationship as a context, this study examines the linkage between professional service providers, their integration in an organization, and their effect on that organization's supply chain efficiency.

As noted by Harvey et al. (2016), characteristics of professional work pose a potentially difficult management dilemma. “These characteristics, autonomous judgment and external regulation/

accreditation, also create a significant practical challenge for any notion of management or coordination in a professional service setting.” Their concern is the potential elimination of the professional service employer from influencing the provider-client relationship. From a supply chain perspective, Harvey et al. (2016) are concerned with managing the service provider's *downstream* relationship with the client. They point out that similar management and control issues seem to be present whether the professional provider works for a specialized professional service organization-law firm, physicians' group, etc. – or within a nonprofessional enterprise such as a hospital or government agency.

We contend that similar concerns and challenges exist in the *upstream* direction, where the professional service provider interacts with others in the supply chain (Harvey, 2016). In common with sociologists (Abbott, 1988; Freidson, 1988) Harvey emphasizes the importance of the power of the various supply chain actors, including the providers themselves, the clients, and managers of the providers. In the supply management context, the conflicts typically manifest as disagreements about supply selection. Professionals assume the role of “surrogate buyers” who make decisions based on their expertise on behalf of the buyer or consumer, which gives rise to inter-organizational agency problems (Solomon, 1986; Tate et al., 2010). Divergent incentives between the actual purchaser (e.g. hospital's materials manager) and surrogate buyer (e.g. the physician) lead to sourcing issues which can expose both parties to opportunism by the supplier.

Our research question probes the extent to which integration

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strategies between the professional agent and the bureaucratic organization affect supply management performance. We examine two integration mechanisms that attempt to align professional incentives and actions with that of the organization in which they reside: bureaucratic pressures and professional hierarchy pressures. Our theoretical framing of professionalization in the bureaucratic organization provides insights on how nonprofessional organizations can best manage professional autonomy so that it does not defy organizational interests, specifically in matters of strategic supply management. Because of the healthcare context of this study, the healthcare management literature regarding matters of physician-hospital alignment and the complexity inherent in healthcare supply chains is also taken into consideration.

We address our research question through an empirical analysis using the American Hospital Association (AHA) survey of hospitals in the United States. Our dependent variable is the hospital's supply chain performance, as operationalized by hospital supply expense. We consider two main physician-hospital integration mechanisms (employment contracts and group contracts) to operationalize the types of pressures that professionals may face to align with the organization in which they reside. The results suggest that integration mechanisms can motivate physicians to be more mindful of the hospital's supply chain efforts, resulting in more effective hospital supply performance. However, different mechanisms diverged with respect to their impact on payroll expense. These findings open the question about the drivers each mechanism employs to motivate physicians to align with the hospital's interests and the cost of achieving such alignment. These results also poke at the underlying tension in professionalism with regards to agency versus stewardship, and intrinsic versus extrinsic motivation.

This study contributes to research on professional services in supply chain contexts by applying sociological concepts to understand how an organization can align professional employees with its supply management objectives. Examples of professional surrogate buyers in other contexts include a professor that selects the textbooks for students, an architect that selects construction materials, an IT consultant that recommends solutions for clients, etc.

Our study also provides a contribution to the healthcare management literature. Previous literature has shown conflicting results regarding the impact on physician-hospital integration efforts on hospital costs (Bazzoli et al., 2004). Our work demonstrates that different physician-hospital integration mechanisms can have opposite effects on the two largest hospital cost categories: payroll and supplies. For example, we observe that a higher proportion of employed physicians is associated with a lower supply expense but a higher payroll expense.

The next section provides some theoretical background regarding the role professionals as surrogate buyers and the purported impact of such a buyer on the organization's supply management performance. This theoretical framework is then overlaid onto the healthcare context as we develop our hypotheses about the effect of physician-hospital integration mechanisms on supply performance. This is followed by a description of the research methods and the analysis. Finally, we discuss the results and their implications, before concluding with some afterthoughts about future research.

2. Literature review

2.1. Professionalization in a bureaucratic organization

Professional services are ubiquitous in modern society, defined by the knowledge-intensive nature of work, high-level customer interaction, and autonomy in the context and content of their work (Abbott, 1988; Freidson, 1983). Professions are occupations that “apply in their work a body of knowledge and techniques acquired through training and experience, have a service orientation and distinctive ethics, and have a great deal of autonomy and prestige in the modern economy.” (Sharma, 1997, p. 763).

While professionalization is most often associated with professional service firms, nonprofessional (i.e. “bureaucratic”) organizations commonly employ professionals such as lawyers, physicians, accountants, engineers, etc. Research has suggested that professionals who reside in a bureaucratic organization experience the threat of an erosion of their power and autonomy, and gradually converge with other occupations in terms of characteristics and structure (Haug, 1988; Lewis and Brown, 2012).

In recent work, Lawrence et al. (2016) map out this progression of professional service operations as it moves away from autonomous work towards either standardization of tasks where guidelines are feasible, or motivating professionals to align with the organizational objectives when standardization is not feasible. Another recent study has found that applying a lean orientation to professional service operation fulfills an organization's desire for control and standardization (Dobrzykowski et al., 2016). These findings further support a previous study about professional service that suggests that technical performance of professional services can be enhanced when appropriately managed by bureaucratic structures (Heineke, 1995). The desire for organizations to standardize and control professionals has been recognized in the sociology literature as the de-professionalization hypothesis (Haug, 1988).

In response to the threat of de-professionalization, professionals in bureaucratic organizations generally act in ways to retain their autonomy and power in resistance to the bureaucratic pressures that attempt to control them (Freidson, 1983; Harvey, 2016). Professionals that reside in bureaucratic organizations sometimes self-organize into professional hierarchies to somewhat insulate themselves from the pressures that attempt to control them (Freidson, 1994, 1985). These professional hierarchies collectively negotiate with other factions in the organization to preserve their autonomy and professional power. In their research surrounding professional service operations, Senot et al. (2016) recognize these professional hierarchies in the hospital and consider the interactions between the different layers of the physician hierarchy with the layers of the nurse hierarchy. More generally, professionals in hierarchies can be classified into two groups: *professional elites* and *rank-and-file* professionals. The professional elites take the role of the hierarchy's curators by interfacing with the bureaucracy and governing the rest of their *rank-and-file* professional colleagues (Freidson, 1994). The rank-and-file professionals are relieved from the bureaucratic pressures, but must instead conform to professional hierarchy practice pressures that are defined by the professional elites. Lawrence et al. (2016) relate professional elites to research physicians who coordinate standards of care which filter down to the “mass service” (rank-and-file) professionals. In this structure, standards of care emerge organically from shared knowledge networks without a central bureaucratic controller (Dobrzykowski et al., 2016; Harvey, 2016). Even though professional pressures end up defining standards of work, professionals retain a sense of collective autonomy and power even as their hierarchy resides within a bureaucratic organization (Freidson, 1994; Waring, 2014).

2.2. Professionals as surrogate buyers

Of interest to this research is the effect of the professional-bureaucratic friction on supply management activities and performance, which prompts us to consider professional involvement in matters of supply selection. One of the many areas where professional judgment may be required by a bureaucratic organization is in the design and selection of operating procedures and supplies. Michael Solomon (1986) identifies the surrogate buyer as an agent that can “guide, direct, and/or transact marketplace activities” on behalf of a consumer or buyer (Solomon, 1986, p. 208). Surrogate buyers are generally professionals who demonstrate (on the basis of their training, licensure, certification, and accountability) different degrees of influence over choice, ranging from descriptive to prescriptive (Aggarwal et al., 1998). In that respect, the

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