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An empirical investigation of integration in healthcare alliance networks

Evelyn H. Thrasher [a,*], Christopher W. Craighead [b], Terry Anthony Byrd [c]

[a] Western Kentucky University, United States
[b] The Pennsylvania State University, United States
[c] Auburn University, United States

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ABSTRACT

Healthcare alliance networks have developed rapidly in the US. Yet, research has not kept pace. This study examines two interrelated healthcare research needs—the value of information technology (IT) and the complementarity of IT with process and decision-making (PDM) integration. Hypotheses relate (i) IT integration, (ii) PDM integration, and (iii) alliance network integration (complementarity of i and ii) to performance. The mixed results lend support to the complementarity of IT with PDM integration and call for a more holistic perspective of healthcare alliance network.

1. Introduction

When describing the healthcare industry (an industry which now accounts for one-sixth of the US gross domestic product and is responsible for the betterment and maintenance of human life) Herzlinger [36, p. 58] stated:

> Health Care—in the United States, certainly, but also in most other developed countries—is ailing and in need of help…The well-known problems range from medical errors…to soaring costs… Such problems beg for innovative solutions involving every aspect of healthcare—its delivery to consumers, its technology, and its business models.

In an attempt to mitigate the problems found in the healthcare industry, organizations have actively formed strategic alliances, defined as "clusters of organizations that make decisions jointly and integrate their efforts to provide a service" [1, p. 2]. Strategic alliances are further defined as "two or more organizations that contractually pool resources to achieve a long-term strategic purpose that is not possible for a single organization" [40, p. 71]. The key premise for forming these alliances is to *integrate* the otherwise autonomous organizations [1,24,60,70,86], to promote collaboration and cooperation [9,56,71], to improve the quality of medical services [42], to reduce costs [73] and, in general, to achieve performance improvement and competitive advantage [40,48,59,63,74].

Alliance formation continues to gain popularity across industries, with the number of new alliances growing by approximately 25% per year [53]; yet the failure rate of alliances is estimated at about 50% [41]. Much of this failure is attributed to the inability to assess the value and performance benefits of the alliance [41,53]. The same issues have been observed within the healthcare industry, causing many to question the benefits of alliance arrangements [18]. For example, [68] observed slowed or stalled progress in the medical service quality and financial performance benefits of healthcare alliance networks. In fact, some have considered the dissolution of these alliances due to the inability to quantify the anticipated improvements in either medical service quality or financial performance [49,61].

In this paper, we argue that strategic alliances in healthcare can provide significant benefits, but the formation of the alliance network is a *starting point* of integration and for benefit realization. Specifically, we hypothesize that three integration measures will significantly explain the benefit differences among healthcare alliance networks. While we will further explain each of these, we believe it is important to introduce them:

Information technology (IT) integration—Alliance network capability that provides seamless access to timely information within and among the network members.

Process and decision-making integration—Alliance network capability that allows for collaborative and efficient decision-making within and among the network members.

* Corresponding author.
E-mail address: evelyn.thrasher@wku.edu (E.H. Thrasher).

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Alliance network integration—Alliance network capability that is created from the synergistic effect of IT and Process/decision-making integration.

The literature base related to integration (e.g., supply chain integration, buyer–supplier integration) is quite informative, but there are several interrelated research needs with respect to integration in *healthcare* alliances—these needs are discussed in the following three paragraphs.

First, it is unclear if the findings of the majority of the integration research will transcend to the healthcare setting. While there is an abundance of integration research efforts [e.g., 21–23,27,31,46,52,58,75,76], the majority of them focus on product-based chains (i.e., in a manufacturing setting) and thus primarily exhibit sequential interdependence [72,78]. Healthcare alliances, which are service-based chains, exhibit reciprocal interdependence, which is the highest form of interdependence [c.f., 72,78], thus the efficient flow and use of information will likely be more difficult to accomplish, resulting in an even greater need for effective integration [57,72,74]. Therefore, integration needs to be further examined in service-based settings such as in healthcare alliances.

Second, although there are studies that have focused on integration in healthcare alliances, they have focused on either process and decision-making integration [14,20,43,67,70,71] or IT integration [45,73], but not both simultaneously. By not analyzing both simultaneously, researchers have not captured the potential for a synergistic effect between them (the potential synergistic effect is supported by the concept of complementarity [87] which we discuss in the next section of this paper). This shortcoming may result in the value of integration being underestimated in healthcare alliances—this could partially explain the questions that have arisen relative to the value of these alliances [18,49,61,68]. Therefore, healthcare alliance integration needs to be more fully examined to capture the potential synergistic effects among IT and process and decision-making integration.

Finally, virtually all of the studies in the healthcare area on alliance networks are case studies. Although informative, the maturing of the literature base warrants larger scale, empirically-based, examinations of integration efforts and potential resulting performance enhancements. For example, while integration of business processes and IT has been purported to be critical to healthcare alliance network success, larger scale evidence of this relationship is lacking in the literature [40,51,70,74].

These three interrelated needs found in the healthcare alliance integration body of knowledge provide the motivation for this study. This study centers on integration in alliance networks within the healthcare industry known as integrated delivery systems (IDSs)—it should be noted that IDS are not information systems, they are strategic alliances. There are approximately 450 IDSs in existence within the United States [37]. IDSs take on various legal and contractual forms [20,57,84], but are typically governed by a formal organizational structure with a network level executive management team that oversees the diverse and exclusive combinations of hospitals, physician practices, Home healthcare, laboratories, pharmacies, and other medical care providers (see Appendix A for an example of an IDS). Each of the medical providers within the IDS may be directly or indirectly involved in the care of a particular patient, depending upon the nature and severity of the illness or condition [86]. The goal of IDSs is to provide a diversified, comprehensive continuum of care [20,57,86].

2. Theoretical foundation

Thompson's Interdependence Theory proposes that organizations, although natural and open systems, will work to achieve bounded rationality at different levels of interdependence [78]. This rationality is most often achieved through effective coordination [72]. Labeled pooled, sequential, and reciprocal interdependence, the strength of interdependence increases across each of these levels [78]. In addition, each level exhibits a greater degree of complexity in terms of the flow of inputs and outputs. For example, pooled interdependence is the weakest form, characterized by loosely coupled entities that provide direct input to a common node but have no connection to one another. At the other extreme, reciprocal interdependence represents the strongest level of interdependence. All entities may be directly linked to all other nodes, depending on the interaction; and these linkages may change with each new interaction. Further, the outputs of each entity may be direct inputs to any other node and vice versa. This results in a high level of complexity and a great need for effective coordination [72,78]. Thompson's levels are not mutually-exclusive [78]. In other words, an organization exhibiting reciprocal interdependence most likely also exhibits sequential and pooled interdependence among different sub-components of the network. Research suggests that reciprocal interdependence is most prevalent in service organizations such as airlines and healthcare providers [72,78]. Reciprocal interdependence, due to the complexity of the relationships, warrants a high level of coordination and collaboration [59].

Coordination mechanisms are defined as a means to link entities of the network to enable communication and common action, while also building a common pool of knowledge [72,78]. Thompson [78] argues that coordination becomes increasingly important across the three levels of interdependence, and this coordination is best accomplished through effective knowledge-sharing and communication. He suggests that using an appropriate coordination mechanism will enable and enhance coordination, and he offers mutual adjustment as a valuable mechanism for those networks at reciprocal interdependence. Mutual adjustment allows for the transmission of information during action and is best suited for those networks exhibiting high levels of unpredictability and variability, such as that evidenced in healthcare alliance networks. Further, mutual adjustment allows for joint problem-solving and decision-making [72,78].

Coordination among healthcare networks is facilitated by the network's resources and capabilities. These resources and capabilities can be both tangible and intangible, but should enable integration across all entities of the network [85]. When effectively utilized, the network will be able to integrate both IT and business processes, thereby enhancing coordination and collaboration across the network [60]. One weakness in recent studies of the value of IS resources is the lack of consideration of the complementary role of IS. IS has not often been shown to directly provide the necessary levels of mutual adjustment needed in reciprocal interdependence, perhaps because the technologies, though valuable, cannot accomplish effective coordination in isolation. Instead, it is the complementarity of the IS resources with the business resources that often provides the desired levels of communication and common action [87]. Complementarity between organizational resources arises when the enhancement of one also raises the value of the other and vice versa [87]. To further explain, take two resources in an organization where each provides some value to that organization. Taken together, we might see that the value added is simply the summation of the value provided by the two resources. However, if the two resources, say A and B, are complementary, the combined value of the two will be greater because in some way resource A either accelerates, increases, intensifies, promotes, or in some other way adds to resource B so that the value provided by B is now greater than it was without its interaction with A. Resource B, likewise, affect A in one of these ways so that now resource A provides more value than before its interaction with B. The overall effect is that the complementary effect of the two resources, A and B, has produced an overall value greater than the sum of the two.