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Can relational coordination help inter-organizational networks overcome challenges to coordination in patient portals?

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Abstract

Purpose: Delivering comprehensive patient portals in fragmented delivery systems depends on coordination among a network of healthcare organizations. Inter-organizational coordination is fraught with challenges, mainly due to a lack of organizational, technological, and geographical proximity between network participants. This paper assesses the extent to which application of Relational Coordination Theory (RCT) can ameliorate these challenges.

Approach: We conducted a conceptual analysis of the usefulness of RCT and the applicability of the Relational Model of Organizational Change to patient portal networks.

Findings: Relational coordination can mitigate challenges caused by lack of organizational and technological proximity among participants in a patient portal network. The Relational Model of Organizational Change is useful to improve relational coordination. However, some organization redesign interventions proposed in the Model may not be directly applicable to patient portal networks due to lack of geographical proximity among network participants.

Conclusion: We suggest three propositions regarding the relationships among relational coordination, organizational and technological proximity, and cost of coordination in an inter-organizational portal network. If future research provides empirical support for these propositions and identifies appropriate adaptations of the Relational Model of Organizational Change for inter-organizational contexts, portal network leaders should strive to strengthen relational coordination in their networks.

Keywords: Relational coordination, Inter-organizational collaboration, Patient portals, Health information technology, Healthcare management

Introduction

Patient portals are information systems that give patients access to a personal health record and typically enable functionalities such as secure messaging with providers, appointment scheduling, prescription refill, and programs for self-management.¹ Comprehensive patient portals have been found to contribute to improved clinical outcomes, patient-provider communication, patient adherence, patient empowerment, patient satisfaction, and health service efficiency.^{2,3} Patient portals can be developed by a single hospital or physician practice. Yet, a comprehensive portal that spans across the continuum of care requires a network of organizations, including, for example, primary and specialist physician practices, hospitals or health systems, rehabilitation facilities, nursing homes, home health agencies, laboratories, pharmacies, and other entities. Such a network could be owned by a single corporate parent, be part of a formal alliance or partnership, or composed of largely independent entities.

In fragmented systems, where networks are typically composed of independent entities, developing such comprehensive portals is proving to be difficult.⁴ Through an in-depth case study of several patient portals being developed in the fragmented Dutch system,⁵ we found that few patient portals were truly comprehensive (connecting patients

with multiple of their providers), and that the few that were, were confronted with the most difficulties. We noted that the difficulties seem related to the need to coordinate activities across separate organizations that collaborate to develop the portal. Numerous definitions of inter-organizational coordination have been proposed in the literature. The breadth of organizational action encompassed by these definitions varies considerably. For example, inter-organizational coordination has broadly been defined as ‘organizations’ spontaneous mutual adjustment to their environments’, while a more narrow definition is ‘controlling organizations’ decisions so as to concert their action and achieve mutually beneficial outcomes’.⁶ Generally speaking, inter-organizational coordination refers to the extent that a given organization adjusts its behavior to take into account the actions of one or more other organizations in its network.⁷

Intensive inter-organizational coordination is necessary throughout the development of a patient portal, which is constantly evolving based on evaluations of functionality, use, and effects.⁸ For example, in addition to agreeing on the portal vendor and determining the role and responsibilities of the involved organizational members, delivering a portal requires numerous steps, which require key participants to agree on a number of decisions. Main steps include continuously seeking integration with workflow, establishing compliance with regulations, implementing the system, training staff, organizing for patient enrollment, and monitoring usage and effects.⁹⁻¹¹ For each of these steps, healthy and ill care recipients and their informal caregivers (we refer to such ‘patient stakeholders’ simply as patients) are a valuable source of feedback, not only in using the portal but also in evaluating and suggesting improvements to enhance its degree of patient-centeredness.¹² Consequently, the inter-organizational coordination required to deliver a portal occurs throughout portal development, implementation, and daily operation and should be achieved through the efforts of the clinical and managerial staff of the organizations involved as well as the patients served by the portal.

Challenges to coordination in patient portal networks

In comparison to patient portal development carried out by a single organization, efforts to coordinate activities across organizational boundaries are challenged by lack of technological, organizational, and geographical proximity.¹³ This challenge is exacerbated by the need to properly engage patients to coproduce services. In the following, we detail how the lack of proximity along the technological,

organizational, and geographical dimensions may add to the challenges of inter-organizational coordination.

Lack of organizational proximity

Organizational proximity covers dimensions such as cognitive, institutional, cultural, and social proximity, and is defined as ‘the set of routines – explicit or implicit – that allows coordination without having to define beforehand how to do so’. Organizations in the portal network may share only little organizational proximity; participants may have different expertise, professional languages, cultural understandings, and procedures for carrying out tasks.¹⁴ Such differences may result in conflicts and communication difficulties that impede task coordination.^{15,16} Shared decision-making may be further complicated if participants see different solutions to problems based on their values, past experiences, or perceived position in the network.¹⁷ Moreover, although typically the portal network is created by contractual agreements that define overall shared goals, each organization also has performance goals and managerial motivations that may conflict with the network goals.¹⁸ Depending on the organization, these goals and motivations could focus on increasing financial returns, increasing productivity, improving patient outcomes, or other organizational objectives. As organizational leaders prioritize such goals and seek ways to achieve them, their priorities and methods may misalign and give rise to conflict.¹⁹ Further, some organizational goals may remain undisclosed, complicating transparent decision-making in the network.¹⁷ In addition to aligning with the goals and motivations of the network participants, the portal should also adequately match the needs and wishes of the target patient population(s) served by these organizations. This inclusion of the patients – for example directly through board representation and usability panels or indirectly through market research – may likely further augment the coordination challenges, as the ‘patient perspective’ also inserts its influence on the process, for example by suggesting suitable functionalities and usage requirements.

Lack of technological proximity

The definition of technological proximity is ‘the level of overlap of the knowledge bases of two [or more] collaborating actors’.¹³ Organizational participants may have little knowledge of the work performed in the other organizations in the network and how this work contributes to the completion of shared tasks.²⁰ They may also have little

knowledge about the patients shared by the network, as recorded in the organizations' information systems and communicated via the portal. Consequently, the organizations' information systems are also part of the knowledge base and thus of the technology to which the proximity applies. Yet, information system infrastructures may vary across organizations in the network. Effective coordination may therefore require either developing a shared information system or obtaining interoperability between existing systems.²¹ The first of those solutions requires establishing a common platform in the shape of a network-wide electronic health record. The second solution requires setting up means for exchanging information among various electronic health records, for example facilitated by regional or, if possible, national Health Information Exchanges.²² Both of these solutions necessitate overcoming the resistance to change in their information systems by doctors, nurses, and others in the various organizations. Furthermore, some organizations may initially be less capable of performing required tasks, such as knowledge transfer and management. Thus, considerable efforts may be needed to align knowledge, infrastructures, and competencies to ensure that patients experience a cohesive service. Again, the centrality of the patient experience inherently necessitates inclusion of the patient. There is likely to be great variation across the relevant patient population with respect to understanding how the portal can assist them in managing their care as well as possessing the required digital literacy skills. Thus, portal networks must take this variability into consideration by creating capabilities and interfaces that are not too technologically complicated for those patients with little knowledge of how electronic information and communication systems in healthcare organizations work, while providing the more sophisticated patient user with the capabilities (such as apps) and options (such as mobile and/or tablet access) they will find useful.

Lack of geographical proximity

Geographical proximity is 'the extent to which two [or more] collaborating actors can have daily face-to-face relations without prohibitive costs'.¹³ Portal networks consist of various organizations, which, even though the network might often be confined to a region or community, are separate entities with at least some geographical distance between each other. Further, given the reliance on information technology that characterizes the network, typically, people working with portals make their contributions from within their own organizations

such as securely emailing with patients and uploading content to an electronic health record. This reliance on technology may hinder planned and unplanned interpersonal interactions across organizational participants in the networks. A similar distance may be observed with respect to patients that are typically nested in the local or regional community and who may only be in contact with their providers in the event an in-person visit is called for.

Study aim

The coordination challenges stemming from lack of proximity along these three dimensions may impede the development and performance of comprehensive, inter-organizational patient portals. Especially in fragmented health systems, such as the Dutch, this is hindering patients and providers from achieving beneficial outcomes possible through use of patient portals. Thus, understanding how to ameliorate these challenges is imperative. The aim of this paper is to assess the extent to which application of Relational Coordination Theory (RCT) can help mitigate the challenges to effective coordination in portal networks caused by lack of organizational, technological, and geographical proximity among network participants.

Relational coordination

Gittel *et al.*²³ introduced the concept of relational coordination in 2000, defining it as a mutually reinforcing process of interaction between communication and relationships carried out for the purpose of task integration. The concept builds on an understanding that relationships influence the frequency and quality of communication, which in turn influence the quality of relationships.²⁴ In fact, 'this mutual influence between communication and relationships lies at the heart of relational coordination'.²⁵ The three relationship dimensions are shared goals, shared knowledge, and mutual respect, and the four communication dimensions are frequent, timely, accurate, and problem-solving communication.

The first relationship dimension is *shared goals*. Shared goals that transcend organizational participants' specific functional goals motivate participants to move beyond sub-goal optimization and to act with regard for the overall work process are crucial to facilitating collective and coordinated responses from participants. Effective coordination therefore depends upon a high level of shared goals for the specific work processes.²⁶ The second relationship dimension crucial to coordination is *shared knowledge*. Coordination relies on interaction

among organizational participants with different cultures, disciplines, and expertise. Shared knowledge allows these participants to understand how their specific tasks relate to the overall work process. Further, cultural and professional differences between participants involved in a work process may foster dissimilar ‘thought worlds’. Thus, shared knowledge about the elements of the work process is important for participants to make effective contributions to the work process. The third relationship dimension is mutual respect. Coordination often entails bringing together organizational participants with different professional identities who belong to different occupational communities. Participants from such different communities may perceive their own role in the coordination process, and their manner of handling tasks in this process, as superior. Such different philosophies can foster disrespect for others, which cause division among participants with different roles and responsibilities. Consequently, improving respect for the competence of others is necessary to overcome professional status barriers to effectively coordinate work processes.²⁵ RCT specifies four dimensions of communication that are critical to enhancing performance. The first communication construct is frequent communication, which is believed to support the development of high-quality relationships by fostering understanding and familiarity between organizational participants with different organizational backgrounds and tasks. Second, timely communication is important to decision-making and service delivery as it enables participants to coordinate work based upon up-to-date information. Third, to be helpful, the information must be accurate. Fourth, communications that have a problem-solving character foster constructive, respectful, and blame-free communication practices among participants from different cultural backgrounds and disciplines.²⁴

Relational coordination is also considered important in the reciprocal interrelationship between ‘worker’ and ‘customer’.²⁷ More specifically, relational coordination between patients and providers can foster attentiveness to the situation and to one another. The result can be improved patient engagement in ‘coproduction tasks that are critical to achieving desired health outcomes when performed in cooperation with the care provider team’.²⁶ There is thus an interaction between relational coordination and relational coproduction: the higher the degree of relational coordination within the network of providers, the better their ability to engage in relational coproduction with patients. At the same time, the degree to which patients

engage in relational coproduction may make visible the lack of relational coordination in the network and incentivize network participants to improve it.²⁷

Relational coordination’s positive effect on organizational performance in healthcare

Over the past 15 years, several studies have measured relational coordination in collaborations between people and examined its impact on work performance and organizational outcomes in healthcare. Relational coordination has consistently been found to improve the quality and efficiency of work processes in intra-organizational collaborations.²⁵

In a large study of hip and knee surgery, relational coordination between physicians, nurses, physical therapists, social workers, and case managers within the same hospitals was correlated with patient-perceived quality of care, postoperative pain, and functioning as well as length of stay.²³ This study was the first to demonstrate the impact of relational coordination on efficiency and quality of care, but several subsequent studies have corroborated this relationship. Two studies found that higher degrees of relational coordination in cross-functional teams within hospitals were associated with improved quality of healthcare delivery.^{28,29} The former study found that higher levels of relational coordination across functional groups working to provide integrated care to elderly patients led to increased quality of integrated care delivery. The latter study, which measured the degree of relational coordination between nurses and other provider groups, found that as relational coordination increased, the number of hospital-acquired infections and medication errors decreased. Further, self-assessed degree of relational coordination among nurse managers in acute hospitals has been found to be positively correlated with enhanced engagement of these nurses in their work.³⁰ Nurses who reported a high degree of relational coordination were more likely to consider their job meaningful and that they possessed the job and personal resources required to tackle the demands of their job. Gittell *et al.*³¹ also assessed the effect of relational coordination on nurse job satisfaction and residents’ quality of life within 15 nursing homes, and found a positive relationship between the level of relational coordination and both outcomes. The higher job satisfaction was believed to derive from instrumental benefits for performing tasks and from intrinsic benefits for fostering positive relationships with others. The presence of relational coordination between formal and informal caregiver has also been demonstrated to improve the capacity of the

informal caregiver to provide care for discharged patients.³² A recent study assessed the correlation between relational coordination within primary practices and the presence of elements of the chronic care model.³³ The authors found a positive relationship, which they argued might be mediated by reciprocal learning within the practice.

Relational coordination and patient portal networks

Motivated by this promise of improved organizational performance, we assess the potential of relational coordination to improve coordination among organizations that collaborate to offer patient portals.

Relational coordination is believed to be especially important in the coordination of work contingent on high task interdependencies, uncertainty, and time constraint, which emphasize the need for mutual adjustment.²³ These contingencies apply to the work performed to develop a portal and to use it to deliver care to patients. First, mutual interdependencies exist since the actions of one participant rely on the input of others to the portal. Interdependencies can occur when various organizations upgrade their information systems, thereby requiring similar upgrades in other parts of the network to ensure interoperability.⁴ They can also emerge, for example, in the coordination of online consults where both the physician and the patient have access to clinical notes from previous health episodes and test results. In such situations, the quality of the consultation relies on the accuracy and comprehensiveness of this information entered by other health service providers.³⁴ Second, dealing especially with patients with complex conditions involves some uncertainty, for instance when physicians or physician extenders triage and respond to patient requests for online consultations.³⁵ In such situations, decisions must be made about which types of patients and which types of health conditions could be handled by the nurse practitioner, and which should be referred to the patient's general practitioner or specialist physician. Further, as we have previously highlighted, there may be differences in patient preferences for online services and the ways patients utilize these services.³⁶ Third, some tasks must be performed under time constraint, since the timeliness of inputs that are entered in and exchanged via information systems is important for the quality of the portal services. An example is the timing of the posting of a test result, which must be submitted from the laboratory to the portal before a patient's

online consultation with a specialist where the results will be discussed.⁴

Hence, the work performed to develop, implement, and use a patient portal is consistent with the nature of organizational work for which relational coordination may be specifically helpful, thereby warranting further assessment of the usefulness of relational coordination in patient portal networks.

Usefulness of relation coordination in patient portal networks

We argue that the dimensions of relational coordination may mitigate challenges associated with lack of organizational, technological, and geographical proximity among participants in the network.

Lack of organizational proximity

Organizational proximity supports shared norms, goals, and respect between people; something that may be less pronounced among participants in an inter-organizational network. We propose that relational coordination may be able to bring the organizational participants closer through shared goals and mutual respect among participants. First, organizations in a portal network typically differ with respect to expertise, professional languages, and cultural understandings, which may complicate agreement on shared goals. For example, some participants may focus on administrative capabilities (such as online appointment scheduling) aimed at improving organizations' operational efficiency, while others may emphasize patient education (such as insight into lab results and care plans) aimed at improving the role of patients in their care. Through shared short- and long-term goals among participants, participants may be willing to adjust their goals and motivations, and even encourage participants to incur short-term sacrifices to demonstrate their reliability as well as to enhance the performance of the network.³⁷ Articulation of shared goals may be particularly important in competitive environments where it takes a clear and mutually reinforcing business case, emphasizing benefits of economies of scale, to bridge oftentimes competing agendas. Second, differences in expertise, professional languages, and cultural understandings may also result in conflict and disrespect between organizational participants. Disrespect could possibly occur between specialized hospital physicians and administrative staff in primary care practices, who differ considerably in their responsibilities and professional backgrounds. With mutual respect it is more likely that participants can

engage in cross-functional and cross-organizational work.^{38,39}

Lack of technological proximity

Technological proximity refers to the extent to which organizational participants' knowledge bases overlap and their corresponding ability to transfer knowledge bases and learn from each other. Among the coordination challenges in a portal network may be the adequate transfer of information and knowledge. As an example, one could think of the capacity of the network to capture participants' practical experiences with using the portal and translating them into lessons, for example related to effectively embedding portal services into case management of a specific patient group – something that may have profound implications for the effectiveness of the portal.² Shared knowledge among network participants is important to mitigate challenges caused by lack of technological proximity. The ability to share knowledge and information has significant effects on collaborative performance, for example by breaking down information asymmetry and facilitating joint conflict-solving arrangements.⁴⁰ Especially transfer of tacit knowledge between participants is important in networks characterized by cultural and professional dissimilarity, and in which partners lack a common understanding of non-explicit information by bridging cultural differences and promoting shared understandings.⁴¹

Lack of geographical proximity

In contrast to the two dimensions addressed above, relational coordination can do little to directly mitigate challenges linked to geographical distance between organizational participants. We will address this issue in more detail below in our discussion of the organizational design interventions proposed by Relational Model of Organizational Change.

As our assessment suggests, relational coordination in a network can mitigate challenges caused by distance along the organizational, technological dimensions. This in turn enables network participants to mutually adjust their work to manage complexities associated with interdependence, uncertainty, and time constraint. Further, to the degree it supports relational coproduction, relational coordination may help ensure that the portal develops in accordance with the needs and wishes of patients and is adequately and appropriately used to achieve desired effects.²⁷ By fostering high-quality relationships, relational coordination reduces the need for formal, restrictive governance mechanisms such as monitoring and

contracts.⁴² In turn, this reduced need for formal governance mechanisms may lower the costs involved with coordination of patient portals.⁴³ We formulate three propositions:

- Proposition 1: The greater the level of relational coordination in an inter-organizational portal network, the greater the organizational proximity.
- Proposition 2: The greater the relational coordination in an inter-organizational portal network, the greater the technological proximity.
- Proposition 3: The greater the organizational and technological proximity, the lower the costs of coordination in an inter-organizational portal network.

Building relational coordination in patient portal networks

Our assessment suggests that relational coordination is an important attribute in patient portal networks, and thus, that the development of a patient portal can benefit from strengthening the network's relational capacities. Yet, there may be aspects inherent to inter-organizational networks that hinder the development of relational coordination. More specifically, we posit that the lack of geographical proximity poses a challenge that requires further discussion and analysis. To do this, we introduce the Relational Model of Organizational Change, which encompasses a set of interventions relational coordination proponents argue will stimulate relational coordination through organization redesign.

The core premise of the Relational Model of Organizational Change is that relational coordination is shaped by organizational structures: structures that reinforce functional silos hinder relational coordination and structures that foster cohesiveness and awareness of the work of others stimulate it.⁴⁴ The Model suggests redesigning organizational structures and practices to strengthen shared goals, shared knowledge, mutual respect, and the important forms of communication by breaking down functional and organizational barriers to coordination.⁴⁵ This also results in improving the capacity for relational interrelating with patients to enable coproduction of portal services and effects. Organization redesign at the structural/systemic level includes interventions such as selecting participants based on their capacity for cross-functional teamwork, constructing measurement and reward systems based on team performance across functions, and creating venues for proactive cross-functional conflict solution. According to the

model, structural/systemic interventions should be accompanied by relational interventions and improvement methods. Relational interventions focus on creating psychological safety, coaching, and role modeling as well as giving feedback to organizational members about how they score on relational coordination metrics. Improvement methods can be quality and efficiency improvement processes, process mapping, and structured problem solving.²⁵ The Relational Model of Organizational Change, which outlines interventions at each of these levels, is illustrated in Fig. 1.

It is likely that lack of geographical proximity has implications for efforts to develop relational coordination with the Relational Model of Organizational Change, particularly the redesign interventions that implicitly assume physical proximity. For example, portal networks may have little opportunity to use physical, in-person meetings/huddles and spatial design to strengthen relational coordination. At the same time, there are interventions that are not dependent on frequent interpersonal interaction between participants. In addition to protocols, information systems, and boundary spanners, structural interventions could be employee selection and training for teamwork, establishing shared accountability for outcomes, as well as shared costs and rewards. Also, relational interventions, such as providing feedback to network participants regarding protocol performance metrics, and other improvement methods such as goal and role clarification activities may be able to compensate for the inability of participants to engage in frequent face-to-face interaction and enable portal network participants to develop the routines of mutual adjustment inherent in relational coordination.⁴⁴ Furthermore, new structural and relational inventions may come into play, which are not significant at an intra-organizational level, and not currently contained in the Model. For instance, networks may be able to develop financial alignments such as reimbursement schemes that reward participants for achieving network-level performance measures. Other interventions could include personnel rotation, inter-organizational process definitions, and performance indicators that take account of inter-organizational performance. Furthermore, generally, new forms of communication technology such as Video Conferencing are increasingly used to substitute for in-person meetings.

In light of the implications we have put forward, an important question is whether inter-organizational collaborations, such as portal networks, lend themselves to organization design interventions proposed by the Relational Model of Organizational Change. So far there is only scarce

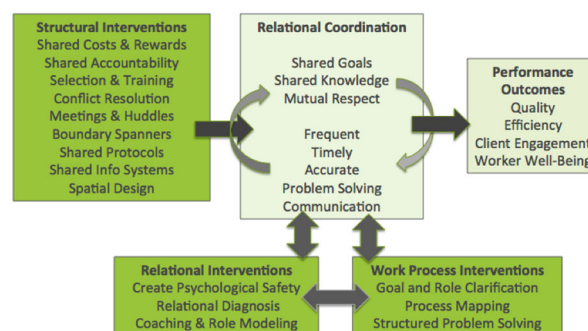


Figure 1: Relational Model of Organizational Change.

theoretical and empirical evidence in support of extensions of RCT to inter-organizational performance.^{20,46,47} In fact, as we have shown, the vast majority of relational coordination studies are from intra-organizational settings. In these studies, research subjects have been individuals on the front-line of care who have frequent interpersonal interaction, such as nurses, physicians, and other providers within the same organization. This stands in contrast to portal networks in which most daily tasks are carried out from within each organization. Further, in these networks, most communication between participants primarily occurs through telephone or email and in-person interaction may take place with large intervals.

Hence, future research should test and adapt (as appropriate) the Relational Model of Organizational Change to more readily apply to inter-organizational networks, such as patient portal networks. This could be done, for example, by implementing interventions in patient portal networks and measuring corresponding effects on patient portal performance. Provided that our propositions about how relational coordination can improve performance in portal networks hold true, tuning the Model to such settings can have positive consequences for patient portals. Any future lessons regarding the improvement of coordination in patient portal networks can also be transferable to inter-organizational collaborations with other purposes. For example, although different in the content of the activities that need to be coordinated, establishing a Health Information Exchange network may also likely benefit from relational coordination capacities among involved parties.

Conclusion

To be effective, a patient portal must offer a valuable set of services to patients. Comprehensive portals that connect patients with all their health service providers can potentially offer the most valuable set of services, since these portals may succeed in

offering patients a single access point to their consolidated information and to connect with their array of providers. In fragmented health systems, developing such comprehensive portals necessitates collaboration among multiple health service providers. Yet, coordination of tasks among providers in such inter-organizational networks brings about several challenges due to lack of organizational, technological, and geographical proximity. We have argued that the success of patient portals depends on managing such challenges and fostering effective coordination within the network.

We have examined the usefulness and applicability of a relatively new theory, RCT, to improve coordination within portal networks. Relational coordination has consistently been demonstrated to enhance performance within health service organizations. We have presented theoretical justifications in favor of the relevance of relational coordination to portal networks and formulated three propositions. These propositions state that relational coordination may mitigate challenges caused by lack of organizational and technological proximity, and thereby reduce the cost of coordination in portal networks. The Relational Model of Organizational Change, which provides guidance to improve relational coordination through organization redesign, may therefore be important to managing inter-organizational coordination in the context of patient portals. However, some of the organization design interventions that can improve relational coordination through the Relational Model of Organizational Change may not be directly transferable to portal networks, mainly due to the geographical distance among the organizations involved and the infrequency of interpersonal interaction. Since strengthening relational coordination may be a key factor in insuring the development and performance of comprehensive patient portals, an empirical test and possible adaptation of the Model is an important research priority.

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