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Strategic Information Management in Integrated Care – a Systematic Approach

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Abstract

Integrated care is an important element in achieving more efficient and effective health care. Information technology plays a vital role in implementing integrated care. In this paper, specific challenges of strategic information management in integrated care are approached.

Methods: Based on literature, two opposite organizational forms of integrated care are described: integrated care networks and hierarchies. A literature analysis concerning information management in integrated care was performed. The publications were indexed with regards to discussed scope of information management. Publications, that were assigned to strategic information management were analyzed with respect to their perspective (national/ regional or integrated care organization). In closing, specific conditions of strategic information management in integrated care are discussed.

Results: 56 of 88 publications could be assigned to strategic and/ or tactical information management. Information strategies were mainly formulated from a regional or national perspective. 3 publications described strategies for hierarchical forms of integrated care. It is concluded, that the absence of centralized authority in integrated care networks requires specific methods of strategic information management.

Keywords:

information management, integrated care,
medical informatics

Introduction

Improved coordination of health care is seen as a key issue in enhancing efficiency and effectiveness [1]. Given the degree of differentiation in health care regarding professionals, units and organizations which leads not only to complex coordination problems, but is also a great strength of the system, integration should be increased [2, 3]. The term “Integrated care” characterizes an organizational status, in which shared care, continuity of care and seamless care are achieved, tailored to individual needs [4-6].

Information technology is often regarded as a prerequisite for integrated care [6-9]. Equivalent to institutional information systems, transinstitutional information systems that support integrated care should be managed systematically. In this paper, we focus on strategic information management, which aims at translating strategic goals into information strategies [10]. While strategic information management is well described for institutional settings, e.g. [10, 11], it is not clear, how it can be implemented in transinstitutional situations [12], such as integrated care.

To approach this problem systematically, the following research questions are addressed in this paper:

Q1 Which organizational forms of integrated care are currently observable?

Q2 Which scopes (strategic or tactical) of information management in integrated care are discussed in current publications?

Q3 What can be concluded by the results of Q1-Q2 regarding strategic information management in integrated care?

Methods

Q1 is answered by applying a framework for systematizing organizational relations in general, e.g. [13, 14] and in health care, e.g. [15-17] with regards to the arrangement of institutions and management within integrated care.

To answer Q2, a literature research was conducted. The study design was designed as retrospective and prolective [18]. Using the pubmed database, we searched for publications with the following limitations: only journal articles were allowed that were published between 2001/10/01 and 2006/10/01, an abstract had to be available and the language had to be English. The queries were conducted on 2006/11/06.

Our goal was to identify publications that deal with the role of medical informatics, information systems or information management in integrated care. In order to generate comprehensive results, we combined each of the MeSH terms “Medical Informatics”, “Information Systems” and “Information Management” with each the following terms related to integrated care: "Delivery of Health Care, Integrated" (MeSH), "Continuity of Patient Care" (MeSH), “integrated care”, “seamless care”, “shared care” and “health networks”. Thus, 18 queries were performed. The relevant publications were indexed with respect to their scope, i.e. assigned to strategic and / or tactical information management [10]. Publications assigned to strategic information management were classified regarding their perspective (national/ regional or integrated care organiza-

tion). The indexation was performed based on the abstracts. If the information contained in an abstract was regarded as not sufficient for indexing, the full article was analyzed. Q3 is answered in the Discussion section by arguing with respect to results of Q1 and Q2.

Results

Q1 Organizational Forms of Integrated Care: hierarchies and networks

Organizational aspects of integrated care can be analyzed at an external level, management level, institutional or patient level [16, 19, 20]. In this paper, we focus on the management and institutional level. Integrated care means division of labour across professionals, units and institutions. This requires coordination [2, 21].

Two basic coordination mechanisms define the boundaries of a range with different organizational forms [13, 21, 22]. One approach is to establish hierarchical organizations, i.e. integrating health care providers of the same level in the value chain (horizontal integration) and of different levels (vertical integration) under unified ownership. Here, division of labor is coordinated through authority [21]. This approach has been pursued in the United States, where large Health Maintenance Organizations (HMOs) have been founded. As summarized by Wijngaarden et al [2], HMOs have been criticized for integrating structures without improving the alignment of care processes to patient needs.

In opposite to hierarchies, another coordination mechanism is to coordinate division of labor through formalized cooperation and exchange relationships between legally independent institutions [16, 17]. We refer to these forms of collaboration as integrated care networks (ICNs). It has been shown in different countries, that ICNs can be successful in providing integrated care across professions, functions, sites and over time [1, 2, 23].

Between the two basic forms hierarchy and ICNs, many different organizational arrangements can occur which possess characteristics of both hierarchies and ICNs. These intermediate forms can therefore be termed “hybrids” [24]. Regarding management, hybrids can be organized from completely independent and decentralized management units to centralized management units with high level of authority, [24], as illustrated in Figure 1.

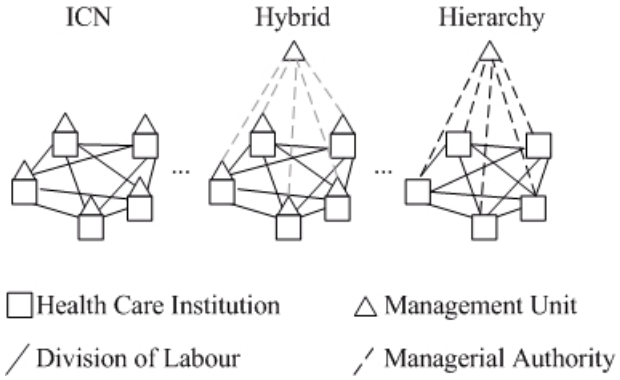

Figure 1 – The organizational continuum of management in integrated care

Q2 Current scopes of Information Management in integrated care

Our pubmed queries returned 269 different publications. 181 publications were excluded, because they discussed either ICN OR issues of medical Informatics/ information systems/ information management, but not both. Of the remaining 88 publications, 56 publications could be assigned to strategic and/ or tactical information management.

Table 1 – Assigned scopes of information management

Scope of Information Management	
Strategic	15
Tactical	48

Most of the publications were assigned to tactical information management. Hence, the focus was on specific technological issues of transinstitutional information transfer. Some publications presented concepts, in which transinstitutional information systems were seen as enablers for integrated care or related concepts, e.g. [25-28]. Another group of publications specified their concepts by describing technological approaches. Here, interoperability and security were the predominant subjects. With regards to interoperability standards such as HL7 respectively CDA were discussed in order to support transinstitutional information exchange, e.g. [29-31]. Security was discussed mainly from the view of access control and authorisation, e.g. [38-41], as well as information transfer, e.g. [32, 42, 43].

Beside the conceptual papers, pilot projects of electronic transinstitutional information transfer were described, e.g. [32-37]. Some publications presented evaluations, e.g. [45-47].

15 publications engaged information strategies or at least approached the topic. As Table 2 summarizes, 12 of these publications formulate strategies to enhance transinstitutional information sharing on regional or national level. Three publications could be identified, that present information strategies for organizational forms that aim to provide integrated care. These three publications refer to hierarchical health care organizations in the United States such as the Veterans Health Administration and PeaceHealth, e.g. [56, 58] [57].

Table 2 – Perspectives of Information Strategies

Author, Title	Perspective
Asp et al (2003): A conceptual model for documentation of clinical information in the EHR [48]	national
Burton et al (2004): Using electronic health records to help coordinate care[26]	national
Dietzel (2003): The electronic health card as a tool for seamless care. German activities to implement telematics [49]	national
Dimond (2005): Electronic health record and electronic patient record [50]	national
Halamka et al (2005): Health care IT collaboration in Massachusetts: the experience of creating regional connectivity [51]	regional
Harno (2004): Integrated regional services: are working process changes desirable and achievable? [52]	regional
Itkonen (2003): North Karelia regional chain of care: Finnish experiences [53]	regional
Malmqvist et al (2004): Sjunet--the national IT infrastructure for healthcare in Sweden	national
Mann (2005): From "silos" to seamless healthcare: bringing hospitals and GPs back together again [28]	national
Mohan et al (2004): The Malaysian Telehealth Flagship Application: a national approach to health data protection and utilisation and consumer rights [54]	national
Orphanoudakis (2004): HYGEIAnet: the integrated regional health information network of Crete [55]	regional
Schabetsberger et al (2006): From a paper-based transmission of discharge summaries to electronic communication in health care regions [44]	regional
Memel et al (2001): Development and implementation of an information management and information technology strategy for improving healthcare services: a case study [56]	Hierarchy
Nolan et al (2005): Using a framework for spread: The case of patient access in the Veterans Health Administration [57]	Hierarchy
Malone et al (2005): Developing and implementing a patient-centered IT strategy [58]	Hierarchy

Discussion

As presented, integrated care can be achieved through different organizational arrangements. In many countries a trend towards the ICNs is observable [2, 21].

The conducted literature analysis revealed that information technology plays a central role in implementing integrated care. However, it also revealed, that strategic information management is an unsolved issue in non-hierarchical organizational forms of integrated care. Most research focuses on technological challenges, such as security and standardization. Without denying the complexity and relevance of this research, we see a research gap with regards to how align transinstitutional information systems to organizational settings in integrated care. Information strategies are formulated exceptionally on regional/ national levels or with respect to hierarchical organizations.

The specific feature of ICN with regards to strategic information management is, that an ICN on the one hand is a conglomerate of different institutions, whose strategic goal systems overlap only in a limited scope and that on the other hand possesses no centralized management that could implement an information strategy by authority. In hybrid organizations it is also unclear, how a centralized information management is related to institutional information management.

For future research, we aim at constructing a framework for describing organizational forms of integrated care more precisely. Furthermore, we want to systematize specific requirements on information management in integrated care in order to develop adequate methods. Here, a key issue will be the balancing of different strategies within ICNs or hybrid forms in order to develop comprehensive information strategies.

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