芽|Sprouts Working Papers on Information Systems ISSN 1535-6078

Increasing the Networkability of Health Service Providers: The Case of Switzerland

Tobias Mettler
Univeristy of St. Gallen, Switzerland

Peter Rohner
Univeristy of St. Gallen, Switzerland

Abstract
Extensive networking led to a high division of labor among the business partners and to an optimization of cost structures in most sectors of western economies. In competitive parts of the health care markets, the first signs of a similar development are beginning to crystallize. As a consequence, networkability, that is the ability to link up with other players (e.g. specialized health service providers, home care institutions) on the basis of commonly agreed standards for the joint provisioning of patient-centered and cost-efficient health services, will emerge to a key concept for future health service delivery. It is therefore the aim of this contribution to give a first overview of potential enablers for the networkability of health care organizations. In doing so, the discussion of the subject matter is carried out from an interdisciplinary point of view, basing on constituent knowledge of the fields of health services research, organization theory and information systems, and is further substantiated with initial empirical findings from the Swiss health care market.

Keywords: Business Networking, External Partnering, Health Information Systems, Networkability

Permanent URL: http://sprouts.aisnet.org/9-1

Reference: Mettler, T., Rohner, P. (2009). "Increasing the Networkability of Health Service Providers: The Case of Switzerland ," . *Sprouts: Working Papers on Information Systems*, 9(1). http://sprouts.aisnet.org/9-1

芽|Sprouts

INTRODUCTION

In the past decade, the effects of globalization, differentiation and specialization of markets as well as technological advance revolutionized first and foremost highly competitive sectors such as the telecommunications or engineering industry. In order to manage the constant pressure of reducing costs, rising product quality, and shortening process and innovation cycle times, a higher specialization and standardization of service components was achieved by the means of expanding the division of labor and by building cooperative business networks (Österle et al. 2001), network organizations (van Alstyne 1997), or so called virtual organizations (Davidow and Malone 1992).

So far, the health care sector has only seen the beginnings of this development. It is still marked by monolithic structures with a low division of labor among the many different health service providers (Porter and Olmsted Teisberg 2004) and by annually increasing expenditures (OECD 2006). The fact that health care differs in structure from most other sectors is attributable to the high level of regulation which can hinder or prevent innovation, the high proportion of government investments and the associated low pressure with respect to effectiveness and efficiency, as well as widely differing interests of the individual players (Ramanujam and Rousseau 2006; Herzlinger 2006). However, in case of Switzerland but also in many other industrialized and developing countries, the introduction of diagnosis-related groups (DRG) for inpatient tariffing or fixing rates for primary care treatments are a clear indication that the pressure to achieve effectiveness and efficiency is set to increase significantly. Moreover, the stress to transform existing structures and relationships is intensified by the increasing demands for more informational self-determination regarding medical decision-making and financial issues on the part of patients. For this reason, *networkability*, in other words the ability to link up with other players on the basis of commonly agreed standards for the joint provisioning of patient-centered and cost-efficient health services, will emerge to a key concept for future health service delivery.

Approaches to study networkability in the fields of health services research, organization theory, and information systems often have concentrated on very specific viewpoints such as the strategic positioning of networked health care providers (e.g. Horak *et al.* 1998; Kauer and Berkowitz 1997), information and communication technology (ICT) support (e.g. Bernstein et al. 2007), the optimization of medical and administrative processes (e.g. Snyder et al. 2005), or cultural aspects of health care networks (e.g. Mur-Veeman et al. 2001).

Therefore it is the aim of this paper to show a holistic perspective on networkability in order to clarify which capabilities health care providers will need to have in the future if they are to cope with the growing pressure for effectiveness and efficiency. In order to achieve this goal,

the paper is organized as follows. First, we describe the research methods used to yield the presented insights. Then, the results of the exploratory survey are discussed into more detail. Basing on these findings, we present in the subsequent section some recommendations how health care providers can systematically increase their networkability. Finally, we present some concluding remarks and give an outlook for continued research in the area.

METHOD

(Morrison 1996) in his book *The Second Curve* says "Welcome to world the world according to two curves. It's a world where the present is hard but the future is doubly and the only certainty is change".

Increasing the networkability of health service providers means change. As resources become scarce and demands on the health care system intensify, sooner or later, health care managers must adopt new mental models of how to manage their organizations. To help them in this difficult task, we followed five steps to study the phenomenon of networkability and to draw some practical conclusions for them (see Figure 1). [1]



Figure 1. Approach to study networkability in health care

Structuring the object system

In order to generate a clear understanding of the subject matter and in delineating what is included and what is excluded in the study, a structuring of the object system – a framework – was needed. Frameworks are conceptual and heuristic aids for representing particular object systems of a domain. Conceptual relates to the aspect that they help to conceptualize and structure an object or groups of objects. Heuristic relates to the support to find a solution for the problem domain. In our case, the business engineering framework as described by (Winter and Fischer 2007) has proved useful as a generic structure for the analysis of a wide range of business areas. The main characteristics of the business engineering framework are the application of multiple views and layers of an organization (see Figure 2). In contrast to traditional frameworks in the information systems context, which mainly focus on IT related artifacts like hardware and software components, the framework at hand uses a broader focus applicable to organizing phenomena. Amongst others, the positioning of an enterprise, its market services and goal system are analyzed on the strategy layer. The organization layer is used to consider work practices, processes and structures through which effectiveness and efficiency can be achieved. The support provided by computer-based information systems for business processes and organizational structures is analyzed on the system layer.

[1] Steps four (analyse data) and five (develop recommendations) are discussed in the results and conclusion section respectively.

As in health care perceptions of the various actors are extremely important to the success of any change effort (Walston and Chadwick 2003), the framework was extended to include the layer of culture and values. Furthermore, to account for domain-specific conditions of the health care sector, the environment dimension was amended.

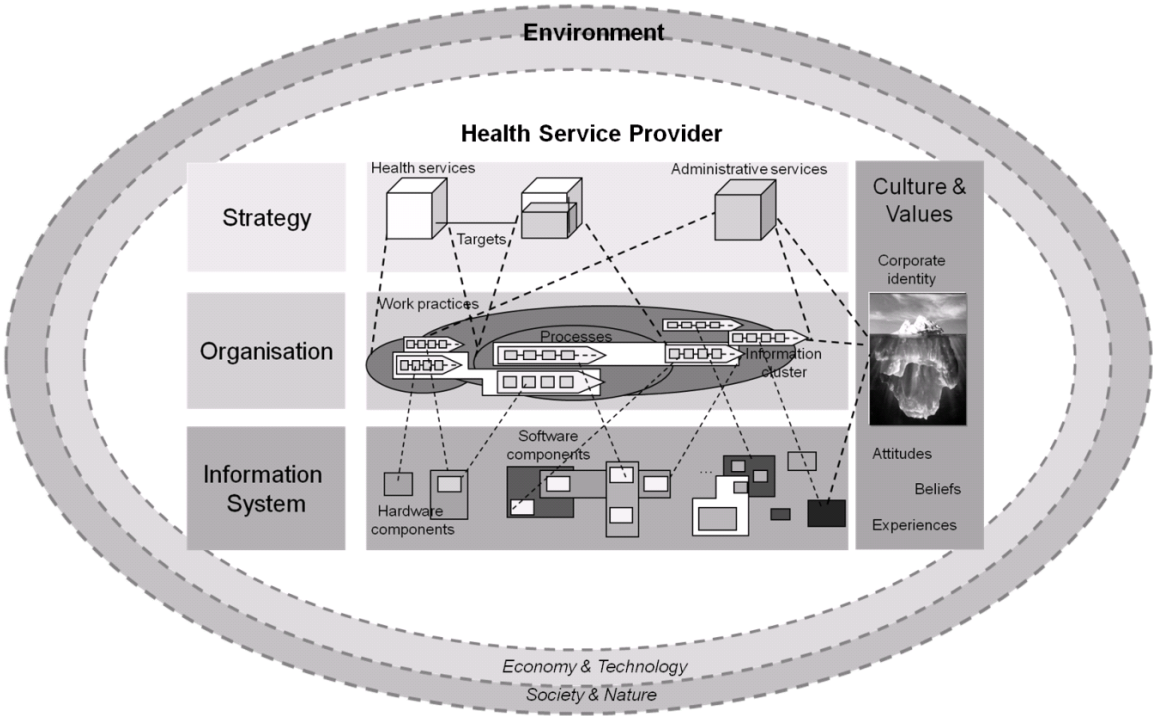


Figure 2. Used framework for analyzing the networkability of health care providers

Generating a sample of possible influencing variables

Since the subject matter still lacks profound theoretical underpinnings, we used the method of 'focus groups' to identify possible variables that have an influence on the networkability for health service providers. In health care, and in particular in the area of health services research, the use of focus groups is a proven qualitative research method for the exploration of people's schemes of understanding (World Health Organization 2001; Carter and Henderson 2005). In order to get a broad distribution of opinions, three different focus groups, one for medical practitioners, one for health insurance companies, and one for service providers with an average of five to ten exponents per fraction, were set up. In the period from June 2005 to May 2006 a total of fifteen sessions – five per focus group – were conducted. The results of the discussions yield to a list with more than one hundred potential influencing variables. To facilitate further investigation, the identified variables were clustered in terms of similarity in content and allocated to a specific layer (e.g. strategic, organizational, technical, cultural or environmental) of the elaborated framework (see Figure 2). The results of discussions are illustrated in Table 1.

Item	Definition
Strategic variables	
Geographical diffusion of the organization	Degree by which the health care provider is influenced by its geographical catchment area
Standardization of services	Degree by which the health care provider is influenced by the standardization of its health services
Incentive system of the organization	Degree by which the health care provider is influenced by monetary and nonmonetary incentives
Interdisciplinary committee work	Degree by which the health care provider is influenced by the results of committee work
IT Planning	Degree by which the health care provider is influenced by its own IT strategy and budget
Organizational variables	
Organizational structure	Degree by which the health care provider is influenced by its organizational structure (e.g. clinics or departments)
Organizational process descriptions	Degree by which the health care provider is influenced by the description of its processes
Process transparency	Degree by which the health care provider is influenced by the transparency of its processes
Process quality	Degree by which the health care provider is influenced by the quality of its processes
Organizational service descriptions	Degree by which the health care provider is influenced by the description of its health services
Technical variables	
Operational information systems (IS)	Degree by which the health care provider is influenced by its operational IS like enterprise resource planning systems
Analytical information systems (IS)	Degree by which the health care provider is influenced by its analytical IS like data warehouses or decision support systems
Automation of administrative processes	Degree by which the health care provider is influenced by the automation of administrative processes
Standardization of data exchange	Degree by which the health care provider is influenced by the standardization of its data exchange
Cultural variables	
Adaptability of workforce	Degree by which the health care provider is influenced by the capacity of its workforce to adapt to change situations
Capacity for teamwork of workforce	Degree by which the health care provider is influenced by the capacity of its workforce to work in teams
Communication capability of workforce	Degree by which the health care provider is influenced by the capacity of its workforce to communicate
Economic orientation of workforce	Degree by which the health care provider is influenced by the economic expectations of its workforce
Customer orientation of workforce	Degree by which the health care provider is influenced by the capacity of its workforce to generate patient benefit
Environmental variables	
Regulation and laws	Degree by which the health care provider is influenced by the regulatory setting of the country
Interest groups	Degree by which the health care provider is influenced by external groupings like trade-unions or patient associations

Table 1. Possible factors influencing networkability of health service providers

Sprouts

Collecting data

A major disadvantage in using focus group discussions lays in the lack of representativeness as a result of the small number of people surveyed. In order to obtain a coverage that is as wide as possible for validation of the identified variables, a survey was conducted in Switzerland during the period from July to September 2007. Beforehand, the draft version of the questionnaire was checked by a number of healthcare experts, with a view to removing any inconsistencies and generally improving the structure. In conducting the survey, the following questions were asked:

(1) To what extent have the identified variables an impact on the networkability of your organization?
(2) Which variables not listed in the questionnaire have also an influence on the networkability of your organization?

The questionnaire was either distributed by post, or by e-mail addressed individually to 500 key persons of health care organizations (general practitioners, hospital managers, health insurance managers, administrative personnel, service provider managers). Of the 500 questionnaires sent out, 65 valid replies were returned, giving a response rate of 13%. Thereof 45% were completed by doctors and hospital managers, 23% by health insurance managers and 12% by employees of a service provider. Another 20% came from other areas (e.g. pharmaceuticals industry, public administration). 68% of the respondents described themselves as working in a management position. The remaining respondents were medical specialists (9%), IT professionals (11%), people working at the interface between medicine and IT (3%), or stated another function (9%).

The questionnaire contained five main blocks (according to the differentiation between strategic, organizational, technical, cultural and environmental variables), and an additional one for the identification of missing influencing variables. To investigate the identified variables a five-point Likert scale was used, where 0 means that the variable has no influence at all, 1 that the variable is unimportant, 2 that it is moderately important, 3 that it is important and 4 that it is extremely important. For the final block, where the respondents were asked about the completeness of the study, a free text field was provided.

RESULTS

The results of the survey are illustrated in form of a descriptive statistics (see Figure 3). Overall, each identified influencing variable was rated as significant for the health service providers' networkability (with a minimum value of 2.36 referring to the item *operational information system* and a maximum value of 3.17 referring to the item *process transparency*; the standard deviation was 1.07). To provide a more detailed view where actions need to be taken, further analysis of the results was performed in accordance with the defined layers of the proposed framework.

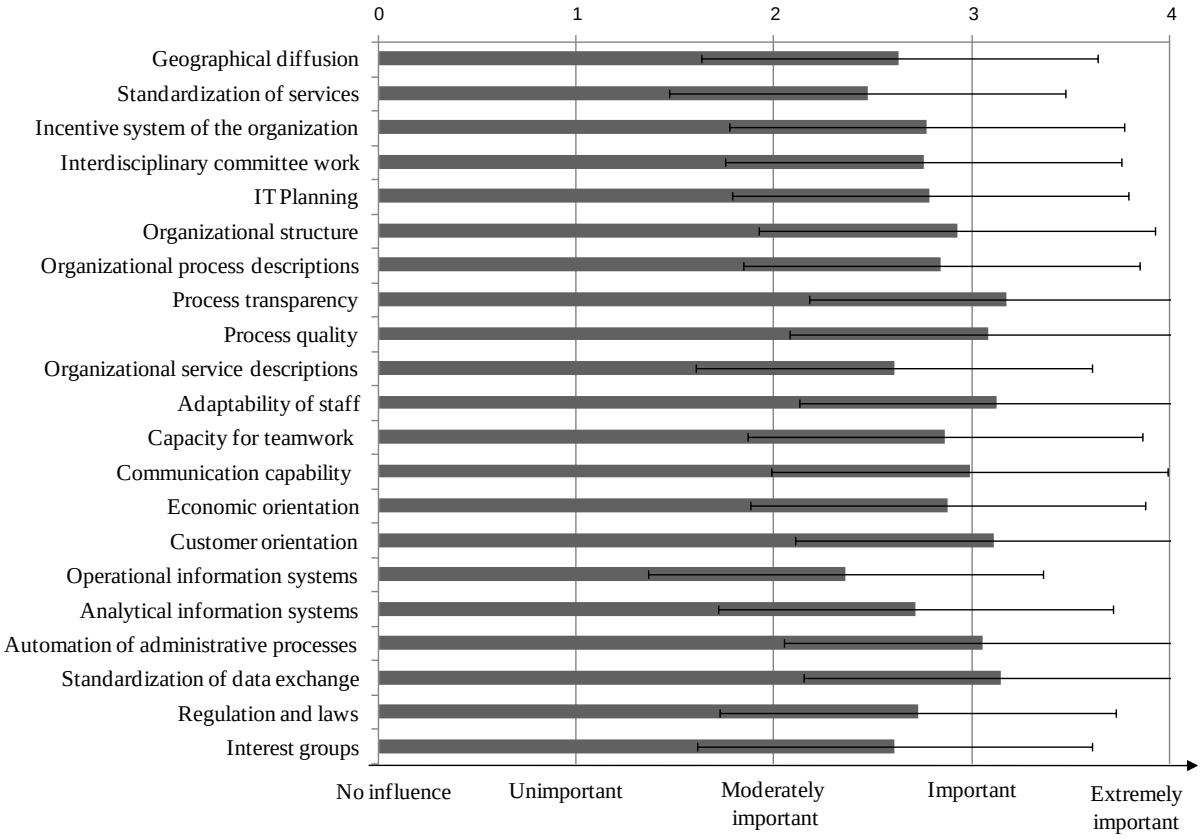


Figure 3. Influencing factors of networkability in reference to their relevancy for health care providers

Strategy

In general, markets can be considered as locations where buyers and sellers enter into exchanges of similar products and services (Wholey and Burns 2003). In the case of a competitive health care market (e.g. due to DRG implementation), the differentiation of the health services provided play a major role to augment market share and the status position within a network. To enhance networkability it is therefore useful to take up both an inside-out perspective (what services can be delivered), and an outside-in perspective (what services are needed). On the one hand, differentiation is influenced by the level of service standardization, that is how much an organization provides or consumes 'normalized' services. On the other hand, it is affected by the geographical diffusion of the organization, that is how wide the organization's services are spread.

In order to control, manage and improve one's position in a health care network, internal and external incentive systems and interdisciplinary committee work (i.e. steering committees between medical and business partners), but also a sound alignment between business needs and IT capabilities are required. Especially the last three mentioned variables (incentive systems, committee work, and IT planning) were considered to have a strong influence on the networkability of a health service providers.

Sprouts

Organization

Rising expectations of patients, increasing competition, as well as the pressure on costs and efficiency require fundamental improvements of processes and structures. In the industrial sector, organizations typically prescribe how their processes have to be performed; especially those processes that represent complex routine work which involve many persons and organizational units and that are in general frequently performed (Vassilacopoulos and Paraskevopoulou 1997). However, in contrast to the industrial sector, health service providers rarely have a formalized documentation of internal procedures. On that account, it is even more surprisingly that the respondents rated process transparency and quality as key influencing variables of networkability, but judged organizational service and process descriptions less important at the same time.

Information Systems

The adoption of ICT in health care is currently seen as an opportunity to improve not only effectiveness, efficiency, and quality of health services but also the transparency of the economic activities and the availability of information in real time (Mettler and Vimarlund 2008). Nevertheless the health care sector shows a relatively underdeveloped information system structure (Parente 2000). Conversely most economic evaluation studies discovered a significant relationship between the financial well-being, size, and productivity of a health service providers and its level of ICT adoption (Fonkych and Taylor 2005). For instance, (Parente and Dunbar 2001) found that especially health service providers with sophisticated information systems have higher total margins and operating margins than those organizations that do not have them. However, as the causality between ICT investment and economic profitability could not be rigorously demonstrated yet, it was not astonishing to see that the respondents valuated operational and analytical information systems as less important in comparison with the other variables.

Culture and Values

Most literature in organizational transformation implicitly follows the assumption that human resources are just another type of input, like financial or physical resources. However, change in health care organizations often may be restricted but can also be enabled by the corporate culture and the shared values of the workforce (Walston and Chadwick 2003). Interestingly, the respondents were conscious of that and rated the cultural variables as highly important. In respect to the networkability of an organization, *people* have to be regarded as strategic key factors who can act individually or collectively to modify the transformation projects, such as trying to impede budget cuts, which they present as a strategy to protect the quality of services, or blocking a more equal deployment of resources, which becomes an obstacle to achieving a more equitable access to care (cf. Rigoli and Dussault 2003). Therefore we think that special attention has to be given to cultural aspects (i.e. adaptability, capacity for teamwork, communication capability, economic orientation and customer orientation of workforce) when enhancing networkability.

Environment

More than in other industries the health care market is affected by governmental control and meddling by third parties. Nevertheless, the respondents considered environmental variables (i.e. regulation and laws, interest groups) less important. Hence it can be concluded that the

Sprouts

health services providers have come to terms with or resigned themselves to the regulatory conditions of the health system and consider it to be more important to concentrate on variables, which they can influence directly (e.g. the strategy, structure and culture of the organization). However, it is still necessary to regard compliance as an important influencing variable of networkability. Furthermore, as the informational self-determination on the part of patients is becoming more eminent in future health service delivery, the consideration of external interest groups certainly will gain in importance as well.

RECOMMENDATIONS

As the intention of this paper is to give practical advice on how to increase the networkability of health care organizations, we deduced a simplistic but comprehensible procedure model (see Figure 4).

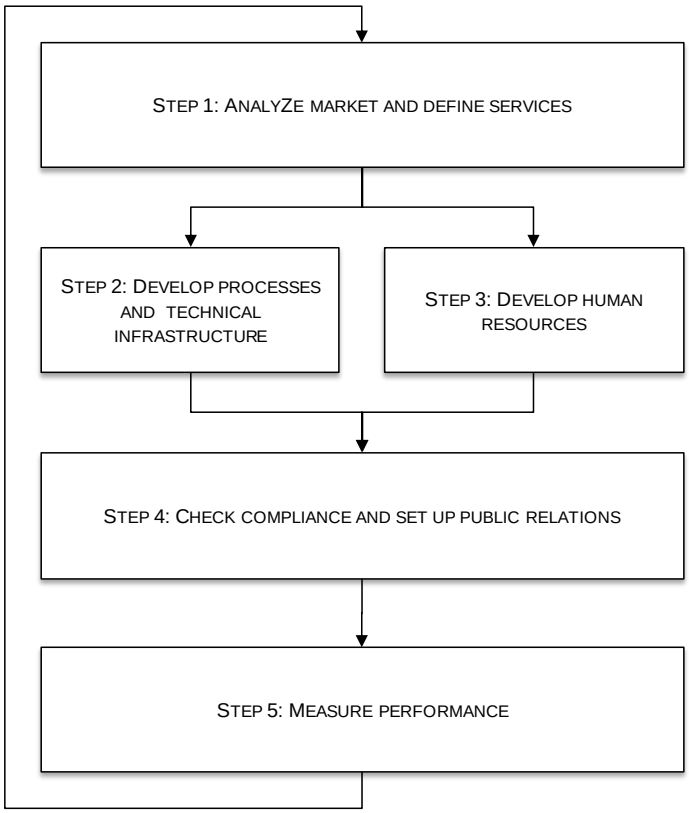


Figure 4. Procedure model for enhancing networkability of health service providers

Analyze market and define services

One key for success is a thorough analysis of the market in order to understand evolving opportunities and threats as they relate to the strengths and weaknesses of the health care organization. Hence, prior to restructuring health service delivery, the current market size, potential growth rate, profitability, cost structure as well as the key success factors have to be

explored. This allows the sophisticated definition of additional health services to be rendered and the identification of those services, which better are yielded to specialized partners.

Develop processes and technical infrastructure

When the systematic market analysis is conducted and the portfolio of health services is defined, it is important to examine the processes and infrastructure which support the rendition of the services. This is addressed by an ongoing process known as business/IT-alignment (Henderson and Venkatraman 1993). The objective of business/IT-alignment is to establish a trusted relationship between the business and IT that allows for an innovation driven climate in which ICT becomes a strategic enabler for tangible (e.g. reducing process cycle-times and costs of administrative processes) and intangible (e.g. improving quality of care) benefits.

Develop human resources

A holistic improvement of the networkability not only requires the adaptation of processes and infrastructure ("hard change") but also to review the corporate culture in order to become more patient-centric ("soft change"). As the effectiveness and efficiency of a health care organization strongly depends on the ability of the human resources (cf. section 3.4), the development of the health workforce is extraordinary important when networkability is developed. A high degree of flexibility, openness and agility of the workforce is needed. However, this cannot be developed in the short run. Thus, activities and instruments that foster the required change have to be planned, implemented and communicated already at an early stage.

Check compliance and set up public relations

After the successful development of soft and hard change initiatives, it is also crucial to check compliance of its implementation. As an increased networkability is always in line with a stronger embedding in the network a healthcare organization is working with, it is necessary to deliberately define governance policies (e.g. what happens in case of a breach of contract on the part of a networking partner). In addition, it is also increasingly important to better involve the different stakeholders. For this, a sophisticated relationship management is needed.

Measure performance

Finally, the outcome of the implemented changes has to be measured (Behn 2003). This is used to evaluate (how well is the organization performing?), control (are the networking partners and the own workforce doing the right things?), motivate (which networking partners should be motivated to do the things right?), budget (on what services should be spent more money?), promote (which stakeholders should be convinced to join?), celebrate (what are the most successful networking partners?), learn (why is service delivery not working?), and improve (what exactly should who do to improve service delivery?). In doing so, an iterative cycle for an ongoing improvement of networkability of health care providers is established.

CONCLUSION

As modern health systems become more complicated and more people need coordinated care, *networkability* becomes a crucial concept for the delivery of good quality and affordable

health services. In the context of health services research, however, little has been done so far to sharpen the understanding of this particular issue. As existent investigations in other fields of research often focus on very specific aspects of their research discipline, only limited conclusions can be drawn for the health care sector. For this purpose, a total of twenty-one influencing variables were identified with the help of focus group discussions and evaluated by means of a survey. On basis of these findings a simplistic but practical procedure model was deduced that describes essential practices on how to holistically increase networkability.

Building on the results presented in this paper, future work should be directed at the practical application of the recommendations to provide the basis for further empirical validation. Moreover, additional models and methods for each recommended step have to be identified, adapted or developed in order to provide better guidance for health care practitioners in day-to-day business.

REFERENCES

Behn, R. (2003), "Why measure performance? Different purposes require different measures", *Public Administration Review*, 63 (5), pp. 586-606.

Bernstein, M. L., Mccreless, T. and Côté, M. J. (2007), "Five constants of information technology adoption in healthcare", *Hospital Topics*, 85 (1), pp. 17-25.

Carter, S. and Henderson, L. (2005), "Approaches to qualitative data collection in social science", in Bowling, A. and Ebrahim, S. (Eds.), *Handbook of health research methods*, Open University Press, Maidenhead.

Davidow, W. H. and Malone, M. S. (1992), *The virtual corporation: Structuring and revitalizing the corporation for the 21st century*, Harper Collins, New York.

Fonkych, K. and Taylor, R. (2005), The state and pattern of health information technology adoption. Santa Monica, CA, RAND Corporation.

Henderson, J. and Venkatraman, N. (1993), "Strategic alignment: Leveraging information technology for transforming organizations", *IBM Systems Journal*, 32 (1), pp. 4-16.

Herzlinger, R. E. (2006), "Why innovation in health care is so hard", *Harvard Business Review*, 84 (5), pp. 58-66.

Horak, B. J., Campbell, D. J. and Flaks, J. A. (1998), "Strategic positioning: a case study in governance and management", *Journal of Healthcare Management*, 43 (6), pp. 527-540.

Kauer, R. T. and Berkowitz, E. (1997), "Strategic positioning. Part 2: Positioning challenges in an evolving health care marketplace", *Physician Executive*, 23 (8), pp. 46-51.

Mettler, T. and Vimarlund, V. (2008), "Understanding business intelligence in the context of health care", *Proceedings of the 13th International Symposium for Health Information Management Research, Auckland, New Zealand*, Massey University, Auckland, New Zealand, pp. 61-69.

Morrison, I. (1996), *The second curve: Managing the velocity of change*, Ballantine Books, New York.

Mur-Veeman, I., Eijkelberg, I. and Spreeuwenberg, C. (2001), "How to manage the implementation of shared care: A discussion of the role of power, culture and structure in the development of shared care arrangements", *Journal of Management in Medicine*, 15 (2), pp. 142-155.

Sprouts

OECD, Directorate for Employment, Labour and Social Affairs (2006), "Change in health expenditure as a share of GDP, OECD countries, 1990 and 2004", available at: http://www.oecd.org/dataoecd/5/28/36992150.pdf (accessed 27 January 2009).
Österle, H., Fleisch, E. and Alt, R. (2001), *Business networking: Shaping collaboration between enterprises*, Springer, Heidelberg.
Parente, S. T. (2000), "Beyond the hype: A taxonomy of e-health business models", *Health Affairs* 19 (6), pp. 89-102.
Parente, S. T. and Dunbar, J. L. (2001), "Is health information technology investment related to the financial performance of US hospitals? An exploratory analysis", *International Journal of Healthcare Technology and Management*, 3 (1), pp. 48-58.
Porter, M. and Olmsted Teisberg, E. (2004), "Redefining competition in health care", *Harvard Business Review*, 82 (6), pp. 64-76.
Ramanujam, R. and Rousseau, D. M. (2006), "The challenges are organizational not just clinical", *Journal of Organizational Behavior*, 27 (7), pp. 811-827.
Rigoli, F. and Dussault, G. (2003), "The interface between health sector reform and human resources in health", *Human Resources for Health*, 1 (9), pp. 1-12.
Snyder, K. D., Paulson, P. and Mcgrath, P. (2005), "Improving processes in a small health-care network: A value-mapping case study", *Business Process Management Journal*, 11 (1), pp. 87-99.
Van Alstyne, M. (1997), "The state of network organization. A survey in three frameworks", *Journal of Organizational Computing*, 7 (3), pp. 83-151.
Vassilacopoulos, G. and Paraskevopoulou, E. (1997), "A process model basis for evolving hospital information systems", *Journal of Medical Systems*, 21 (3), pp. 141-153.
Walston, S. L. and Chadwick, C. (2003), "Perceptions and misperceptions of major organizational changes in hospitals: Do change efforts fail because of inconsistent organizational perceptions of restructuring and reengineering?" *International Journal of Public Administration*, 26 (14), pp. 1583-1607.
Wholey, D. and Burns, L. (2003), "Understanding health care markets: Actors, products, and relations", in Mick, S. and Wyttenbach, M. (Eds.), *Advances in health care organization theory*, Jossey-Bass, San Francisco.
Winter, R. and Fischer, R. (2007), "Essential layers, artifacts, and dependencies of enterprise architecture", *Journal of Enterprise Architecture*, 3 (2), pp. 7-18.
World Health Organization (2001), "Focus groups on health care experiences", available at: http://www.who.int/responsiveness/surveys/Focus-Group-Mod-Guide-final.pdf (accessed 27 January 2009).

芽|Sprouts
Working Papers on Information Systems | ISSN 1535-6078

Editors:
Michel Avital, University of Amsterdam
Kevin Crowston, Syracuse University

Advisory Board:
Guy Fitzgerald, Brunel University
Rudy Hirschheim, Louisiana State University
Blake Ives, University of Houston
Sirkka Jarvenpaa, University of Texas at Austin
John King, University of Michigan
Kalle Lyytinen, Case Western Reserve University
Rik Maes, University of Amsterdam
Dan Robey, Georgia State University
Ron Weber, Monash University
Kwok Kee Wei, City University of Hong Kong

Sponsors:
-Association for Information Systems (AIS)
-EPrints Services, UK
-Case Western Reserve University, USA
-City University of Hong Kong, China
-Copenhagen Business School, Denmark
-Helsinki School of Economics, Finland
-Indiana University, USA
-Lancaster University, UK
-Pennsylvania State University, USA
-Syracuse University, USA
-The City University of New York, USA
-Université Catholique de Louvain, Belgium
-University of Amsterdam, Netherlands
-University of Limerick, Ireland
-University of Oslo, Norway
-Victoria University of Wellington, New Zealand

Editorial Board:
Egon Berghout, University of Groningen
Kieran Conboy, National U. of Ireland Galway
Jan Damsgaard, Copenhagen Business School
Robert Davidson, City University of Hong Kong
Guido Denene, Université Catholique de Louvain
Alan Dennis, Indiana University
Brian Fitzgerald, University of Limerick
Linda Friedman, The City University of New York
Ole Hanseth, University of Oslo
Sid Huff, Victoria University of Wellington
Ard Huizing, University of Amsterdam
Lucas Introna, Lancaster University
Steve Sawyer, Pennsylvania State University
Virpi Tuunainen, Helsinki School of Economics

Managing Editor:
Bas Smit, University of Amsterdam

Office:
Sprouts
University of Amsterdam
Roetersstraat 11, Room E 2.74
1018 WB Amsterdam, Netherlands
Email: admin@sprouts.aisnet.org

芽|Sprouts