

Using governance to understand how to improve an SME's success with introducing ehealth applications in Dutch healthcare organisations

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Abstract

The objectives of the Government with regard to ehealth are still in sharp contrast to the present situation regarding the use of ehealth. This has not so much to do with technical possibilities, nor with supposed healthcare organisations' reluctance to adopt ehealth solutions. Many technically adequate ehealth solutions are available and healthcare managers see the benefits and want to make use of ehealth applications. Still, adoption falls way below stated ambitions. We argue that governance aspects play a role in the limited use of ehealth applications. In a case study, we looked at the adoption of patient portals by hospitals. It shows that on the one hand, many patients are not aware of the benefits of patient portals while at the other hand, these patients would like to make use of these benefits.

The development towards a mature digital organization follows four of phases. The first phase is the Frame phase, in which digital challenges are defined. The second phase is the Focus phase, in which direction is given to the ehealth investments. The next phase is the Engage phase, where the organisation is mobilized. The final phase is the phase of Sustain in which the change is anchored in the organisation. Within the Engage phase, one core bottleneck is that digital transformation is not supported by digital means. In this phase are opportunities for SME's. The Hanze University of Applied Science can combine its expertise in the field of ICT with knowledge of communication and knowledge game design and user experience to contribute to the effective communication on ehealth applications by researching communication patterns and developing communication means.

Introduction

Information and Communication Technology (ICT) is becoming increasingly important in healthcare and healthcare providers are spending significant efforts to reach a level of utilisation of ICT that has become common in other domains. Not only does ICT promise benefits for generic, business-like activities within healthcare organisations, such as planning and operations, billing and accounting, payrolling and procurement, but also for specific healthcare activities related to the core processes of care and cure. In this paper, we use the term 'ehealth' to indicate any use of ICT in healthcare.

Despite the potential of ICT for healthcare, the adoption of ICT by healthcare organisations – both to support business activities and to support care and cure activities – remains problematic [REF]. One example is the failure in the Netherlands to create a standardised, national Electronic Health Record (EHR) (Thole, I.M., & Sigterman, 2011). The opportunities and benefits of adopting ICT by healthcare organisations are well accepted in general, but getting ICT implemented and used extensively offers many domain-specific challenges. And while big companies will have a hard time taking up these challenges, most SMEs would lack the resources to do so successfully. In our research, we try to

come up with a better understanding of the mechanisms involved in the adoption of ICT in healthcare organisations to create tools and mechanisms that enable SMEs to enter this fast growing market successfully.

The slow adoption of ehealth has several causes, some of which are due to the specific nature of healthcare. The approach to innovations in healthcare have been characterised by a lack of homogeneity and by a lack of attention to governance (Locatelli, Restifo, Gastaldi, & Corso, 2012). As an illustration, the abovementioned failure of introducing a national EHR in the Netherlands was also more due to a lack of governance, i.e. lack of communication, than to technical challenges (Twist, 2012). In this paper, we discuss how governance influences the success or failure based on data available for the implementation of one particular ehealth application, i.e., patient portals for hospitals.

We define “governance” as the processes of interaction and decision-making among actors involved in a collective endeavor that optimises achieving intended results and information sharing.

This paper is structured as follows. First, the Dutch healthcare system is described. Second, we examine the ehealth ambitions formulated by the Dutch government. Third, we describe patient portals and their functionality in hospitals. Fourth, we discuss the role of governance in this particular example. Finally, we use this case study to make recommendations for future research into the use of governance by SMEs to ensure successful ehealth applications.

The Dutch healthcare system

The Dutch healthcare system is set up as a free market constrained by government supervision. Every year, the government fixes a basic health insurance policy package, i.e., tariff and covered costs. This package includes basic medical costs and is open to all citizens with no preselection or tests. Health insurance companies offer this package. Health insurance companies offer additional packages for an extra fee, but these may require preselection. The basic package includes a deductible (currently 350 euro), which is also fixed by the government yearly. Health insurance companies sign contracts with healthcare providers to obtain favourable tariffs for all kinds of standardised diseases and interventions. Thus, the major stakeholders are patients, government, health insurance companies and healthcare providers.

Patients are entitled to a basic package and pay a monthly fee. There is a standard, fixed deductible determined by the government. Patients may choose any health insurance company and opt for a higher deductible (resulting in a lower tariff) or for additional coverage, provided the health insurance company accepts the patient for this additional coverage.

Healthcare is organised in primary, secondary, and tertiary care. Primary care is available without referral, secondary and tertiary care only after referral by primary care such as general practitioners or family doctors. General practitioners play an important role in this system, because they act as a gatekeeper and are instrumental in keeping costs and the load on the healthcare system down. Remuneration of secondary and tertiary care is structured in the form of standardised diagnosis-treatment combinations (Diagnose Behandel Combinaties – DBCs). The remuneration for a DBC is set in the contract between health insurance company and healthcare provider. This remuneration is based on the estimated average cost of treatment and not on actual costs.

In 2013, the total cost of healthcare in the Netherlands was €94.2 billion, €5608 per resident.¹ The way the healthcare system is organised in the Netherlands, combined with a high level of organisation of patient interest groups, have put the Netherlands at the top of the Euro Health Consumer Index (Björnberg, 2015) in 2013 and 2014. But it also makes it harder for SMEs to be successful in introducing ehealth applications because of the number of stakeholders involved, the way remuneration is organised, and the way this influences the business case for all stakeholders.

Ehealth in the Dutch healthcare system

Although healthcare in the Netherlands is well-organised, there are some major concerns. Costs are increasing rapidly and the affordability in the long run is questionable: the last 20 years costs have gone up from just €7 billion to over € 90 billion annually. Because the average life span increases, more people are chronically ill and for long periods of time dependent on healthcare.

It is important that patients with chronic diseases can receive care without having to go to a hospital or general practitioner all the time. Self-management, including self-measurements and self-treatment, as well as better access to health information and remote monitoring are important innovations for chronic patients. According to the Dutch Ministry of Health, Welfare, and Sport, ehealth plays a crucial role in making this possible, thereby improving the quality of healthcare, the quality of life, as well as keeping costs down (Schippers & Rijn, 2014).

But while the need is clear, actual adoption of ehealth by healthcare organisations in the Netherlands falls behind in comparison with other countries (KPMG, 2012). Identified barriers are the complexity of the current remuneration system, lack of cooperation, lack of coordination, lack of trust, and lack of knowledge on the potential of ehealth. These are governance issues, not technical issues. This understanding has led to the formulation of a healthcare system-wide agreement to address these governance issues (Covenant Governance eHealth, 2013).

Moreover, the Ministry of Health, Welfare, and Sport has formulated targets for adoption of ehealth by the healthcare system. In a letter to the parliament, the minister of health has formulated targets for the coming 5 years (Schippers & Rijn, 2014):

- 80% of all chronically ill citizens should have access to their medical data regarding medication, test results, and vital functions and be able to use these in mobile and web applications.
- 40% of all citizens should have similar access to their data.
- 75% of all chronically ill (diabetes and COPD) and elderly citizens should be able to self-measure and share the data with a healthcare provider for telemonitoring.
- 100% of all citizens receiving home care should be able to contact a healthcare provider 24/7 via videoconferencing tools (such as Skype or Facetime).

Governance aspects of ehealth

The healthcare sector has certain characteristics which are troublesome for the adoption of ehealth (Locatelli, Restifo, Gastaldi, & Corso, 2012). One of these is the need for reliability and security of data. On the one hand, data must be absolutely reliable: lives depend on it. On the other hand,

¹ Based on census information by the Dutch national statistics bureau CBS for 2013.

access to data should only be given to those who have a need and a right to see it because of the privacy of health related data. National and international regulators such as the WHO (World Health Organisation) as well as health insurers all put strong requirements on the reliability and security of health related data. ICT providers may not always have a business case in light of these requirements, including the legal implications of not having been able to maintain the reliability and security requirements.

Another characteristic which hinders the adoption of ehealth is the fact that healthcare organisations have a strict division of responsibility between operational management and medical management. A medical professional is by law entitled to making decisions in the treatment of patients based on medical grounds alone. No administrator may overrule these decisions based on operational grounds such as costs. Consequently, an ehealth innovation that may be very attractive to one party in a healthcare organisation may be less so to another party and be blocked by the latter. Furthermore, healthcare organisations, especially hospitals, may have many different specialisations under one roof, each with their own priorities and decision making. The culture in healthcare is still often hierarchical and specialist, which is not supportive of a collaborative, multidisciplinary way of working. Given the fact that many healthcare professionals are not very receptive regarding ICT-based solutions, getting an ehealth application adopted is a complex persuasion and decision making process (Locatelli, Restifo, Gastaldi, & Corso, 2012) (Kane & Labianca, 2011).

Different sectors have different attitudes towards ICT adoption. The banking sector, for example, has a much higher adoption rate than many other sectors, including healthcare. In a worldwide survey, CAP Gemini and MIT studied the level of adoption in different sectors and organisations. In this survey, they used a classification system with 4 classes: *Beginner*, *Conservatives*, *Fashionistas*, and *Digital Masters*. Most healthcare organisations are, according to this survey, *Beginners*. Banks and high tech companies are often *Digital Masters* (Consulting & Sloan, Digital Transformation: a roadmap for billion dollar organizations, 2011) (Consulting & Sloan, Digital Maturity in health care, results from the first global survey, 2014).

It is interesting to analyse the process that *Digital Masters* have followed to get where they are to get an idea of what healthcare organisations have yet to accomplish. The survey distinguishes 4 phases:

1. Frame phase: digital ambitions are being defined.
2. Focus phase: decisions are made in which innovations to invest.
3. Engage phase: the organisation is being mobilised.
4. Sustain phase: the innovation is anchored within the organisation.

The researchers doing the survey, pinpointed issues for the Dutch healthcare system in each of these phases.

Frame phase: while the Dutch policy of allowing bottom up ehealth initiatives to foster freely is well appreciated by the healthcare organisations, it prevents easy upscaling.

Focus phase: Dutch healthcare organisations have a tendency to focus on big and complex applications. However, *Digital Masters* excel at *Think big, act small, move fast*: they concentrate more on low-hanging fruit.

Engage phase: experience shows that mobilising people to adopt ICT-based solutions is more effective using digital means such as e-learning and social media. However, Dutch healthcare organisations show a preference for traditional communication means such as leaflets and phone calls.

Sustain phase: the knowledge and experience to embrace ICT-based solutions fully is not sufficiently available in healthcare organisations. This does not only concern the IT department, but also the digital skills of everybody else involved in delivering care, such as healthcare professionals and patients. “The potential of, e.g., big data is huge, also in healthcare, but achieving it requires skills that didn’t use to be present in healthcare organisations.” (translated from Dutch) (Consulting, Digitaal als het nieuwe normaal. Een kompas voor digitale transformatie in de zorg., 2015).

Case: Patient portals

We use the case of Patient Portals for hospitals to further examine the role of governance in the adoption of ehealth. Patient Portals are among the best known (online) ehealth applications (Op zoek naar meerwaarde. eHealth monitor 2014, 2014). Hospitals are exemplary for the complexity of business and healthcare processes and the number of stakeholders involved and therefore serve as a sufficiently challenging environment for studying governance aspects. In the Netherlands, there are three types of hospitals: General Hospitals, so called Top Clinical Hospitals (specialising in one or more healthcare subfields), and Academic Hospitals affiliated with a university.

A Patient Portal is a website which provides patients access to different websites and applications and allows the patients to manage and share their personal health data (Online inzage in mijn medische gegevens Patientenportalen in Nederland, 2011). Several functionalities typically supported by Patient Portals are online registration as a patient, supplying medical history data and filling in survey forms, online consults, and online scheduling of appointments. These are all fairly straightforward functionalities that are common in other sectors such as the banking sector. Patient Portals are instrumental in realizing a substantial part of the government’s 5 year ambition.

During the Spring of 2015, a study was done among 118 hospitals in the Netherlands to investigate the current state of the art in Patient Portals and to measure the usage of these Portals. Only 8% of the hospitals has an extensive Patient Portal. Online access to one’s own medical records is possible for only 2% of all general hospitals, 18% of the top clinical hospitals and 50% of the academic hospitals. Functionality that is available most is online scheduling of appointments (44.4%), online submitting of medical history and other data (24.4%), and online registration (18.9%). Functionality that is available the least are online access to medical records or lab test results (3.3%) and online consults (2.2%) (Onderzoek patiënten portalen voorjaar 2015, 2015).

Another study by NICTIZ (Dutch Institute for Standardisation and Ehealth) looked at the actual usage of available functionality (Op zoek naar meerwaarde. eHealth monitor 2014, 2014). Results of this study are shown in Table 1. The study is based on a sample of healthcare users from the Consumers Panel Healthcare, a group of 12,000 citizens maintained by NIVEL for monitoring the demands and opinions of the general public as healthcare consumers. NIVEL is a Dutch research organisation studying the development of healthcare in the Netherlands. For this study, only people were included who visited medical specialists in hospitals.

	%	%	%	%
Online scheduling of an appointment with a healthcare provider	62	12	5	45
Online reminders of appointments with the healthcare provider	64	12	6	49
Online request for repeat prescription from the healthcare provider	73	5	2	50
Online or email Q&A with the healthcare provider	72	7	3	40
Online consult via video conferencing technology	70	2	1	20

-  Patients who do not know if this is possible
-  Patients who do know this is possible
-  Patients who make use of this functionality
-  Patients who would like to use this functionality

Table 1. Desirable and actual usage of ehealth applications by healthcare users in hospitals.

This table clearly shows that patients hardly know about available ehealth applications. Most of them indicate not to know whether something is available (between 60 and 70%), even though between 40 and 50% indicate to want to use these functionalities if they were available. Patients are the most interested in being able to request a repeat prescription and making an appointment online. Video conferencing is the least interesting, according to the patients (only 20% appear to be interested). The fact that ehealth applications are under-used is understandable given the fact that many patients are not aware of the possibilities.

Medical specialists were asked for the same functionalities as in the patient survey if the functionality was available and whether the specialists would be interested in having the functionality available. The results are shown in Table 2. Among other things, the table shows that the availability of the functionalities is limited.

	%	%	%	%	%
Online scheduling of an appointment with a healthcare provider	36	2	21	24	17
Online reminders of appointments with the healthcare provider	24	21	41	12	11
Online request for repeat prescription from the healthcare provider	22	14	41	12	11
Online or email Q&A with the healthcare provider	9	4	40	22	25
Online consult via video conferencing technology	3	7	26	32	32

-  Functionality is available
-  There are plans to make this possible within 1 year
-  No plans, but the medical specialist would want this

	No plans, and the medical specialist has no preference
	No plans, and the medical specialist is against this

Table 1. Desirable and actual usage of ehealth applications by healthcare users in hospitals.

Most ehealth applications have limited availability. Only 36% of the specialists indicate that appointments can be made online. But when they are, patients are not aware of this (62%), even though they would like to be able to use it (45%). A similar situation is seen with online repeat prescriptions. It is possible for 22% of the specialists, 41% support making it possible, and 50% of patients would like to use it. Yet, only 2% of patients does use this functionality.

Communication during the *Engage* phase

During the *Engage* phase, the internal and external stakeholders are mobilised to allow for the implementation of digital solutions. As noted earlier, this process of mobilisation in Dutch healthcare providers is rarely supported by digital communication tools, such as e-learning and social media. Rather, communication typically uses more traditional means such as paper leaflets and phone calls that do not support the digitisation process. This is reflected in the way Patient Portals have been introduced. There are initiatives for creating ehealth applications, but both healthcare providers and healthcare users are hardly aware of the possibilities and each other's preferences. This shows that communication is very important and that the currently deployed means of communication are inadequate. So, this suggests that one of the subjects to add to an SME's toolbox for introducing successfully new ehealth application is adequate communication by digital means.

The example of *Digital Masters* leads to conjecture that the difficult adoption of ehealth is partly to blame on a form of communication with internal and external stakeholders that is too conventional. Appointments are being made by phone and a paper letter is sent to conform an appointment. This may very well lead to the patient's assumption that these are the only means of communication with the healthcare provider. Consequently, patients will be less inclined to see if online services are available for making appointments. Government services such as municipalities and tax authorities have been moved online. It is interesting to understand why citizens look online for those services, but not for healthcare related services.

Additionally, the question is what incentives would help patients to turn to ehealth applications. Banks have put a fee on paper copies of bank statements and customers save money using online services. Some municipalities offer certain services only online. Even health insurance companies receive an increasing number of invoices through online channels. An understanding of incentives that work in moving stakeholders to ehealth applications should also be part of an SME's toolbox.

The transition to ehealth applications is not just copying traditional forms of communications to a digital form. New patterns of communication are emerging. Self-management is often mentioned as a means to better and more cost-effective healthcare. But in self-management, the patient will have another role within the healthcare process. In order to be able to do self-measurements and to communicate these with relevant healthcare providers, the patient needs to become an active part of the healthcare process, where patients traditionally could be much more passive while undergoing diagnosis and treatment. Conversely, the healthcare provider has to become more active in sharing knowledge about illnesses and treatment to empower the patients and has to start monitoring the

self-management process rather than doing it. The Patient Portal case shows that this does not happen automatically. An SME's toolbox should include methods for to help internal and external stakeholders to understand expected changes in their roles and behaviour and start acting them.

SME's should develop appropriate tools for communicating if they intend to be successful in developing and delivering ehealth applications. Once an SME has mastered these tools, the tools themselves may become a business opportunity for SME's

Conclusions

Demographic change and the advance of technology create needs and opportunity for many new ehealth applications and will offer SME's huge market potential for new ehealth applications. However, seizing the opportunity involves overcoming some complex barriers. To a large extent, these barriers are not technical, but are concerned with issues of governance such as remuneration and communication.

We have seen that stakeholders do not necessarily resist the use of ehealth: stakeholders see the benefits of ehealth applications. The case study of Patient Portals compared with parallel examples of digitisation in other sectors, illustrates various ways in which other approaches to communication will improve adoption of digital solutions. SME's need to develop tools for adequate communication supporting the introduction of new ehealth applications in order to improve adoption of new applications. These tools in themselves may become marketable items in a domain that is lagging in the exploitation of opportunities offered by ICT.

Bibliography

- Björnberg, A. (2015). *Euro Health Consumer Index 2014*. Health Consumer Powerhouse.
- Consulting, C. G. (2015). *Digitaal als het nieuwe normaal. Een kompas voor digitale transformatie in de zorg*. Heliview.
- Consulting, C. G., & Sloan, M. (2011). *Digital Transformation: a roadmap for billion dollar organizations*.
- Consulting, C. G., & Sloan, M. (2014). *Digital Maturity in health care, results from the first global survey*.
- Kane, C., & Labianca, G. (2011). IS Avoidance in Health-Care groups: A multilevel investigation. *Information Systems Research*, 504-522.
- KPMG. (2012). *Accelerating Innovation: the power of the crowd. Global lessons in ehealth implementation*.
- Locatelli, P., Restifo, N., Gastaldi, L., & Corso, M. (2012). Health Care Information Systems. Architectural Models and Governance. In C. Kalloniatis, *Innovative Information Systems Modelry Techniques* (pp. 79-98). Intech.
- (2015). *Onderzoek patiënten portalen voorjaar 2015*. M&I partners.

(2011). *Online inzage in mijn medische gegevens Patientenportalen in Nederland*. Nictiz; NPCF.

(2014). *Op zoek naar meerwaarde. eHealth monitor 2014*. Utrecht en Den Haag: Nictiz en NIVEL.

Schippers, E., & Rijn, M. v. (2014). *e-Health en zorgverbetering. Brief aan de Tweede Kamer*. Den Haag.

Thole, E., I.M., W., & Sigterman, T. (2011). Operatie landelijk EPD mislukt. Wat nu? *Tijdschrift voor compliance en zorg*, nummer 2.

Twist, M. (2012). *Het EPD voorbij? Evaluatie besluitvormingsproces kaderwet elektronische zorginformatie uitwisseling*. Nedderlandse school voor openbaar bestuur.