User Centred Networked Health Care
A. Moen et al. (Eds.)
IOS Press, 2011

doi:10.3233/978-1-60750-806-9-649

Web 2.0 in Healthcare: State-of-the-Art in the German Health Insurance Landscape

Mirko KUEHNE[a,1], Nadine BLINN[a] , Christoph ROSENKRANZ[b]
Markus NUETTGENS[a]
[a] *School of Business, Economics and Social Sciences, Hamburg University, Germany*
[b] *Department of Economics and Business Administration Goethe University, Frankfurt am Main, Germany*

Abstract. The Internet is increasingly used as a source for information and knowledge. Even in the field of healthcare, information is widely available. Patients and their relatives increasingly use the Internet in order to search for healthcare information and applications. "Health 2.0" – the increasing use of Web 2.0 technologies and tools in Electronic Healthcare – promises new ways of interaction, communication, and participation for healthcare. In order to explore how Web 2.0 applications are in general adopted and implemented by health information providers, we analysed the websites of all German health insurances companies regarding their provision of Web 2.0 applications. As health insurances play a highly relevant role in the German healthcare system, we conduct an exploratory survey in order to provide answers about the adoption and implementation of Web 2.0 technologies. Hence, all 198 private and public health insurances were analysed according to their websites. The results show a wide spread diffusion of Web 2.0 applications but also huge differences between the implementation by the respective insurances. Therefore, our findings provide a foundation for further research on aspects that drive the adoption.

Keywords. Web 2.0, Health 2.0, Health Insurance

1. Introduction

A major chance for participatory healthcare and approaches that integrate patients in healthcare are the ideas associated with concepts such as "Health 2.0" or "Medicine 2.0". Health 2.0 describes the connection of healthcare, E-Health, and Web 2.0 [1], [2], [3], [4]. The term "Web 2.0" is generally associated with technologies that facilitate interactive information sharing, interoperability, and collaboration on the World Wide Web, leading to the development of social networks, social media, and communities [5], [6], [7], [8], [9]. Health 2.0 involves all types of participants from the healthcare sector (e. g., insurance providers, doctors, hospitals, patients associations, or self-help groups) that try to provide access to healthcare information or services using the Internet and Web 2.0 technologies [1], [3]. Against this background, our research examines the adoption and implementation of Health 2.0. As a first step in our research, we conducted a complete inventory count in the German health insurance landscape. We

[1] Corresponding author: Mirko Kuehne. E-mail:{mirko.kuehne}@wiso.uni-hamburg.de

analysed the website of all German health insurance provider regarding their provision of Web 2.0 applications.

The remainder of the paper is structured as follows: first, we explain the methodology and design of our research. Second, we present findings from our study. Finally, we discuss the results and give an outlook on further research. In the German healthcare system, health insurances play a highly relevant role. They are responsible for the majority of publicly funded health care provision. There are two main types of health insurance – the public health insurance, which is also known as sickness funds, and the private health insurance. Approximately 85 % of the population is member of one of the 152 public health insurance [10]. Public officers, self-employed people/entrepreneurs, and employees with a gross income above 49,500 EUR per year [11] are usually privately insured by one of the 46 private insurances.

2. Methodology

Our study on the website of the public and private insurances follows the method of "third-party web assessment" [12]. We apply the "mystery user" approach [13], that is, an examiner puts her- or himself in the role of a client that requires the services provided by the website in order to ensure inter-subjectivity and realism. This is also known as "mystery shopping", Wilson, 1998. Three research assistants were trained according to the developed survey guidelines. Afterwards, they independently conducted the study. Furthermore, cross-checks with randomly chosen records were used in order to check the correctness of the collected data.

We employ a framework developed by Ganesh and Padmanabhuni [14] in order to assess the technological objects. Ganesh and Padmanabhuni [14] developed a generic conceptual framework in order to structure the Web 2.0 landscape according to the following parameters: "Content", "Collaboration", "Commerce", "Computing as a Service", and "Technology". They indicated that for every application domain, an adaptation of the framework is required. Hence, we subjected the framework to experts from the healthcare domain. The expert group consisted of healthcare experts and IT-related staff from the insurance sector. As a result of structured interviews, they approved the following Web 2.0 technologies as relevant for the healthcare domain: "Blog", "Wiki", "Social Tagging", "Social Networking", "Chat", "RSS Feeds", "Podcast" and "Forum". Following the conceptual framework from Ganesh and Padmanabhuni [14] "Blog", "Wiki", "Social Tagging", "Chat" and "Social Networking" belong to the item "Collaboration". "Podcast" and "RSS Feeds" to the item "Content". Moreover, "Forum" was mentioned by the experts but it is not included in Ganesh and Padmanabhuni's [14] framework. According to the experts, it belongs to the parameter "Collaboration"; therefore we include Forum in our evaluation. Objects belonging to "Commerce", "Computing as a Service", and "Technology" were not mentioned by our experts. In addition, the hype about social networking sites, Raake and Hilker [15] has led us to revise the evaluation criteria "Social Networking". Next to social networks, which are self-operated by the health insurance providers, several unattached networks such as Facebook and Twitter play an important role. Health insurance providers and their customers are organized in these networks in user-groups. In addition to Facebook and Twitter we also included XING, which is the largest German business online community. Based on the growing

importance of these social networks we supplemented our framework with them. Therefore, our framework is structured as follows:

- Content: RSS Feeds, Podcasts
- Collaboration; Blog, Wiki, Chat, Social Tagging, Social Networking
- Social Networks: Xing, Twitter, Facebook

As we conducted a complete inventory count, the database comprises all 46 private and 152 public health insurances. Hence, 198 complete data sets were gathered in total. All criteria are transformed to a binary scoring model. If a criterion is fulfilled (offered) by a health insurer's website, the health insurer scores one point - otherwise it scores zero points. For the fulfillment of a criterion it is not necessary that the health insurer runs the Web 2.0 technology by itself. Some insurance companies, for example, share a "Blog" or a "Forum". That means for our survey, if there is an integrated Web 2.0 technology or if it is linked by the website of a health insurance provider (no matter, shared or self-run), the website gets one point for the technology. The same logic applies for the criterion "Social Networking". If there is a self-operated social network on the website of the health insurance provider or if there are links to further networks, the criterion "Social Networking" is fulfilled. However, the criterion can also be met by an explicit search in the social networks "Facebook", "Twitter", and "XING", where we searched for the particular names of each health insurance provider in the social networks. Therefore, the three social networks are a subset of the criterion "Social Networking". The criterion was fulfilled if we found a user-group or something similar.

3. Results

In the first step, we analyze the results for "Content". The Web 2.0 technology, which is used the most from this area Podcasts. 35 % of the private and 30 % of the public health insurances offer Podcasts oh their website. RSS Feeds are offered by 32 % of the public and only by 13 % of the private insurances. Next, we shed a light on the area "Collaboration". The most applied Web 2.0 technology by the public insurers is "Forum" (89 %), followed by "Chats" (83 %). The reason for the strong provision of these two technologies is a shared platform by the public insurances, which provides "Forum" and "Chats". In contrast, only 13 % of the private insurances provide these technologies. There is also a strong use of "Social Networks". 59 % of the private and 39 % of the public insurances provide either their own "Social Network" or link to one. The ability for "Social Tagging" and the provision of "Blogs" is almost similar. 11 % of the private insurances provide a "Wiki", whereas only 1 % of public insurance companies apply this technology. Regarding "Social Networks", we observe that private health insurances, if compared to public insurers, have a stronger presence in those communities: 41 % of the companies provide an own user-group in "Facebook", 35% of them have a "Twitter" account, and 24 % are represented in "XING". The use of social networks by public insurers is lower in comparison: 13% are applying "Twitter" and 3 % are represented in "XING"; only their presence in "Facebook" is almost similar with 38 %. Figure 1 summarizes these findings.

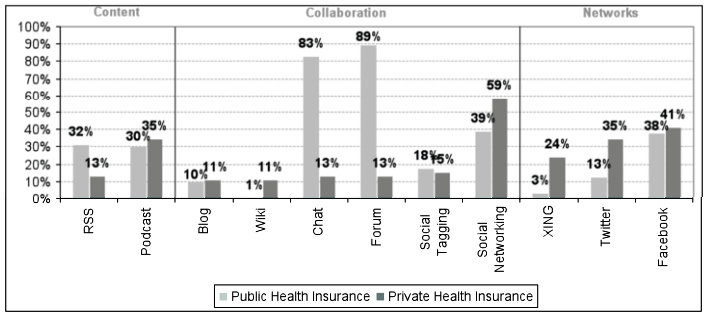

Figure 1. Results of the evaluation.

67 % (31 out of 46) of private health insurances use at least one of the eight Web 2.0 applications (Content and Collaboration) from the framework. 15 companies do not use any of the examined Web 2.0 criteria. Regarding the public insurers, 151 companies (99 %) use Web 2.0 applications from the 2009 framework. That means, almost all public health insurers offer one of the 8 examined Web 2.0 applications on their website (or link to a shared website).

Regarding the number of used Web 2.0 applications (Content and Collaboration), we observe that public health insurances have more applications in use than private insurances. On average, private insurances apply three applications – in contrast, public health insurances apply 2.5 applications. Most of public insurances provide two applications (44 %) followed by three application (25 %) and four applications (14 %). In contrast, most of private insurances provide one application (32 %). Two, three, four, and six applications are also less applied by private as by public insurances.

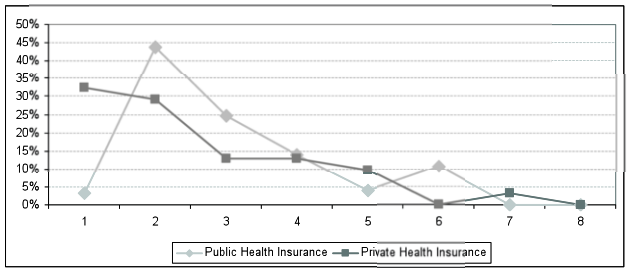

Figure 2. Number of used Web 2.0 applications.

With an average of 1.7, the private insurances are stronger organized in one of the three examined Social Networks. 52 % of private insurances use one, 26 % two and 22 % all three Social Networks. The public insurances use on average 1.4 Social Networks; 66 % use one, 29 % two and only 5 % all three.

4. Discussion

Almost all public health insurance companies apply Web 2.0 applications (99 %). Also 67 % of the private health insurances provide any of the examined Web 2.0 applications. Nevertheless, the private insurance companies apply more applications and Social Networks on average. Our findings provide first answers about the State-of-the-Art of the adoption and implementation of Web 2.0 technologies in the German

health insurance landscape. Next to the wide spread diffusion and adoption of Web 2.0 technologies and Social Networks, we could show huge differences between the two insurance types regarding the adoption and implementation of the applications. Even between the companies within their respective insurance types we observed large differences from "no use" of (no Web 2.0 applications are used) to "strong use" (7 applications are used). But how can the differences be explained? What aspects influence the adoption and implementation of Web 2.0 applications? At present, there is no literature on the disparity of the differences in the adoption of IT and even not in the adoption of Web 2.0 technologies by public and private insurances. Based on our research and interviews we suppose that the disparity of the differences is grounded in the business models of the two insurance types. Private insurances are focusing on product sales whereas public insurances are primarily driven by the differentiation to other public insurances – because the product "public health insurance" with its services is unified by government. According to this, we assume that public insurances try to differentiate themselves to others by providing special services such as Chats with experts or providing health information by RSS Feeds. In contrast, the private insurances try to acquire new customers in Social Networks or explain their products via Podcasts.

To explain the differences regarding the adoption of Web 2.0 applications, we started a questionnaire to managers of health insurance companies to uncover the driving factors of Web 2.0 adoption.

References

[1] Ferguson T. From patients to end users, *British Medical Journal **324** (7337),* (2002), 555-556.

[2] Van De Belt TH, Engelen LJ, Berben SA, Schoonhoven L. Definition of Health 2.0 and Medicine 2.0: A Systematic Review, *Journal of Medical Internet Research **12** (2)*, (2010) e18.

[3] Eysenbach G. Medicine 2.0: Social Networking, Collaboration, Participation, Apomediation, and Openness, *Journal of Medical Internet Research, **10** (3),* (2008), e22.

[4] Eysenbach G. What is e-health? *Journal Medical Internet Research, **3** (2),* (2001), e20.

[5] Musser J, O'Reilly T. *Web 2.0 - Principles and Best Practices*, O'Reilly Media, Sebastopol, CA, USA, 2007.

[6] Vossen G, Hagemann S. *Unleashing Web 2.0: From Concepts to Creativity*, Morgan Kaufmann Burlington, MA, USA, 2007.

[7] O'Reilly T. What Is Web 2.0 – Design Patterns and Business Models for the Next Generation of Software [Internet]. 2005 [updated 30 September 2005; cited 22 July 2010]. Available from: http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html.

[8] McAfee AP. Enterprise 2.0: The Drawn of Emergent Collaboration. *Sloan Management Review **47** (3),* (2006).

[9] O'Reilly T. Web 2.0 Compact Definition: Trying Again [Internet]. 2006 [updated 10 December 2006; cited 22 July 2010]. Available from: http://radar.oreilly.com/archives/2006/12/web-20-compact.html.

[10] BMG Bundesministerium für Gesundheit, *Gesetzliche Krankenversicherung – Mitglieder, mitversicherte Angehörige, Beitragssätze und Krankenstand*; Ergebnisse der GKV-Statistik KM1, 2010.

[11] BMJ Bundesministerium der Justiz, *Sozialgesetzbuch Fünftes Buch - Gesetzliche Krankenversicherung*, Bundesanzeiger Bonn, 2009.

[12] Irani Z, Love P. *Evaluating Information Systems: Public and Private Sector*, Butterworth Heinemann, Oxford, (2008).

[13] Heeks R. Benchmarking eGovernment. Improving the National and International Measurement, Evaluation and Comparison of eGovernment, In *iGovernment Working Paper Series, Institute for Development Policy and Management (Ed.).* University of Manchester, 2006.

[14] Ganesh J, Padmanabhuni S. Web 2.0: Conceptual Framework and Research Directions, *AMCIS 2007 Proceedings*, (2007), Paper 332.

[15] Raake S, Hilker C. Web 2.0 in der Finanzbranche: Die neue Macht des Kunden. Wiesbaden, 2010.