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Author(s):

Mekniran, Wasu ; Kramer, Jan-Niklas; Kowatsch, Tobias 

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Reimagining Preventive Care and Digital Health: A Paradigm Shift in a Health Insurance's Role

Wasu Mekniran^{1,2}^a, Jan-Niklas Kramer^{1,5}^b and Tobias Kowatsch^{2,3,4}^c

¹Centre for Digital Health Interventions (CDHI), Institute of Technology Management,
University of St. Gallen, Switzerland

²CDHI Department of Management, Technology, and Economics, ETH Zurich, Switzerland

³Institute for Implementation Science in Health Care, University of Zurich, Switzerland

⁴School of Medicine, University of St. Gallen, Switzerland

⁵CSS Kranken-Versicherung AG, Switzerland

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Abstract: Amidst non-communicable diseases' substantial health and economic burdens, health insurance companies and digital health technologies (DHTs) are increasingly crucial in enabling preventive care and minimizing global health expenditure. This position paper explores the perspective of an innovation manager of a Swiss health insurer. The interview transcript was analyzed using thematic analysis. The results highlight the importance of current regulations, the future role of health insurance companies, and the potential of DHTs to promote preventive care and business model innovation.

1 INTRODUCTION


Healthcare expenditure per capita rose 6% across 50 countries in 2020 alone (World Health Organization, 2022). Several countries are under pressure to reform healthcare systems. On the one hand, preventive care delivered by digital health technologies (DHTs) seems promising (Castro et al., 2023; Jaconson et al., 2022; Kowatsch & Fleisch, 2021; Kramer et al., 2020), as they can be a more accessible alternative to traditional interventions. On the other hand, prevention should be considered, as it accounts for less than 3% of overall health expenditure, although focussing on prevention can change the healthcare system from a reactive to a proactive approach that promotes overall health and well-being (Gmeinder et al., 2017).


To successfully implement preventive care, several stakeholders, such as governmental and regulatory bodies, should come together to shape a health insurance plan, for example, through a partnership between health insurer, hospitals, and universities (Harrison, 2021). This indicates that health insurers with a proper environment can influence the healthcare system and play a key role in


achieving successful preventive care (Brook et al., 2006; Herzlinger & Parsa-Parsi, 2004). Therefore, our work aims to contribute to the existing scientific literature by going deeper and studying a health insurance perspective of preventive care and digital health technologies.

This position paper explores the perspective of an innovation manager at one of the largest Swiss health insurance companies, CSS Group, which insures over 1.75 million customers with 98 agencies. The results can inform external and internal drivers of business model innovation (BMI), where redesigning business processes in healthcare enables or improves the implementation of preventive care. To this end, an interview with the innovation manager was conducted to answer the following research questions: (1) What regulatory change is required to make preventive care successful? (2) For what do we need DHTs most? (3) What is the future role of a health insurer? and (4) Why would a health insurer offer DHTs?

Next, related work on preventive care and BMI is presented. The qualitative research methods are then described. Finally, the results of the interview are followed by a discussion and conclusion.

^a <https://orcid.org/0000-0001-5184-0438>

^b <https://orcid.org/0000-0002-8912-1209>

^c <https://orcid.org/0000-0001-5939-4145>

2 RELATED WORK

2.1 Focus on Preventive Care

Preventing non-communicable diseases (NCDs), including common mental disorders, is essential to reduce the substantial burden on healthcare systems. Particularly in low-middle-income countries, healthcare costs for NCD are worsening (Hajat & Stein, 2018) (Murphy et al., 2020). Recognizing these health and economic challenges, WHO declared 2021 to 2030 a decade of healthy aging (WHO, 2020). This initiative aims to reform the current sick-care system, where ambiguous actions hinder various stakeholders from collectively promoting preventive care.

To achieve sustainable prevention and healthy aging goals, the WHO outlined priority action areas such as ensuring that communities foster and provide access to long-term care for those in need. As aging leads to NCDs, the obvious solution is to proactively minimize those risks by living a healthier lifestyle. This movement to extend the health span rather than merely living longer refers to healthy longevity (Fried et al., 2022).

2.2 Business Model Innovation

Business Model Innovation (BMI) is a reconfiguration of the business model to generate more value (Foss & Saebi, 2017). For instance, transitioning from a product-based to a service-based model, incorporating digital platforms for customer engagement, or adopting a subscription model for recurring revenue. Given this context, the way healthcare providers administer health interventions and how governments structure reimbursement strategies can be examined through the lens of BMI. This approach is vital for the successful implementation of preventive care (Kaplan & Milstein, 2019). For instance, if a digital channel is used to deliver health interventions, trust plays a pivotal role; therefore, the choice of the delivery channel must be carefully considered (De Santis et al., 2021). In a time of rapid demographic and technological changes, preventive care needs suitable business models and ecosystems to be truly efficient.

Therefore, current stakeholders in healthcare systems, such as health insurance firms, need to evaluate new business models to match their capabilities with the desired value propositions. This study explores possible approaches that could make preventive care more effective and examines how DHTs can offer valuable contributions.

3 METHODS

To address the research questions previously mentioned, an interview was conducted with an innovation manager. The interview framework was developed based on topics highlighted during the Scale-IT-up 2024 workshop, which focuses on emerging business models in the field of digital health. This workshop is held in collaboration with the 17th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOS-TEC, 2024). The methodological details are outlined below.

3.1 Data Collection

The interview was conducted with Dr. Jan-Niklas Kramer in October 2023. The authors developed a structured interview guide following a BMI research framework in Figure 1 (Foss & Saebi, 2017). The dimensions in this Business Model Innovation (BMI) research framework offer insights into why organizations are motivated to adopt BMI (antecedents), how BMI is influenced at various organizational tiers (moderators), what the anticipated results of BMI are (outcomes), and the process through which BMI evolves.

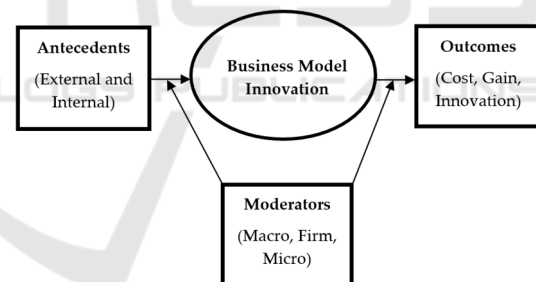


Figure 1: BMI research framework. Note: own illustration adapted from Foss & Saebi (2017).

3.2 Data Analysis

The interview was conducted and transcribed with Microsoft Teams Classic (version 1.6). This study used the qualitative data analysis tool ATLAS.ti (version 23) to analyze interview transcripts. The preliminary coding frame is based on the interview outline. Data were analyzed using a thematic analysis process (Clarke et al., 2015).

The coding focused on areas of BMI to derive insights from interview questions. This study followed the thematic analysis approach of Clarke et al. (2015): (1) becoming familiar with the data, (2) generating codes, (3) generating themes,

(4) reviewing themes, (5) defining and naming themes, and (6) finding examples.

Table 1 lists themes and definitions used to derive insight from answers to the research questions. This study adopted a Business Model Navigator (BMN) to help guide the data analysis process in Figure 2 (Gassmann et al., 2020). In addition, the BMI process in the BMI research framework has been replaced with the four dimensions of BMN: What, Who, How, and Value. Eventually, the BMN dimensions provide us with logic to investigate specific relationships in business models, specifically what is offered, how it is delivered, how the value is captured, and to whom.

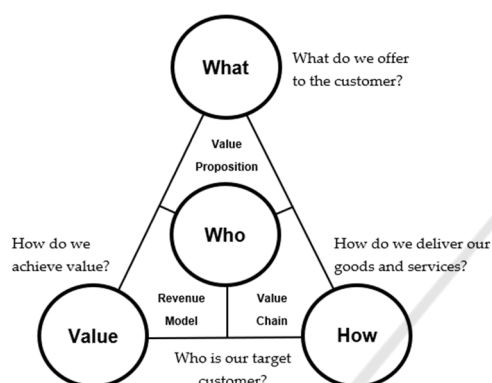


Figure 2: Business Model Navigator's dimensions. Note: own illustration adapted from (Gassmann et al., 2020).

Table 1: Theme and its definition. Note: BMI stands for business model innovation.

Theme	Definition
Antecedents: external	Change in competition, stakeholder, etc.
Antecedents: internal	Dynamic capabilities, change in strategy
Moderators: macro-level	Competition law, regulations
Moderators: firm-level	Organizational values, design, culture
Moderators: micro-level	Managerial cognition, loss aversion, etc.
Outcomes: finance	Financial performance, revenue, etc.
Outcomes: innovativeness	New value creation
Outcomes: cost reduction	Lower cost in operation
BMI: what	Offering
BMI: who	Target customer
BMI: how	Delivery of an offer
BMI: value	Revenue model and cost structure

4 RESULTS

This section describes emerging themes, the identified corresponding BMI elements, and their classifications according to our research questions, for instance, *What* and *Who* dimensions of the business model that capture the value proposition aspect of the results are analyzed (Gassmann et al., 2020). Figure 3 presents a heat map that displays the overall distribution of themes derived from the interview. The numerical values on the heat map represent the frequency of each theme in relation to each research question (RQ). In this way, the heat map illustrates both the quote density and the structure of this particular interview.

		◇ RQ1 ⊞ 24	◇ RQ2 ⊞ 20	◇ RQ3 ⊞ 29	◇ RQ4 ⊞ 7
● ◇ Antecedents:external	⊞ 5	4			
● ◇ Antecedents:internal	⊞ 6	3		2	1
● ◇ BMI: how	⊞ 23	3	6	12	2
● ◇ BMI: value	⊞ 10	3		7	
● ◇ BMI: what	⊞ 18		8	8	2
● ◇ BMI: who	⊞ 11	3	6	2	
● ◇ Moderators: firm-level	⊞ 8	3		5	
● ◇ Moderators: macro-level	⊞ 8	6	1	1	
● ◇ Moderators: micro-level	⊞ 5	3		2	
● ◇ Outcomes: cost reduction	⊞ 8	1	2	4	1
● ◇ Outcomes: financial perfo...	⊞ 8	1	2	3	2
● ◇ Outcomes: innovativeness	⊞ 9	2	1	5	1

Figure 3: Heat map of theme distribution based on business model innovation dimensions (vertical) according to the research question 1-4 (horizontal).

4.1 What Regulatory Change Is Required to Make Preventive Care Successful?

Table 2 lists the external and internal motivators (antecedents) and moderators at the macro-level that set the landscape of preventive care in the current state. An underlying message is that Swiss regulations must enable preventive care offerings in general. Although there are examples of alternative reimbursement systems for secondary and tertiary prevention, such as Prescription Digital Therapeutics in Germany (FIDMD, 2020); (Fürstenau et al., 2023), regulatory bodies still need to successfully combine efforts to lower the hurdle of preventive care implementation in Switzerland.

Table 2: Quote on regulations for preventive care in the current state.

Theme	Quote
antecedents: external	the regulatory landscape is a big hurdle for prevention... The law limits healthcare providers from offering preventive services...
antecedents: external	prevention is the responsibility of each and everyone... himself or herself.
antecedents: internal	Historically...the philosophy of the Swiss healthcare system is... a sick care system
antecedents: internal	Ideally, the first step comes from the policymakers themselves...and acting together, this is something that does not yet seem to be the case in Switzerland.
antecedents: internal	...for example, the farmer and MedTech and lobby, who could oppose these regulations as they might threaten their current business model.
moderators: macro-level	...in Germany, for example, with the DiGA list, it is not prevention, but it is an example where the system has put a legal process for the reimbursement.
moderators: macro-level	We as a society need to (be) regulated, (and) it is also an enabler.

4.2 For What Do We Need DHTs Most?

Table 3 lists the value propositions of DHTs from the *What* and *Who* dimensions of the business model, along with the expected outcomes that could be derived from DHTs. The results of the interview suggest that DHTs are particularly beneficial for improving access to care for stigmatized and chronic diseases, such as HIV/AIDS and mental health issues, especially among vulnerable populations such as the elderly and low-income communities. Contrary to popular belief, the primary users of DHTs tend to be middle-aged rather than younger individuals, according to CSS experience. There is a selection bias among the user group, as healthier individuals frequently adopt DHTs (Lupton, 2020).

Table 3: Quote on value propositions of DHTs.

Theme	Quote
BMI: what	...high value (for) the classic non-communicable diseases, heart disease, diabetes, and obesity.
BMI: what	where there is a shortage in care such as dermatology...similar(ly) mental health...access to care is a great opportunity for digital health.
BMI: who	diseases that are stigmatized; mental health, but also sexually transmitted diseases.
BMI: who	convenience factor (as) in our telemedicine models we have a very broad spectrum of people, but mostly they are drawn in by the price.
BMI: who	We often have a mean age of around 45...contradicts the assumption that digital products are primarily for the younger population.
BMI: who	... The people who use digital products are more health conscious, more healthy... selection bias.
outcomes: cost reduction	...low burden way to access care, and...we are seeing that digital health technologies in mental health (are) among the most successful examples.

4.3 What Is the Future Role of a Health Insurer?

Table 4 reports on quotes around the future role of health insurance companies from the *How* dimension of the business model and the expected outcomes of BMI. Three strategies that insurers could shift their role based on the results of the interview: (1) staying out of the healthcare market and pursuing a cost-leadership strategy; (2) supporting healthcare providers as contract innovators in implementing preventive care (Gilson et al., 2009); and (3) extending the range of offerings as a healthcare provider themselves.

Table 4: Quote on the shift in the role of health insurance.

Theme	Quote
BMI: how	offering a capitation model where physicians are also accountable and responsible for prevention.
BMI: how	...health content, with counselling trying to help people navigate the healthcare system.
BMI: how	...so-called managed care contracts...typically between the insurer and a primary care network.
outcomes: cost reduction	a cost leadership strategy, focusing and reducing all other expenses and focusing on paying the healthcare bills.
outcomes: financial performance	...to negotiate integrated care contracts with hospitals and primary physicians (Contract innovator).
outcomes: innovativeness	...move toward being a health care partner and a health organization...extending the business model more towards healthcare services.

4.4 Why Would a Health Insurer Offer DHTs?

Table 5 highlights quotes about why health insurance companies would offer DHTs. The findings suggest that insurers can differentiate themselves by improving the user experience, serving as both a primary advisor and a comprehensive information platform that links to additional healthcare services. For example, the WELL app from the CSS allows users to assess their symptoms and schedule doctor's appointments, all within one platform. Furthermore, DHTs promise to lower expenses related to the management of chronic diseases. This can be achieved through features such as medication reminders and automated health summary, among others.

Table 5: Quote on why insurance would offer DHTs.

Theme	Quote
BMI: how	...to facilitate information exchange between healthcare providers and.
BMI: what	...project with the highest value created...in the customer experience.
outcomes: cost reduction	mainly for this purpose (as for) chronic disease programs and the main benefit would be cost savings.
outcomes: innovativeness	...customer experience and differentiation in the market.

5 DISCUSSION

The interview results show that the Swiss healthcare system's focus is on sick care and not on preventive care. To this end, the results are consistent with previous work, which shows that prevention is mostly neglected (Gmeinder et al., 2017). At the same time, the capitation model is gaining momentum in health insurance, confirming the trend of shifting values and roles between insurers and healthcare providers (Miller, 2009).

An explanation for the care-providing limit and the absence of reimbursement models is described as necessary changes in Section 4.1. Regulation is seen as motivators and moderators of BMI that, unfortunately, hinder the move away from sick care to health care. Another structural challenge is the annual option for customers to cancel their insurance contracts. This arrangement discourages insurers from investing in long-term preventive measures. The reason is that the benefits of such investments, such as cost savings, manifest over an extended period. If a customer switches to a different health insurance provider within that time, the financial advantages go to the competitor. However, as described in Sections 4.2 and 4.3, insurers look forward to collaborating with healthcare providers using DHTs and to incentivizing healthcare providers to make provisions, as the remuneration system, like the capitation model, can have an impact on overall health outcomes (Kaplan & Milstein, 2019). It was also revealed that DHTs are primarily employed by health insurance companies to improve the customer healthcare experience, rather than focusing on illness prevention (see Section 4.4).

The discovery was made that DHTs can provide benefits, such as expanding care access for vulnerable populations with stigmatized and chronic diseases. Additionally, DHTs will further reduce the operating costs of current healthcare providers. This could include hospitals and other medical facilities by automating primary care functions such as routine checks, medication management, and basic diagnostic tests.

As limitations and future scope of this work, current findings should be deepened by additional interviews to continually reduce opinion biases. Second, the discussed region could be extended beyond Switzerland to neighboring countries. Lastly, employing a second or third investigator to triangulate the coding process could reduce human error. Future research will extend the current work to include various stakeholders in the health insurance

industry, such as policyholders, healthcare providers, regulatory agencies, and insurers.

6 CONCLUSIONS

Qualitative data was collected and analyzed from an interview with Dr. Kramer, an innovation manager at one of Switzerland's largest health insurers. According to our findings, regulatory frameworks for preventive measures enable providers to offer to individuals in need.

From a BMI perspective, our findings highlight the trend of collaboration between insurers and healthcare providers. This makes health insurers important in setting the right incentives for primary care providers, such as the capitation model that controls the volume of care given and rewards a cost-saving strategy (Miller, 2009).

Although there are approaches to achieving cost leadership and innovating business models for health insurance companies, DHTs present a great potential to realistically enable future health insurance roles. Lastly, future research can compare different geographic regions and the paradigm-shifting dynamic of preventive care.

CONFLICTS OF INTEREST

WM, JK, and TK are affiliated with the Centre for Digital Health Interventions (CDHI), a joint initiative of the Institute for Implementation Science in Health Care, University of Zurich; the Department of Management, Technology, and Economics at the Swiss Federal Institute of Technology in Zürich; and the Institute of Technology Management and School of Medicine at the University of St Gallen. CDHI is funded in part by CSS, a Swiss health insurer and MavieNext, an Austrian healthcare provider. TK is also a co-founder of Pathmate Technologies, a university spin-off company that creates and delivers digital clinical pathways. However, neither Pathmate Technologies nor MavieNext were involved in this research.

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- Technologies (BIOSTEC, 2024) include, but are not limited to:
- How to make prevention successful?
 - How to make healthy longevity successful?
 - How to make healthy aging successful?
 - How to make elderly care successful?
 - How to cope with the economic burden of non-communicable diseases?
 - Which emerging business models in digital health are promising?
 - What needs to change in terms of regulations to make digital health successful?
 - What is the future role of a health insurance company?
 - Which digital health technologies (DHTs) are already used and reimbursed? In which fields? What are those offerings? How are these paid for? (self-paid, basic insurance, additional insurance, etc.)
 - Are you offering DHTs? Did you develop these DHTs yourself or are you partnering with startups or other companies?
 - Do you offer DHTs rather in the prevention or in the management of diseases?
 - For which diseases do you think we need DHTs most? Why? Where do you think DHTs will work best? (what kind of disease and persona)
 - What is your main goal of offering these DHTs? (new revenue streams, cost-efficiency, customer loyalty)
 - What is the importance of business ecosystems for these DHTs?
 - What kind of learnings did you generate so far? Are there DHTs that worked better than others? Why?
 - Could you already assess the effectiveness and/or efficiency of DHTs?
 - What kind of DHTs failed? What were the reasons?
 - How would you improve DHTs you are offering?

APPENDIX

Topics of interest at the 17th International Joint Conference on Biomedical Engineering Systems and