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The Crossroads: Technology & the Physician's Professional Identity

Implications of the online primary care setting on the physician's professional identity

A case study of KRY

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ABSTRACT

The implementation of new technology in healthcare implies disruption to established processes, norms, and boundaries of medical professions and in turn, turmoil for professional identities. Extensive research on the effects of technology in healthcare within the fields of professions theory and identity theory already exist. However, previous research primarily studied the implementation of technologies that affect only certain components in physicians' professional work. Alternatively, this study explores a case that has significantly changed the whole context in which physicians work, with the goal of understanding the holistic effects on the physician's professional identity. A qualitative case study of KRY, the first Swedish company to call themselves a fully online based primary healthcare facility, has been conducted. We find that the online primary care setting challenges established elements of the physician's professional identity and introduces new, uncharacteristic aspects to the professional's work.

Keywords: Professional identity, professions theory, identity theory, technology, healthcare

Supervisor: Magnus Mähring

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1. Introduction

The following section will provide a background to research area, state the purpose of the thesis and briefly introduce the case company.

1.1 Background

"The world of A.D. 2014 will have few routine jobs that cannot be done better by some machine than by any human being." - Isaac Asimov, 1964

Asimov's bold prediction about the extent to which technology is involved in business processes has not quite been realized, but with the exponential rate of development it will be soon. New forms of technological implementation has led researchers to predict shifts in industries unlike anything we have experienced before (Schwab, 2016). Research conducted by McKinsey & Company suggests that approximately 45 percent of the activities individuals are paid to perform can be automated by adapting currently used technologies. This research implies that even the highest-paid occupations, such as financial managers, physicians, and senior executives including CEOs, have a significant amount of activity that can and will be transformed by technology (Chui et al., 2015). In addition to replacing humans in performing simple, routine jobs, technology is challenging and redefining the key roles of professionals.

Professionals can be differentiated from other kinds of workers by their monopoly over certain skills and knowledge (Spencer, 1986). They claim exclusive rights over their work activities (Abbott, 1988). As new technology is implemented, processes will be adapted, norms will be challenged, and jurisdiction over certain tasks will be threatened. Thus, the conduct of core activities in many professional roles will be changed, affecting professions and the individuals that identify with them.

Even though extensive research on technology's effect exists within the fields of professions theory and identity theory, the nature of the advanced technologies and capability of directly impacting key roles of professionals, suggest that new challenges will arise. Traditional professions, as they are defined today, are in flux. As technology continues to develop, the effects on professionals will simultaneously evolve giving rise to compelling and unexplored areas of research.

1.2 Purpose

This thesis aims to address the need for research at the intersection of new technology and professionals. The study aims to shed light on the implications of technology on professionals. We studied physicians that work at KRY, a company that by using technology has changed the doctor's working environment. We chose to focus on the physician's professional identity, or professional's self-concept based on attributes, beliefs, values, motives, and experiences (Slay, 2010).

The implementation of new technology challenges the components that comprise professional identity. Therefore, studying it provides insights into how those components react. Thus, the study aims to gather an understanding of how the change in working environment affects the enactment of the physician's key roles and in turn, the physician's professional identity. The findings will uncover details about the relationship between the physician's professional identity and implementation of new technology. Through examining the current, as well as the expected long term effects, we believe that these findings can provide support in generating strategies for how to combat or compensate for the changes that occur. The findings lay the groundwork for interpreting future technological disruptions to professional identity.

We started by gathering information on the physician's professional identity as well as how it has previously dealt with change afforded by technology. Then, through a qualitative case study comprised of interviews with key players, we investigated the role, value, and work of physicians working in an online setting with the aim to answer the question:

> *How does working in an online primary care setting impact the physician's professional identity?*

1.3 Case Studied: KRY

The case study included KRY[1], the first Swedish company to call themselves a fully online based primary healthcare facility. KRY provides an online platform through which doctors and patients can meet via video calling. The service allows patients to schedule their appointments and meet with doctors without having to visit a physical center. KRY was founded in 2014 and has to date treated over 50 000 patients. KRY is not part of the publicly-financed national healthcare system, but has hopes to be included in the future. Their head office is in central Stockholm. However, the office solely houses operational employees and technology team. Their physicians are free to work from wherever, thus most work from their home.

The technology used by the company, namely video calling, has existed for many years. However, KRY is using it in a way that disrupts the long standing status quo that you must visit a healthcare facility in order to receive medical treatment. The traditional primary care puts the doctors and other medical professionals at the center of the healthcare industry. The patient's health was dependent on the services provided by the physician and could only receive care by visiting a physical center. Now, due to the nature of KRY, the doctor-patient meetings have been adapted. KRY provides a unique opportunity to evaluate how these adaptations affect the strong norms, rules, and routines that have been established as authoritative guidelines for social behavior and have ultimately defined the physician's professional identity. We interviewed physicians about the changes they have perceived and through the lens of professional and identity theory, we will interpret how physicians cope with these changes. The findings will answer the research question providing further understanding of how a physician’s professional identity changes with the incorporation of new technology.

[1] The name of the company, KRY, directly translated from Swedish to English means fit, hearty, or well.

2. Literature Review

In order to better study the implications of technology on the identity of the professional, the following section will explore existing definitions of professions and identity. Additionally, it is relevant to explore what previous research found about the effects of technology on the identity of professionals.

Although, the idea of technology has been incorporated in professions and identity theory for many years, technologies previously studied did not cause as significant challenges to professions as KRY does. Because of the advances in technology, softwares and programs are now more significantly impacting professional work[2].

Section 2.2 reviews previous studies that examine the impact of specific technologies on healthcare professionals by focusing on the implementation of EPR (Electronic Patient Record). EPRs affect the way physicians interact with the patient documentation and in turn, the doctor's routines. In the case, KRY has removed the physical environment and replaced it with an online setting. This affects many aspects of the physician's work by removing physical tasks, adapting the hierarchical structure, altering the doctor-patient relationship, etc.

The findings of this previous research are relevant for this thesis since they often reference fundamental theories about professional identity and give insight into how the physician's professional identity handled change. However, since the impact of the technology is not as significant, we used the information as a way to guide the research and to help focus on relevant aspects, rather than as a theoretical framework. Thus, the section does not directly reflect the theoretical understanding we had leading up to designing the study, but instead has been developed in such a way that provides the reader with a theoretical background needed for the rest of the paper.

[2] Work characterized by the following: (a) non-routine tasks requiring expertise based on both abstract knowledge and practical apprenticeship; (b) occupational monopoly over this practice jurisdiction and individual autonomy within it; and (c) legal and ethical responsibility for this practice that is typically reflected in values of service. (Adler et al., 2008)

2.1 General Research on Professional Identity

Research about professions has occupied a special position in sociology for a long period of time (Freidson, 1984). In general, professions are usually defined as productive trades, such as butchers, bakers, and electricians and categorized under the social division of labor. However, when discussing professionals, one usually refers to more than merely specialized workers (Freidson, 1984). Herbert Spencer's work from the 19th century singles out professions as "occupations that perform tasks of great social value because professionals possess both knowledge and skills that in some way set them apart from other kinds of workers" (Spencer, 1896). Early in the 20th century, research urged the cultivation of "professionalism" as a means of reorganizing and reorienting the behavior of those involved in industrial pursuits (Tawney, 1920).

In contrast to traditional studies that devote considerable effort to developing a precise definition of professions, Abbott states that professions are "exclusive occupational groups that apply somewhat abstract knowledge to particular cases" (Abbott, 1988). His book, *The System of Professions,* revitalized a stream of research that had ended up in hair-splitting debates about how to define professions. He encouraged researchers to see professions as systems rather than fixed entities. From this perspective, the professional occupation is characterized by the possession of abstract knowledge on which the occupation bases its claims for the exclusive rights to control its work activities. Moreover, most studies treat professionalization of occupations as a unidirectional process. However, Abbott assumes it to be multidirectional. He states that while some activities within an occupation may become routinized or automated and cast off, others can become elaborated and defined as the core of the profession. Therefore, analyzing the tasks and activities performed in different professions is highly relevant for understanding processes of and changes in professionalization (Abbott, 1988).

Identity theory is an even wider field with roots in philosophy, sociology, and psychology. Within philosophy, it is generally described as the family of views on the relationship between mind and body. In the fields of psychology and sociology, it is described as a person's sense of who they are based on their group memberships

and sense of belongingness to the groups. Some research propose that there are three mental processes involved in building the social identity (Tajfel and Turner, 1979). First, just as we categorize objects, we categorize people in order to understand them better. Through assigning them, and ourselves, to categories, we can define appropriate behavior by referencing the norms of the group we identify with. In the second stage, we adopt the identity of the group that we categorized ourselves in. As a consequence, we will act as we believe members of this group are expected to act, ultimately relating our self-esteem to the group membership. Finally, we compare our group to other groups, potentially impacting the our self-esteem as a result of the comparison.

In combination, or even through applying one to the other, professions and identity theory have the potential to explain many phenomena in industries with highly professionalized identities. In more recent research, professional identity is often defined as one's professional self-concept based on attributes, beliefs, values, motives, and experiences (Slay, 2010). However, due to its rather diffuse nature, researchers are continuously exploring what makes up the professional identity.

Researchers generally agree that something particular about identity formation arises when studying professionals, as opposed to other types of workers. A common practice is to attempt to describe factors that contribute to the strengthening of said identity. These are often derived from case studies and surveys that target professionals in certain businesses.

In the book, Creating Sociological Awareness: Collective Images and Symbolic Representations, Strauss (1991) states that professionals carve out for themselves and proclaim unique missions early in their development. This statement of mission is connected to establishing their own sense of purpose and often takes a rhetorical form because it creates recognition and builds institutional status (Strauss, 1991).

Additionally, sociology theory stresses the conception of occupational unity, comparing it to a brotherhood (Bucher & Strauss, 1961). The assumption that all members of an occupation can be colleagues is much dependent on entry into the

occupation being controlled. A challenge that may arise is that when a group within an occupation develops a unique mission, they no longer share a common mission with the others in the same profession, potentially alienating them. Fournier (2000) also discussed the significance of boundary construction and stressed its importance in the establishment and reproduction of professions. He claims that professionals construct and maintain a professional field to clarify who is considered inside and outside of the profession. Thereby, the specific professional field becomes closed to other occupational groups (Witz, 1992).

One of the main indicators of a strong unity within a profession is colleagueship. Bucher and Strauss (1961) state that "Whom a man considers to be his colleagues is ultimately linked with his own place within his profession." Inevitably, the working environment and institution need to be taken into consideration when examining what relationships are formed. They constitute where different segments of professions come into contact with each other. Within the field of medicine, research about differences between specialties have found that physicians within one specialty feel separated from physicians within others. They claim an area for themselves and aim to exclude others from it in order to claim it theirs alone (Strauss, 1991).

Haug (1973) claims that the following has accounted for a physician's professional identity in the past: possessing a monopoly over a body of knowledge that is relatively inaccessible to lay people; having a positive public image that stresses altruistic rather than self-serving motives; and having the power to set their own rules as to what constitutes satisfactory work. Further, Haug (1973) argues that if these characteristics disappear, consequently the special prestige and authority enjoyed by the professions will erode. He discussed that the monopoly over a defined area of knowledge is more difficult to maintain when technology is enabling the storage of knowledge in retrievable mediums and making it more accessible. Although this research is a few decades old, it is still relevant to the technology today.

Holsinger and Beaton (2006) claim that physicians are driven by autonomy, mastery, and a sense of purpose. Further, they state that if a system incentivizes activities that completely or partially disregard these values, it can negatively affect physicians internal drive and lead to resistance. Moreover, a number of studies have demonstrated the negative impact of bureaucratic organizations on professionals (Freidson, 1988). This emphasizes the importance of flexibility in tasks and type of supervision for professional workers.

As you can see, there are many ideas on the what constitutes professional identity. This topic is under continuous debate by researchers. Researchers agree that professional identity is built from many elements and that changes to these elements presents challenges. Factors frequently mentioned as cornerstones of professional identity include autonomy, colleagueship and monopoly over a certain knowledge or skill set.

2.2 Technology & the Physician's Professional Identity

Researchers have studied health information systems and related issues such as implementation, use, and evaluation since the 1970s (Kaplan, 1997). Some focus on the physician's professional identity while others focus on the professional's sense-making and its impact on the adoption of the technology. The main argument is that doctors that are subject to a high degree of technological routines as well as external regulation are losing control over professional autonomy and the content of their work (Dent & Whitehead, 2002). Petrakaki et al. (2014) state that healthcare professionals have experienced new professional delimitations and clinical governance structures as a result of the shift of the healthcare sector's focus towards clinical performance, health outcomes and patient satisfaction. This shift devolves authority from doctors to managers and to nurses (Flynn, 2004; Greener & Powell, 2008). Consequently, their professional identity and status is threatened.

Jensen and Aanestad (2007) studied how healthcare professionals make sense of, and react to, the implementation of EPR[3]. Based on a case study from two Danish

[3] Electronic Payment Record

hospitals, Jensen and Aanestad have analyzed how the technology relates to the professionals' roles as well as how the roles have impacted the implementation process. They state that technologies stimulate continuous sense-making if they are to be contextualized and adapted to specific work settings and contexts (Bansler & Havn, 2004). As technology implies different possibilities of action for different users, organization members have to figure out how it can optimally be applied to their context of use (Hutchby, 2001).

Further, Jensen and Aanestad (2007) found that doctors define themselves in relation to their mission as a professional and the core of their work, namely to treat the patient (Jensen & Aanestad, 2007). Since doctors did not believe that the EPR implementation would increase the quality of patient treatment, they were reluctant to invest much time and effort in it. The doctors also did not feel that it fit into their role as the technology forced them to perform tasks that had earlier been carried out by lower ranked groups. The findings from their study highlighted the importance of considering the physician's autonomy as well as the need to communicate the benefits of the technology in a way that is relevant for the physician's mission.

Håland (2012) studied the introduction of technology in healthcare based on the idea that new technology often implies the redistribution rather than the reduction of work (Håland, 2012; Star & Strauss, 1999). The roles of healthcare professional are strongly influenced by the technology they are using. It structures how their work is organized and also how responsibilities are distributed between professionals (Berg, 1999). According to Strauss (1999), new technology introduction calls for renegotiation and thereby, a reconstruction of the social order in a hospital. In other words, it affects relationships and shifts boundaries between professionals. Håland (2012) claims to have found that professionals express changes in the relations between doctors, office staff, and nurses with regards to tasks and responsibilities.

Resistance to changes was also evident in the study. Hughes (1958) states that doctors resist changes that introduce tasks outside the boundaries of their profession's work content. The boundaries are often redefined to further reject

“dirty work” and maintain their professional status (Fournier, 2000). Research regarding legitimating strategies used by professionals to create or reproduce these boundaries has been conducted by Currie et al. (2009). The study revealed that modernization is more likely to fail if it challenges the professional’s interests too strongly and that the professional’s response to the introduction of new technology is unpredictable and depends on an interaction between professional groups and other actors in a negotiation process (Currie et al., 2009; McLaughlin & Webster, 1998).

The implementation of EPR was an example of the socio-technical negotiations in which nurses and doctors renegotiate their established relationships and existing boundaries to some extent. Håland (2012) concludes his study by emphasizing the likelihood that new technology introduced in the healthcare sector will further challenge professional groups through having them engage in more complex negotiations. Consequently, this might blur the professional boundaries, potentially redefining the professional groups involved.

3. Methodology

The following section will describe the research approach, process, and design. It will also provide the reasons behind the choices made for each aspect.

3.1 Arriving at the Research Topic

The general topic of how technology is disrupting industries caught our attention early. We were particularly fascinated with the dawn of Artificial Intelligence (AI) in business. AI is a perfect example of how technology with capabilities beyond medial tasks imposes on high level jobs that require many years of school and the development of specific skills. This idea was particularly intriguing and lead us to explore literature with the question "In what ways can AI threaten managers' work and organizations?" in mind. Because of the buzz about IBM Watson Health, developing AI with a focus on predictive analytics in healthcare, we narrowed our focus to the healthcare industry. We began gathering information on how the technology is currently being implemented and used in healthcare by talking to relevant players in the industry, summarized in the table below (See Appendix A for a more detailed version of the table).

Name	Position	Company/Organization
Daniel Forslund	Political advisor - Innovation in healthcare	Stockholms County Council
Martijn G.H. Van Oijen, PhD	Associate Professor	Academic Medical Center – University of Amsterdam
Jessica Emond	Executive Communications	IBM Watson Health
Eileen M Norton	Program Manager to Chief Health Officer, Dr. Kyu Rhee	IBM Watson Health
Dr. Bertalan Mesko, PhD	Founder	The Medical Futurist
John Holmes	Associate Professor	University of Pennsylvania
Jason Maude	Founder and CEO	Isabel Healthcare
Daniel Persson	VP Business Development	Min Doktor
Javier Hernandez-Lichtl	CEO	Baptist South Florida
Hans Winberg	Secretary General	Leading Healthcare

Table 1: Pre-Study Interviews

These pre-study interviews provided us with an academic, political, and business perspective on healthcare in Sweden as well as internationally. This helped give us a holistic view of the industry and determine relevant topics of study. Our exploratory pre-study research also indicated that the use of Artificial Intelligence and its derivatives in healthcare is still some years away. Our discussions also uncovered the complicated nature of the implementation of technology in this industry. It was explained that it results from not only heavy regulations but also the resistance from professionals. This led us to delve into professions theory, which could help explain this resistance. We found that physicians are usually considered the prototypical professional (Bucher & Strauss, 1961), which reinforced our choice. From here, our research question was adapted to, 'how does technology impact medical professionals?'. Figure 1 summarizes our pre-study process.

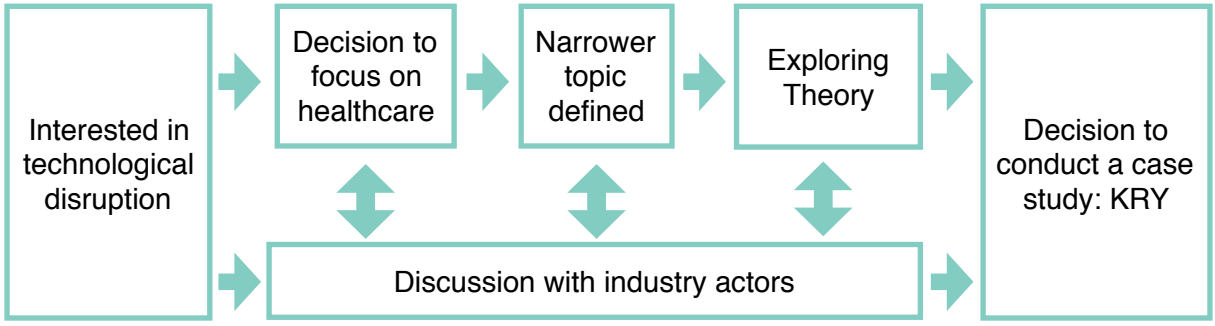


Figure 1: Pre-Study Process

Through further discussions with various industry players, we identified some compelling options for potential research studies. The use of technology in a way that is greatly impacting the core roles or tasks of medical professionals was the main criteria. We chose to undertake a case study of a company, KRY, that focuses on providing a platform for online primary care visits. Doctors can meet with patients virtually and provide diagnosis, treatment, referrals, and prescriptions through the application. The online platform removes the physical aspect of the visit. Thus, the incorporation of this technology transforms the environment in which the doctor meets patients. This has implications on the interactions between the doctor and patient, the tasks the doctor perform, etc., which are aspects that forge professional self-perception and identity.

We focus on the impact of this technology on primary care doctors who are core members of the physician professional group. Every licensed physician can practice as a primary care doctor. It does not require specialization, although there is the potential to specialize in this area. This aided in further narrowing the focus of our research from general healthcare professionals to a specific subgroup.

3.2 Research Approach

Professional identity can be considered a social construct, an idea that appears to be natural and obvious to people who accept it but is based on their perception of their reality (Berger & Luckmann, 1966). In order to effectively explore the physician's professional identity, our research approach needed to facilitate deep investigation of people and their interactions in their professional settings (Gubrium & Holstein, 1997). A qualitative, interpretivist approach based on the notion of induction was deemed most appropriate.

A qualitative research approach allows for the inclusion of subjective information regarding how individuals perceive certain changes and phenomena. It enables us to ask questions of what, why, and how to dig deeper into the experiences of professionals with this new technology and working environment. With an interpretivist approach, we aimed to understand the world as lived by the people in it. We used analytical skills to make sense of the participants' perceptions of and experiences in social realities bounded by time and context (Hudson & Ozanne, 1988). The results of interpretivist research are socially constructed rather than objectively determined (Carson et al., 2001). Therefore, our goal is to expose patterns and interpret the relationship between primary care physicians and technology rather than to generalize and predict causes and effects (Neuman, 2000; Hudson & Ozanne, 1988).

Additionally, we aimed for an approach that would enable a flexible research structure to account for the unpredictability of the findings (Bryman & Bell, 2011) and complexities of perceived realities assumed by interpretivists (Hudson & Ozanne, 1988). We used pre-existing theories and ideas to formulate the overall

purpose of the research (Gersick, 1994) and guide the research direction. For example, when creating an interview guide we referred to theory in order to ensure focus on key elements of professions and identity. In line with the notion of induction, the intent was not to prove or disprove a certain theory. We deemed this type of approach inappropriate because the technology at hand is impacting the profession to a greater extent and the effects are largely unknown. Instead, we used the empirical data to formulate new ideas and continued to gather relevant theory as we collected and analyzed data (Bryman & Bell, 2011). The development of these new ideas and introduction of new theory was based on the principles from an iterative-inductive and a grounded theory approach. We cycled back and forth between data and theory allowing us to adapt to new knowledge uncovered throughout the study (Orton, 1997).

3.3 Research Design

A case study designs allows researchers to focus on a bounded situation in a real-life context (Yin, 2003). Since KRY is a company that operate at the crossroads between technology and professionals, it fits the criteria needed to answer our research question. Therefore, a case study was deemed appropriate. More specifically, we used an embedded case design, which includes collecting and analyzing data from different perspectives or sub-units (Scholz & Tietje, 2002). The primary perspective we assumed was that of the physician in order to understand their perception on the new environment. Further, we looked at the organizational perspective to uncover how they have incorporated assumptions about the technology's affect on the physician's into the business model and operations. We also looked at the KRY patient's perspective on the online environment. All together these perspectives gave us a holistic picture of the KRY.

In addition, we have also included the perspectives of doctors that do not work at KRY, have not worked in an online environment, and solely work in traditional healthcare setting. A summary of the whole research process is displayed in Figure 2.

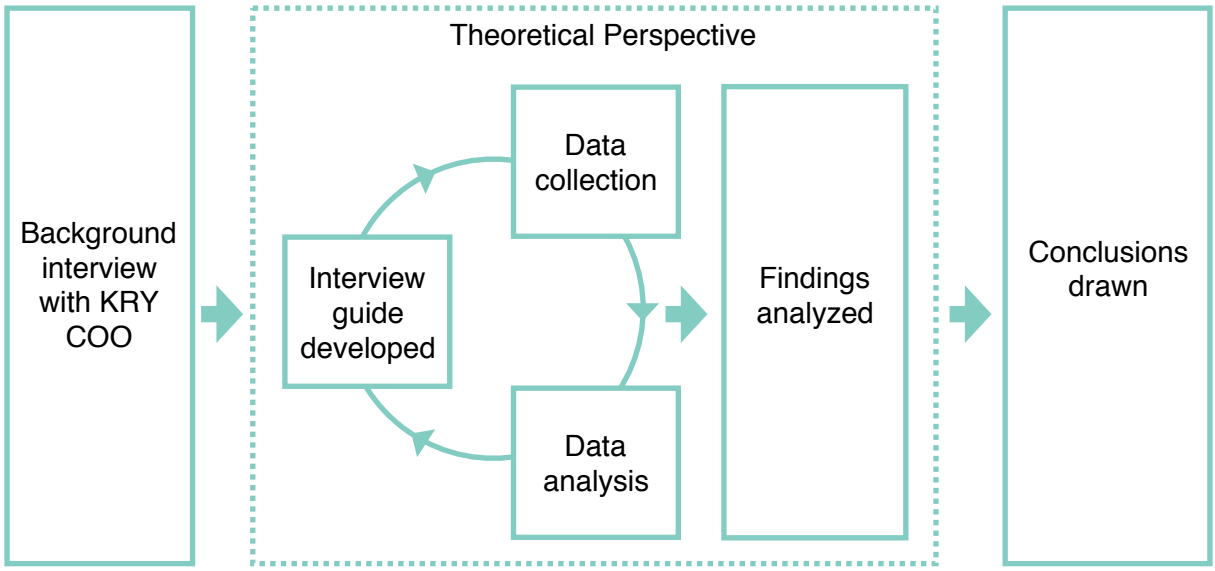


Figure 2: Research Process

3.3.1 Data Collection

Interviews

The data collection consisted mainly of interviews. Initially, we interviewed Chief Operational Officer who provided general information about KRY, its operations, and the physicians employed. The information received from this interview, along with some theory, was used to create an interview guide (See Appendix B). The aim was to ask questions that would provoke answers that discussed different key elements of professional identity. These guides were continuously developed through iterative cycles between findings and theory in order to optimize their ability to initiate deeper discussions without biasing the answers of the interviewee. Versions of this interview guide were used in the semi-structured interviews with all physicians, ones working at KRY and ones that are not. At the beginning of every interview, we presented our project, ensured anonymity and asked about documentation. Then we led into some basic questions to build comfort and then eased into more elaborate questions that asked the interviewee to describe his/her profession in

terms of key roles, and key values. The interviewees were prompted to expand on ideas and provide examples when applicable.

For the KRY physicians, we originally tried to organize the interviews in three chronological parts: past, present, and future. The purpose of this design was to gather a greater understanding of the period at hand and explore as deeply as we needed. As the interviews progressed, they morphed into first talking about the physician's profession generally, then about KRY, and finally, about the future. As a result, the interviews with KRY physicians include discussions about the online as well as the traditional primary care setting[4].

We interviewed a total of 13 doctors, 5 that work solely in the traditional healthcare setting and 8 KRY doctors. During the interviews, it became evident that most KRY doctors carry out a larger percentage of their work at a physical center than in KRY. Every doctor we interviewed works in the traditional healthcare setting as well. The interviews with the KRY physicians occurred over the company's online platform and with the non-KRY physicians they occurred in person. In addition to the interviews with the physicians, we interviewed key operational officers at KRY, namely the Chief Operational Officer, Chief Medical Officer and the Chief Recruitment Officer. Different questions were developed based on the position and role of the interviewee.

The interviews lasted 30 minutes on average and were recorded and later transcribed. Not having to take notes during the interviews allowed us to focus on the responses from the interviewee and generate appropriate further questions. This format allowed us to follow-up on interesting side-tracks, which enriched obtained empirical insights with a great level of detail (Bryman & Bell, 2011; Gillham, 2005; Gray, 2014). The transcriptions were sent to the interviewees for validation and verification. The recordings and transcriptions from the interviews were all stored in a shared folder that also contains all documentation of the thesis process. A summary of the interview subjects is presented in Table 2.

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[4] By traditional primary care setting, we are referring to the setting of the physical primary care facilities or centers that have typically been the arena for primary care physician's work.

Position/ Occupation	Age & Gender	Years Practicing Medicine Non-KRY/(KRY)	Interview form	Employer(s)
Online Physician 1	32/Male	6 years/(1 ½ years)	Video meeting	KRY/Multiple Hospitals
Online Physician 2	34/ Female	10 years/(3 months)	Video meeting	KRY/Neurology Clinic in Buenos Aires
Online Physician 3	36/Male	6 years/(1 ½ years)	Video meeting	KRY/Akademiska Sjukhuset, Uppsala
Online Physician 4	27/ Female	2 years/(2 months)	Video meeting	KRY/Rental Doctor in Primary Care
Online Physician 5	40/Male	18 years/(1 year)	Video meeting	KRY/Karolinska, Stockholm
Online Physician 6	33/Male	6 years/(1 ½ month)	Video meeting	KRY/Rental Doctor
Online Physician 7	34/Male	6 ½ years/(3 months)	Video meeting	KRY/Rental Doctor
Online Physician 8	30/Male	2 years/(9 months)	Video meeting	KRY/Rental Doctor
Traditional Physician 1	26/ Female	1 ½ years	Face to face	St: Görans Sjukhus, Stockholm
Traditional Physician 2	27/Male	1 ½ years	Face to face	Jakobsbergs Sjukhus/Stockholm
Traditional Physician 3	33/Male	6 years	Face to face	Rental Doctor
Traditional Physician 4	37/ Female	10 years	Video meeting	Astrid Lindgrens Barnsjukhus
Traditional Physician 5	26/Male	1 ½ years	Face to face	Lasarettet i Köping
CMO	32/Male	N/A	Face to face	KRY
COO	43/ Female	N/A	Face to face	KRY
CRO	34/ Female	N/A	Phone	KRY

Table 2: Study Interviews

Following the data collection and analysis, we provided the CMO and COO at KRY the findings in order to review findings and validate interpretations. We presented and discussed them in order to cross-reference data interpretation (Flick, 2009).

Patient Feedback

In addition to the interviews, we extracted data from KRY's patient feedback system. This provided us with an additional understanding of the online clinical setting. Following the online visits with a KRY doctor, the patient is given the opportunity to provide feedback. They are asked three questions: 1. Did the doctor help you with your problem?, 2. Rate your doctor from one to five, 3. Will you recommend KRY to someone you know?. In addition, the patient is asked to provide a comment about their experience (See Appendix C). A majority of the comments were in Swedish and were compiled in an Excel sheet that was also stored in the shared folder.

3.3.2 Data Analysis

A grounded theory approach was used to identify themes common throughout the interviews and develop connections between the themes that answer the research question. We used grounded theories key feature of collecting and analyzing data recursively in order to develop findings from the study (Strauss & Corbin, 1998). The approach involved some connection to ideas that we came across in our initial literature exploration involved in developing the interview guide, but the themes emerged from the data collected during the interviews and not from preconceived hypotheses (Gersick, 1994). The iterations between the interview data collection and analysis as well as the categorization and incorporation of the patient feedback are explained below.

Interviews

The data analysis started with each researcher reviewing the interview transcription individually. This measure was used in order to avoid affecting the co-author's interpretation of the results (Flick, 2009). We coded, or broke down and grouped, the data based on parts that seemed to be relevant and theoretically significant. After independent analysis, we discussed the interview together and created

concept cards based on themes. On the cards, we collected elements from different interviews that related to a particular theme. This process continued and developed as we completed more interviews and collected more data. We added to the cards and created new ones when necessary. In line with grounded theory's iterative nature, our early analytic work led us to collect more data around emerging themes and questions (Charmaz, 2006). When a prominent concept developed, we would reference literature and adapt our interview guide in order to facilitate further discussion on the topic and delete extraneous questions.

After all the data was collected, it was analyzed. The themes were developed further through the support of theory. The themes were compiled in a table (See section 4.4) in order to consider the findings and their implications holistically. Connections were identified, revealing two main categories: disappearance of the physical environment and appearance of the KRY setting. Conclusions were drawn based on considering these categories together and the implication on the physician's professional together.

Patient Feedback

The qualitative, interpretivist approach was also applied to the patient feedback. The comments were labelled with descriptive adjectives, categorized, and analyzed. For instance, "Kanon att slippa åka iväg för att få hjälp " ["Great to not have to go somewhere to get help"] was labelled with "convenience", "accessibility" and "Home-turf advantage", grouped with other comments with similar labels, and considered together in order to reveal patterns. This was done in Swedish in order to preserve meaning.

3.4 Quality Assessment

Assessing the quality of qualitative research is a challenging feat as it involves social situations that cannot be frozen or fully isolated. Additionally, the notion of interpretivism suggests that there are multiple accounts of the social world (Guba & Lincoln, 1994). This adds to the challenge of assessing quality as it points out the high amount of subjectivity present. There is continual debate about the optimal criteria. Some qualitative researchers believe that the criteria commonly used for

quantitative quality assessment can be adapted to fit qualitative research. Others believe that qualitative research should be evaluated based on different criteria. The latter idea resonated with us and led us to consider three sub-criteria of Guba and Lincoln's trustworthiness in place of the traditional reliability and validity.

Credibility

According to Guba and Lincoln (1994), credibility results from carrying out the study in a manner that upholds good research practice and from sharing research findings with the members studied in order to receive confirmation that the researchers have understood the context correctly (Bell, 2006). The former was addressed by consulting methodology books and experienced researchers on best practices in data collection and analysis. The advice provided was used to maximize the soundness of findings. For example, we consciously took measures that halted analysis in order to apply different theoretical arguments. We strived to find the most effective understanding of findings and avoid settling on explanations prematurely.

The latter was addressed in two ways. First, following each interview, the recordings were transcribed, main findings summarized, and sent to the interviewees. They were able to verify that meaning was not lost, that their responses and comments came across as they meant, and that the interviewers understood correctly. This was especially important because the interviews were in English, which was not the mother tongue of any of the interviewees. Sometimes they struggled to express what they meant in English and sometimes even used Swedish phrases and words to fill in the gaps. Second, after all the data was collected and analyzed it was presented to and discussed with the operational managers that were previously involved in the study. Additionally, anonymity of the interviewees was used in order to increase the probability of producing credible findings. We made sure clearly tell to the doctors that they would be anonymous and as promised, upheld their anonymity throughout the study.

Moreover, as we have studied a technological phenomena that to a large extent redefines the manner in which a service is provided, there are multiple aspects to

the effects on the physician's professional identity. Consequently, we have combined multiple sources of research in order to address all findings as accurately as possible. In order to ensure their applicability to our case, we have made sure to compare the contexts in which the research was conducted. To our advantage, research on professional identity is often conducted through studying medical professionals, ultimately increasing their applicability to our case study.

Dependability

As we stated before, interpretive research is time and context bound. Therefore, dependability cannot be judged on the replicability of the study and instead, must be solely judged on how the research was performed. In order to fulfill this criterion, we have provided full transparency in our data collection and analysis. Lincoln and Guba suggest documentation of the entire process in order to minimize potential errors and biases (Lincoln & Guba, 1985). As stated in the research design, we kept documentation of the study in a shared folder. Here we openly described all aspects of the process. The folder was shared with the researchers and the supervisor, which allowed accessibility to our work and spontaneous auditing. Additionally, we have utilized our partnership in the study to address this criteria. We reviewed and reflected on interviews separately and only discusses after we both felt ready with our own ideas and themes. We addressed ideas and themes that were not shared in order to understand why in order to limit personal bias. Further, during analysis we assumed different roles in order to increase the perspective on the data. For example, one of us would play devil's advocate while discussing certain topics or one of us would act as a proponent of a particular theory and then we would swap. We also consulted our supervisor to get an external perspective. These initiatives strive to increase dependability.

Transferability

Qualitative research typically involves the study of a particular group, which was true of this study. Because of this characteristic, researchers are motivated to create what Geertz (1973) calls a thick description, a detailed explanation of the context and situation studied, in order to satisfy the transferability criteria (Bryman & Bell, 2011). A thick description allows others to judge how and when the findings are

transferable. In order to facilitate this comparison between studies, we have provided descriptive explanations of the context including the details about the case company and the doctors studied throughout the paper and especially in Methodology.

Additionally, we believe that because of the nature of professions, there is further transferability. As we explained in Literature Review, professionals are often grouped and considered exclusively from other types of workers since they have many strong and common traits. The findings are likely to be applicable to professions that include work where unique competences are applied to one case at a time. If a similar technological implementation occurs that disrupts or transforms the profession environment similarly, it is likely that we would be able to see comparable patterns in the implications on professional identity.

4. Empirical Findings & Analysis

In this section, the empirical findings will be presented and analyzed. First, we will provide a brief introduction to the case company. Second, the process of providing care in a traditional healthcare setting and the corresponding process in the KRY setting will be provided and their differences briefly described. Following the two processes, elements of the interviews that we have deemed important with regards to the physician's professional identity will be presented in themes. We deemed these elements important through continuously reviewing theory throughout the data collection process. The idea was to first let the findings speak for themselves before correlating them to previous research. Within the themes presented, further analysis of the themes based on theory is provided. Ultimately, the section will be summarized in a table to provide a more holistic view.

4.1 Case Company: KRY

KRY is a young company that provides an online healthcare platform. KRY enables patients to book online meetings with physicians. Through their service, KRY aims to contribute to improving the medical service and creating more efficiency in the healthcare system. Today, a majority of the medical cases in the primary care facilities are ones that require simple treatments, referral to another doctor, or simply reassurance from a doctor. One doctor in an interview explained:

> *"...people have been flooding the ER or Primary care centers for no reason. They come and we don't even examine them. We just say tell them there is nothing wrong with them and to go home….KRY is a way to filter those that need to go and be examined physically and those that don't."*
>
> - *Online Physician 6*

As the quote expresses, some patients do not require the extensive resources of a hospital. They occupy the time of doctors and take away from more critical cases. Thus, there is high demand for a solution that would filter out the less relevant cases and thereby, enable more efficient use of the healthcare system's capacity.

KRY hopes to reduce the number of patients at the traditional primary care facilities, emergency rooms, and hospitals. They strive to do this through providing a platform that can efficiently handle the simpler cases and provide these patients with adequate medical treatment faster at minimal costs. This is beneficial for patients with less complex issues as it lessens their wait time and allows them to see a doctor from home. Additionally, the patients only pay 250 SEK per visit, which is about what they would pay at the physical primary care center.The medical providers at the traditional primary care facilities in turn receive more relevant cases that make use of the resources available. Thus, doctors working in the traditional primary care setting are able to focus a larger portion of their time on the critical cases that demand more of their attention and skills.

KRY is currently operating in 21 municipalities throughout Sweden, which means the doctors see patients living in within one of these municipalities. The doctors, on the other hand, can live all around the world. KRY currently employees 35 doctors that are licensed to practice in Sweden, but do not necessarily live and physically work there. These doctors work anywhere from one shift, which is normally between four and eight hours, per month to five shifts a week. After these shifts, the doctors are able to rate their patient meetings and provide KRY with feedback. KRY recommends that the doctors work to no more than 50% in the online environment. They believe that working full time on the platform is not optimal for the physician's development and overall job satisfaction. Therefore, the physicians working at KRY usually have another job in a traditional healthcare setting. KRY provides a secure online chat room called "fika room", in which doctors can talk to one another and discuss patient cases. Additionally, they hosts lectures and mingles to bring their physicians together. KRY also sends out a monthly newsletter to their employees, containing information about how the company is doing and what lies ahead.

4.2 Primary Care Settings Explained: Traditional vs. KRY

The following sections describe a typical patient visit in the traditional primary setting and in the KRY setting, respectively. The processes are based on descriptions provided by the doctors in the interviews.

4.2.1 Traditional Setting

The traditional primary care setting has been developed over many years and have thus established specific processes for handling patients. The typical patient journey begins with the patient calling the primary healthcare facility, saying he or she wants to see a doctor, and explaining the problem to a nurse. The nurse determines how serious it is, how soon the patient should come in, and what type of appointment is needed. Next, the nurse adds the appointment to a doctor's schedule along with the notes from the call.

When the patient arrives for the appointment, he or she talks to the reception and takes a seat in the waiting room. The doctor can see in the system that the patient has arrived and can go retrieve the patient by calling their name in the waiting room and taking them into the examination room. The doctor speaks to the patient about the symptoms and uses relevant questions to try to identify the problem. Depending on what the doctor suspects the problem is, blood tests may be taken taken, physical examination performed, etc. to diagnose the patient. If the doctor can identify the problem, he or she starts thinking about how to fix it, in other words, a treatment plan. Once the treatment plan has been decided, the doctor communicates it to the patient and begins to execute the plan. If the doctor cannot identify the problem without further tests or a specialist opinion, he or she orders further testing or refers the patient to another physician.

The average meeting lasts approximately 10-20 minutes. If there is time, the doctor will document the meeting so that the nurse can do the necessary paperwork. However, often the doctor has another patient appointment and is forced to prepare the necessary information for the nurse later in order to avoid delays that will cause

them to fall behind on their schedule. A simplified visual representation of this process can be seen in Figure 3 below.

	Contacting care provider	Scheduling appointment	Travel to meeting	Meeting the patient	Post-meeting administrative work
Nurse					
Physician					
Patient					

Figure 3: Traditional Treatment Process

4.2.2 KRY Setting

The KRY patient journey begins with the patient logging into the KRY platform, either through the app or on a computer, using a common form of electronic identification, BankID. The patient then enters his or her symptoms and fills out a form that is tailored to those symptoms. Once the form is completed, the patient has the option to upload picture. Then, he or she can select a day and time slot for the appointment. The doctor that was available during the time slot receives an SMS that informs him or her that a patient has scheduled an appointment. The form that the patient filled out can be found in doctor's KRY account and he or she can look at it whenever.

Before the appointment starts, the patient logs in to the application and a clock displays the time until the meeting counting down as the time approaches. When the time for the appointment arrives, the doctor video-calls the patient through the application or browser and the meeting begins. The doctor wears a white coat and presents himself or herself as a doctor, but is usually not in a medical facility and can be located anywhere around the world. The doctor discusses the problem with the patient and verifies the information that the patient provided prior to the meeting.

If possible, the doctor provides the diagnosis and the treatment plan. When the meeting is over and the doctor has hung up, the doctor creates a prescription or referral if needed and completes administrative tasks, such as creating the medical record if there is time. If there is no time between meetings, these things are done later when there is time or after the doctor's shift is over. On average, the time with the patient is 10 minutes and there is 5 minutes for administrative work. The process is illustrated in Figure 4 below.

	Contacting care provider	Scheduling appointment	Travel to meeting	Meeting the patient	Post-meeting administrative work
Physician					
Patient					

Figure 4: Online Treatment Process

4.2.3 Differences

As seen in Figures 4 and 5, the patient seeks out the care provider in both settings. However, in the traditional setting, a nurse receives the call and schedules the appointment whereas in the KRY setting, the platform does the job of the nurse and the patient chooses from available time slots (See Appendix D). Another major difference between the two processes above is patient travel to the appointment. In the traditional setting, the patient needs to visit the care center, but in the KRY setting this is unnecessary. At a traditional primary care facility, the nurse assumes many of the administrative tasks, whereas in the KRY setting some of this tasks fall on the physicians.

4.3 Collected & Analyzed Data

Throughout the interview process, we noticed that certain ideas kept appearing. These ideas were continuously grouped and analyzed from a theoretical perspective in order to create themes. These themes are presented in the table below and discussed further in the rest of the section. Within each theme, the findings from the traditional setting and the KRY setting are described. Thereafter,

the two settings are compared and analyzed based on the physician's professional identity[5]. The analysis is conducted using theories both discussed in Literature Review as well as other theme specific theories that were found while gathering the empirical data.

Theme	Description
Supervision	The monitoring of tasks and activities, setting standards for processes and developing routines.
Autonomy	The extent of freedom from external control or influence. I.e. power over time management or methods for the execution of work tasks.
Relationships	Comprised of the different core relationships the physicians have, namely with other doctors, nurses, and patients.
Sense of purpose	The idea of what it means to be a doctor. The self-defined mission and key value provided.
Skills & knowledge	The core competencies and skills that are necessary for the work of a physician.

Table 3: Themes Described

4.3.1 Supervision

Traditional Primary Care Setting

The doctors we interviewed were homogenous in their explanations of supervision in traditional primary care setting. Direct supervisors are typically also doctors, usually specialists or more senior doctors. For this reason, they work in parallel with their subordinates.

> *"While I have my patients, my supervisor has his patients. The patients never go to the supervisor. More or less you don't get feedback from the supervisor and what the patient thinks."*
>
> - *Online Physician 3*

The quote states that the supervising doctors also have patients of their own, which implies limits on the day-to-day monitoring of the subordinate doctors. Many of the

[5] We use the definition of professional identity stated early, namely the professional's self-concept based on attributes, beliefs, values, motives, and experiences (Slay, 2010).

doctors expressed that besides receiving direct feedback from the patient, there is no feedback of their work. It was not until we inquired further that some doctors mentioned that they do receive formal feedback from their supervisor every six months in the form of statistics. The doctors went on to explained that they often see their supervisor in the workplace and can approach them if they have an issue or want to discuss a difficult case. This is possible because the supervisors are fellow professionals.

In the traditional primary care centers, other types of supervision do exist. There are some operational managers involved in doctor's work in terms of scheduling and upholding regulations and standards set by the municipality. These managers are removed from the doctor's professional work and instead, are solely involved in the logistical and bureaucratic details.

KRY

The doctors that work at KRY are part of a tech startup business environment. As a result, the organizational structure differs from that of a traditional primary care facility. There are more operational managers involved in the supervision of the doctors.

The COO and CRO are responsible for the on-boarding process during which they introduce doctors to the platform and assist the doctors with other technical or logistical aspects. Additionally, the COO monitors the doctors work to ensure that KRY's customers are satisfied. These managers are not doctors and fit into a different professional group. The CMO, who is responsible for overseeing the quality of healthcare provided, on the other hand is a doctor and also works for KRY through the online platform. He is available if the doctors have medical issues and need assistance.

Since KRY is not only a healthcare provider, but also a startup business that is establishing a brand and awareness in the market, they are highly concerned with how the doctors represent the company. The supervisors at KRY use the feedback provided by patients after their meetings to get insight into the work of their

physicians. This provides valuable information regarding possible improvements to the service including the doctor's work.

> *"We are monitoring them [the doctors] and we have this pretty interesting system that the patients after every meeting can rate their own meeting."*
>
> - *CMO*

When the physicians discussed the patient rating system to us, they expressed that they do not provide a fair basis for the evaluation of their medical performance. They explain that some patients are expecting a treatment that is not medically correct. The doctors therefore cannot meet the patient's expectations, which leads to patient dissatisfaction and bad ratings.

Supervision Analyzed

Within traditional primary care, supervision of physicians is typically enacted by other physicians. In KRY, the physicians are partly supervised by non-medical professionals, trained in the field of management. Theory on the supervision of professionals generally claims that members of their own profession routinely fill the supervisory, managerial and executive positions (Freidson, 1984). It is also claimed that as long as the formulation and control of professional work remains in the hands of the members of the same profession, the risk of deprofessionalization, or discredit of professional status is negligible (Schriesheim et al., 1977). KRY physician's value is likely to be undermined as non-medical professionals minimize the complexity of their work (Jensen & Aanestad, 2007).

Traditional primary care centers have an overall low degree of supervision implying a high degree of professional independence. KRY, through their use of a patient rating system, has introduced additional supervision, which impacts the physician's freedom to perform their core roles. The KRY physicians have an increased sense of being monitored, which affects their perceived level of autonomy. This idea along with other findings related to autonomy will be developed in the next section.

4.3.2 Autonomy

Traditional Primary Care Setting

When asked about the specifics of the patient meeting, each doctor revealed their own particular techniques in diagnosing and treating the patient. They have developed their own ways of asking questions, observing the patient, and getting to the root of the problem. They gave examples and explained how experience has led them to adapt in different ways.

> *"I ask 'so what can I help you with today', very formally and then let them talk. I don't say how do you feel because they teach us to say 'how do you feel?' but it is too diffused and people start talking about everything."*
>
> - *Non-Online Physician* 3

The doctors have the freedom to adapt their work practices based on what they think is best. They also provided details about the way in which they interact with the patient physically.

> *"I am normally a person that likes to draw when I talk to my patients. I like to talk about statistics and whatever. I draw charts and things just to show the life function looks if the patient continues to smoke for example."*
>
> - *Online Physician 5*

These examples reveal autonomy doctors have in their work. In the time they have with the patient, they are free to interact with them as they wish as long as the ultimate goal of providing medical care is achieved.

> *"In our profession, it is not like someone is going to sit with you and say this is how we do it. They just put you there and say do it and don't kill anyone."*
>
> - *Non-Online Physician 5*

This idea is supported by the hands-off nature of the supervision at the traditional primary care centers discussed in the previous section. Supervisors do not monitor the specific measures taken by the doctor to handle their patient cases granting doctors a high level of autonomy.

There are, however, limitations and restrictions on this autonomy from other sources. The availability tools of the facility is limitation to providing care. Doctors can only order tests and provide treatment based on what resources are available. Another major restriction on their autonomy is the regulation present in healthcare.

"The patient may come with demands...I want to go for an MRI, I have to go for a CT scan...but these are the expensive things that we must have to look at the rules and regulations, established by the Ministry of Health. If they don't fulfill these case indications, we try in a proper, in an efficient way to convince them that it is not really the thing we really have to do right now."

- *Online Physician 5*

In combination with this, there are financial pressures both on the cost and on the revenue side. On the cost side, the money spent on the patient should be minimized.

"...you shouldn't do this and this because it costs this much…'don't take those tests', don't prescribe those medicines because they cost too much.'

- *Online Physician 4*

On the revenue side, the requirements, demanded by Landstinget (The County Council), need to be met in order to maximize the money received for the treated patients.

"If they [the medical facilities] benefit from taking more patients, then this is what they tell you to do."

- *Non-Online Physician 5*

This often manipulates the doctor's use of their time and forces them to, for instance, take on more patients in the given time frame.

The rules and guidelines do, at times, change, but the pressure is more or less constant. These external elements limiting the doctor's autonomy are common among all doctors and have been established in the profession. And even though the doctor is influenced by this pressure in the bigger picture, they still have the power in the moment to decide how much time needs to be spent treating the patient in order to provide high quality healthcare.

"I actually take that right as a doctor. If I feel like I have a patient that needs a lot of time, I just tell the next patient you have to wait because it is just like that."

- *Non-Online Physician 3*

KRY

When asked to describe their time with patients in KRY, each KRY doctor presented their own personal process. The processes differed from one another, but to a lesser extent than the descriptions in the traditional primary care facilities. In KRY, the process has been more standardized. For example, one doctor explained,

> *"You have to present yourself and we usually say 'Welcome to KRY, I am Robin Smith [fictional name].'"*
>
> - *Online Physician 2*

This is one of KRY's ways to ensure that the doctors are making the patient's feel comfortable with an online setting. KRY knows that patients are not used to meeting a doctor in this way and that they need to compensate for this and make sure the patient, or customer, is satisfied.

> *"They [the doctors] are KRY when they meet the patient and they need to provide a good feeling for the patient so they know that this is something I will come back to. And if the person that sits in the field doesn't do a good job then everything, the tech team's programming, our work here, everything is worthless."*
>
> - *CMO*

Ultimately, this puts pressure on the doctors and impacts how they do their job. As we discussed earlier, patient feedback is used to give the operational team an understanding of customer satisfaction and allows them constantly check on their physicians' work.

The team applies standardization of work where they see fit, which further directs the doctor's work. For example, the operational team provided scripts for how to handle situations where the patient demands medications KRY doctors are not allowed to prescribe.

In addition to making a good impression on the patient, KRY aims to provide a convenient and time efficient service. KRY displays a countdown meter for the patient and holds the doctors accountable for starting their meetings on time.

> *"When I work in the physical world, it is standard that you are 10/15 minutes late, but it doesn't work like that when you work with KRY. You can be no more than 2 or 3 minutes late. That is our goal actually. That is one of our*

KPIs internally. 95% of all meetings should start within 3 minutes of scheduled time. So that is one big thing for us, to be accurate because that is one of the things that tend to be important for the patients."

- CMO

There are exceptions in the case of emergencies, but generally there is great amount of time pressure. Doctors are also reminded through text messages when the starting time of their next meeting has passed. This shifts control over time from the physician to the KRY. Additionally, because of the online nature of the company, physical examinations are impossible to conduct.

"For example, if I think a patient has pneumonia I can't check the patient and say 'yes you have pneumonia' because I can't listen to their lungs so I have to tell them that they have to go to a primary care center. For me, in the primary care center, it takes me one second and I can say 'ah you have pneumonia', 'you don't have pneumonia'."

- Online Physician 4

This restricts the physician's diagnosing process through limiting the possible methods that they can use. The doctors at KRY are also limited in the medications they can prescribe and the amount of sick leave they can give. This implies constraints on the doctor's treatment process.

Autonomy Analyzed

In general, we found that physicians have a high degree of autonomy in their work in a traditional primary care setting, echoing findings from previous research (Haug, 1973; Holsinger & Beaton, 2006). Physicians have traditionally enjoyed high levels of autonomy to regulate their work and decide what constitutes satisfactory patient treatment (Haug, 1973). For instance, they decide on the methodology, the techniques and the use of tools and treatments in the provision of care to patients (Currie & Guah, 2007; Pratt et al., 2006). The KRY setting and processes imposes new restrictions on this autonomy. KRY's business mission to provide time efficiency and customer satisfaction increases the time pressure on their physicians and calls for more standardized routines and processes. Theory states that if physicians are exposed to a system that undermines their right to flexibility, it bears the risk of negatively affecting their motivation (Holsinger & Beaton, 2006; Zuger, 2004). This

could be a potential result of the business characteristics of KRY constraining their physicians' autonomy (Pathman et al., 2002).

4.3.3 Relationships

There are three main relationships that impact the physician's professional identity. These are the doctor-doctor relationship, the doctor-patient relationship, and the doctor-nurse relationship. Each one is considered independently below.

Doctor-Doctor Relationship

Traditional Primary Care Setting

Doctors at a primary care work by themselves with their patients and generally, do not interact too much with colleagues. Even though the healthcare facility could employ 10-20 doctors, doctors work in parallel and their paths rarely cross.

> *"You have your list with your patients and you are working with them and you tend to have a coffee your colleagues, but you don't really talk about your patients or how you work. I don't know what or how that doctor does with his or her patients. I just guess that he is doing quite the same way as I'm doing."*
>
> - *Online Physician 1*

However, the interviewees mentioned meeting other medical professionals around the facilities or discussing patient cases over coffee and lunch. Spontaneous interactions do occur between doctors, which contributes to building and maintaining the doctor-doctor relationships.

KRY

At KRY, there is no physical workplace for the doctors. As a consequence, the lunchroom discussions and other spontaneous interactions are lost. As mentioned earlier, KRY has a secure online chat, "fika room", in which doctors can interact and hosts lectures and mingles. These efforts try to compensate for the lost interactions with other doctors. When we asked the doctors about how they interact with other doctors at KRY, they responded by referring back to the idea that doctors are usually not involved in each other's work and avoided further discussion.

Doctor-Doctor Relationship Analyzed

A doctor's work in the traditional primary care centers is mostly independent from other doctor's work, but the doctors do interact with each other around the medical facilities. Even though the doctors downplay the extent to which the physical environment influences their work, theory tells us that the working arena plays a crucial role in professional identity. In accordance with the findings, research shows that the physical workplace and the institution itself are not simply places where people belonging to different occupations and professions come together and enact their roles. Work environments are the arenas where the roles are forged and developed (Bucher & Strauss, 1961). These roles, and the socialization between colleagues in general, are said to be strong contributors to the development of a collective identity. Consequently, the lack of physical interactions between KRY doctors may have negative consequences on the unity between occupational colleagues and consequently, affect where online physicians group themselves in terms of their profession in the long run.

Doctor-Nurse Relationship

Traditional Primary Care Setting

There are many different aspects of the doctor-nurse relationship as the nurses play different roles in the primary healthcare facilities. They assist the doctors, provide feedback, make the schedules, transcribe the patient journal, and sometimes even take on their own patients. The nurse act as a medical assistant to help the doctor with medical tasks and procedures. Most of the doctors agreed that the nurses are not used often in primary care, but are available when needed. The doctors will send the patients to the nurses if they need simple tests done, such as blood sugar, blood pressure, hearing tests or memory tests.

> *"Usually things I don't think I need to do it because our time is more expensive so we have to select what we do. It is unnecessary for a doctor to do certain things."*
>
> *- Non-Online Physician 3*

Throughout the interviews, a manager-employee dynamic in the doctor-nurse relationship was also described.

> *" I am the manager that delegates the tasks."*

- *Non-Online Physician 2*

The nurses also assume the secretary role and assume many non-medical, administrative tasks for the doctors. They help write the patient journals, do the paperwork, schedule appointments, etc.

> *"Most often they call the nurse … and then they book an appointment … the nurse determines how serious it is and how soon the patient should come in."*
>
> - *Non-Online Physician 1*

The nurse can also be a colleague and take on patients just as the doctor does. In the cases where the necessary treatment is simple enough, the nurse sees the patient instead of the doctor. However, patients occasionally still request to see a physician in order to confirm that they have received proper care. Moreover, nurses sometimes function as a source of feedback.

> *"They [the nurses] usually tell you what the patient thinks about you. So they are a very good source of feedback. Also their professional opinion about how you are as a doctor is very important, almost more than the patient actually."*
>
> - *Non-Online Physician 3*

The nurses provide a different perspective on the cases and the problems at hand. In the interviews, it was mentioned that you can sometimes avoid mistakes and limit "entering a state of tunnel-vision" by listening to a nurse. Some doctors even argue that the nurses have a better understanding of the problems.

> *"They [the patients] speak to the nurse more freely and are more honest. The nurses have the actual contact with the patients because the nurse and the patients are more like equals in a way. The patient behaves toward the nurse in a more equal way."*
>
> - *Non-Online Physician 4*

KRY

At KRY, there are no nurses and thus, the doctor-nurse relationship dissipates. In terms of the medical assistant role, the doctors working in an online platform are unable to proceed with the medical tests the nurses would typically do in the traditional primary care setting deeming this aspect of the relationship null. However, this is not true of the other elements of the relationship. Nurses as a source of feedback and as a support to medical decisions also disappear,

potentially complicating the decision-making process for the physician. Regarding the non-medical tasks the nurses usually perform, at KRY, the doctors now must assume some that they previously did not have to.

> *"All doctors write their own journals. At a physical healthcare center, you dictate your journals and most doctors are spoiled with that. You can just talk to a dictator or a nurse and they take care of everything. But here [at KRY] we are our own secretary."*
>
> *- CMO*

Doctor-Nurse Relationship Analyzed

In a traditional setting, the nurse supports the physicians through providing a second opinion on diagnoses and through performing more simple and routine tasks. Since KRY does not include nurses, there is no hierarchical level beneath the doctors. This eliminates the doctor's ability to delegate work and exercise power. Research argues that when new technology is introduced in the healthcare sector, professional groups will be forced to engage in more complex negotiations that potential blur the professional boundaries (Håland, 2012). Moreover, shifts in boundaries concerning who executes certain tasks and activities are strongly related to changes in professionalization (Abbott, 1988; Jensen & Aanestad, 2007). Since the elimination of nurses forces the doctor to perform non-medical, administrative tasks, the boundaries between the two professionals are challenged. As a result, the physician's professional self-concept is likely to be rattled. In addition, being able to exercise hierarchical authority increases perceived status (Mintzberg, 1979; Haug, 1973; Flynn, 2004; Greener & Powell, 2008). The loss of hierarchical authority over the nurse will deflate the physician's self-concept.

Doctor-Patient Relationship

Traditional Primary Care Setting

In the traditional primary care, the doctor-patient meetings take place at the healthcare facility. The patient is forced to physically go to the doctor in order to receive care.

> *"They have to choose the nice clothes ... take a shower … pay for transportation … take leave from their jobs."*
>
> - *Online Physician 5*

The patient is involuntarily under the command of the medical providers, i.e. doctors, subsequently classifying the doctor above the patient. In some interviews, doctors mention that,

> *"Patients look at doctors as if they are something almost god-like."*
>
> - *Non-Online Physician 2*

The same physician goes on to say that he believes it is largely cultural and that there is some type of placebo effect associated with being treated by a physician. He believes that regardless of the treatment, the patients feel better after meeting with a doctor.

Another aspect of the doctor-patient relationship that stood out during the interviews was the idea that there is a discrepancy between what the patient expects from a doctor and what the doctor, based on his or her education, is able to provide.

> *"My key role is to do my best from a health perspective meet the needs of patients from what I with scientific proof can find to be the best, but it is not always what the patient wants"*
>
> - *Online Physician 4*

At times, the doctor is unable to give the patients what they want because it is not the correct medical care. As a consequence, physicians occasionally have to deal with negative reactions and hostile patients simply because they did not provide what the patient expected.

KRY

KRY aims to provide a service that focuses on patient convenience as one of the main values. As part of this goal and because of the nature of the business, the doctor and the patient meet halfway on neutral ground in the online platform.

> *"KRY is different. Here you do your job in the best way you help those people in a way they really do like. They don't really want to travel with a sick kid a baby who is just maybe like 8 months old … all the way to the hospital ... when there is snow everywhere."*
>
> - *Online Physician 5*

Patients resounded this sentiment in their comments from feedback provided after their online meeting. For example, "Fantastiskt att få träffa en läkare hemma." [Amazing to be able to see a doctor from home.]. Doctors, who used to be at the center of care, are assuming an auxiliary role in the online service. The doctors are feeling this shift and are responding by adjusting their practices in order to compensate.

> *"...you have to be even more professional on the internet because the people that you meet already think that it is minus [less] serious, if you understand what I mean."*
>
> - *Online Physician 2*

The patient feedback has revealed that the patients are often evaluating the service as a whole without mentioning the doctor. Recurring comments include "Great app!", "Convenient app, quick response" and "Quick and easy".

As mentioned earlier, doctors brought up their reservations about this type of feedback in the interviews. Multiple doctors explained that the format of the rating does not fit with medical care.

> *"You get a rating one to five on how the patient thought the meeting was….mostly it is positive feedback, but still I think it is important that medicine doesn't become a service only. That's why I think it is wrong. You don't go to a restaurant and feel happy about the food - it's not the same thing. You have to get the right care and that doesn't always make the patient happy."*
>
> - *Online Physician 4*

Doctor-Patient Relationship Analyzed

In the traditional setting, the patients are forced to come to the physician's "home-turf". In KRY, doctors and patients arguably meet halfway, which is more convenient for the patient. The control is thus shifted from the doctor towards the patient, challenging the doctor's high status. Additionally, the patient are able to rate their medical experiences. The ratings can be influenced by their unmet expectations and is not necessarily based on the quality of care. Research suggests that if professionals work is reviewed by a system that incentivizes actions that undermine their mastery of an area, it can drain internal drive (Holsinger & Beaton, 2006; Zuger, 2004). Therefore, the increased importance of the patient's opinion is likely to result in an erosion of physicians' professional satisfaction. Additionally, patients are asked to evaluate their experience from the online meeting as a whole, which essentially downgrades the doctor to merely a component of a service delivery system.

4.3.4 Sense of Purpose

Traditional Primary Care Setting

When we asked the interviewees what it means to be a doctor, we received a variety of answers. However, the majority of these were centered around the value they bring to patients. They often mention being responsible for and passionate about helping others through providing comfort and advice.

> *"It means you have a responsibility to look after people's health and well being."*
>
> \- *Online Physician 1*

In other attempts to describe a doctor's purpose, the interviewees talked about how in the past being a doctor was considered a calling. Doctors sometimes have to put the patient's well-being before their own. The responsibility associated with being a doctor includes large rewards, but also significant consequences. Many physicians feel that their sense of responsibility is greater than in other occupations.

> *"We deal with people and the consequences are much bigger if we fail than the consequences in other work."*
>
> \- *Non-Online Physician 2*

In one way or another, every doctor confirmed this sentiment. Moreover, they often pointed out that they are constantly reminded of their purpose. They see the impact they have on their patients' lives and the validation of their importance.

> *"For example, today the patient probably would've died if there wasn't a doctor present when this happened."*
>
> - *Non-Online Physician 2*

Physicians also told us that their role as a doctor goes beyond medical help. They explained that people often yearn for a doctor's opinion and advice in non-medical matters as well as medical ones.

> *"Not only give advice about healthcare, give advice about medication, but also to give some guidance generally in their life...my main role is to provide medical care, but many patients don't know that. When they have some problem in their life, they seek a doctor."*
>
> - *Non-Online Physician 1*

Doctors also explained that patients are not the only ones seeking their advice and that their duty goes beyond the workplace. For instance, family and friends often ask for medical help. They said that this is a part of being a doctor and on many occasions, claimed that being a doctor was more of a lifestyle, than just a job.

KRY

When asked what it means to be a KRY doctor, the doctors that work at KRY argued that it is not very different from work as a traditional primary care doctor.

> *"It doesn't mean so much different than being another kind of doctor, I think. So you are an easily accessible doctor."*
>
> - *Online Physician 4*

There is increased convenience for the patient, but the main purpose is still to comfort and advise patients by understanding their concerns and providing the best care possible.

> *"I don't think it is that different to work at KRY compared to having the patient with me. But of course it does have some differences. I don't touch the patient myself. I cannot ask for some analysis. Otherwise it is quite the same thing."*
>
> - *Online Physician 2*

When asked follow-up questions however, we uncovered that KRY doctors also feel like they are part of a mission to improve and advance the medical system.

> *"I thought it would be interesting too because this could be the future of medicine. That these kinds of components come in."*
>
> *- Online Physician 4*

Because KRY is new and is continuously under development, the doctors at KRY are involved in testing and proving the capabilities of this new way of working. KRY also allows their physicians to rate their meetings with patients. By doing so, they are contributing feedback that is used to improve the company. Additionally, some doctors have a direct role at KRY to contribute more explicitly to the development of the system.

> *"I have hand picked some of the doctors working at KRY and am getting feedback from. I want them to have one leg in the physical work and one leg in KRY. And have them take their knowledge from the physical work to KRY."*
>
> *- CMO*

As the quote implies, these doctors make up the Medical Board at KRY and are helping define the boundaries of online medical care. They are helping build an understanding of the types of situations and diagnoses that can be handled online.

Sense of Purpose Analyzed

From the findings about the traditional settings, it is clear that doctors have this strong sense of purpose that has been developed over many years and is continuously validated. Theory confirmed that it is characteristic for professionals to carve out for themselves and proclaim unique missions (Strauss, 1991). The mission described includes helping other, saving lives, and giving advice, both medical and non-medical. This seems to be maintained when working to an online setting as it is just a new medium for physicians to fulfill this sense of purpose.

However, the findings reveal that KRY doctors believe they have an additional purpose to help develop to future of healthcare. The findings indicate that some KRY physicians are adding a new dimension and in turn, redefining their mission. Some theory explains that defining a new mission or purpose could be an attempt by the physicians to create or reproduce existing professional characteristics

(Currie et al. 2009). This could imply that the online physicians are trying to compensate for losses in other aspects of their identity. Other theory says that redefining their occupational mission carries the risk of alienation from others within the same profession (Bucher & Strauss, 1961). This suggests that doctors that work at KRY may be segregated from other doctors and loose connection to those that they identify with.

4.3.5 Skills and Knowledge

Traditional Primary Care Setting

In order to become a doctor, you must go to school for many years during which you accumulate a vast amount of information and experiences. As a result:

> *"Doctors are the only ones that diagnose so that is the key role. To determine what the problem is and then direct the treatment."*
>
> *- Non-Online Physician 2*

Historically, doctors have secured monopoly over the information needed to understand and diagnose problems of the human body. However, technological development has made the information more accessible and threatened this monopoly, but doctors still,

> *"... know a little more than the patient because you know biology, you understand biology better and you have to try to help people with that."*
>
> *- Online Physician 2*

Additionally, doctors possess the skills needed to apply the knowledge and license to treat the patients.

KRY

At KRY, the doctors are meeting with patients, gathering information, deciding on diagnoses, and developing treatment plans. They are utilizing their core physician competencies. However, the type of patients they encounter is different from the those in the traditional primary care setting.

> *"You meet a very limited type of patient. A lot of rashes. A lot of throat ache or coughing. When you work in the physical world you get a much wider spread of patients…"*
>
> *- Online Doctor 4*

This implies that the doctor only employs parts of their accumulated knowledge and experience. One doctor argued that it limits your development as a doctor.

> *"To be a doctor it is a lot about making decisions. You are supposed to make the decision for the patient and the nurses. Everyone is going to ask you. And here it is too simple, you are not going to develop that part of your brain."*
>
> *- Non-Online Doctor 3*

Additionally, because of the physical limitations of KRY, the doctors are also not utilizing some of their medical skills. However, when we discussed this with doctors, they pointed out that working on an online platform demands other skills. One doctor, argued that this way of working is actually more difficult.

> *"...the challenge is bigger on the doctors to identify the problems and find a solution because in the physical healthcare system you can always tell the patient to go to the lab and take some tests and then you google like hell or ask my colleagues."*
>
> *- Online Physician 1*

According to this argument, doctors have to be even more prepared and ready to analyze the situation at hand. In addition to staying sharp and updated with their knowledge, the doctors at KRY have to engage further social skills in order to compensate for the lack of physical interaction. The CMO resounded this sentiment when discussing how they choose physicians to work for KRY.

> *"I would say that working at KRY you have to have good social skills. You need to have a bigger knowledge about primary care than what you need when working at a physical primary care center because when you work at KRY you have these 15 minute time slots … You don't have any time to look in books, to look online, to talk to other colleagues because the patient is there and is waiting for you to give your judgement."*
>
> *- CMO*

Skills and Knowledge Analyzed

Our findings revealed that doctors believe that their unique schooling, biological knowledge, and medical skills are main aspects that differentiate them from their patients. These aspects are also seen as key to fulfill their role as a doctor. These

sentiments echoed the idea that a large part of the professional identity stems from possessing a monopoly over an area of knowledge and a given set of tasks (Haug, 1973). When working at KRY, some of these skills and knowledge fall into disuse and other skills become more necessary. Research argues that some activities within occupations may become cast off, while others become elaborated and ultimately defined as the core of the profession (Abbott, 1988). Therefore, while the decreased need of medical knowledge and skills challenges the status of the professional, the increased need for social skills, which deviates from the core skills and knowledge of a traditional physician, can potentially begin to redefine characteristics of the profession.

4.4 Summary of Themes & Analysis

The following table summarizes the main findings from each theme in the traditional primary care setting as well as the KRY setting and highlights the key points in the analysis. Although the themes were a great way to organize and analyze the findings, we found that they were insufficient for explaining the overall situation at hand. Considering the themes independently neglects the relationships between them. Therefore, we developed the connections between the themes and found that the they could be categorized by those that result from the disappearance of the physical environment and those that appear as a result of the KRY setting.

Theme	Traditional	KRY	Implications
Supervision	• Other physicians fill managerial positions • Supervision has a hands off character	• Increased supervision due to KRY being a business • Professional background of supervisors varies	• Physicians feel that their value is undermined due to being supervised by professionals who might not understand the complexity of their work
Autonomy	• Physicians free to use their own methods and manage their time • Limited by facility tools, regulations and financial aspects	• Physicians can use their own methods but processes are more standardized • More limited due to lack of tools and stricter time allocation	• The KRY system constrains autonomy • Can negatively affect physicians internal drive and work satisfaction
Relationships	• Limited day-to-day interaction between medical professionals • Doctors exercise authority over nurses • Patients perceive doctors as “god-like” and go to doctor’s “home turf” for care	• No physical interaction between medical professionals • Nurses do not exist • Doctor and patient meet halfway on “neutral ground” • Patients rate their medical experience	• Lack of doctor-doctor interaction negatively impacts online physician's sense of belongingness • Loss of hierarchical authority over nurse decreases the online physician’s status • Increased patient influence undermines the online doctor’s mastery of a subject
Sense of Purpose	• Responsible for people’s well being • Doctors are advisors in and beyond their job in both medical and non-medical matters	• Sense of purpose two-fold: provide medical care to improve patient’s health and sense of improving the healthcare system is added	• Conventional sense of purpose maintained • Added sense of purpose potentially disrupting professional boundaries
Skills & Knowledge	• Doctors claim superior biological knowledge • Monopoly over medical tasks and treatment methods	• Physicians are utilizing their competences to a lesser extent • Working online requires better social skills.	• Specialized knowledge falls into disuse, which diminishes prestige • New skills necessary for success, challenging professional norms

Table 4: Themes Analyzed

5. Discussion of Findings

In the following section, the implications of the two categories, namely the disappearance of the physical environment and the appearance of the KRY setting, will be discussed. Thereafter, the two will be combined to delve deeper into the overall effect on the physician's professional identity.

5.1 Disappearance of the Physical Environment

An online primary care setting lacks a physical working environment. Consequently, some established building blocks of the physician's professional identity fall away. The physical environment, and its multitude of interpersonal connections, is more than just the working arena (Bucher & Strauss, 1961). It is where the doctors interact with other medical professionals and with the patients. The physical environment is also the physician's domain that reinforces their status and hierarchical standing (Mintzberg, 1979).

The doctor-nurse relationship is one of the main building blocks of the professional identity that dissipates. The absence of nurses, as afforded by the disappearance of a physical environment, changes the scope of the doctor's work. The doctors assume some of the nurse's roles by completing administrative, non-medical tasks, in effect degrading the doctor (Fournier, 2000). Additionally, the doctors lose their ability to exercise hierarchical power since their subordinates vanish. This challenges their status not only because they lack power, but also because, as many of the interviewee's quotes have revealed, the doctors self-concept is supported by their superior position in relation to the nurses. Thus, without the nurses, the physician's professional identity is challenged.

The physical interaction between a physician and a patient in the traditional setting is clearly one that characterizes the physician's authority and social prominence. As a result of the disappearance of the physical environment, the physician's relationship with the patients drastically changes. The patients, who have been said to perceive the physician as "god-like", now consider them as a component within a convenient service. Physicians have historically been able to decide how and where

care is provided (Haug, 1973). Since the patient does not need to physically visit the primary care facility any more, they can receive care on their terms, eliminating the physician's home turf advantage. We believe that this ultimately reduces the patient's perception of the status of online physicians. They will no longer be considered this superior being and instead, merely a sophisticated service provider. We saw that physicians receive a great deal of validation from their patient's desire for their advice. As a result of this change in perception, patients may not seek this advice from online primary care physicians in the same manner, consequently eroding the physician's professional identity.

The use of specific skills is yet another building block of the physician's professional identity. Physicians spend years in school learning medical skills that define them as members of the medical profession. Some of these skills, such as listening to the patient's lungs and determining if they have pneumonia, fall into disuse with the elimination of physical interaction with the patient. Therefore, the skill set employed is smaller, which challenges the physician's self-concept. Moreover, the physicians do not physically touch their patients, disconnecting them from the care they provide.

Lost physical interactions also diminish the doctor's connections with their professional counterparts. Thus, without them the online primary care physician may be estranged from other primary care physicians. The idea of separation of the online and non-online physician surfaced in a couple of interviews. One interviewee suggested that the online primary care may become its own specialization. Another proposed that a new type of reduced schooling could be developed specifically for online primary care physicians. These discussions provide confirmation of the deterioration of the professional identity. These physicians are engaging in a typical sense-making activity. Redefining the boundaries of their professional identity is a way to try to uphold their profession (Fournier, 2000). These expressions indicate that they feel as though the KRY setting is challenging the physician's professional identity.

5.2 Appearance of the KRY Setting

The KRY setting includes many aspects that are not present in a traditional primary care setting. KRY is a tech startup whose main competitive advantage is to provide convenience based care. Consequently, patients also have to be considered as customers, increasing the importance of their satisfaction. The business nature of KRY also exposes doctors to different standards that challenge the doctor's work. Further, KRY's mission to contribute to improving the healthcare system introduces a new dimension to the doctor's work. These aspects affect the physician's professional identity in a way that has not been seen before. Based on our findings, theory and past research, we have developed conclusions on the implications of these aspects.

KRY has taken patient-centered care to the next level. Their patient feedback and rating system is a testament to that. Along with understanding patient satisfaction, this feedback grants KRY visibility into their physicians' work, implying an increase in the degree of supervision. This visibility is used to ensure that the doctors meet KRY's requirements, undermining the doctor's expertise. Additionally, the format of the feedback inadvertently juxtaposes the doctor's work to non-professional work, devaluing the doctor's competence. Many doctors complain about the validity of this rating system. One doctor even argued that it is valid for going to a restaurant and rating your satisfaction from the food, but not for a doctor's work. This substantiates the claim that the rating system undermines the physician. Considering that the mastery of medical skills and knowledge is one of the main components of the physician's professional identity (Haug, 1973), these present threats to its intactness.

As a consequence of being a tech startup, the organizational structure of KRY differs from the traditional primary care facility. This exposes physicians to supervision from non-medical professionals. When we incurred further about the KRY doctor's perception of this situation, the doctors expressed that they choose to interact more with the CMO, who is also a physician, than to the other operational managers. We believe they gravitate towards a the more conventional supervision because they are trying to uphold their professional identity. The installment of non-

medical supervisors over KRY doctors constitutes deprofessionalization[6] according to professions theory (Freidson, 1984).

KRY also imposes further time constraints and standardized processes on their physicians. The timekeeper is technologically programmed into the platform, which leads to more time rigidity, undermining the physician's ability to manage their own time. Additionally, KRY restricts treatment options, such as medications that can be prescribed and sick leave that can be granted. As a consequence, doctors working in the online environment should experience deprofessionalization as a result of less autonomy with regards to flexibility in task execution and control over their time (Holsinger & Beaton, 2006; Zuger, 2004). However, our findings show that the doctors downplay the need for the high extent of autonomy and claim that because the cases are simple and often of similar in character they don't need it. Regardless of whether that is true in regards to the online primary care work, this statement from the doctors implicitly confirms that there is decrease in autonomy. In agreement with previous research, we argue that this decrease in autonomy will constitute a significant challenge to their professional identity in the long run (Haug, 1973).

As the online physicians only meet their patients virtually, the digital medium over which care is provided reduces the diversity of cases that can be treated by the online physicians. Some doctors believe that this implies a decrease in the need for medicinal skills. They express that online physicians often see similar cases, which they resolve in the same manner. Others believe that the online environment implies a need for superior medical knowledge and exceptional diagnosing skills. They argue that online physicians still have to provide accurate care, despite the increased time pressure, the loss of impressions as a result of the technological medium, and the inability to perform certain clinical tests. Further, others believe that, regardless of the comparative need of medical skills, additional social skills are necessary in the online environment. They claim that social skills are required to compensate for the technological filter, namely the computer screen. As a result, the online doctor's role shifts focus from diagnosing and applying medical skills to ensuring comfort for the patient. Each of these beliefs about the shift in skills

[6] Previously defined as the discredit or deprivation of professional status.

needed for the online environment provides evidence that the professional identity is under pressure to adapt.

Many physicians at KRY expressed the belief that the online setting is the future of healthcare and that by working there, they are contributing to advancements in the industry. As a result, the mission of their work as doctors at KRY is twofold. They aim to care for patient's well-being, upholding the conventional sense of purpose, as well as help improve the healthcare system, the added sense of purpose. However, in a post interview discussion, one of the KRY doctors explained to us that no one in the medical world would consider working long-term in an online setting a merit, which led us to question the motive behind this additional sense of purpose explained by KRY doctors. We originally believed that this additional sense of purpose served as a contributor to the online physician's intrinsic motivation. And in some cases, this may be true. However, when considering the other implications of the online environment, we hypothesized that the online doctors physicians may be justifying a new professional mission in an attempt to compensate for the loss of other identity building aspects (Currie et al. 2009). If the former reason is true, this will lead to a redefinition of their role and mission, which as theory explains carries the risk of alienation by others within the same profession (Bucher & Strauss, 1961). If the latter is true, it further suggests that the physician's professional identity is being disrupted by the online environment. Either way, the soundness of the professional identity is under pressure.

5.3 Disappearance & Appearance: The Combined Impact

To fully understand the implications of the online working environment on the physician's professional identity, we needed to consider both the disappearance and the appearance of certain aspects. The combination of these includes the dissipation of established building blocks and the introduction of new aspects that are attempting to permeate the physician's professional identity. Together these create turmoil for the professional identity. The observations discussed above have revealed that the physician's professional identity is experiencing this turmoil, however the findings also imply that the physician's professional identity as a whole is still intact. The KRY doctors expressed that their work in an online setting does

not greatly differ from their traditional work as a doctor. As we know from the findings that there are many professional differences between the two settings, this illustrates that they still identify strongly with their profession despite the challenges that the online environment imposes.

One explanation could be that the physician's work external to KRY, in a traditional primary care setting, upholds the physician's professional identity. It enables them to counteract the deterioration caused by the KRY setting by replenishing their professional identity with the reinforcement of professional norms and behaviors in the traditional healthcare setting. The doctors receive the validation from the interactions, routines, tasks, etc., which allows them to effectively re-enact their role in the KRY setting. By working in the traditional setting, the physician is shielded from negative impact to their professional identity.

Additionally, interviewees referred to their work in the traditional primary care setting center as their 'normal job' or what happens in the 'physical world', potentially implying that the work happens in two different worlds. These ways of describing and distinguishing their work hints at attempts to separate the two. We interpret this as compartmentalization of the their work in the traditional primary care setting and their work in the online. As a result, the aspects that would otherwise deteriorate the physician's professional are isolated and unable to effect it.

When we inquired about their future with KRY, many of the KRY doctors described the work as temporary. This is another reason for why the physician's professional identity has, thus far, evaded depletion. By labelling the work as temporary, the doctors are setting it apart from their professional identity. Yet another explanation, arises from the lack of lapsed time. KRY has only been around for about two years, which is therefore the maximum amount of time any of their physicians have worked in the KRY setting. The changing and redefining of professional identity is a complex process that requires extensive time implying that the changes have not yet been realized.

If the KRY physicians did not work in the traditional primary care setting, we believe erosions to the physician's professional identity would have been more evident. A physician working solely in an online setting is likely to have their professional identity challenged. They would have begun redefining boundaries to defend their professional identity in ways that our interviewees alluded to in discussions comparing online primary care physicians to other primary care physicians. The doctors would try to delineate between the two in order to salvage the physician professional identity.

6. Conclusion

The study indicates that working an online primary care setting will deplete the physician's professional identity. This is caused by the disappearance of the physical environment as well as the appearance of new aspects, challenging core components that have traditionally upheld said identity. Some findings from the studied case do not however provide substantial evidence that this depletion is occurring. We have concluded that this is because the online physicians are still working in a traditional healthcare setting, which allows them to uphold their professional identity. Moreover, they haven't worked in the KRY setting long enough for the deprofessionalization to make a noticeable impact. Should they work solely in an online setting for a longer period of time, the impact will become more evident.

The disappearance of the physical environment affects a number of dimensions that threaten physician's professional identity. The elimination or changes in the nature of their interactions with other physicians, nurses and their patients are key examples. The loss of interactions with their professional counterparts challenges their sense of belongingness to a professional group, especially since they are engaging in somewhat new and unestablished forms of exercising their profession. The disappearance of the nurse redefines professional boundaries in the medical arena as responsibility over certain tasks shift. The demotion of the physician's status from the eyes of patients weakens the physician's superiority. Moreover, the physicians are now unable to perform physical examinations and tests, limiting their use of profession-specific skills and knowledge. All in all, the disappearance of the physical environment calls for a reestablishment of the characteristics of the physician's professional identity.

The business context of the KRY setting challenges the physician's professional identity. This occurs through the introduction of new aspects that impact traditional characteristics of, and views on, physicians' work. The focus on patient satisfaction results in increased supervision. The combination of more rigid time constraints and standardized work processes due to an increased efficiency focus minimizes the physician's perceived autonomy. The supervision by non-medical professionals, as

a result of the business model and different organizational structure, contradicts physician's professional norms. Additionally, the complexity of the cases that can be treated online is lower, decreasing the need for medical skills and knowledge. And at the same time, the need for social skills increases because the doctors must provide high quality care despite the loss of impressions caused by the technological medium. Ultimately, an added business context to the physician's professional work suggests a redefinition of the established norms and characteristic core competencies of physicians.

7. Main Contributions & Future Research

The following section outlines the main contributions of this study and offers ideas for highly relevant and much needed future research.

7.1 Main Contributions

Technological advancements are continuously incorporated into healthcare. This often results in the redefinition of tasks and boundaries that affect professional identity. While this is a well studied field, previous research has mainly studied technologies that affect isolated components in physicians' traditional processes of providing care. Thus, the impact on the physician's professional identity usually concerns adoption and sense-making (Bansler & Havn, 2004). This case study however, focuses on a use of technology that dramatically redefines the context and the manner in which care is provided. As a result, the physicians in the study are not merely in a process of implementing a technological tool into their current work routines. Rather, they are challenged to enact the core role of their profession, namely to provide care to patients, in a business context and through a technological medium.

We contribute to the field of professions theory through analyzing the implications of this technological phenomena, which impacts the physician's professional identity in multiple ways simultaneously. In order to understand the themes that arose from our interview data, we combined theories and previous research from many different researchers. The findings of the study conclude that it is important to consider the disappearance of the traditional context and the appearance of a new context when studying new, transformational technology in professional work. By looking at these two perspectives, the different elements that construct professional identity can be considered as well as the connections between them. This helps uncover the individual as well as the aggregate effects on the soundness of professional identity. Previous research usually resolved to considering a few aspects of professional identity and we argue that research studying the impact of technology on professional identity needs to assume a more holistic perspective.

In addition, we bring attention to the effect of the context on professional identity. We believe that, in addition to further challenges due to technology itself, the changing working contexts of professionals will also provide threats of their own. The study revealed a way to uphold, at least temporarily, professional identity when working in a new context. If professionals continue working partly in the traditional context, it can help provide the reinforcement and validation needed to avoid depletion of their professional identity.

Lastly, the findings serve as a base for developing strategies for compensating for the loss of certain identity building aspects due to the disappearance of a physical workplace. Research shows that modernization is more likely to fail if it challenges the professional's interests too strongly (Currie et al., 2009). Thus, it is highly relevant to understand how certain changes interfere with the professional's interests. This study provides the reactions of physicians exposed to the change as well as analytic interpretations, both of which are valuable for strategy development.

7.2 Suggestions for Future Research

The study revealed a very interesting situation. Although the findings show that the physician's professional identity should erode as a result of working in an online environment, the professional identities of the subjects appeared to still be intact. We have discussed potential reasons for this, and encourage future research to study cases that include physicians that either do not work in a traditional primary care setting or include physicians that work a larger percentage of their time in an online setting. Additionally, it would be interesting to repeat the study in five years to re-evaluate the impact to professional identity and understand its relationship with time. It will be interesting to see how the prediction about the online physician becoming alienated from other physicians will be enacted and further to see if a new specialization develops, as foreshadowed by our interviewees.

The case study focused on one company, which gave us deep insight into a particular group. In order to increase generalization of the findings, we encourage future research to perform a similar study with an alternative company that focuses on providing primary care through an online platform in order to verify the findings

of this study. This study will provide insight into the commonalities in the effects on professional identity and draw further conclusions on the aspects that challenge the professional identity.

Additionally, in a pre-study interview with a Stockholm political advisor, we found that public healthcare is starting to also implement an online setting in their practices. Broadening the study to include non-business oriented organizations could provide further insights and understanding of how the physician's professional is impacted specifically by an online setting without the addition of a business context.

The data in this study implies that many interviewees view KRY as some sort of end state, to how technology will transform the healthcare industry. However, we believe that this is just the first step of the commoditization of medical professionals. Technology's rapid rate of advancement will generate severe challenges for professional identities. Technology will begin assuming more and more of their core functions. We believe it would be prudent for the medical associations to start having discussions with their members about the significant transformational technologies, such as IBM Watson Health, that are just around the corner. These technologies will disrupt professional work as well as potentially introduce even more customer centric business models. Whether it is because of technology, changing working contexts, or a combination of both, there is no doubt that professions will be significantly redefined in the coming years. Professional identities are at the foot of an uphill battle.

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Appendix

A. Pre-Study Interview Extended

Name	Position	Company/ Organization	Insights Provided
Daniel Forslund	Political advisor - Innovation in healthcare	Stockholms County Council	Highlighted changes that are occurring in healthcare, making it more patient centered. Moreover, he described the political decision making processes and provided reasons for regulations hindering development and implementation.
Martijn G.H. Van Oijen, PhD	Associate Professor	University of Amsterdam	Information regarding the difficulty to implement AI in healthcare.
Jessica Emond	Executive Communications	IBM Watson Health	Information regarding to what extent IBM Watson has been implemented.
Eileen M Norton	Program Manager to Dr. Kyu Rhee	IBM Watson Health	Information regarding to what extent IBM Watson has been implemented.
Dr. Bertalan Mesko, PhD	Founder	The Medical Futurist	How AI will make lives better in terms of predictive analytics.
John Holmes	Associate Professor	University of Pennsylvania	Information about the AIME conference and their Scientific Programme Committee
Jason Maude	Founder and CEO	Isabel Healthcare	How Isabel Healthcare is using technology for predictive analytics
Daniel Persson	VP Business Development	Min Doktor	The extent to which online primary care is being provided and tested by governmental care providers as well
Javier Hernandez-Lichtl	CEO	Baptist South Florida	Had just signed a contract with IBM Watson health, described areas of use.
Hans Winberg	Secretary General	Leading Healthcare	Hans Winberg hinted at the idea that the coming technology has the potential of “flipping” the healthcare industry. Traditionally, the doctor has been at the center, but in the future, technology is more likely to be at the center. (Quality, Safety, Integrity)

B. Interview Guide Examples

As we explained in Methodology, the interviews were semi-structured and we aimed for a free discussion rather than answers to specific questions. As a result, these interview guides provided a foundation for the interviews and do not represent the exact questions asked. Further, not all questions were used in all interviews.

Interview Guide for KRY Doctor Initial Version

Past
Why did you become a doctor?
How long have you been practicing medicine?
How would you define your profession as a doctor?
What would you say were your core tasks as a doctor?
What were the aspects of your work that you would not compromise as a doctor?
How do you know you if you are doing your job?

Present
Why did you choose to work at KRY?
How did you end up at KRY?
When did you start working at KRY?
How would you define your profession as a KRY doctor?
What would you say are your core tasks as a KRY doctor?
How do you know you are doing your job?

When we asked you this about .. in the past you said this and … in the present you said this, would you like to comment on the difference?
How are the two work environments different?
How are the two work environments the same?

Future
How long do you think you will be working at KRY?
Where do you see yourself in a year? 2 years? 5 years?
What do you see yourself doing?
What are your future plans?

Interview Guide for KRY Doctor Later Version

As the interviews progressed, they morphed into first talking about the physician's profession generally, then about KRY, and finally, about the future.

Profession
Why did you become a doctor?
How long have you been practicing medicine?
What does it mean to be a doctor?
What would you say is your key role as a doctor?
What is the key value (output, result from your role) you provide as a doctor?
How do you know you have done your job well?
Can you describe the typical patient journey from when they enter the room to when they leave the room?
What is your relationship with the nurse?
What is your relationship with the other doctors?
What time constraints are you working under?
How is your schedule created/structured?

KRY
Why did you choose to work at KRY?
How did you end up at KRY?
When did you start working at KRY?
What does it mean to be a KRY doctor?
What would you say is your key role as a KRY doctor?
What is the key value you provide as a KRY doctor?
How do you know you have done your job well?
Can you describe the patient journey from when you answer the phone to when you hang up.
What time constraints are you working under?
How is your schedule created/structured?
When we asked you this about .. in the past you said this and … in the present you said this, would you like to comment on the difference?
How are the two work environments different?
How are the two work environments the same?
In terms of financial compensation, how does it compare to your non-KRY job?

Future
How long do you think you will be working at KRY?
Where do you see yourself in a year? 2 years? 5 years?
What do you see yourself doing?
What are your future plans?

Interview Guide for Non-KRY Doctor

General
Why did you become a doctor?
How long have you been practicing medicine?
Where? Within what fields?

Profession
What does it mean to be a doctor?
What would you say is your key role as a doctor?
What is the key value you provide as a doctor?
How do you know you have done your job well?
Can you explain the typical patient journey?
What role do nurses or other doctors play in this?
What is your relationship with the nurse?
What is your relationship with the other doctors?
What time constraints are you working under?
How is your schedule created/structured?

Future
Would you consider working with on an online platform?

Interview Guide for KRY Operational Officers

Pretend like we don't know anything about KRY and describe it to us.

KRY
How many doctors work at KRY?
How were the doctors recruited?
How much do they work at KRY?
What does their schedules look like?
Is there training for the doctors?
How do the doctors receive feedback from their work?

Operational Role
What are your main roles as COO/CMO/CRO?
Have you held a similar position elsewhere?
What is your relationship with the doctors?
What are your biggest challenges with the doctors?

C. KRY Feedback for Patients

Utvärdering

Blev du hjälpt med ditt problem?

Ja Nej

Vad ger du för betyg till din vårdgivare (1 = mycket missnöjd, 5 = mycket nöjd)?

1 2 3 4 5

Skulle du rekommendera någon du känner att använda KRY? (1=absolut inte, 5=ja definitivt)

1 2 3 4 5

Övriga kommentarer

Vi tar tacksamt emot kommentarer från dig:

Spara

D. Booking Appointments in KRY

