Reward Systems in the Post Digitization Era: Possible Benefits and Risks

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Abstract: The last decades have been characterized by extremely intense digitization – in the shape of investments in administrative and embedded IT together with advanced Internet solutions – as regards companies and organizations worldwide. Today, however, most establishments are already highly digitized, which affects the conditions for work and organizations' forms and functions.

Thus, based on an empirical investigation of the health care sector, this paper addresses the notion of the post digitization era through specifically examining IT-based reward systems. This, of course, is not a novel phenomenon, but new ways of using the reward system concept – together with IT and original ideas – in order to increase efficiency, effectiveness, and productivity are considered. This, in turn, might have great implications concerning core strategies and the organization of work. In order to fulfill the paper's purpose of identifying possible benefits and risks associated with digital reward systems, especially in health care, a case study built on semi-structured interviews was performed.

The findings of this study indicate that there are several possible fields of innovative application – including both developments of existing solutions and potential future utilizations – concerning digital reward systems in health care. Moreover, in order for reward system implementations to be successful, organizations have to define, measure, valuate and evaluate input, output and performance appropriately, and the process of doing so is also affected by the present stage of digitization. This too is contemplated throughout the paper. Finally, important associated matters such as risk-reward trade-offs and quantity versus quality are discussed.

The results presented in this paper are based on a limited material. Still, they are valuable and original because of the empirical foundation derived from an important industry/sector. Furthermore, they illustrate modern implications of reward systems in highly digitized contexts, and put forth novel views on possible fields of application of IT-based reward systems, and associated potential benefits and risks.

Keywords: reward systems, post digitization, information technology, health care

1. Introduction

Today, most establishments are digitized, which effects how work is organized. That is why the notion of the post digitization era is presented in this paper. Although new IT-innovations will continue surfacing, it is not that they are digital per se that will generate the vital effects. Instead it is matter of how IT is handled and incorporated in its organizational context that will be decisive to its impact and importance (Zammuto et al. 2007; Bannister and Remenyi 2005; Carlsson 2004; Peitz and Illing 2006; Orlikowski 1992).

Even though some allege that IT is becoming a commodity, not generating significant competitive advantages or productivity benefits (Carr 2005), there is another side to IT. Novel digital solutions will always be produced and benefit certain players, but, in a more general sense, the importance and value of IT will be manifested through innovative utilization and creative thinking (Lucas 2005; Bannister and Remenyi 2005; Horzella et. al 2006).

This paper, however, addresses the post digitization era through specifically examining IT-based reward systems (see e.g. Kerr and Slocum 2005; Bartol and Srivastava 2002; Jansen and Von Glinow 1985; Eisenhardt 1985). This, of course, is not a novel phenomenon, but new ways of using the reward system concept – together with IT and original ideas – in order to increase efficiency, effectiveness, and productivity are considered here. This, in turn, might have great implications concerning core strategies and the organization of work. Thus, it is believed that reward systems and adequate performance measurements can be a vital part of strategic organizational change. This conviction is strengthened by the notion that IT and organizational change are highly intertwined phenomena, and can work as catalysts for each other (Volkoff et al. 2007; Zammuto et al. 2007; Orlikowski 1992).

Through empirically investigating the health care sector, several possible fields of innovative application – including both developments of existing solutions and potential future utilizations – are identified. Moreover, in order for reward system implementations to be successful, organizations have to define, measure, valuate, and evaluate input, output, and performance appropriately, and the process of doing so is too

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affected by the present stage of digitization. This, as well, is contemplated throughout the paper. The key research question is the following: Which potential benefits and risks are associated with modern digital reward systems, especially in health care?

The choice of the health care sector as the main target of the study is based on previous research (Kollberg 2007; Fryk 2007), indicating that it offers interesting opportunities for investigating digital reward systems. Primarily this is so because health care is fairly recently digitized, which results in new ways of handling information. Furthermore, the health care field brings to the fore important moral and ethical problems in the current context.

The paper begins with short descriptions of the methods and the research object. Then the results are presented as some general remarks about health care and reward systems, followed by possible benefits and risks, using empirical examples from health care. Finally, a summarizing discussion – together with suggestions for future research – is put forth.

2. The empirical investigation and methods

The general research object in this study is digital reward systems, but, in order to empirically investigate them, the major target is Swedish health care and the specific one is Danderyd University Hospital in Stockholm, Sweden. Thus, this is a classic case study, which can be very useful when doing exploratory and explanatory research like the one at hand (Yin 2003; Ammenwerth et al. 2003a; Eisenhardt 1989; Benbasat et al. 1987). The Hospital is public and fairly large with over 3,000 employees, more than 37,000 treatment events, approximately 230,000 health care appointments, and a 2.3 billion turnover.

So as to examine digital reward systems, health care professionals – with respondents from all age groups, key formal competence levels, and professional categories – were interviewed using so-called repeated semi-structured qualitative interviews. Also, afterwards, additional interviews were conducted if considered necessary, and the respondents had the opportunity to provide feedback. This method has been proven suitable when trying to generate rich and truthful depictions of implementation efforts and their effects (Levine and Rossmoore 1993; Yin 2003). The research, however, is complemented with material gathered at Gynekologkliniken in cooperation with Capio St Göran's Hospital, Löwenströmska Hospital, Märsta Närvård (a health care center situated approximately 25 miles north of Stockholm), Stockholm County Council and Apoteket Ormen (a pharmacy in Stockholm), together with on-site observations, informal interviews, and reviewing of secondary sources, the Internet, and related research. Primarily, though, the material on which the presented findings are based is derived from interviews with 24 respondents, lasting for approximately 1-2 hours each. Further details of many of the fundamentals such as the research object, Swedish health care, and the respondents are found in Fryk (2007).

Several other studies recommend this kind of bottom-up perspective, or micro-level approach, when aiming to understand complex digitization effects in health care (Edmondson et al. 2001; Timpka and Bjurulf 1989; Fryk 2007). It is simply a matter of studying the use of novel IT, in the shape of digital reward systems, through the eyes of the actual users together with on-site observations. Of course, relevant documentation – sometimes based on more aggregated data – is also considered.

3. Post digitization reward systems and health care

An inclusive and traditional definition of reward systems is presented by Kerr and Slocum (2005, p. 130), where they conclude that "Reward systems are concerned with two major issues: performance and rewards. Performance includes defining and evaluating performance and providing employees with feedback. Rewards include bonus, salary increases, promotions, stock awards, and perquisites". In the current paper this is considered true, but with two major differences: First, the reward systems discussed here are exclusively digitally based. Second, the rewards are not always monetary. Of course, rewards such as salary increases and bonuses exist in health care, but, since traditional corporate factors like revenue and competitive advantages do not always apply in health care, at least not in the public sector, rewards are mostly based on work related perquisites and benefits. Thus, it is rather a matter of rewarding adequate behavior through facilitating the work situation, acknowledging ideological or humanitarian wins, and professional satisfaction in connected to, for instance, increases in patient health, shortened convalescence, and better health care quality. In other words, there is a clear difference between health care and e.g. manufacturing or finance companies, due to varying incentives and purposes. Health care, especially as regards the public sector, is more about cost reduction, efficiency and effectiveness, and primarily high quality care.

Moreover, there are several ways to change peoples behavior – through rewards, threats, or persuasion – and two major aspects to consider when deciding on what to reward, namely behavior and/or results (Rapp and Thorstenson 1994). In health care one cannot focus solely on results, because of measurement difficulties, but rather start by changing behavior. Furthermore, health care professionals often perceive threats and persuasion as counterproductive. Especially since health care is driven primarily by humanitarian goals and not monetary wins.

So, traditionally, the purpose of reward systems is to monetarily reward desirable behavior (Bartol and Srivastava 2002; Rajagopalan and Finkelstein 1992). This empirical investigation, though, clearly indicates that modern digital reward systems in health care can be built on a new relationship between performance and reward. For instance, by using a more time efficient patient administration system, the reward for physicians is that they get more time to spend with each patient while they still get the same monetary compensation. Also, the system can be used to see changes in patients' healthiness and personal satisfaction concerning the health care. The actual reward system in this case is the part of the entire solution that keeps track of time spent with patients and the outcome in the shape of health care quality.

Another important observation, which became evident when talking to the respondents, is that what constitutes what here is called the "post digitization era" is that in most parts of all industries – whether it is a matter of business or the public sector – there has been a shift from digitization to consolidation to improvements as regards IT-investments. In other words, first, the main goal was to invest in IT in order to automate business processes or make information handling more efficient in connection to administration. Second, it was a matter of consolidating systems, making input and output compatible, and unifying internal and external parts of organizations' processes so as to facilitate communication and realize possible collaboration benefits. Now, however, most organizations have a widespread and functioning IT-infrastructure and the previous competitive advantages or productivity benefits spawn by IT are not as important. In that sense IT has become a commodity or a General Purpose Technology (GPT), not unlike electricity or telephones (Rosenberg and Trajtenberg 2001; Nahuis 1998). The present study, though, shows that improving and tailoring existing IT – together with innovative and strategic use – can be decisive to organizations' survival and/or success.

To sum up, one strategic, and possibly innovative, IT-solution is digital reward systems. This applies to most industries, but I limit my discussion to health care due to identified interesting aspects that can be highlighted using this perspective. Moreover, because of today's affordable advanced information systems, it is fairly easy to handle information (collect, store, process, recall, and communicate data, text, images and speech), which makes it possible to keep track of various kinds of input, output, and performance, and reward behaviors accordingly.

4. Promising benefits

Now when most organizations have IT-infrastructures, and customized solutions, investments in IT can be focused on valuating, implementing, and evaluating strategic digital information systems (Gardner 2000), such as reward systems. When it comes to health care, the opportunities are many. Early on, Barley (1986) showed that the introduction of clinical IT can support health care as regards organization, treatments, and patient and employee satisfaction. Looking at health care today, most parts are digitally connected: The processes relying on administrative (e.g. patient information systems), embedded (IT in tools and machinery), and medical (information systems for diagnosis and treatment) IT are intertwined both concerning the actual work flows and the digital networks. This makes it possible to strategically choose which parts of the processes to focus on when analyzing performance and rewards. Given that adequate measures are established and accepted, there are really no technical limits to how input, output, and performance can be measured, valuated, and evaluated. Additionally, when such conditions are present, the information can be used for strategic scenario analysis through simulation and modelling (Young 2005; Ivatts and Millard 2002; Moroza 2006). This, in turn, can be used to lay the groundwork for intelligent digital reward systems.

These opportunities exist due to a kind of IT that cannot be deemed a commodity. In health care, innovative reward systems can help cut costs, increase time efficiency, enhance health care quality, shorten convalescence time, boost patient satisfaction, and promote creative thinking in connection to treatments and technical development. One has to recognize, though, that the reward part of the system is somewhat complicated. The incentives cannot always be monetary based. Health care professionals themselves

propose combinations of different rewards depending on the health care institution at hand, and its specific financial, organizational, political and legal conditions. Examples of rewards might be: Acknowledgement of ideological or humanitarian wins, personal professional satisfaction, official displays of appreciation from management, additional time off, greater individual freedom as regards work and time flexibility, favorable resource allocation, traditional monetary rewards, and various perquisites such as interesting conferences, and social events.

One case of a modern digital reward system found in the current empirical investigation is the so-called "smart-list", an information system for choosing good medicines when writing prescriptions. The system is based on a database that includes medicines presented in FASS – a list of all approved medicines in Sweden. When a physician or nurse is about to write a prescription, he/she fills a form on the computer screen. The typed text includes information about the patient, his/her medical history, and the diagnosis, and when the form is submitted the system automatically generates a list of preferred medicines based on effect, quality, and price. The lists are regularly put together by the county councils and different experts, and recommended to health care institutions. Furthermore, when the medicine and dosage is determined, the system produces a complete prescription ready for printout. This system has many advantages: It helps health care professionals choose a good medicine, it facilitates prescription writing, it saves a lot of time, it lowers cost, and it eliminates confusion due to bad hand writing. This is important because health care personnel spend lots of time writing prescriptions, and the medicine administration is complicated. Since the entire system is digital, it is also fairly easy to keep track of system usage, the number of prescriptions written, the amount of time required for writing each prescription, and the overall medicine consumption. In this aspect the performance part of the reward system is measurable. The rewards for using the system vary between different health care institutions – some are content with the fact that the average working day has become less administratively complicated, and that health care professionals get more time to spend with patients, while others have chosen to reward usage through events such as minor social happenings. This reward system, of course, relates to a rather small fraction of an organization like a hospital, but that is one of the major points: In the post digitization era, an organization's reward systems portfolio can be made up of a suited combination of numerous customized systems.

Another information system that, with some efforts and adjustments, can be the base for reward systems is the digital registration of time consumption during the health care processes. It keeps records of health care professionals' time spend with patients, time between patients, and patients' waiting and convalescence time. The produced information can be used to reward certain behavioral patterns, and this can be a great strategic tool for effective resource allocation and enhanced health care quality.

According to the respondents, there are also many reward systems possibilities – although not yet in use – connected to the diagnosis and treatment of patients. At this stage of digitization, information systems can be used for initial routine diagnoses and subsequent treatment suggestions. These, obviously, are rather delicate matters and the people in charge of the development need to proceed with caution. In health care, naturally, there is very little room for mistakes or failures, and the security regarding diagnosis and treatment of humans cannot be jeopardized by IT-implementations. Still, the more digitally refined these procedures get, more opportunities for reward systems arise. It is extremely important to recognize them, prepare for them, and use the technology to ensure patient security, health care quality, and cost effectiveness. Thus, this development is important to the future of health care. Researchers have already emphasized that reward systems is a significant piece of the puzzle of when working towards higher output quality (Ittner and Larcker 1995), and most likely, this will be even more true ahead.

5. Potential disadvantages and risks

Unfortunately reward systems in general, and perhaps in health care specifically, are associated with various problems – some more serious and fundamental than others. One practical dilemma is the lack of consensus as regards the use of standards and nomenclatures in health care (Jilert 2005; Kollberg 2007; Fryk 2007). It is not that there are no standards, in fact, according to the respondents, there are probably too many, but in order to define and measure input, output, and performance, the concerned parties have to agree on what to measure, how to do it, and how to present the results. Otherwise it is impossible to stimulate the preferred behavior, measure the degree of fulfillment, and reward it accordingly.

Furthermore, the health care aspect per se ads output complexity: How can healthiness, perceived wellbeing, patient satisfaction, and treatment efficiency be measured? How much is a healthy human life worth? There are no perfect answers to these questions, but this investigation indicates that health care

institutions, and other key actors, should work together continuously in order to establish common definitions and measures that, to the greatest feasible extent, resemble reality.

Consequently, the topic of performance measurement is highly intertwined with the definition and estimation of input and output. Kollberg (2007) and Fryk (2007) have found that measuring performance within health care is very intricate, especially due to the previously mentioned lack of consensus as regards standards and nomenclatures. In other words, when trying to implement, for example, management tools like balanced scorecard or total quality management in health care, there is a need for comparable measures, terms, calculations, and figures. So, today, there are many standards, but there is almost no agreement as to which ones to use. Instead, various local practices are predominant, which often makes the implementation and use of digital reward systems troublesome when it comes to valuation, evaluation, and comparability. Furthermore, Ammenwerth et al. (2003b) acknowledge the fact that all information system implementations – including digital reward systems – are associated with certain dilemmas and challenges such as difficulties regarding valuation, evaluation, definitions, standards, measures, and consensus. These problems need to be further researched using interdisciplinary approaches and including people from both academia and practice.

Typical performance measurements in health care identified in this investigation are locally established Key Performance Indicators (KPIs) such as number of treatment events per year, total cost/number of examinations, total staff cost/number of examinations, number of examinations/number of yearly employees, external revenues/total revenues, and bed occupancy. These measures, though, say very little about the actual health care quality, and patients' perceived wellbeing and satisfaction. Thus, in order to realize the possible benefits from digital reward systems, the health care establishments have to complement these traditional "hard" economic measures with "soft" estimations of output. Otherwise the reward systems may have inherently skewed effects, and there is a risk that the proclaimed goals of "the patients first" might be missed. Additionally, Rapp and Selmer (1981) conclude that the use of similar quota measures might be dangerous because they can lead to efficiency at the expense of effectiveness.

Another complex issue, that can be a potentially big problem, is that health care is built on strict and comprehensive moral and ethic codes that do not always mix well with the strive for monetary based efficiency and effectiveness. If the healthiness of patients is the main goal, witch most often is proclaimed, the incentive structure should promote work processes, resource allocation, priorities, and organizational forms and functions that support that goal in the best possible way. Thus, it is incredibly important that the digital reward systems do not undermine the moral and ethic codes of health care – e.g. by encouraging an unbalanced pursuit of efficiency, effectiveness, and monetary winnings, at the expense of patients, employees, and the development of health care. These reward systems related risks are imminent in most industries (Frey and Jegen 2001; Jansen and Von Glinow 1985), even though the potential consequences might not be as devastating as human suffering or lost life.

One failed digital reward system – which was revealed during the study – in Stockholm is the monetary compensation system where health care organizations get paid per treatment event, without recognizing the actual time per event. This has caused huge problems for health care organizations that, for instance, are responsible for many immigrants that sometimes do not know the Swedish language very well, and/or old and/or very sick patients with complex medical histories, which makes appointments take more time. These problems – brought about by a poor reward system – have led to unjust compensation allocation where certain geographical areas are disadvantaged due to the characteristics of their patients. Similar problems are discussed in Rapp and Thorstenson (1994), and this diametrically contradicts the moral and ethic codes of health care. The potential solution that is being discussed right now is a digital reward system that calculates financial compensation based on time spent with patients instead of number of encounters. This is possible due to the widespread and advanced IT-infrastructure together with innovative digital solutions. These are all features that distinguish the post digitization era.

6. Conclusions and future research

An innovative way of strategically utilizing novel IT is through investments in clever digital reward systems that can help steer organizations in desirable directions. In general, this is true for most industries, but the opportunities in health care are especially interesting because the digital reward system concept is rather new and few solutions have been tried. Parts of information systems seen in large corporations could be implemented in health care in order to keep track of data needed to stimulate preferred behaviors. The key issue is that the inherent functions of IT changes the way information can be handled, and this brings about

many possibilities for positive organizational change. The current investigation indicates that, presumably, this is especially true when it comes to health care and reward systems, irrespective of change strategy as regards behavior and/or performance.

Additionally, there are many areas in health care where digital reward systems could facilitate the achievement of the proclaimed goal to increase patients' healthiness and personal satisfaction. The IT-enabled ability to register time in different connections – e.g. time spent with patients, time between patients, patients' time spent in waiting queues – is especially interesting since this information can be used in reward systems that can improve efficiency and effectiveness. Subsequently this can lead to lower costs and improved health care quality.

Consequently, I predict the value of IT in the future to be closely related to innovative use and creative thinking. The main concern will not be achieving competitive advantages and/or productivity benefits through infrastructural investments in IT, but development through novel digital solutions – such as reward systems – that support organizations' unique desires. Thus, in the post digitization era, reward systems can lead to many positive results both in traditional companies and public organizations such as health care institutions.

Nevertheless, the risk-reward trade-off dilemma is imminent in health care. In this connection, quantity is good but quality is absolutely necessary, which calls for serious caution when establishing what to measure, how to measure it, and which behaviors to reward. Here is a great opening for future investigations. Research on the topic of moral and ethics in health care reward systems is scarce and any empirical contributions would certainly be appreciated. Furthermore, there still are no premium common definitions and methods for measuring input, output, and performance in health care, and it is essential to reach consensus regarding these matters in order to fully realize the possibilities presented by modern IT in the post digitization era.

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