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IT Infrastructure for Workplace Health Promotion: Between self-management and organisational coaching rhetorics

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Abstract. As Workplace Health Promotion (WHP) initiatives are gaining relevance in welfare programmes, employers are becoming more interested in ensuring that workers, particularly those at risk, can benefit from guidance in following lifestyle intervention that can reduce extra costs for the companies who employ them. This opens new possibilities for dedicated health infrastructures in the workplace enabling health information sharing and connecting various stakeholders, such as doctors, employees, employers, data protection officers, designers. In this paper we describe DMCoach+, a platform aimed at supporting healthy lifestyles at work- Overall a group of 120 users are followed by a physician as coach for six months assisting them getting aware of their basic parameters (heart rate, BMI, waistline, activity time) and, through a gamified experience, improve their condition. The aim of this paper is to provide a preliminary discussion to understand how stakeholders and users across three pilots (two in Italy and one in the Netherlands) have planned the use of the app DMCoach+, which was provided by their work organisations as part of a more widespread health welfare infrastructure. The paper features a preliminary discussion about the main findings about the stakeholder's workaround to shape the infrastructure designed for people and organisations that have voluntarily participated in a pilot to prevent illness in the workplace.

Keywords: *organisation studies, workplace health promotion, case study, organisational welfare, safety*

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Introduction

In recent years several labels – such as Workplace Wellness, Wellbeing and Welfare – have been coined to describe new challenges for organisations to play a key role in health promotion. While all these labels all refer to wellbeing in organisations, Workplace Promotion Program (WHP) has become to most used label. A general accepted definition about this label is: "A healthy workplace is one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and well-being of all workers and the sustainability of the workplace" (WHO 1995).

Several campaigns have been addressed at employees avoiding unhealthy behaviour, to reduce unproductive time and to follow personal objectives in training and physical activities (Goetzel 2019) also employing self-monitoring devices to take care of one's health condition. There is growing concern about the consequences of unhealthy behaviour. Smoking, alcohol, dietary habits, and sedentary life, associated with some medical parameters (e.g. cholesterol, BMI, blood pressure) are becoming part of the social competences to define an unhealthy lifestyle and are represented as part of a predictive framework of future illness. On the one hand we can consider a situation where laypeople are become more competent in healthy habits, and on the other hand organisations are dealing with the structural changes arising from such a workforce.

Some characteristics of the workforce in Western societies show that working life is being prolonged by at least ten years compared with the recent baby boomer generation of workers. As a consequence, workplaces are facing an increase in the average age of employees. Several studies have shown that the aging workforce and prolonged careers pose a significant challenge to employers when it comes to maintaining a healthy workforce (Mooney 2012; WHO 1995). Employees' wellbeing has become especially important in those people who experience various parameters (such as body mass index) out of the healthy range provided by national and international guidelines (Abarca-Gómez et al. 2017).

Such transformations of the workforce have caused two other main problems. From one side, Western countries are facing strong restrictions in health budgeting. Economic crises and the increasing costs of health systems are pushing governments to find other strategies to keep their populations healthy and reducing access to health structures. On the other side, Western populations are increasing awareness of key information regarding health conditions. The long history of personal health management shows that people want to be aware of their health conditions and are asking for increased involvement in health

decisions. While this does not mean that people's health conditions are getting better, it demonstrates that there is great potential in sustaining programmes aimed towards prevention of health problems (Arena et al. 2013).

Tighter health budgets and a public willingness to be informed about personal health supports the idea of promoting health and wellbeing in a setting wherein people spend the bigger part of their time: their workplaces. Many researches have evaluated several companies' prevention programmes that have been promoted in recent years to discover how to maintain a healthy population. Goetzel and colleagues (2019) have analysed the stock performance of such programmes, and despite a correlation between the company dimension and the presence of WHP programmes, many aspects need further investigation to understand the effective impact on individual health. Cultural and organisational contexts can affect results and there is presently little data from longitudinal studies. However, on closer examination of individuals' habits, the topic assumes increasing complexity. One of the complexities is represented by the voluntary nature of participation in the programmes and the sensitive impact of biometric information being shared with employers. To tackle these problems, companies are turning to the mobile technologies, and programmes often use self-tracking apps, wearables, and dashboards to encourage personal adhesion to a suggested programme. However, such programmes are dependent on different characteristic, such as mood, self-identification, citizenship, biopolitics, data practices and assemblages (Lupton 2014). Workers are not completely free in their workplaces, therefore involving them in WHP requires special attention to avoid misuse, discrimination and any labelling.

With this complexity in mind, we can consider the WHP programmes and the technologies used as a mediators between the employer and the employees in preventing health problems in the workplace (Piras et al. 2017).

The IT infrastructure in 'the middle' becomes a boundary object for the interpretative flexibility of the object itself and for all the arrangements that a similar technology needs to face (Star 2010). It is thus relevant to explore how the infrastructure is actually used by all actors involved. Furthermore, despite the best intentions of the employers, this kind of infrastructure is complex and multi-layered, connected to many organisational components like employees, designers, occupational physicians, HR offices, and other institutional actors (Dunkl 2017).

Our questions in response to the issues described above are: how can an organisation use its infrastructure to encourage employees to assume healthier behaviours in their lifestyle? What happens to the infrastructure if the effort must be supported by health parameters and continuous contact between employer and employee through the infrastructure?

DMCoach+ in the middle: the object, the boundaries, and the people

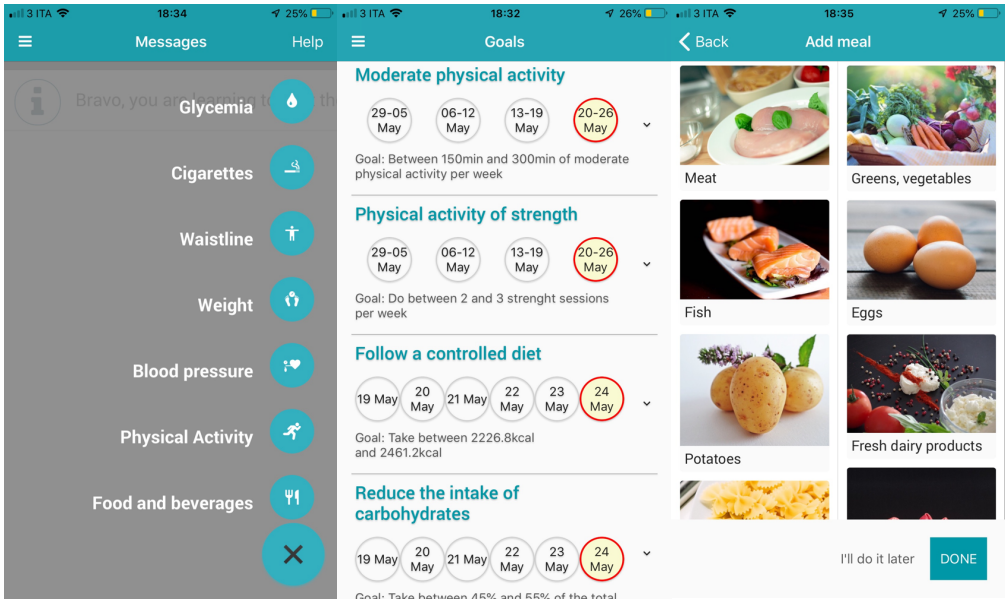
The study explores this topic following the trajectory of an app named DMCoach+ that was developed to help people with type-2 diabetes (T2DM), including those at risk of developing the condition. The app was supports mainly healthy nutrition, physical activity and weight loss as key factors to manage T2DM patients and reduce the risks of developing the condition in clinical settings. Literature suggests that technology-mediated interventions can be used as effective tools to improve adherence to prescribed treatment and to support patients in the self-management of their lifestyles, while disseminating diabetes prevention programmes (Lupton 2014, Kamar 2015, Goetzel et al. 2019). The app was evaluated through a one-year clinical trial in Italy (Ferron and Zancanaro 2018). More recently, the application was modified to be adapted to become a prevention tool to be used in a non-clinical setting, namely the workplace.

DMCoach+ is a platform to help to promote healthy lifestyles in the workplace driven by the occupational physicians. Physician cad remotely coach and monitor the employees and define a set of lifestyle and data tracking (self-monitoring) objectives for each employee/user. Employees are encouraged to adopt healthy habits also through motivational and personalised feedback in line with their attitudes and behaviour. DMCoach+ provides users with coaching that is automatic and contextualised to the personal profile (habits and lifestyles). Occupational physicians have the possibility of taking measures when necessary; they can change current goals or suggest others, and directly communicate with the employee about inappropriate behaviour that they have detected through the data collected by the app.

DMCoach+ includes a smartphone application for employee use and a web dashboard. The app gives the opportunity to track daily personal behaviors about nutrition, fitness and basic parameters. As in other apps for wellbeing , the interface has been designed to help user to have clear understanding of their vital parameters and a strong support in their goals behavior in changing life style.

The app includes some "games" to improve the performance in getting better about the physical control of the body through a virtual coach. Lifestyle objectives can take the following form: “Do at least <N> minutes of moderate physical activity every <i.e. week>”. Data tracking objectives can take the form: “Log your data related to <i.e. blood glucose> <N> times per <i.e. day>”. Ideally, these objectives will be discussed and agreed together with the employee during a medical appointment. Through the smartphone app, users can track some biometric data, such as weight and waistline measurements. Furthermore, employees are kept active through several specific data requests, reminders, motivational prompts and educational pills as appropriate to the situation.

Fig. 1 Three screen shot about the app



Users are profiled following the Transtheoretical Model of Behaviour Change (TTM) that suggests five different levels of motivation to change personal unhealthy habits – Centis et al. (2014) have reduced these levels to two groups: Not Ready to Change (NRC) and Ready to Change (RC).

Not Ready to Change:

- Pre-contemplation: the individual is not aware or interested in the consequences of her/his own behaviour and has no intention of changing it;
- Contemplation: the individual is aware of the consequences of her/his own harmful behaviour and is planning to change it in the near future.

Ready to Change

- Preparation: the individual is going to change her/his own behaviour and has made some efforts to do so;
- Action: the individual successfully changed her/his own behaviour for a short time;
- Maintenance: the individual has maintained the new healthy behaviour for at least six months.

The experimentation phase provided a six months program. Empoyees are assessed by team of health professionals such as physicians, psychologists, nurses to meet at the beginning of the experimentation. Based on some vital parameters, they give a complete evaluation about the objectives for each employee. The encounters lasted 20' after an open meeting devoted to the recruiting. People at

the meeting have to sign the Research Information Sheet, download the app and get all the help useful to get ready for the experimentation. During the experimentation employees are in contact with the physician who set month by month goals and games. At the end of the experimentation, not yet concluded, there will be an evaluation phase to analyze how the whole experimentation worked.

Preliminary findings

After one year of a preliminary clinical trial, now the experimentation phase is ongoing. In these two years of monitoring the app and the collection of the experiences about its use conducted through interviews, observation of meetings, and discussion with developers and stakeholders, about such subjects as user interface and design, health parameters, the doctor's duty, we can share the preliminary findings.

A first effect regards the health as "object". The stakeholders discussing details about the experimentation, have to deal with something that become a new topic in the relation with workers. This opened two different reaction. From one side health become a new field of negotiation between employees and the employer. This affect the idea that someone is at risk, and that this risk can affect the individual performance. An indirect effect of this regards the idea that many workers are doing something "dangerous" at the workplaces so the infrastructure shed light upon the life quality inside the company.

A second effect highlighted from the field is that the workers got a new vision of their heath, not just as individuals, but also as employees. Common practices about personal behavior like measuring vital parameters and keeping healthy habits, through the experimentation became part of the work experience. People, now, are allowed to give a look to the app during job time, chatting a little about goals and games with colleagues, asking for short answers from the health professionals.

A third effect is about the infrastructure itself. People consider it more than a simple "app" because it has been shared with the company which assure the support of a professional coaching. Yet, it seems that putting in the middle an infrastructure and some humans connected professionally to health domain, it become a trustworthy infrastructure, despite the real satisfaction about the requirements (Piras, Rossi and Miele 2018). Many times the app didn't match the expectation of people, but this doesn't affect the satisfaction of users. The infrastructure give the opportunity to the employees to be "seen" by someone relevant to the company.

These findings confirm others of several previous studies. The WHP infrastructures are promoted in a complex environment, usually through big companies, that provide programmes for prevention offered to the workforce (Roman and Blum 1988, Farnsworth 2004). Observations confirm how the infrastructure deals with complex 'translations' through a long process between HR offices, designers, occupational physicians and, less often, the employees or their representatives.

In this case the complexities relate to the sensitive information necessary to run the app and the 'coaching' functionality provided by the infrastructure. The word 'coach' is probably the most important wildcard of the infrastructure. To be a 'coach' is not a defined role in a technological setting, and general practitioners are not usually asked to act as coaches. However, this infrastructure allows emplyees/users and healthcare practitioners to be involved in a new way, and the companies using the app are supporting a new moral suasion strategy for their workforces. At the same time, employees/users are expected to be part of a complex process where they are expected to do a new 'job' for the benefit of the company and wider society.

Conclusions

This app project is pushing forward the common relationship between doctors and employees, organisations and workers, and, in some way eventually, their relatives. Qualitative research with users facing a lower level of illness – such as T2DM patients who therefore need constant control – confirms that both infrastructures and human presence play key roles in perception of the app.
When people face with health issues, they want to be a central net of their relationship network, even if this mean a new understanding of the relation with the company.

Some projects highlighted user preference for human interaction, despite the availability of the app (Mathiasen et al. 2017), while studies suggest paying closer attention to users' habits and providers' needs (Årsand et al. 2012, El-Gayar et al. 2013). The design of apps such as DMCoach+ need to consider that people want tools that provide an opportunity to become more knowledge-driven in their self-management when it comes to their personal health. Moreover, people are interested in increasing their visibility to health professionals to assume the 'value' of their individual stories. Unfortunately, as the DMCoach+ illustrates, such infrastructure is changing the network of relationships between actors. The apps are reconfiguring the network, transforming roles, expectations, belonging, and compliance. Following Hanseth and Monteiro (1997), from a sociological point of view – suggested for example by the actor-network

approach – we can affirm that "granted that technological artefacts never fully determine patterns of use, the issue is really to what extent a specific artefact in a given context inscribes a certain behaviour. Analytically viewed, the strength of an inscription relies on three aspects: the size and complexity of the surrounding actor-network which is linked to the inscription, the degree to which it is aligned with this surrounding actor-network and the strength of the inscription on its own" (p.200). Apps for self-management, more than others, are pushing forward a new scenario among networks for health. They show how people are accepting an increasing diffusion of health networks made by both humans and non-humans, but employees still want a dominant position in this series of networks: they still want counsellors, health professionals, and personal goals, as our experimentation has shown. The coaching provided by several objects towards the people throughout all their life is accepted if it is seen as a way of being closer to the professional.

Creating the infrastructure for peoples' health needs requires roles for people, for practices and for representation. Including the organisations and their workforce in such infrastructure reduces some complexities, as suggested by Hanseth and Monteiro, but will build something wholly new in which the 'political fight' prescribed by inscriptions of objects will continue.

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