Borsa di studio attivata ai sensi di quanto disposto dal D.M. n. 1061 del 10/08/2021

Titolo del progetto: Smart Working: a decision support system for companies which incorporates its impacts on the city environment

La borsa sarà attivata sul seguente corso di dottorato accreditato per il XXXVII ciclo:
INFRASTRUTTURE E TRASPORTI

Responsabile scientifico: Guido Gentile
Area per la quale si presenta la richiesta: GREEN
Numero di mensilità da svolgere in azienda: 12
Numero di mensilità da svolgere all'estero: 6 presso Università del Lussemburgo
Azienda: Movesion srl
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Progetto di ricerca:
Abstract.
The objective of this research is a solution for companies interested in the sustainable and agile transformation of their organization and workplace. It entails an evidence-based methodology to evaluate the workplace potentialities and accessibility in order to support agile working decisions. The methodology comprises a holistic evaluation of the workplace, captured from the workers and the managers through a questionnaire, able to inform the organizational readiness for agile implementation and give supportive information for decision making.
Organizational readiness will be mapped in a dashboard of agile critical success factors -support, communication and trust - at organizational, managerial and employee level. Three frameworks will be proposed to articulate strategies for agile transformation, one for each management level of the organization. The business case and environmental impact of agile transformation will be discussed and numerical procedures to compute financial indicators and air pollutant emissions will be formalized. A simulation of the impact model will be made with a medium sized company. The financial impact is evaluated by calculating the return on investing on agile implementation. Environmental impact is assessed by calculating emissions related to home-based working.

Introduction.
We are immersed in the digital age. We have seen in the last time an eagerness among workers and organizations to capitalize on the digital revolution transforming their workplace to promote new ways of working. This phenomenon has been accentuated by the measures taken to contain the COVID pandemic we are currently living.
A reflection of this movement is the trend of Agile working (sometimes referred as ‘smart’ working) concept. Agile term was initially used on software industry as a group of practices to develop a more flexible and business-responsive technology infrastructure (agile manifesto, 2001). The term has been adopted and translated to ‘agile working’ by some practitioners and organizations interested on the human side of work. Afterwards, several think tanks, professional organizations and business journals have devoted attention to the concept of agile working and how can be used to benefit both organizations and workers (Grant, 2020).
An agile workplace brings benefits to the organizations, as it is capable to reduce costs whilst increasing productivity and supporting well-being for workers. Nonetheless, to harvest these benefits, a careful decision process and the

involvement of the whole company are required. Several practitioners, research scholars and business managers agree that implementing agile working practices (AWP) across organization increases productivity, attracts top talent, retain staff and improve overall culture and well-being (CIPD, 2020). Other studies, however, have highlighted concerns about feelings of isolation, missed opportunities, and challenges in separating home and work life. (MTI, 2019).
A natural question that may come from the previous statements, read by a business owner, is if agile working is a reality in his own company. Further, this interest can lead to question: what is my company doing for agile working implementation? how successfully is on implementing it? How are employees experiencing agile working? Which factors are relevant to define this successfulness? How can I evaluate the situation of my company? What are the obstacles to agile working maturity? What can I do to improve agile working in my organization and obtain the benefits from it? How can these benefits be measured? How much it will cost to my organization?
This research project is oriented to business managers and practitioners looking to implement or improve the organization of agile working. State of the art research from occupational psychology, organization and management studies, as well as of transportation engineering, will be used to design an instrument able to explore these issues within the organization, through a survey method innovative to the field.

Context.
Before the rise of ‘agile’ working, several terms have been used to refer new ways of working. Since the 1970s, many have put great hope in rising ‘telework’ levels and predicted major changes in daily activity patterns (e.g., Nilles, 1975; Toffler, 1980). In the following 30 years telework as a work practice did not appear to be the great success that early visionaries predicted. Only a small part of the workforce engaged in telework (Choo et al., 2005).
Teleworking has evolved in new organizational practices adopting new modalities like ‘flexible’ working increasing in many contexts and the number of flexible workers now amounts to a considerable proportion of the workforce in many countries (Elldér, 2019). It will most likely increase even more in the near future when many employers around the world now lifts restrictions on telework as a response to Covid-19 (Elldér, 2020) considering working from home a measure that enables compliance with the restrictions brought about by the current health emergency while at the same time ensuring business continuity.
In the Italian context, there is a legal framework for agile working stablished with Law 81/2017 and the practice of teleworking is becoming increasingly widespread, especially in large organizations. In 2019, before COVID’s pandemic 58% had already introduced a structured project and 5% stated that they would introduce one within the next 12 months. Based on analysis performed on a statistically representative panel of workers, the number of home workers is estimated around 570,000 people, 20% more than 2018 (Corso, 2020). A questionnaire made during the lockdown in Italy to a sample of 15,000 from the private sector reveals that 90% of workers and 80% of managers would like to continue doing “smart working”.
Agile implementation is a subject of interest for different fields. From occupational psychology, being interested in the well-being of workers; management and organizational behavior studies suggesting different agile approaches to organize work and people in the organization; Business Administration studying the business case of agile working, Computer Engineering, approaching agile from the IT governance and Transportation Engineering studying the effects of new ways of working on daily mobility patterns.

Occupational psychology.
Agile working is an argument of interest for occupational psychology, and for many years the research work was focused on remote working. Empirical evidence on the association between remote working practices and well-being of workers were not conclusive (De Menezes & Kelliher, 2011). For instance, Ter Hoeven and Van Zoonen (2015) claimed that the more flexibility individuals had around their work location, the greater work-life balance, job autonomy and effective communication they experienced, thus increasing their well-being. Nevertheless, further research has suggested that individuals who use remote working practices may frequently experience feelings of guilt (Moe & &Shandy, 2010) and may overwork to reciprocate the permitted flexibility (Chesley, 2010). Consequently, remote may

become more unfavourable since individuals, may engage in behaviors such as exchanging emails during non-working hours, a practice that has been linked to stress (Chesley, 2014) and blurred home-work boundaries (Tietze & Musson, 2005).
Scholars identify different categories to conceptualize worker's well-being. Van Horn's model proposed the following work-related well-being dimensions: affective, professional, social, cognitive and psychosomatic. These dimensions can be measured by using a standard SF-36 Health survey developed by Rand.
Occupational psychology is also interested on competencies related to agile working. A Competency Framework based on Self-determination theory (SDT) considers how psychological needs can best be supported to enable workers' personal growth, well-being and productivity. SDT argues that only when three basic psychological needs are met growth and functioning will be enjoyed (Grant, 2020). These three basic psychological needs are autonomy, relatedness and competency. A questionnaire designed can be used to measure these three elements on workers (Deci & Ryan, 2000).

Organizational and Management studies.
Agile implementation and change management have been studied by several practitioners (Mckinsey, KPMG, Deloitte), think tanks (Agile Future Forum, Agile Alliance, the Work Foundation) and professional organizations (e.g., the UK chartered Institute for Personnel and Development, CIPD), suggesting different frameworks to approach agile transformation. No framework is considered the best and suitable to each kind of company. Various frameworks are in use and organizations frequently combine elements of methods and frameworks that best suit their organizations.
Practitioners have designed several constructions to articulate strategies for agile implementation. KPMG proposed an agile operating model based on six elements that enables organizations to approach Agile transformation in a holistically way. Deloitte suggests a workplace ecosystem framework composed by 4 dimensions. Agile Future Forum has designed a six steps pathway for organizations to become more agile. CIPD has designed a guide for adoption of flexible working modalities for companies with traditional structures. The present work considers some of these contributions to build a coherent framework, to measure agile readiness on organizations.

Mobility Management.
Mobility Management or TDM (Transportation Demand Management) refers to various strategies that change travel behavior (how, when and where people travel) in order to increase transport system efficiency and achieve specific planning objectives. There are numerous TDM strategies using various approaches to influence travel decisions. Some improve the transport options available; some provide incentives to change travel mode, time or destination; others improve land use accessibility; some involve transport policy reforms and new program that provide a foundation for TDM. One of the strategies is the implementation of agile working programs as a mean of travel substitution for working activity (VTPI) and distribution of traffic flow throughout the daytime reducing congestion at peak hours.
From the mobility management point of view, agile working is a growing option of interest. Teleworking (which is not identified with agile working) has been a subject of interest for transportation engineering since the 80's. Teleworking is considered as a telematic mode of commuting (a telematic mode of commuting) and the term 'telecommuting' is still in use by the transportation field. In fact, recent research shows that in the United States telecommuting mode share increased gradually from 2.3% in 1980 to 5.3% in 2018 -percentage between all modes of transport- and since 2016 it exceeds the share of transit nationwide except in the very most transit-rich cities (Mokhtarian, 2005).
Nevertheless, teleworking has several limitations and drawbacks, since it's not for everyone and it is not a permanent condition. The evident trend, observed in young people, is that individuals identified the need (or requirement) to travel in parallel to the possibility of flexible work arrangements (working from home, working while travelling, working from a local business centre, etc.). This is because young people recognize the need for face-to-face contact with their peers, and consider ICT-based contact as supplementary to real-world relationships, rather than a substitute for them (Pawlak, 2015). Also, it has been verified, by Harvard Business school scholars, that commute to work serves as a liminal role transition between home and work roles, prompting employees to engage in boundary management

strategies.
The present work is also of interest to public administration agencies, since agile working can be an effective mobility management strategy, considering that it is able to reduce travel demand and also can relief congestion on peak hours (Ellder, 2020). As a consequence, there is the hypothesis that pollution derived from work related travel is reduced. Even if this hypothesis is not object of the present work, pollutant emissions released from work-related travel are computed and contrasted with increased emissions from household energy consumption.

Objectives.
The purpose of this study is to build an instrument able to evaluate the organizational status quo, guide the implementation of agile working from the situational context and evaluate the impact of agile working implementation on a bottom line.
The main objective are:
- to define a framework to represent agile factors able to measure readiness and for decision-making at the different levels of the organization;
- to design a survey process to collect workplace information from manager's and employee's perspectives
- to design a model to evaluate the impact of an agile working implementation program.

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