University of Applied Sciences and Arts of Southern Switzerland
Department of Business and Social Sciences
Inno3 Competence Centre

SUPSI

DIGILAV

Introduction and back ground

Digitization is a transversal and multidimensional phenomenon. It is difficult to predict which technologies will be better than others, what are the impacts and how it will change the way of work. These changes can be monitored?
With these considerations, we decided to explore two specific fields: industrial and health care. We observe, measure, analyze and interpret directly in the working contexts the current state of knowledge and skills requests, the degree of preparation for digitization by individuals and organizations, as well as the changes already generated or in progress. We analyze the Access - adoption - use - diffusion of technologies and changes that these involve.

This project is an internal project of SUPSI witch involved: inno3 Competence Center, the health area of Department of Business Economics, Health and Social Care and the Department of Innovative Technologies.

Research question

How to develop a system of multidimensional indicators for the constant monitoring of technological changes and their effects/impacts useful to industrial companies, the health sector as well as institutions (public and private)?

Objectives

SUPSI project mapping
Map the projects and skills developed in recent years in SUPSI (including associated schools) on themes of digitization and automation, as well as on the themes of work and its transformation.

State of art
Literature analysis to identify the state of the art of digitization in the two areas

Key variables
Identify and select the key variables on digital changes and their impacts.

Indicators system
Development of a multidimensional indicator system for a constantly monitoring of digital changes and their effect/impact in the industrial and health sector.

Method

Two laboratories: Lab Indu (Two industrial companies) , Lab San (three health facilities)

Companies involved
Mikron e GF Machining Solution

State of art
Literature analysis to identify the state of the art of digitization in the industrial sector.

Indicators
Development of a multidimensional indicator system describing the phenomenon of digitalization in the industrial production sector and its impact on the workplace.

Digital assessment
Analysis of the current situation of digitization with particular reference to strategy, processes, products & services, technologies and personnel.

Digitization impacts
Impacts of digitization on products, on production processes, organizational forms and on Business Models (interaction between workers and physical cyber systems, use of virtual reality in the simulation of plant behavior, use of the Internet of Things, ...)

Interviews
Structured interviews to analyze changes in strategic processes fo companies

Health facilities
Clinica Hildebrand, Clinica Luganese Moncucco, Casa Anziani Alto Vedeggio.

State of art
Analysis of the literature, definition of a specific theoretical framework related to digitization in the health sector

Indicators
Development of a system of multidimensional indicators describing the phenomenon of digitalization in the health sector and its impact on the workplace.

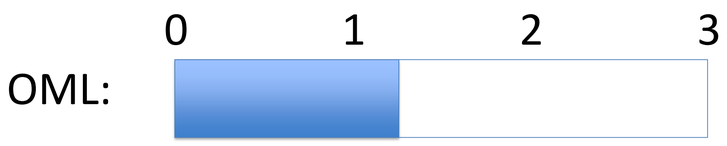
Qualitative analysis
Focus groups and semi-structured interviews on three levels of analysis: macro, meso, micro

Digitization impacts
Impacts of digitization on products, processes, and organizational forms (introduction of surgical robots, introduction of aid devices, replacement of paper files with digital files, professional / patient / family relationships, ...)

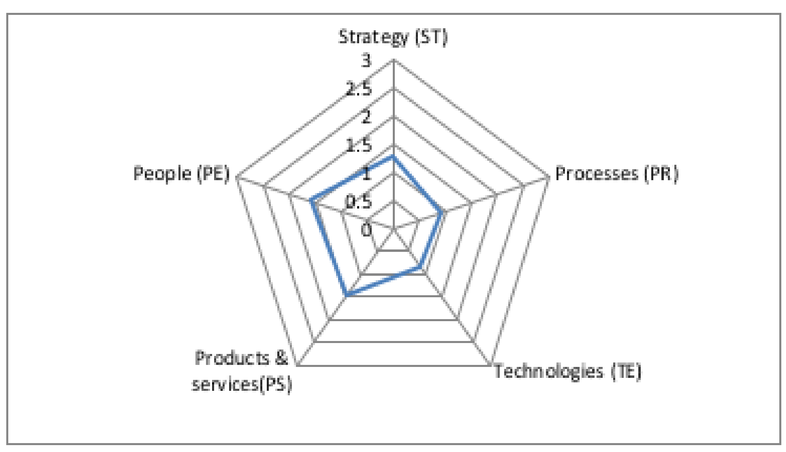
Quantitative analysis
Measurements of interactions between operator and digital tools through specific tools and software

Lab Indu Results

Overall Maturity Level (OML)

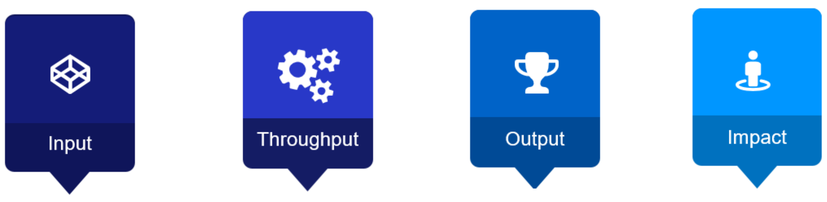


$$Overall\ Maturity\ Level\ (OML) = \frac{ST + PR + TE + PS + PE}{5} = \frac{1{,}36 + 0{,}96 + 1{,}1 + 1{,}05 + 1{,}69}{5} = 1{,}23$$



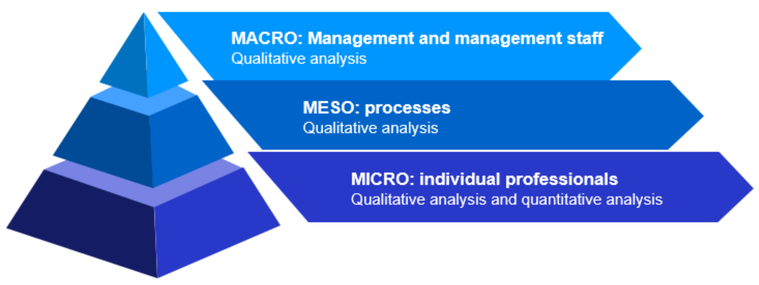
	Limit values	
Maturity level	**Low**	**High**
Level 0: Absence	0.0	0,75
Level 1: Novice	0,75	1,5
Level 2: Intermediate	1,5	2,25
Level 3: Expert	2,25	3

Some indicators



% HR expenses for digitization	% digitized business processes	N. Services created thanks to digitization	% work time with digital interactions

Lab San Results



Some indicators

Number of specific professional resources dedicated to the topic of digitization	% tempo di lavoro con interazioni digitali	Time for the human relationship with the patient	N ° new products / services created thanks to digital

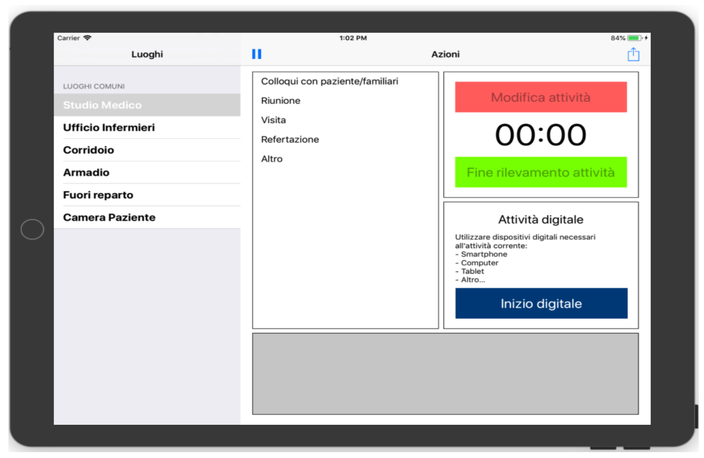
Qualitative analysis:

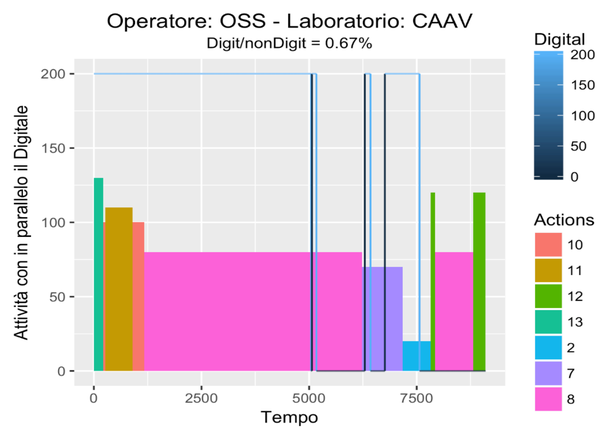
Focus groups and semi-structured interviews. identified:

- Digitization process
- Favoring factors
- Unfavorable factors
- Organizational aspects
- Report - Communication
- Indicators

Quantitative analysis:

Specific software to detect interaction between operator and digital tools.





Results

The awareness of the opportunities and risks of digitization is already at good levels. The technological equipment is generally good even if not all technologies on the market are present. Different sectors require different measurement and analysis approaches.

Readiness degree of digitization

There is certainly still a lot of empirical work to do in terms of measures to demonstrate the relevance and validity of the effects and impacts expected from digital technologies.

Use and diffusion degree of digitization in the cases analyzed

The few cases analyzed show us that could be improved the absorption capacity of digital technologies and the opportunities related to differentiated use and diffusion.

Work's impact

The cases analyzed are insufficient to draw significantly and general conclusions.

Lab Indu:

The lab-indu shows that much remains to be done in term of internal development of important skills for the future and also in workplaces organization (Smart Working, etc.)

Lab-san:

Somes reticences are linked to the risk of "dependence" on electronics and information technology and the risk of focusing on the use of digital technologies instead of taking care of relationship with the patient/family. Some people have also indicated an increase in workload. The remote access to information allows flexible access to data but also generate confusion between work and private life.

Why monitoring is important (indicators)

The few observations/cases allow us only to make hypotheses on future impacts. Since there is not yet a system of indicators to measure the phenomena of digitization. We believe in the importance of monitoring and we are aware that indicators must be continuously improved. This improvement could result in a large scale applicable model for the use of companies/organizations for their innovation strategies, but also for institutions (training, business associations, ...) for their policies.

Contact information

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