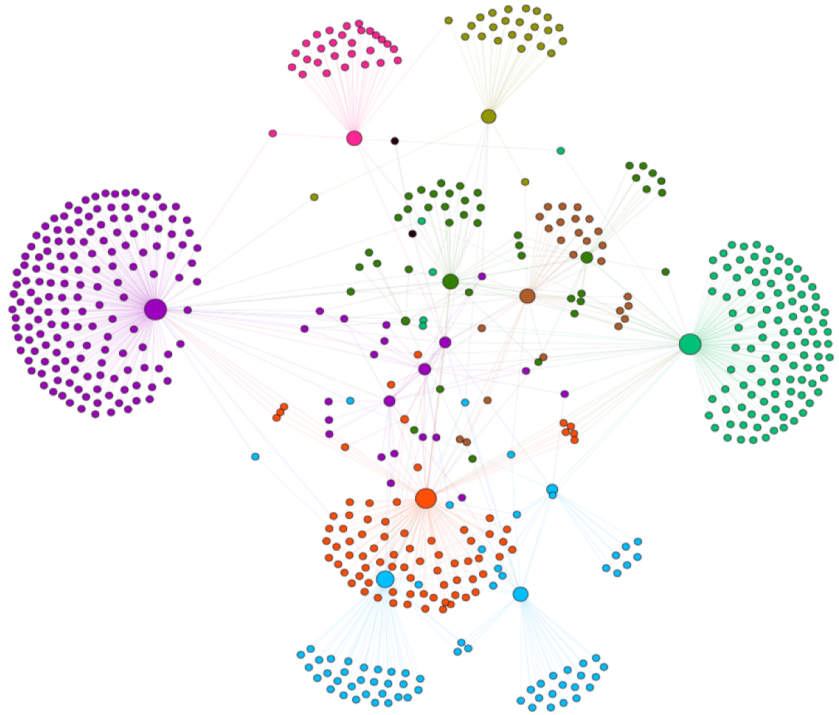


SOFT SKILLS OF THE FUTURE

A HETEROUGENOUS APPROACH BASED ON DATA MINING TECHNIQUES

ELENA COLI

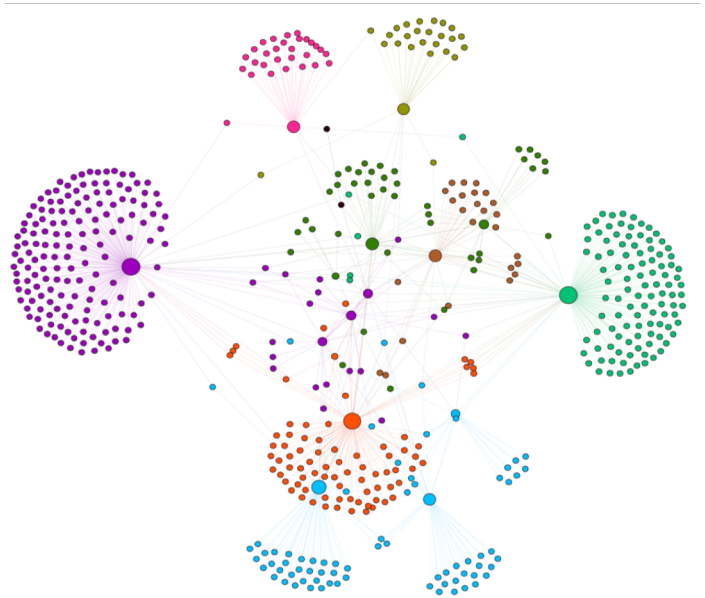
INTRODUCTION

METHODOLOGY

RESULTS

CONCLUSION

INTRODUCTION



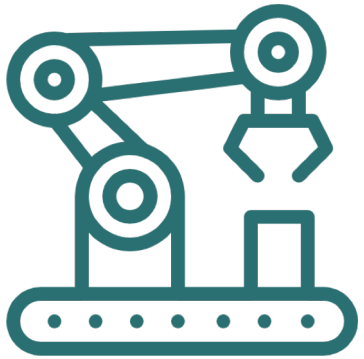
THE FOURTH INDUSTRIAL REVOLUTION

Global
Scope

Exponential
Growth

Certain
Impact

Caddel Last, (2016): "Global commons in the Global Brain"



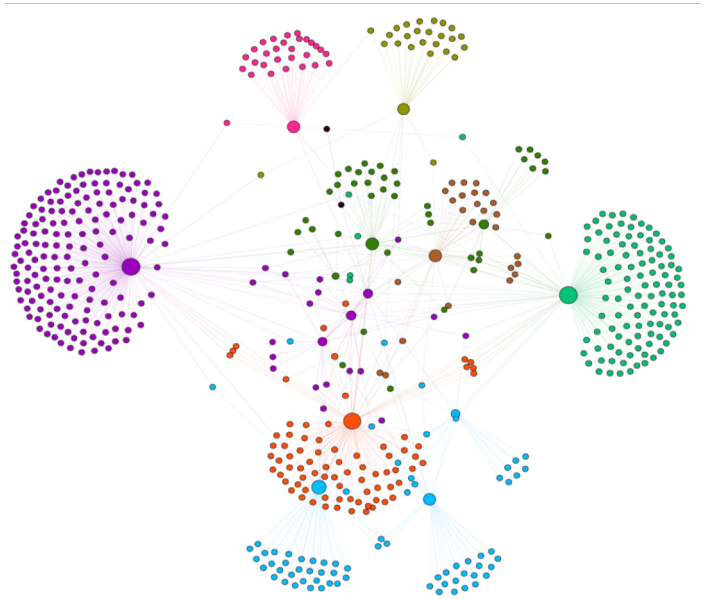
Substitution of **specific workers** by automated systems

Increase of **existing workers' competences**

Emersion of **new Job Profiles**

Soft Skills are a set of **non-technical** skills and knowledge that support effective participation at work. They are not specific to the type of work and are strongly related to the **qualities** and **personal attitudes**, **social skills** and **management**. Because of their intangibility, some of these capabilities are difficult to quantify, recognize, evaluate and develop.

METHODOLOGY

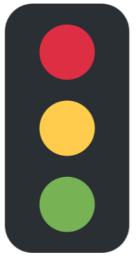


METHODOLOGY

Soft Skills Extraction

Soft Skills Cleaning

Dictionary Construction



Classification of Ambiguity and skill reformulation

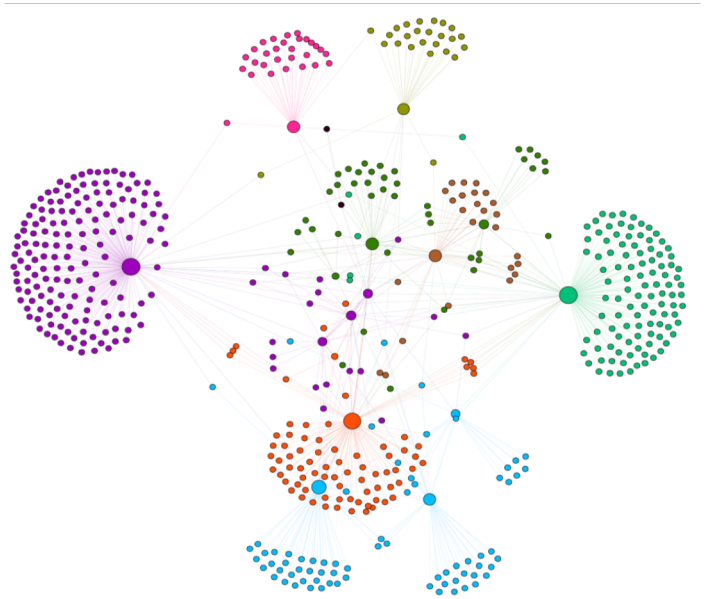
First Soft Skills 4.0 Ranking Definition

Context Analysis

Human Corrective Factor Definition

Final Soft Skill 4.0 Ranking Definition

RESULTS



RESULTS

TRAFFIC LIGHT LOGIC TAGGING
Abstraction
Active Learning
Active Listening
Adaptability
Address Complexity
Altruism
Ambiguity Tolerance
Analytical Thinking
Attention to Detail

Some soft skills were reformulated, mainly using **synonims** for non-polysemic ones and **stemming** for polysemic ones, in order to increase the recall. Sometimes **the search field of the papers was narrowed** in order to increase the accuracy.

RESULTS

TITLE-ABS-KEY(*“skill to be searched"* **AND** (“skill*” **OR** “abil*” **OR** “compet*”) **AND** ("second machine age" **OR** "fourth industrial revolution" **OR** "digital age" **OR** "digital economy" **OR** "industry 4.0" **OR** "cloud computing" **OR** "automation" **OR** "internet of things" **OR** "cyber-physical systems" **OR** "big data”))

ORIGINAL SKILL	SCOPUS OCCURRENCE
Instructing	1885
Planning	1757
Decision Making	1520
Innovation	1281
Visualization	1259
Reliability	1145
Flexibility	1101
Networking	795
Programming	597
Precision	588
Problem Solving	548

RESULTS

First Level Context Analysis on Keywords

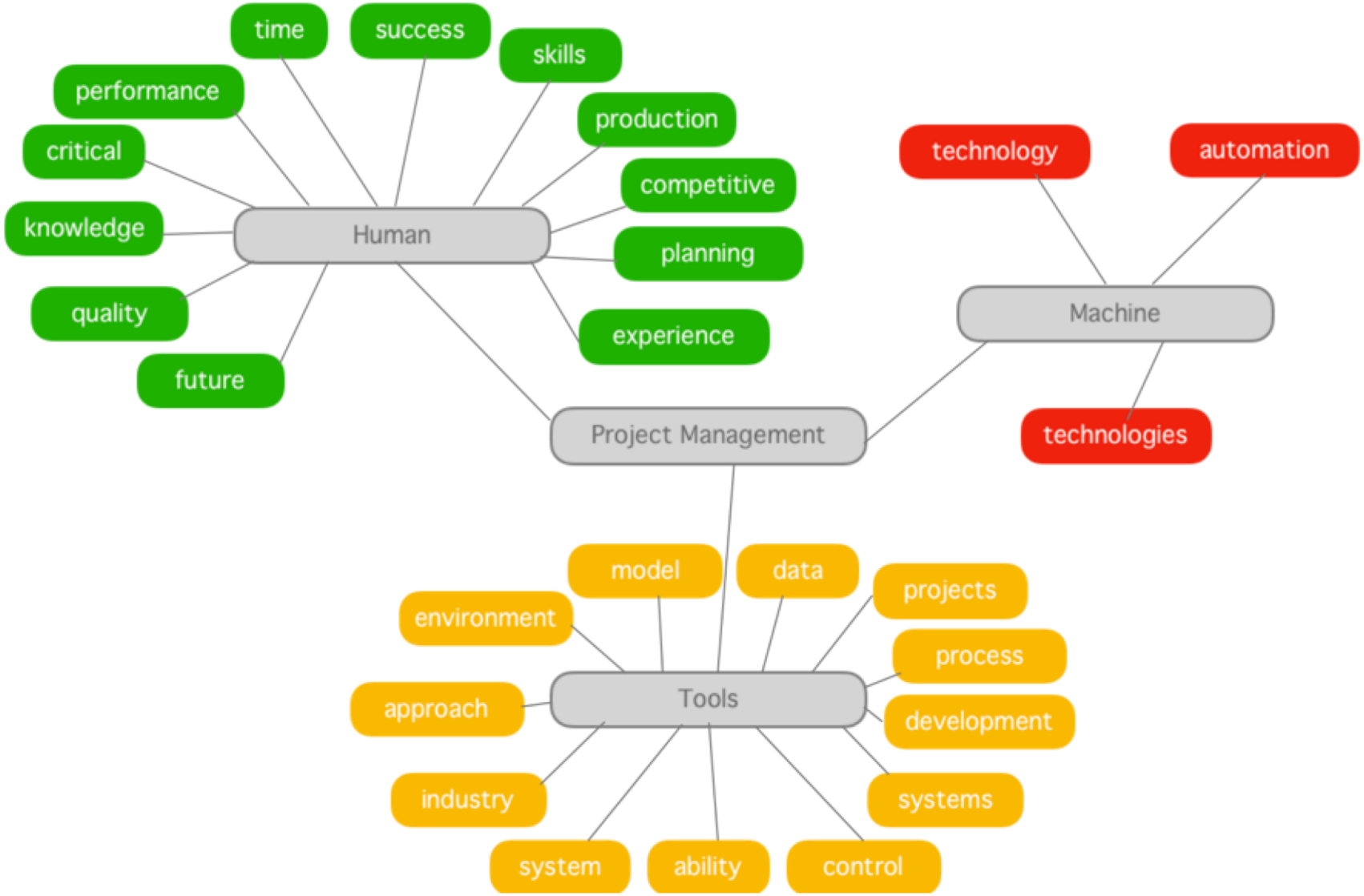
	df_stem	n	tag
1	autom	14	M
2	big data	10	M
3	cloud comput	9	M
4	simul	5	M
5	knowledge manag	4	H
6	optim	4	H
7	product	4	H
8	systems integr	4	M
9	cad	3	M
10	engineering manag	3	H

Second Level Context Analysis on Abstracts

	project_management	tag
process	0,99	T
development	0,99	T
projects	0,99	T
automation	0,989	M
ability	0,989	T
control	0,989	T
technology	0,988	M
systems	0,988	T
competitive	0,988	H
time	0,988	H
skills	0,987	H
technologies	0,987	M
industry	0,987	T

The relation between the soft skills and human competence **was quantitatively evaluated**, in order to attribute a human or a machine label to each soft skill.

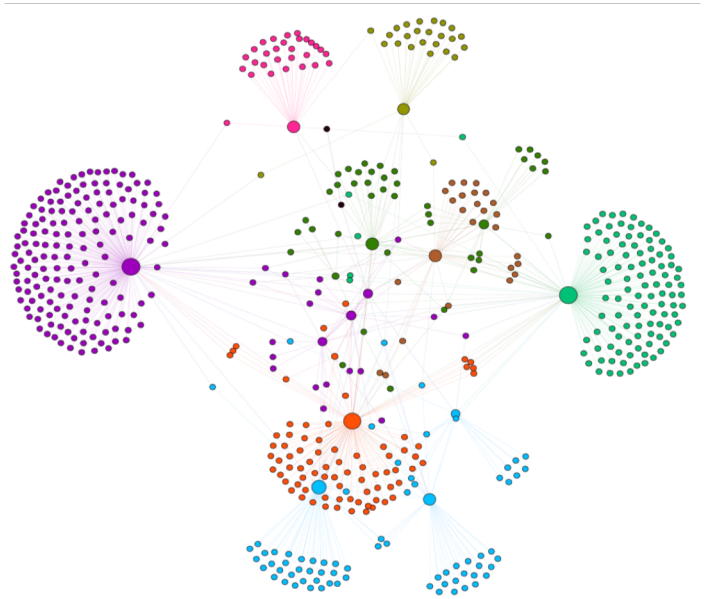
RESULTS


time
success
skills
performance
production
critical
competitive
knowledge
Human
planning
quality
experience
future
technology
automation
Machine
technologies
Project Management
model
data
projects
environment
process
approach
Tools
development
industry
systems
system
ability
control

RESULTS

ORIGINAL SKILL	ORIGINAL OCCURRENCE	HCF	TAG	ABS	RELIABILITY
Visualization	1259	16%	M	422	HIGH
Monitoring	1677	26%	M	410	HIGH
Decision Making	1520	30%	M	308	HIGH
Instructing	1885	34%	H-M	304	HIGH
Networking	795	14%	M	290	HIGH
Planning	1757	34%	H-M	279	HIGH
Flexibility	1101	31%	M	205	HIGH
Reliability	1145	32%	M	201	HIGH
Precision	588	20%	M	177	HIGH
Innovation	1281	43%	H-M	90	MEDIUM
Respect	446	30%	M	88	MEDIUM
Initiative	395	28%	M	85	MEDIUM
Expertise	365	27%	M	84	MEDIUM
Reasoning	390	30%	M	77	MEDIUM
Systems Analysis	429	36%	H-M	61	MEDIUM
Abstraction	235	25%	M	59	MEDIUM

CONCLUSION



CONCLUSION

Automation of Human-Machine Tagging Process

Use of **additional sources** to improve the methodology

Identification of **resilient/obsolescent Job Profiles**

CONTACTS

Thank you for your attention!

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