



UNIVERSITÀ DEGLI STUDI DI PADOVA
Dipartimento di tecnica e gestione dei sistemi industriali



Tesi di Laurea

*Gestione della forza lavoro over 55 in Dab Pumps S.p.A:
analisi e definizione della roadmap*

Relatrice

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Correlatrice

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Laureanda

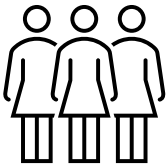
Giulia Caprari

THESIS OBJECTIVES

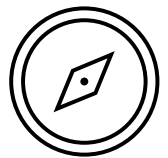


Defining a **strategic roadmap**

for managing
workforce aged 55 and above



in a real context of a
manufacturing company



using the **MAIA framework** and
the **ISO:25550**.



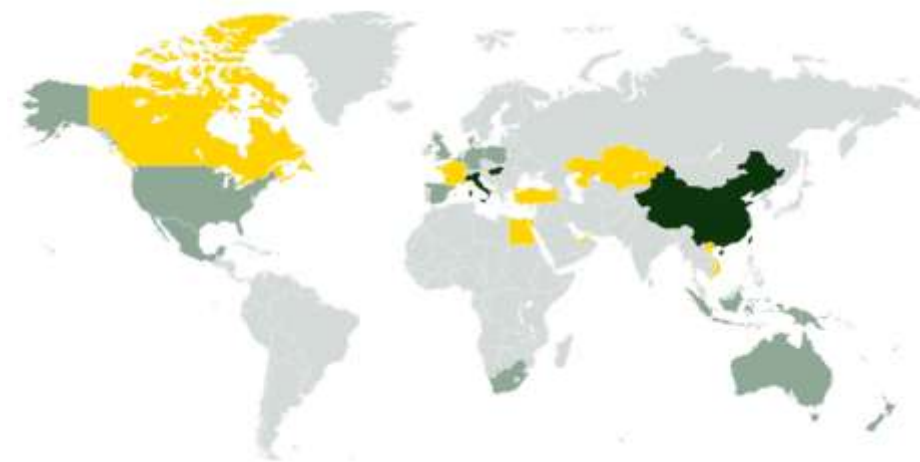
ISO 25550



DAB Pumps S.p.A.

DAB Pumps is a manufacturing company active in the field of technologies for the water handling and management.

HEADQUARTIER: Mestrino (PD)



**RESIDENTIAL
BUILDING SERVICE**

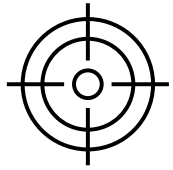


**COMMERCIAL
BUILDING SERVICE**



**AGRICULTURE
AND IRRIGATION**

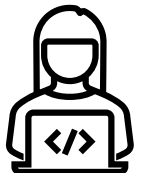
TARGET ANALYSIS



**Workforce aged 55
and above**



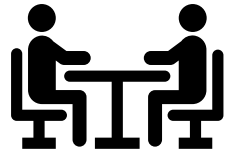
BLUE collars



WHITE collars

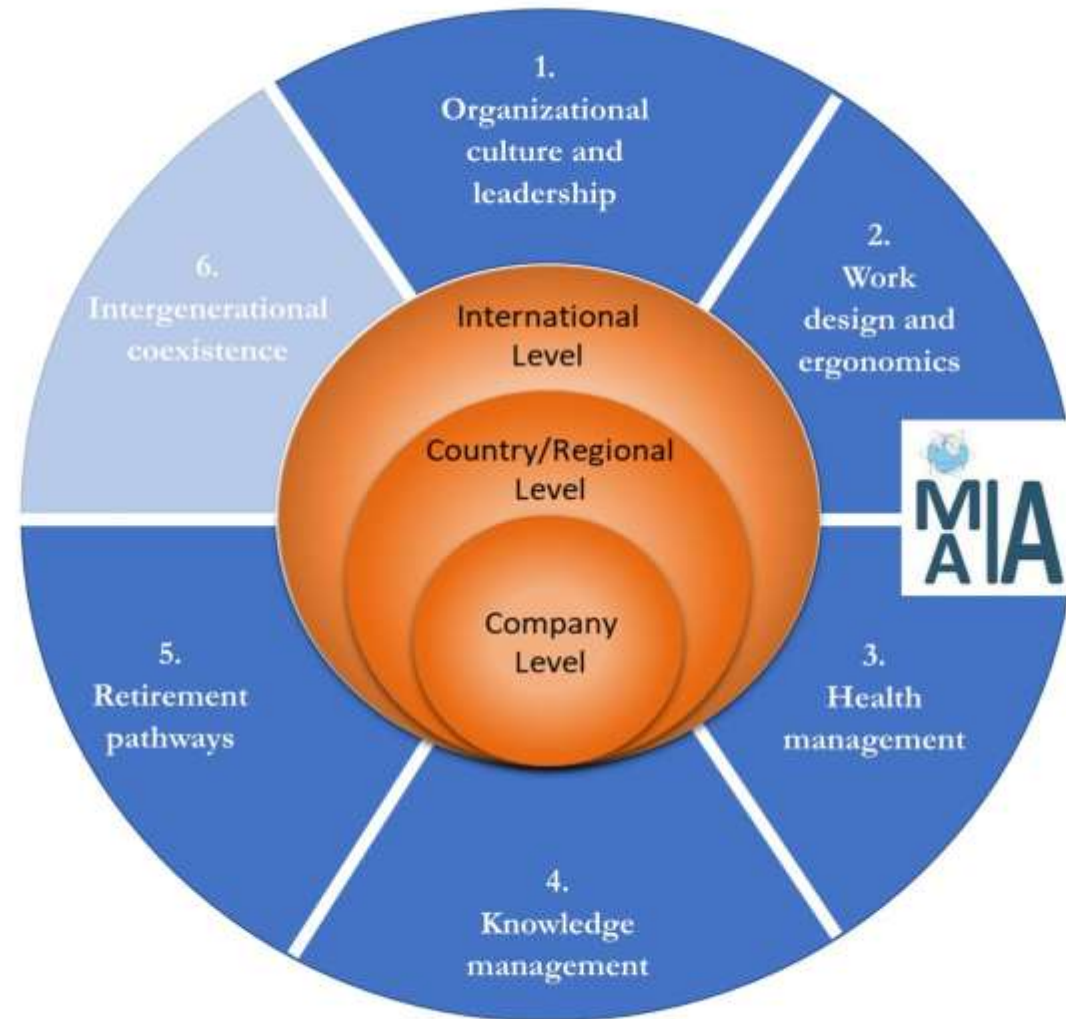


METHODOLOGIES

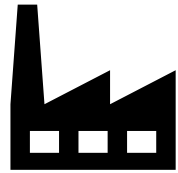


Unstructured Interviews

- HR Business Partners
- Head of functions
- Foremen
- Some operational workers



METHODOLOGIES



Ergonomics assessment

- Simplified NASA-TLX survey
- Ergonomics risk assessment through RULA & REBA methods

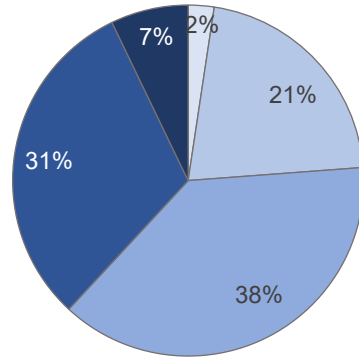
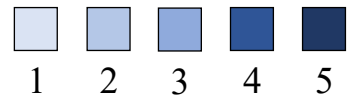




Simplified-NASA SURVEY



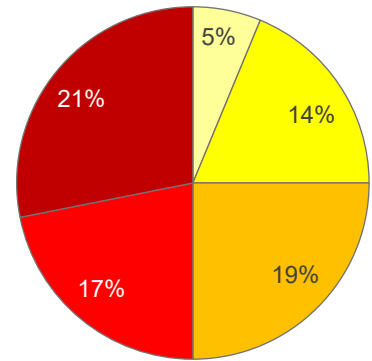
How much **PHYSICAL ACTIVITY** is required?



42 WORKERS

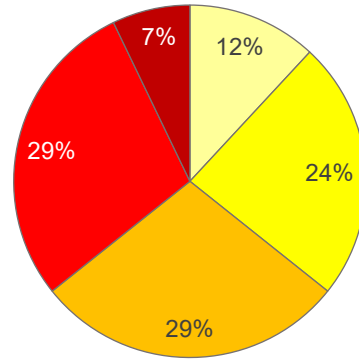


How much do you feel **PHYSICAL STRESS** after/during task performance?



32 WORKERS

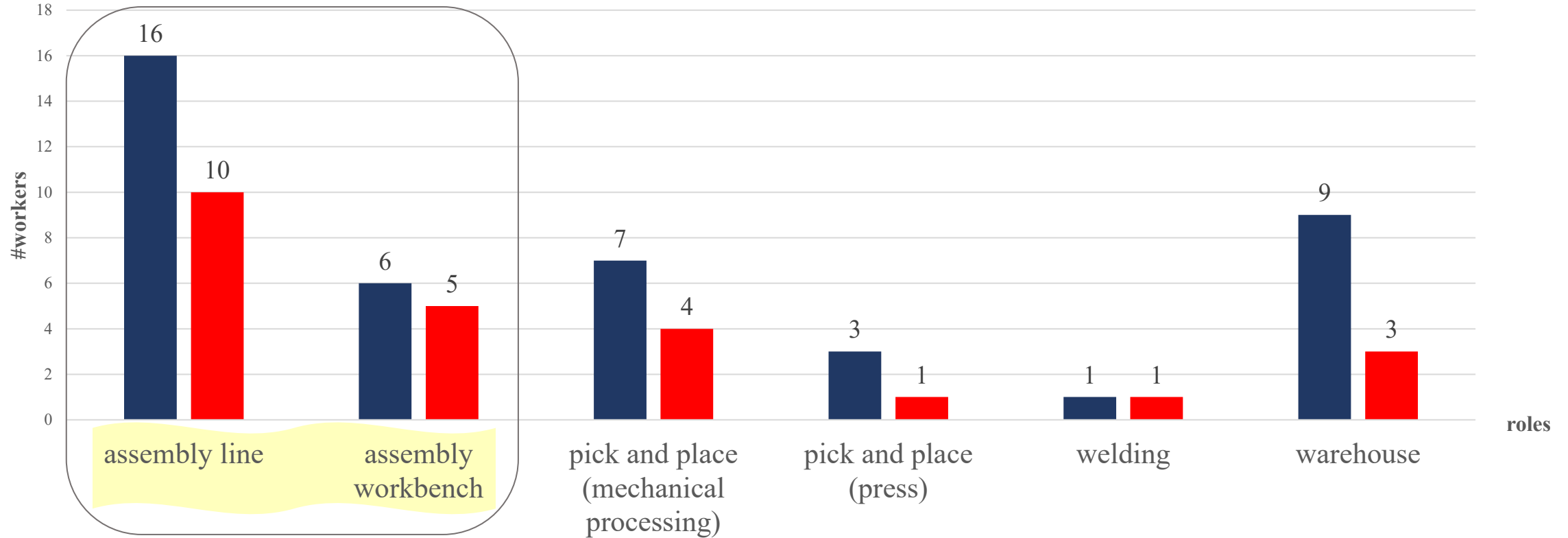
How much do you feel **MENTAL STRESS** after/during task performance?



42 WORKERS

ROLES

Physical activity (3,4,5) & Physical stress (3,4,5)



#workers = 42

#all workers

#workers [Physical activity 3, 4, 5 & Physical stress 3, 4, 5]

ERGONOMIC RISK ASSESSMENT: RULA METHOD




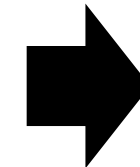
Manipulated object	 Mass = 5,5 lbs
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TABLE A: arm and wrist		
Step 1: upper arm	1+1-1	1
Step 2: locate lower arm	2	2
Step 3: locate wrist	2+1	3
Step 4: wrist twist	1	1
Step 5: SCORE in table A		3
Step 6: add muscle use		1
Step 7: add force/load		1
SUM OF SCORES		5

TABLE B: neck, trunk and leg	
Step 9: locate neck	3
Step 10: locate trunk	2
Step 11: legs	1
Step 12: SCORE in table B	3
Step 13: add muscle use	1
Step 14: add force/load	1
SUM OF THE SCORES	5



RULA SCORE
6

ASSEMBLY WORKSTATION

Motor casing + stator assembly



Postura	Tempo di postura [centesimi]	RULA score
P1	90	5
P2	80	4
P3	197	6
P4	135	6
P5	204	6
P6	120	7
P7	362	6
P8	362	4
P9	143	5
P10	150	4
P11	250	6
P12	200	3
P13	180	6
RULA SCORE medio pesato		5,2

Postura	Tempo di postura [centesimi]	REBA score
P1	90	5
P2	80	5
P3	197	6
P4	135	5
P5	204	5
P6	101	7
P7	362	7
P8	362	4
P9	143	6
P10	150	4
P11	250	5
P12	200	3
P13	180	4
REBA SCORE medio pesato		5,1

4. KNOWLEDGE MANAGEMENT



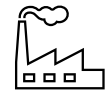
**24 INTERVIEWS
to the heads of function**

to investigate which are the critical roles

R&D (8)



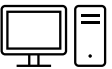
Operations (6)



Marketing & Sales (5)



IT (2)



HR (2)






Finance (1)

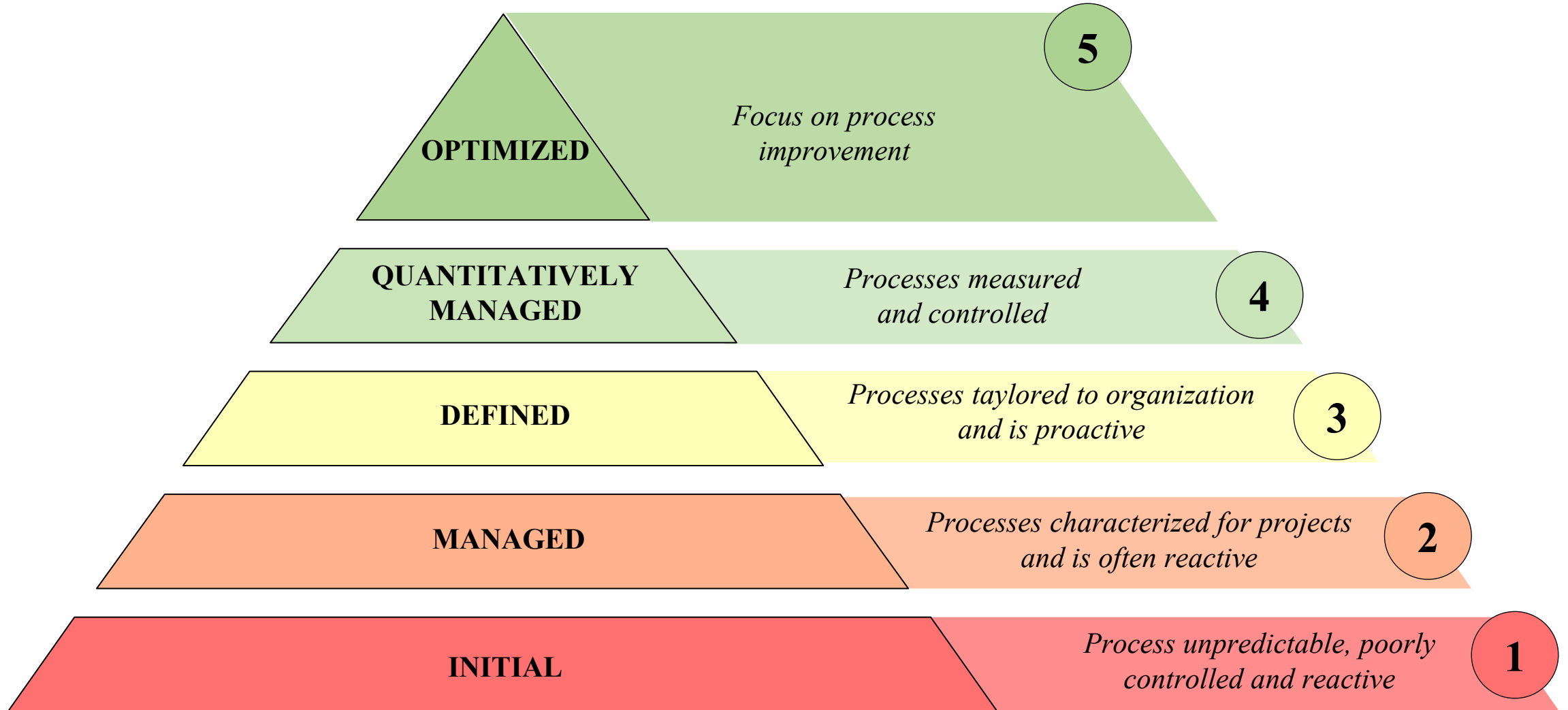


CRITICAL ROLES



LEGEND:
 - Ageing worker
 - Young worker
 - No worker for now

	FUNCTION	ROLE
	R&D	Plastic injection molding expert
	R&D	Electronic engineer
	R&D	Hardware engineer
	R&D	Mechanical designer
	R&D	Patents expert
	R&D	Product encoding expert
	R&D	Fluid-dynamic simulations engineer
	Operations	Electronic process engineer
	Operations	Press foreman
	Operations	Plant manager
	Operations	Maintainance coordinator
	Marketing & Sales	Sales manager
	Marketing & Sales	Sales manager

MATURITY MODEL



Active Ageing Workforce through MAIA project and ISO 25550

 = Operational worker
 = Office worker

Strategic domains

WORK DESIGN and ERGONOMICS

Support the operator through the physical and mental effort.

HEALTH MANAGEMENT

Take care about the worker health and facilitate him in its management in private life.

ORGANIZATIONAL CULTURE and LEADERSHIP

Create a safe and age-friendly environment where ageing workers can do their best with the effect of being proud of themselves and being valuable for the company.

KNOWLEDGE MANAGEMENT

Implementing methods to create a flow of knowledge through the generations in the company.

RETIREMENT PATHWAYS

Make a plan for the last period of the worker's career to have an appropriate and simple transition both for the worker and the company.

Operative actions suggested

Worker's involvement in job assessment (3)

Role of mentor / trainer (1)

Planning job rotation (2)

Postural training courses to increase the awareness about ergonomics importance (1)

Assistive technology (3)

Planning job rotation (2)

Health extra screening (1)

Health promotion programs and activities to encourage workers to take care of their health (2)

Improving the environment working conditions (2)

Worker's involvement in job assessment (2)

Reward based program (2)

Raising workers awareness about their abilities (2)

Encouraging and providing continuous learning paths (3)

Workshops to remove bias (1)

Enhancing mapping methods about knowledge (2)

Role of mentor / trainer (2)

Intergenerational meetings (3)

Mapping skills (soft and hard), criticality of the skill, retirement intentions (1)

Flexible time arrangements and work allocation (3)

Succession plan (2)

Reward based program (2)

Tools already applied in DAB

OCRA and NIOSH analysis

Friendly work tools:

- Ergonomic assembly line
- Kit area and focused positions for workers with limitations
- Hoists, pulley to unload the stress, tool to reduce wrist twisting, transpallet to adjust the height of the platform

Workers' involvement in risk analysis at different levels in various plants

ICAS / LYRA

Smart working

Time flexibility

DAB EHS procedures

Grundfos Olympics

Aptitude assessment tool: Saper, Saper essere, Saper fare

EMS annual survey

Agile intergenerational teams

Leadership Programmes

ProduttivaMente

Learning week

DAB Arena in Bientina plant

Skill matrix for blue collars

Teams channel for department

CRM recent adoption

Design review (R&D)

Agile reviews

Product development projects review

Communities of practices

Company tools: windchill, infor, talentia,...


If workers have 35 years of seniority they have an economic benefit

Occasional analysis and interviews to map the upcoming retirement intentions

Prize giving ceremony

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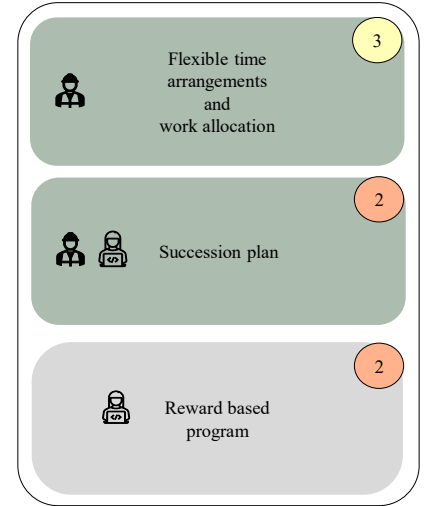
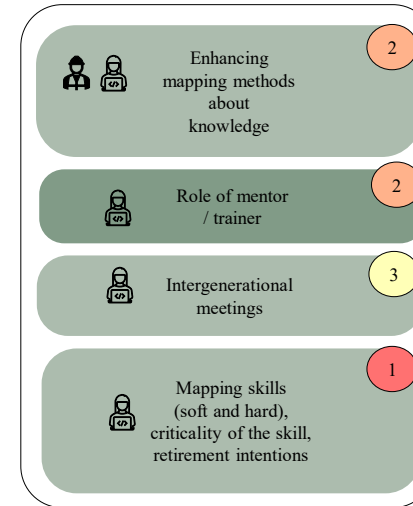
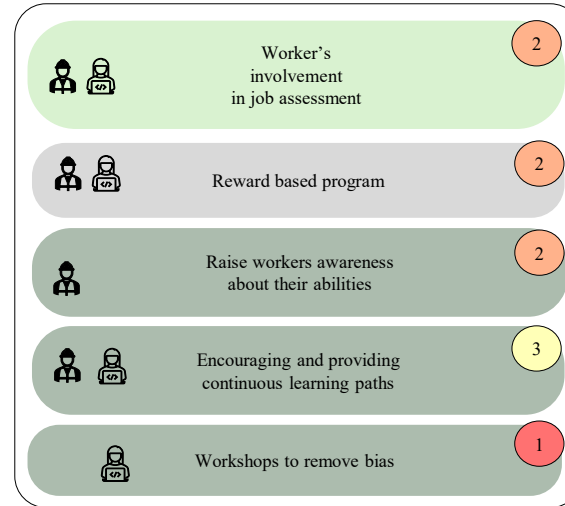
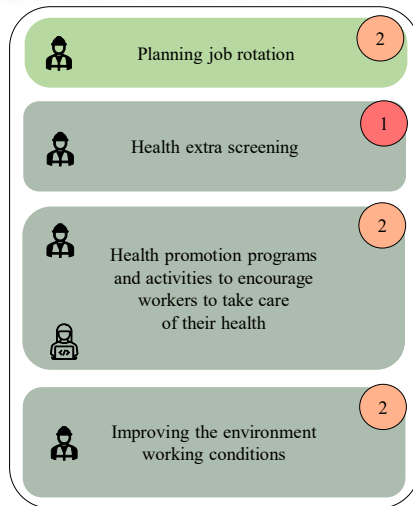
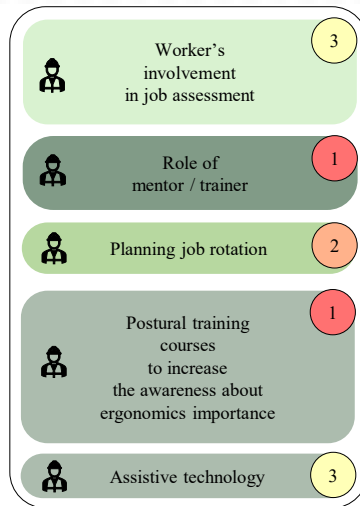
KNOWLEDGE MANAGEMENT

Implement methods to create a flow of knowledge through the generations in the company.

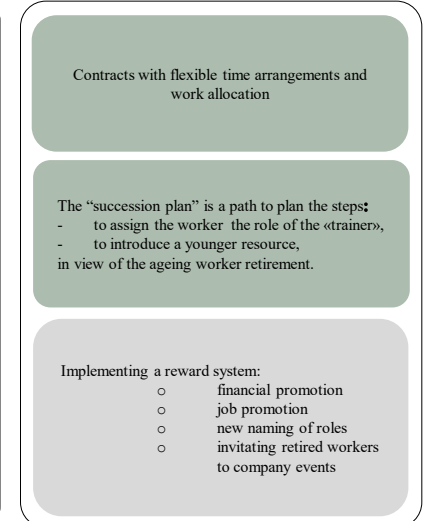
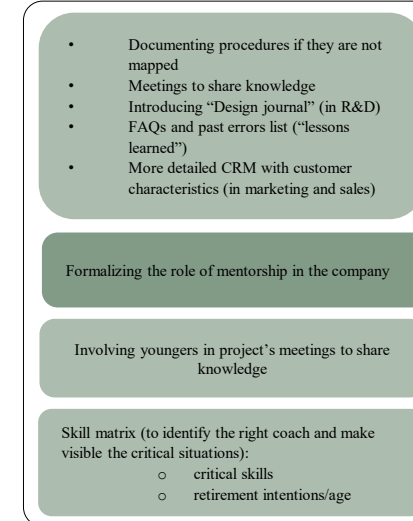
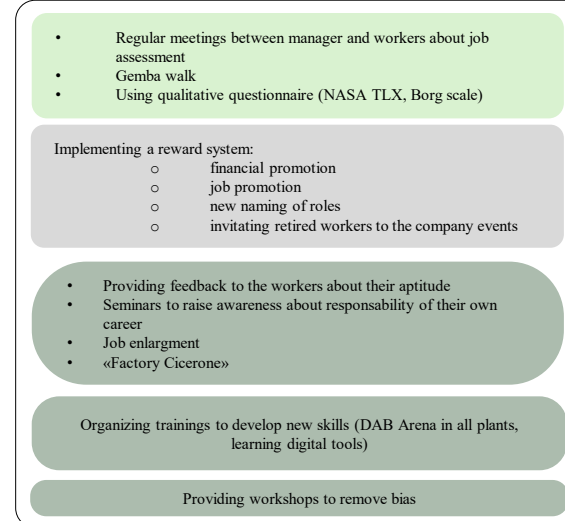
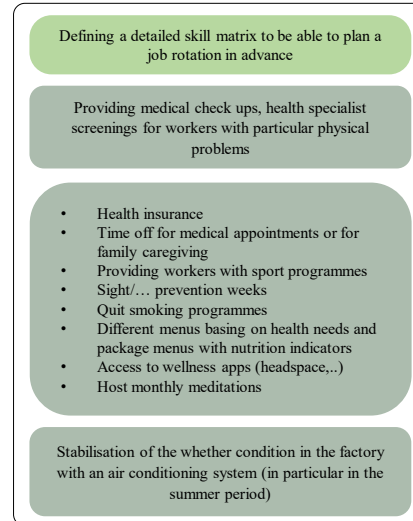
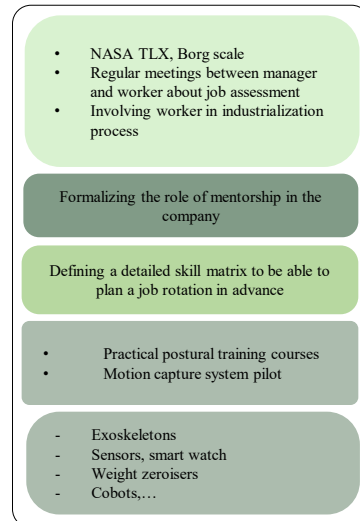
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Operative tools suggested



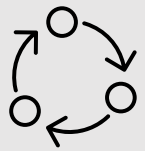
CONCLUSIONS



Centrality of the domain « Organizational culture and leadership »



Individualization relevance



Synergic effect between MAIA framework domains



Need for more specific guidelines for different industry sectors in view of the labor shortage

**THANKS FOR YOUR
ATTENTION**