ERGONOMICS in Early phase design in Industry

”ERGO 2018:

Human Factors in Complex Systems

and Environments” St. Petersburg 3.-7.7.2018

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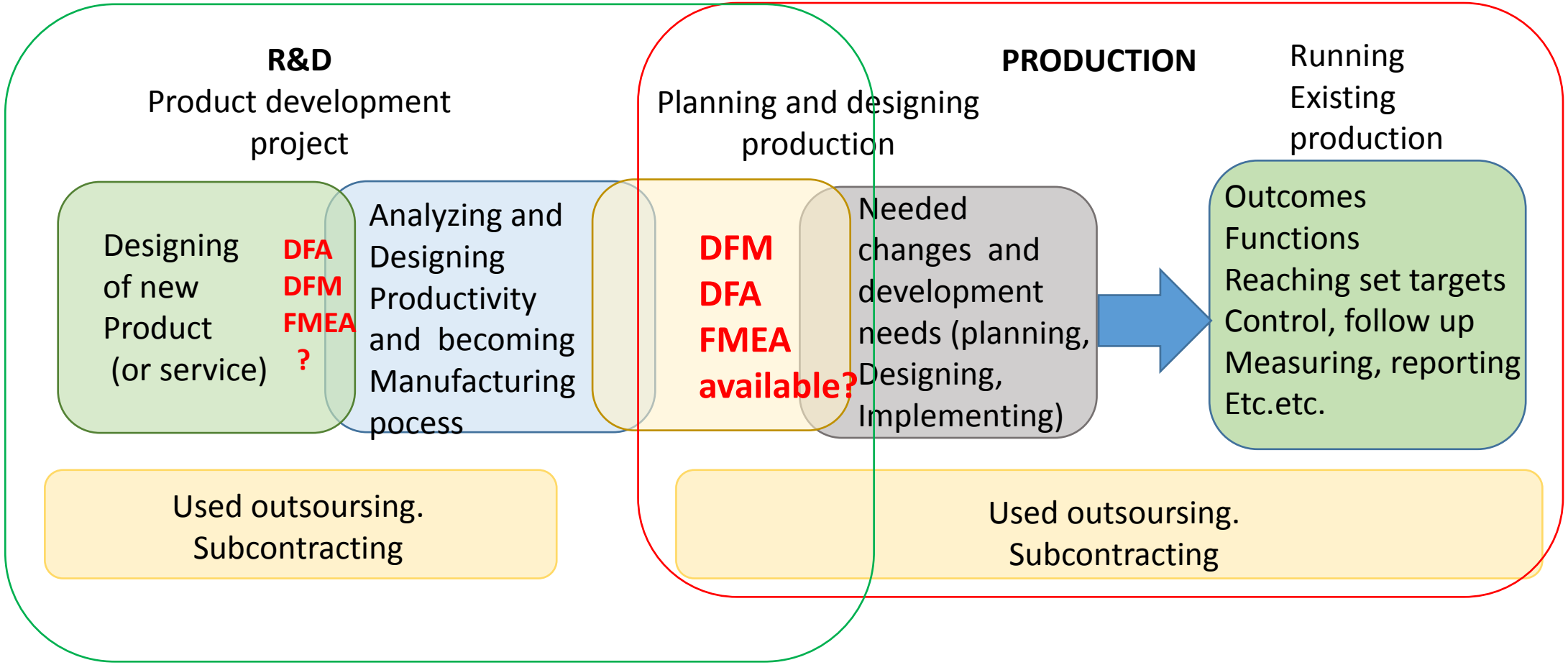
GUESTIONS TO BE ANSWERED

- What are the necessary conditions that are needed for doing ergonomics?
  - On National level?
  - On Company level?
- What are the differences in understanding of ergonomics between Ergonomists and enterprices in practice?
  - Research?
  - Management and designers at companies?
  - Education?
  - Consultants?
- Current status?
- Target?
- Actions to be done?

ERGONOMICS IN INDUSTRY?



PROACTIVE OR REACTIVE ERGONOMICS?

Engineering Science LOAD FACTORS OF WORK for Human

Medical sciences How Human(individual) is loaded

Engineering Design driven System Performance

Managing Maintaining Repairing

Occupational Healthcare Wellbeing driven, Work ability

System functionality approach

Individual / individual work activity approach

Proactive

Usability of given data, information at the customer. WORKPLACE!!!

Activities at the Companies "Practice" Capability? Results? Performance?

Reactive

Usability of given data, information at the customer. WORKPLACE!!!

NEEDED now and in the future

TODAY

ENGINEERING PRINCIPLES AND ERGONOMICS FIT TOGETHER → INDUSTRIAL ERGONOMICS

Definition of Industrial Engineering

- *"Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, equipment and energy. It draws upon specialized knowledge and skill in the mathematical, physical and social sciences together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems".*

Presented at ICEME 2011

Industrial Engineering Standards in Europe (The IESE Project)
http://www.iestandards.eu/

Funded by the Leonardo EU Program
Life Long Learning

IEA Strategy

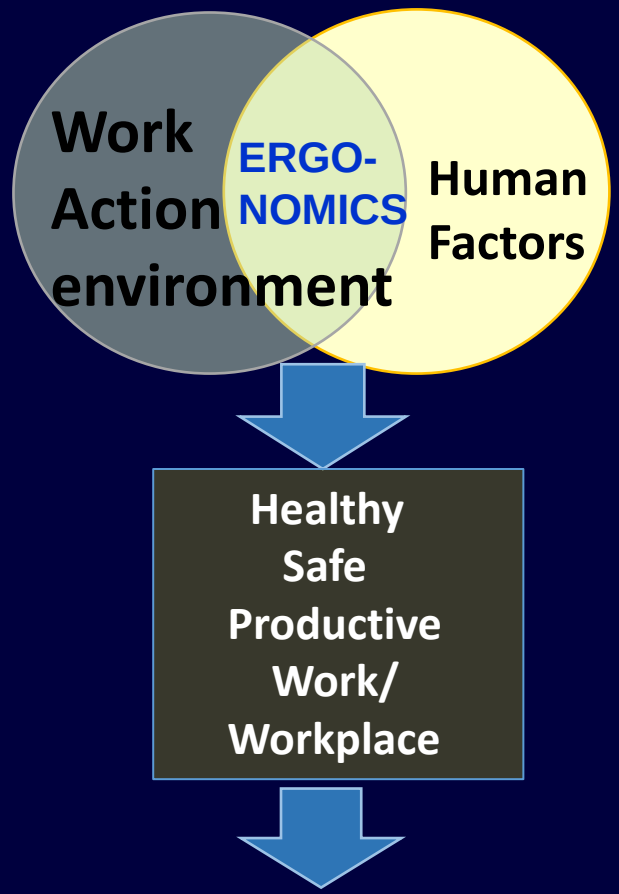
Ergonomics is a system approach, design driven and it has two outcomes Performance of the system and wellbeing

Science, theory, principles

HUMAN FACTORS + SYSTEM = ERGONOMICS

Focus on

- Product/ service
- Work /action
- Work environment
- Used methods, tools and technologies
- Set targets for the actions



Human Factors

In relation to:

- Action in focus
- Environment
- Used methods, tools and technologies
- Used methods
- Set targets

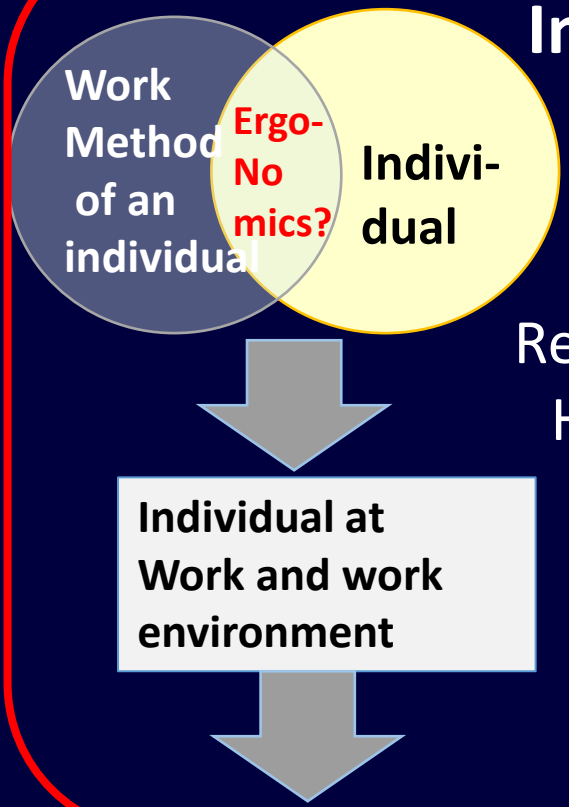
"Human Technology"

Physical
Cognitive
Organizational

Overall capability of the system

ACTIVITY IN TODAY….

The work in question
Work environment
Work tasks
Work methods
Requirements for the human
In the work in question
Set targets for the work
in the company
Capability of the company
to use ergonomics
Etc.



Individual character and capabilities

Suitability in the work in question
Way of acting in the work in question
Reaching the targets in the work in question
Health and safety at the work in question
Motivation and individual targets
Wellbeing at work
Etc.
Studying worklife through individuals

Using ergonomics science, theories and principles

NOT IN FOCUS

IN FOCUS

ERGONOMICS IN INDUSTRY IS AN IMPORTANT PART OF PRODUCTIVITY

Productivity

Shigeyasu Sakamoto

Method x **P**erformance x **U**tilization

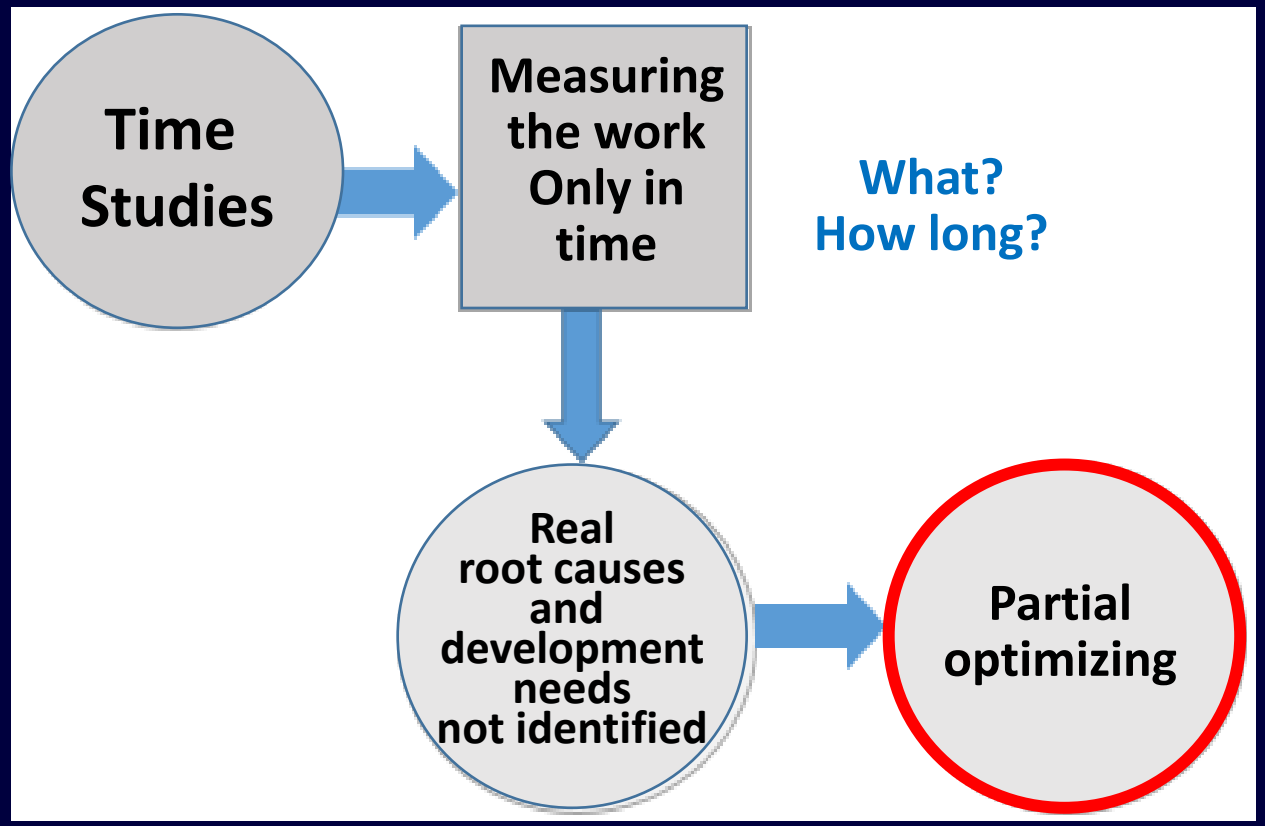
Work Method
How good?

Performance
How exclusive?

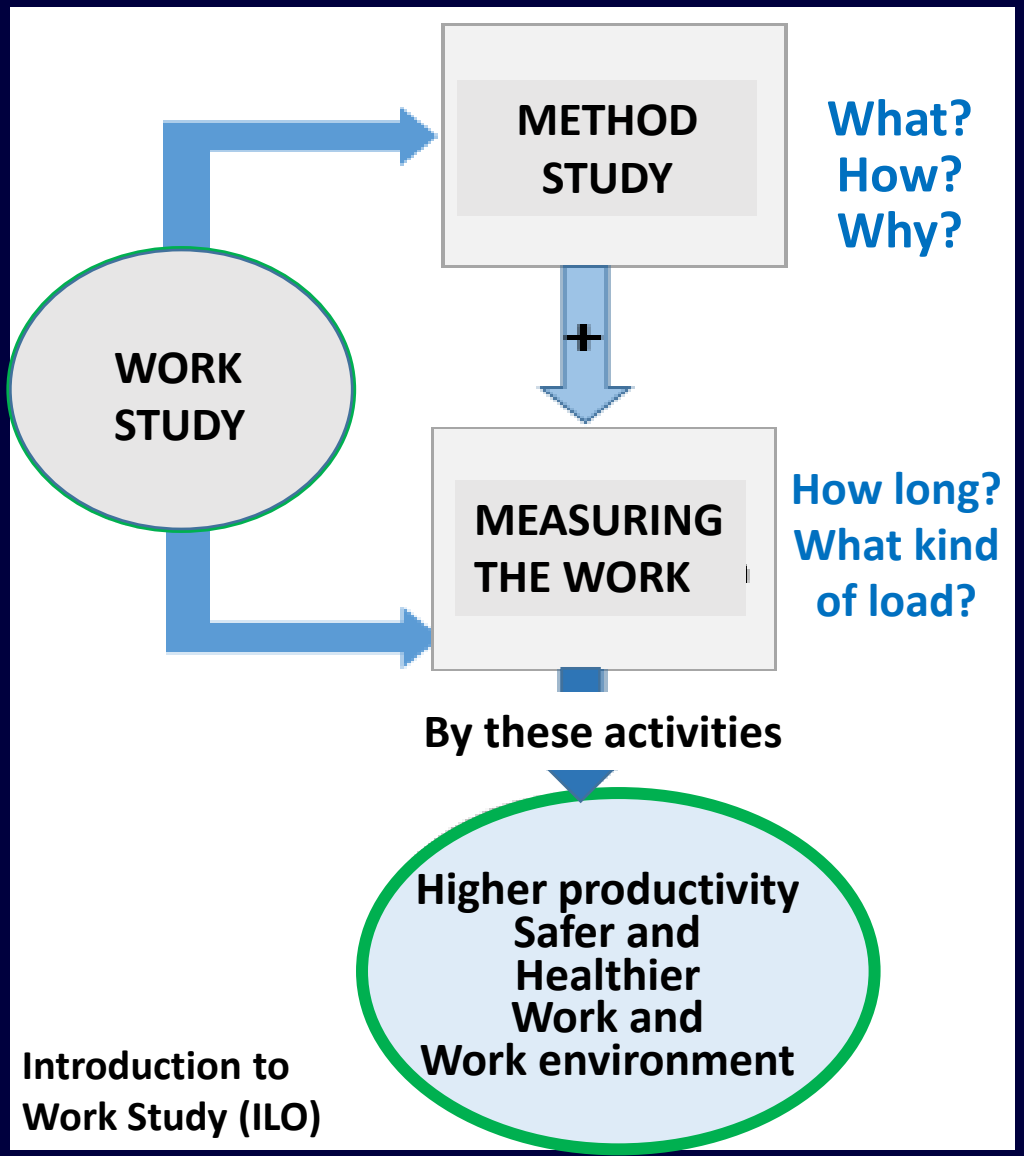
Utilization
How long?

TIME!!!!!

TIMESTUDIES OR WORK STUDIES?



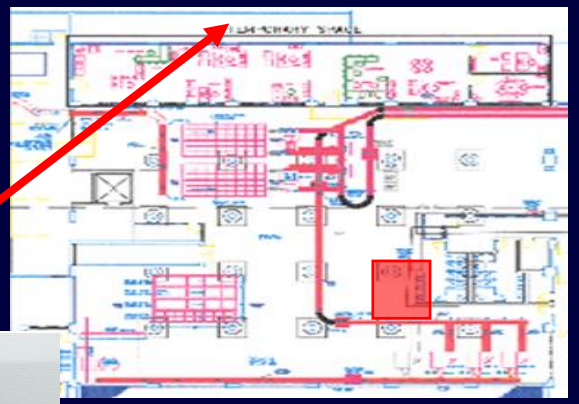
This it is what is done today



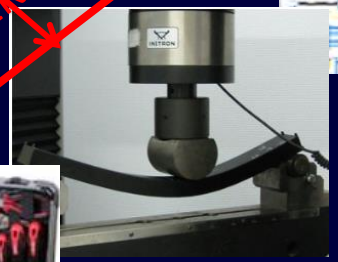
This it is what shall be done !!!!

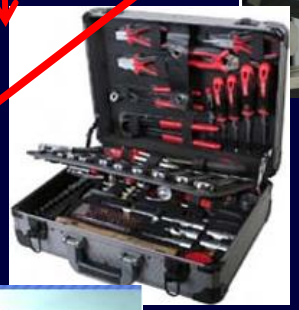
FROM PRODUCT TO WHOLE PRODUCTION

Different
Systems in connection to whole
System…



TRANSPARENCY





Production type in relation to product and used technologies and manufacturing methods in relation to set targets. Structures, functions, health, safety, productivity. Including supportive funktions Like cleaning, filling materials, conveying, repairing Etc.

MANUFACTURABILITY (DFM)

Used technologies, automaton, semiautomation, robotics, machines, Equipment, systems (SW) and methods for manufacturing and producing.

TECHNOLOGY DEVELOPMENT (NEEP)

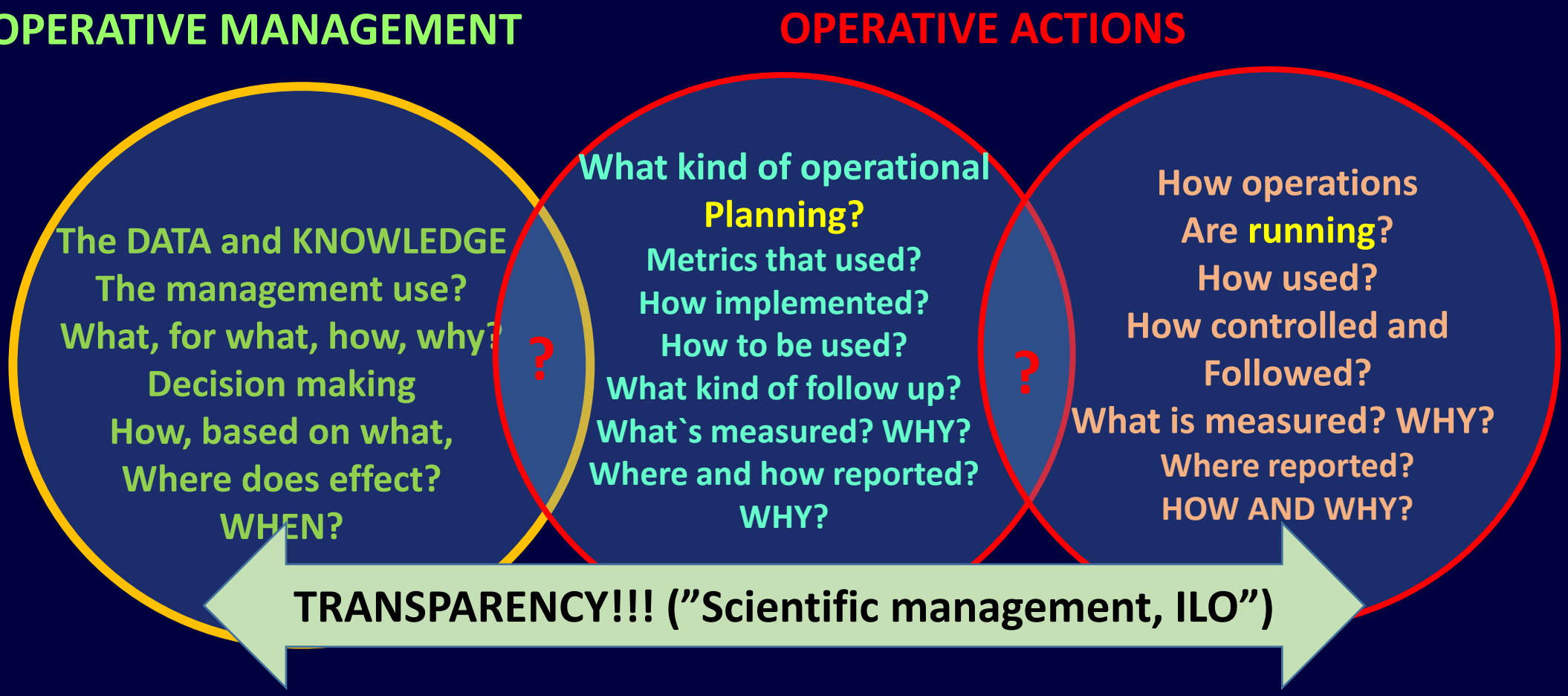
Product spesific tools, usability, safety, ergonomics, quality etc.

TOOL DESIGN (PSPHW)

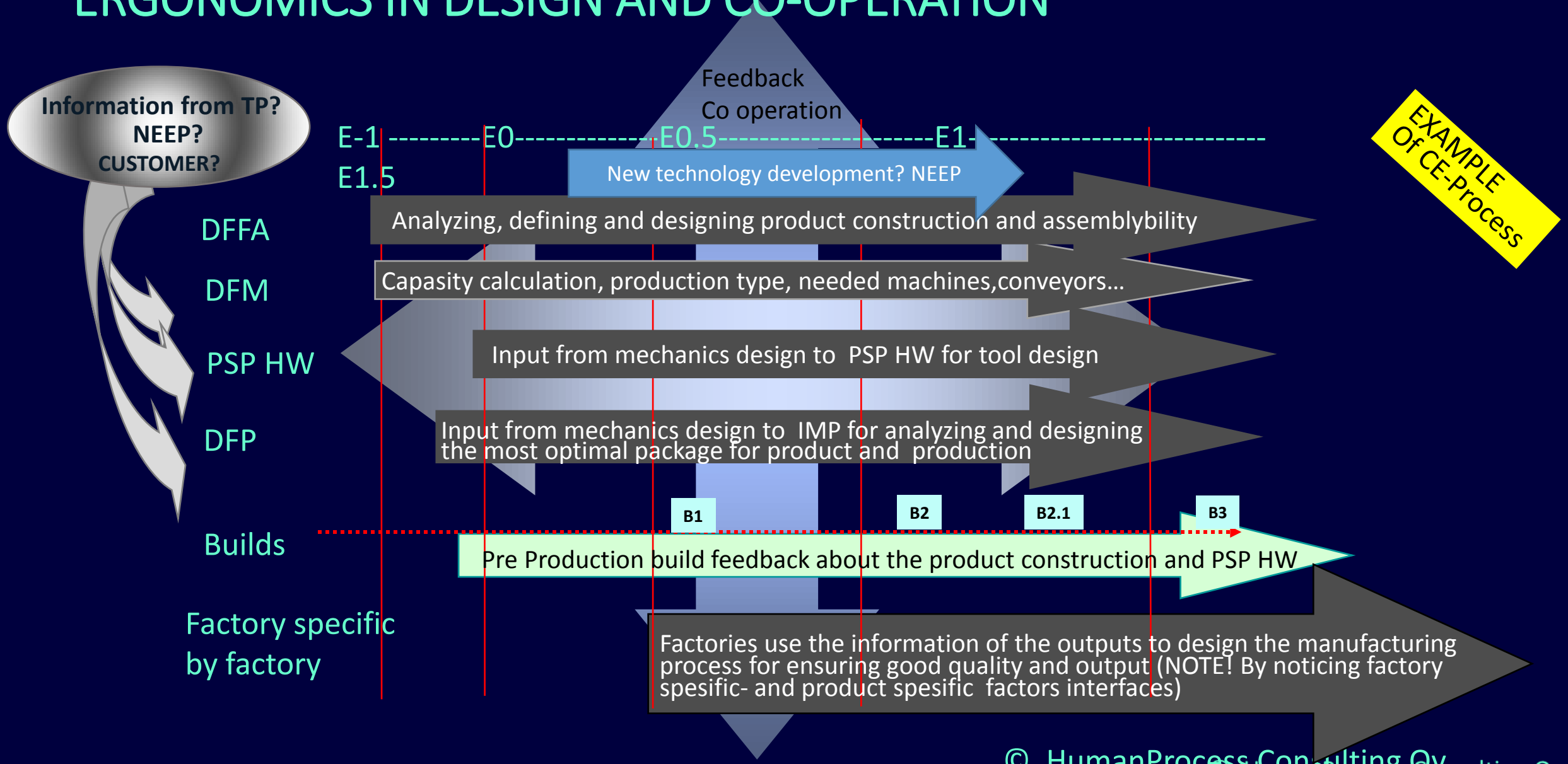
Product, materials, parts, assemblybility, assembly methods, handling of parts quality requirements etc. From human factors and productivity point of view.

PRODUCT DESIGN (DFA)

HUMAN BEHAVIOUR IS GUIDED BY THE STRUCTURES,SYSTEMS AND WAYS OF WORKING IN THE ORGANIZATION



SYSTEMATIC APPROACH IN ORGANIZATION IS THE BASE FOR ERGONOMICS IN DESIGN AND CO-OPERATION



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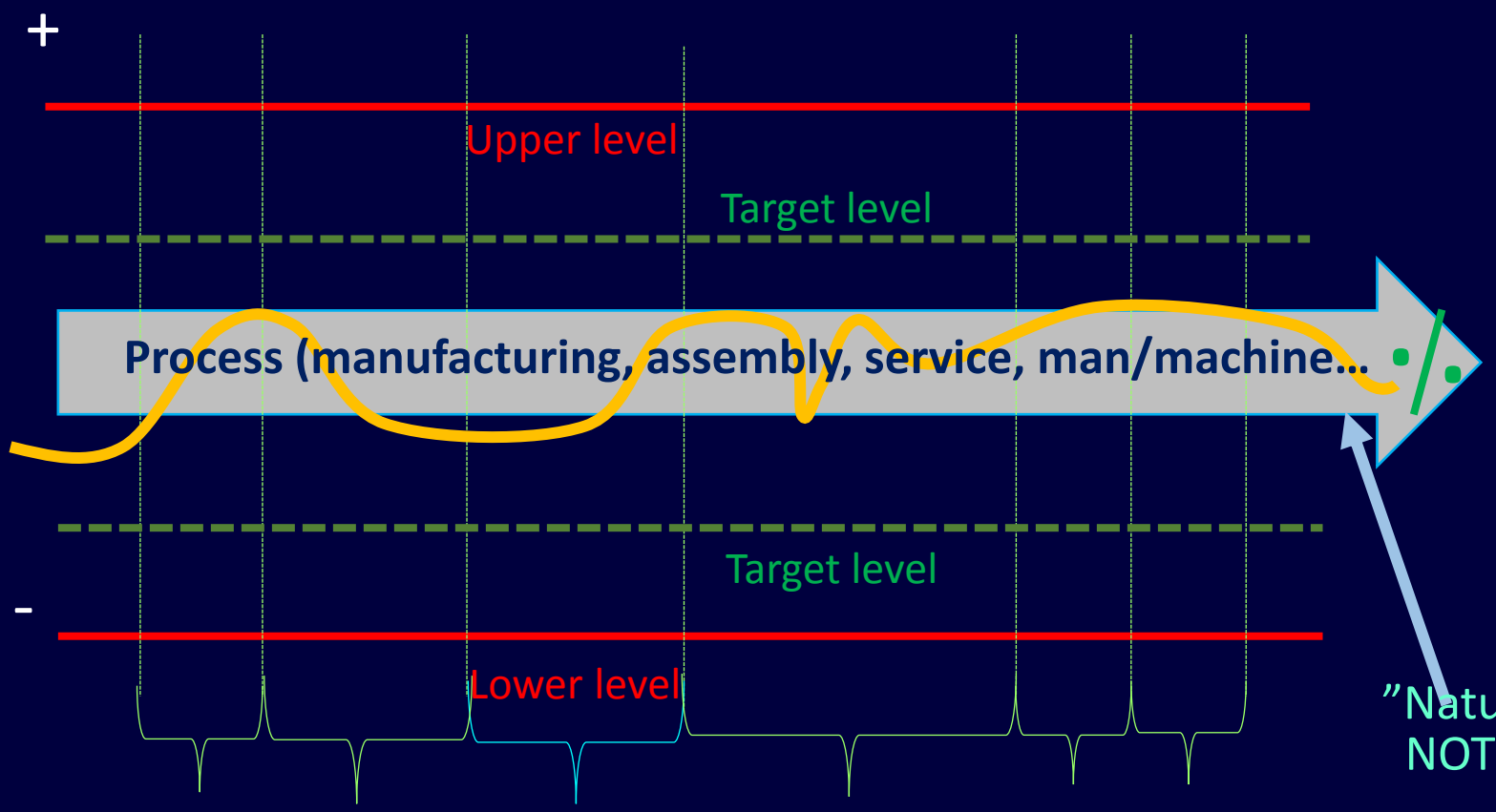
PERFORMANCE OF A PROCESS (SYSTEM)



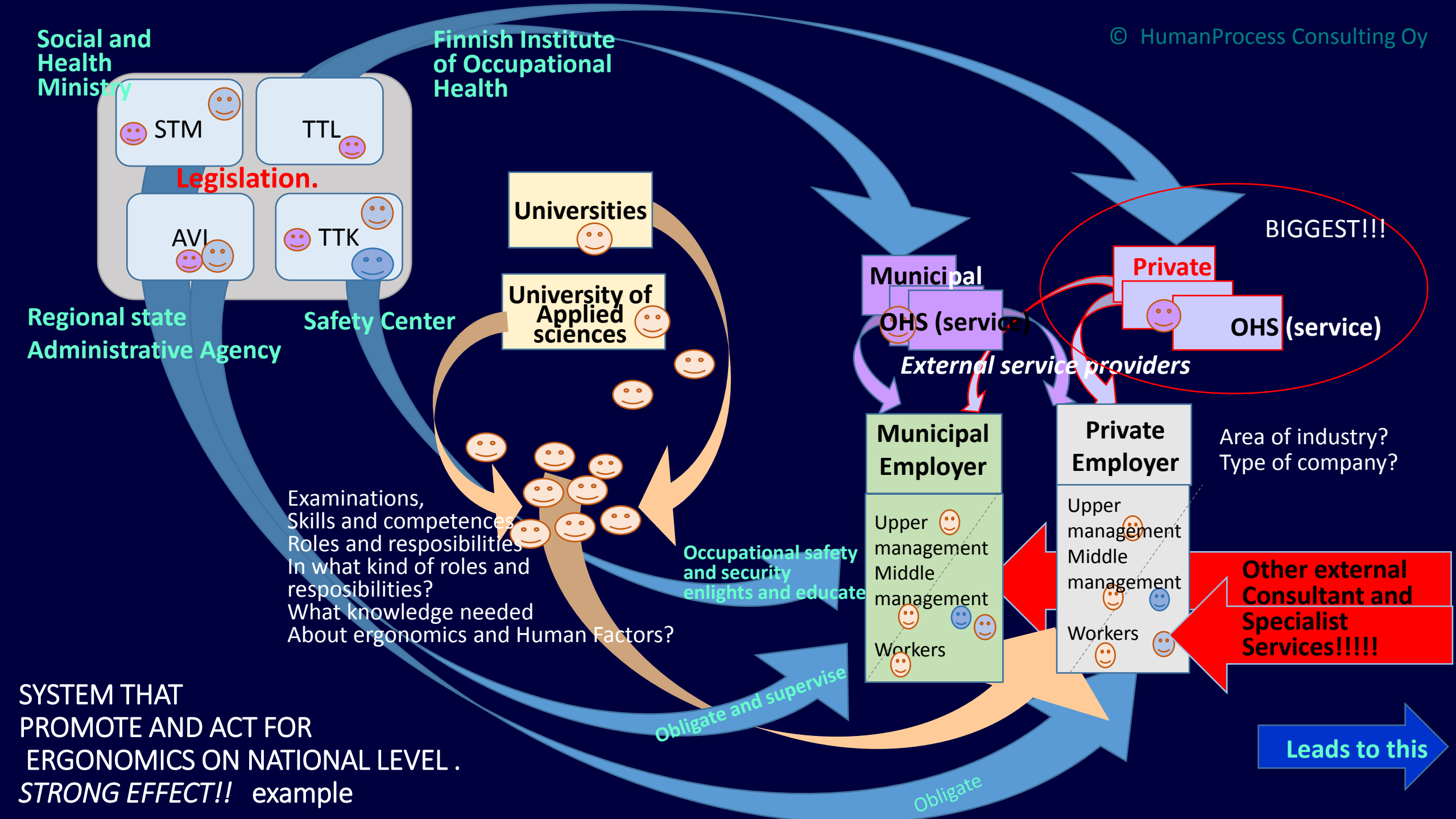
?

ENDRESULT
- .Reach set targets
- .Safe
- .Healthy
- .Productive
- Good quality

”Natural wobbling””
NOTE! Different than variation!!!

ARE HUMAN FACTORS INCLUDED IN NATIONAL LEVEL ACTIVITIES?

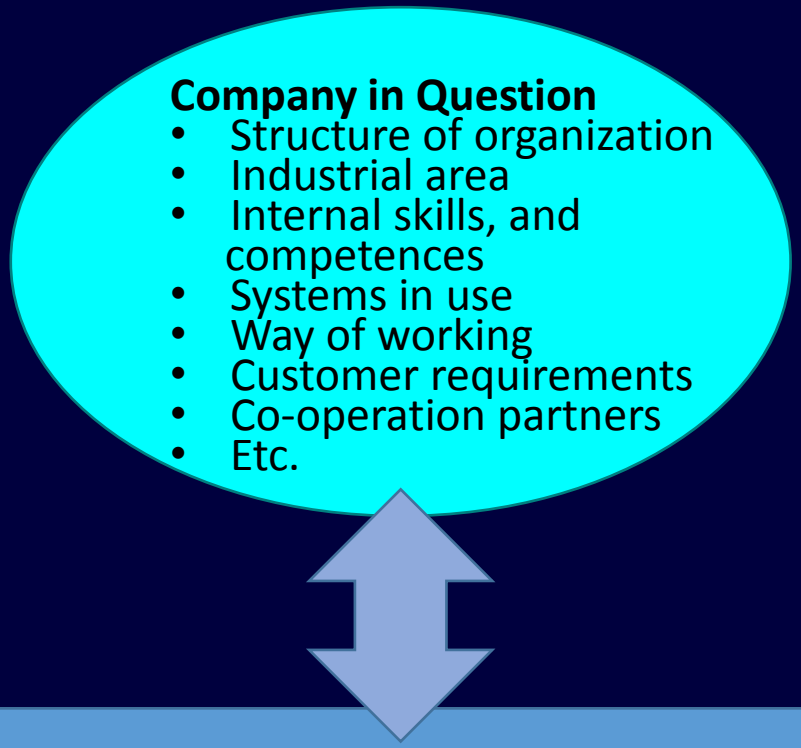
The machine that enables ergonomics?



SYSTEM THAT
PROMOTE AND ACT FOR
ERGONOMICS ON NATIONAL LEVEL .
STRONG EFFECT!! example

MARKETING AND IMPLEMENTING ERGONOMICS

The real need for ergonomics in practice?



Ergonomists need skills and Competences in:

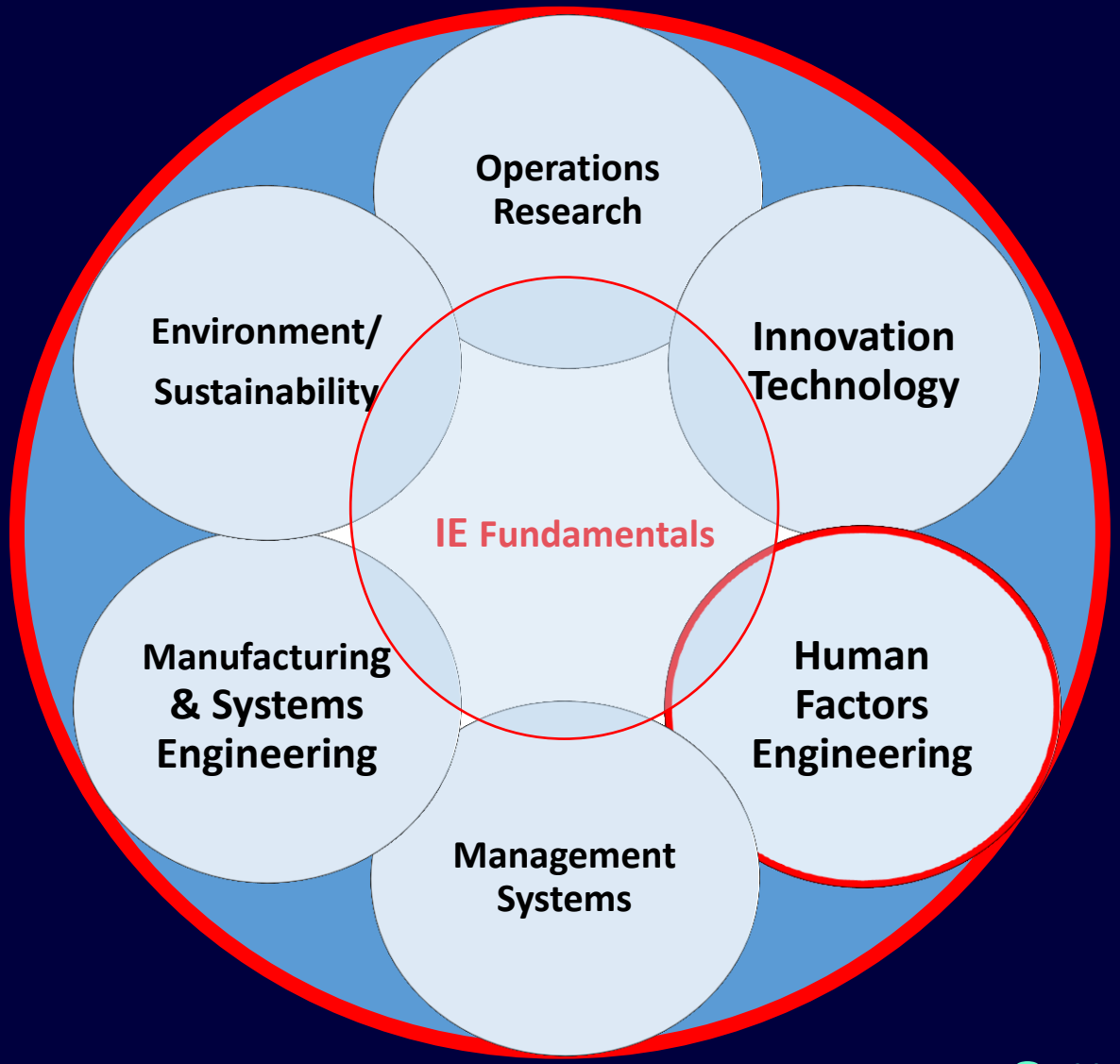
- ***Studying customer`s systems***
- ***Defining needs in co-operation with the customer***
- ***Marketing services***
- ***Making Productizing***
- ***Managing projects***

Ergonomists need clarity in the role when acting as an ergonomist!!

ERGONOMICS services, products, education, coaching, Consultation etc.

WHAT`S AVAILABLE?
BY WHOM?

WHAT COULD BE THE FUNDAMENTALS OF ERGONOMICS COMPARED TO INDUSTRIAL ENGINEERING?



Areas of Industrial Engineering (IESE)

Industrial Engineering Standards in Europe (The IESE Project)
http://www.iestandards.eu/
Funded by the Leonardo EU Program Life Long Learning RESULTS OF STUDY!!!! Click the icon

Education and Culture DG
Lifelong Learning Programme

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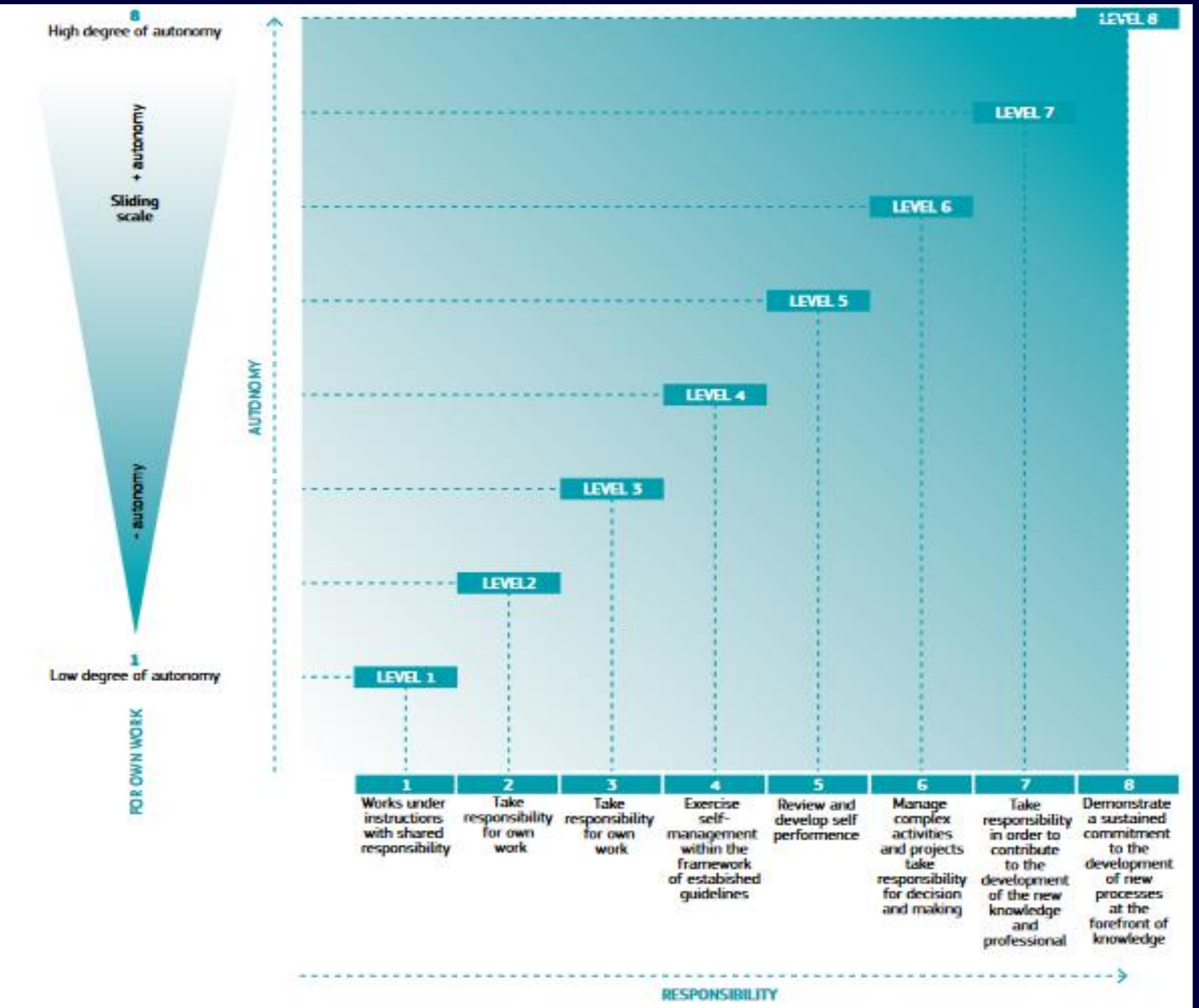

HOW ABOUT HAVING AN DESCRIPTION OF LEVELS in CAPABILITY TO DO ERGONOMICS?

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EQF

EXAMPLE

FUTURE???

Ergonomics play a remarkable role!!!

IoT and Industry 4.0

WORK IN FUTURE? **INDUSTRY IN FUTURE?** **ERGONOMICS IN FUTURE?**	COMPANIES ABILITY TO ANALYZE OWN SITUATION? DEFINE NEEDS, ASK FOR HELP IN DESIGN	HOW WELL OWN STATUS IS KNOWN? How in detail the Organization's processes are studied, described and documented?

Let`s help each others to find a road to actions to implement Ergonomics in daily design in industry

THANK YOU!!!!

Elina Parviainen
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