

The need for a Maintenance Skill Passport

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BEMAS - Belgian Maintenance Association vzw-asbl

Is Maintenance important ?

- In Europe, about 6 million people work in technical maintenance
- Every year about **450 Billion Euro** is spent on maintenance of industrial technological assets, with an estimated reinvestment value of **10.000 Billion euro**. A big part of these industrial assets are based in NWE.

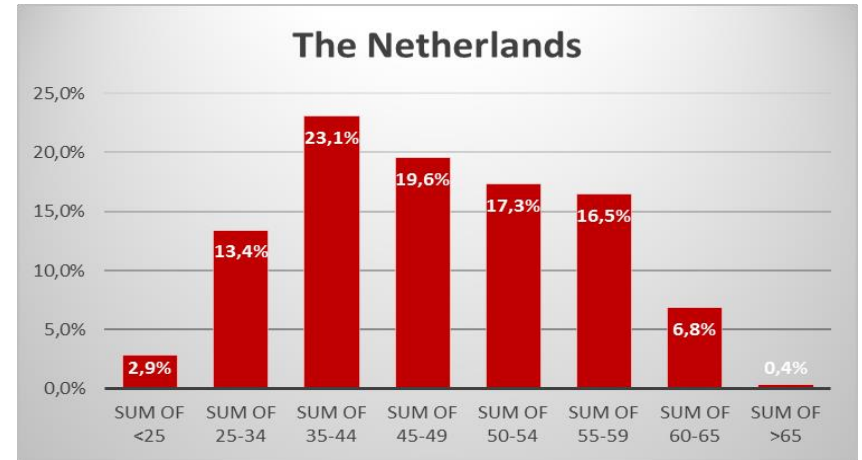
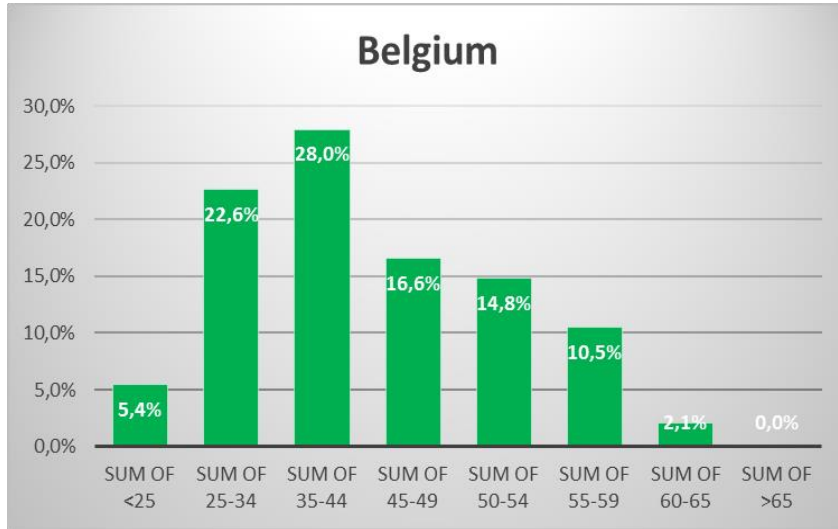




Is Maintenance important ?

- Replacement value of the industrial asset base (ARV)
 - BeNe: 700 billion EUR
 - North West Europe: 4.000 billion EUR
- Contribution of industry in GDP:
 - BeNe: 1.000 billion EUR
 - North West Europe: 5.750 billion EUR
- Occupational group
 - BeNe: 450.000 FTE's
 - North West Europe: 2.600.000 FTE's





- In Belgium about 12% will retire in the next 10 years
- In The Netherlands about 23% will retire in the next 10 years
- Off course the main question is: will we be able to get new maintenance personnel started in the next 10 years and how will we avoid a major loss of knowledge & experience?

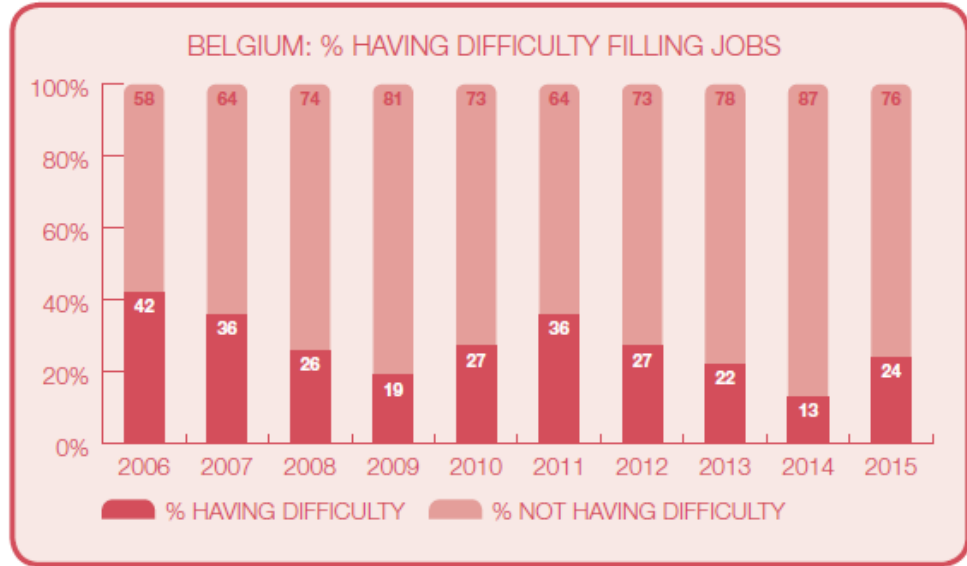
HARDEST JOBS TO FILL

For the fourth consecutive year, **SKILLED TRADES** vacancies are the hardest jobs to fill globally. **SALES REPRESENTATIVES** are in second place, followed by **ENGINEERS, TECHNICIANS AND DRIVERS**.

- 1 **Skilled Trade Workers** (especially chefs/bakers/butchers, mechanics and electricians)
- 2 **Sales Representative**
- 3 **Engineers** (especially mechanical, electrical and civil engineers)
- 4 **Technicians**
- 5 **Drivers** (especially truck/lorry/heavy goods drivers, delivery/courier drivers, heavy equipment/construction drivers)
- 6 **Management/Executives**
- 7 **Accounting & Finance Staff** (especially book keepers, certified accountants and financial analysts)
- 8 **Office Support Staff**
- 9 **IT Staff** (especially developers and programmers, database administrators, and IT leaders and managers)
- 10 **Production/Machine Operations**



Source: ManpowerGroup™ Talent Shortage Survey 2015

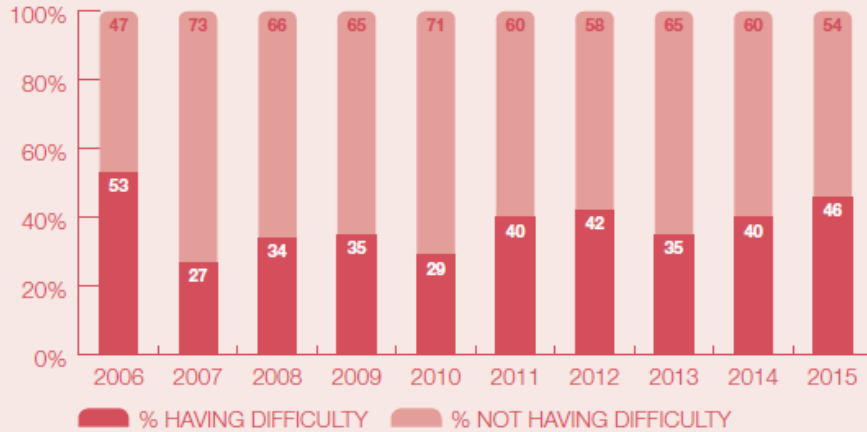


- BELGIUM
TOP 10 JOBS EMPLOYERS ARE HAVING DIFFICULTY FILLING
- 1 | Skilled Trades
 - 2 | Sales Representatives
 - 3 | Technicians
 - 4 | Accounting & Finance Staff
 - 5 | Drivers
 - 6 | IT Personnel
 - 7 | Secretaries, PAs, Receptionists, Admin Asst. & Office Support Staff
 - 8 | Engineers
 - 9 | Project Managers
 - 10 | Laborers

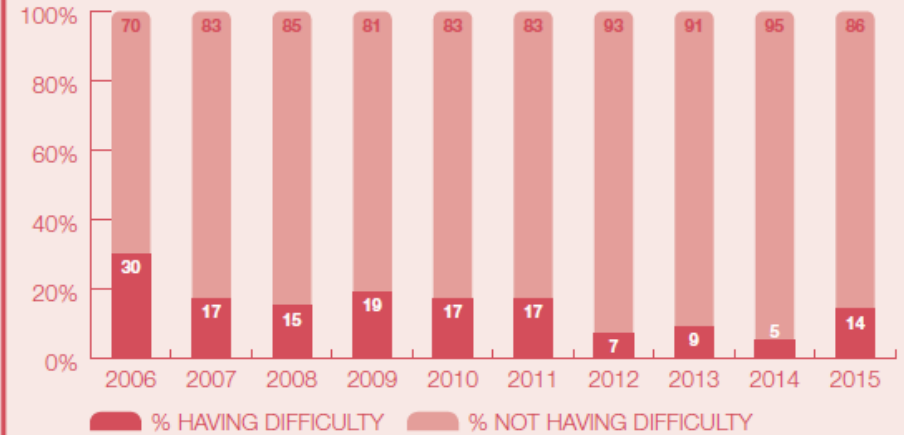


Source: ManpowerGroup™ Talent Shortage Survey 2015

GERMANY: % HAVING DIFFICULTY FILLING JOBS



NETHERLANDS: % HAVING DIFFICULTY FILLING JOBS



**GERMANY
TOP 10 JOBS EMPLOYERS ARE HAVING DIFFICULTY FILLING**

- 1 | Skilled Trades
- 2 | Management / Executive (Management / Corporate)
- 3 | Technicians
- 4 | IT Personnel
- 5 | Engineers
- 6 | Accounting & Finance Staff
- 7 | Sales Representatives
- 8 | Sales Managers
- 9 | Drivers
- 10 | Doctors & other Non-Nursing Health Professionals

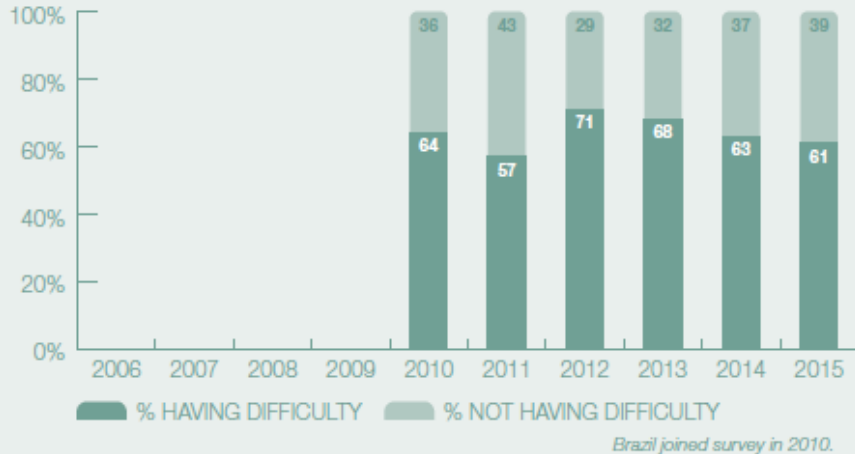
**NETHERLANDS
TOP 10 JOBS EMPLOYERS ARE HAVING DIFFICULTY FILLING**

- 1 | Skilled Trades
- 2 | Secretaries, PAs, Receptionists, Admin Asst. & Office Support Staff
- 3 | Technicians
- 4 | Doctors & other Non-Nursing Health Professionals
- 5 | Management / Executive (Management / Corporate)
- 6 | IT Personnel
- 7 | Laborers
- 8 | Customer Service Representatives & Customer Support
- 9 | Engineers
- 10 | Sales Representatives



Source: ManpowerGroup™ Talent Shortage Survey 2015

BRAZIL: % HAVING DIFFICULTY FILLING JOBS

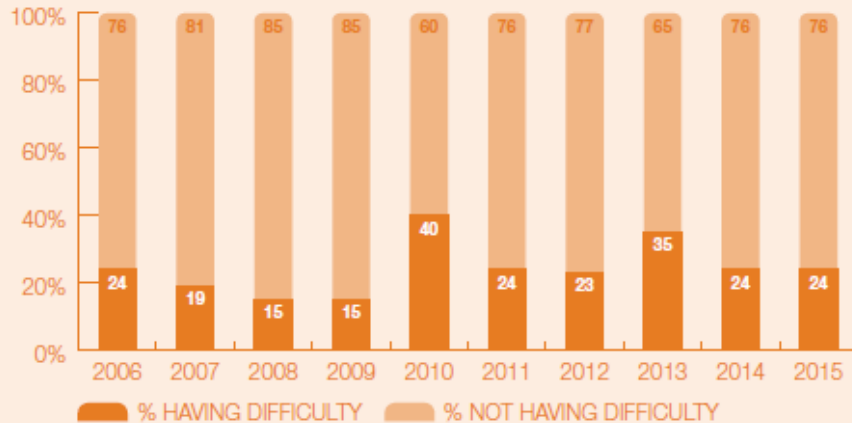


BRAZIL

TOP 10 JOBS EMPLOYERS ARE HAVING DIFFICULTY FILLING

- 1 | Technicians
- 2 | Skilled Trades
- 3 | Production Operators / Machine Operators
- 4 | Secretaries, PAs, Receptionists, Admin Asst. & Office Support Staff
- 5 | Laborers
- 6 | Drivers
- 7 | Sales Representatives
- 8 | Engineers
- 9 | Accounting & Finance Staff
- 10 | IT Personnel

CHINA: % HAVING DIFFICULTY FILLING JOBS



CHINA

TOP 10 JOBS EMPLOYERS ARE HAVING DIFFICULTY FILLING

- 1 | Technicians
- 2 | Sales Representatives
- 3 | Sales Managers
- 4 | Management / Executive (Management / Corporate)
- 5 | Laborers
- 6 | Skilled Trades
- 7 | Engineers
- 8 | IT Personnel
- 9 | Production Operators / Machine Operators
- 10 | Researchers (R&D)

6.624 job vacancies for one bottleneck job in 2015

6.624 vacatures voor één knelpuntberoep

28/01/2016 om 06:24 door mtm | Bron: BELGA



HOME

BIZNIEU

ECONOM

BEDRIJVI

MARKETI

CONSUM

BEURS

MOBILIA

BELEGGI

MIJN GE

EXPERTS

BEREKE

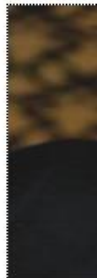
- 6.624 job vacancies for maintenance technicians. (in 2015)
- # 1 bottleneck job
- 4 of 10 vacancies not filled after 3 months



Foto: belga

Vlaamse bedrijven hebben vorig jaar liefst 6.624 vacatures geplaatst voor onderhoudstechnici die machines monteren, herstellen en onderhouden. Daarmee is het knelpuntberoep nummer één in Vlaanderen, schrijft Gazet van Antwerpen. Bijna vier op de tien vacatures voor onderhoudstechnici zijn na drie maanden nog niet ingevuld.

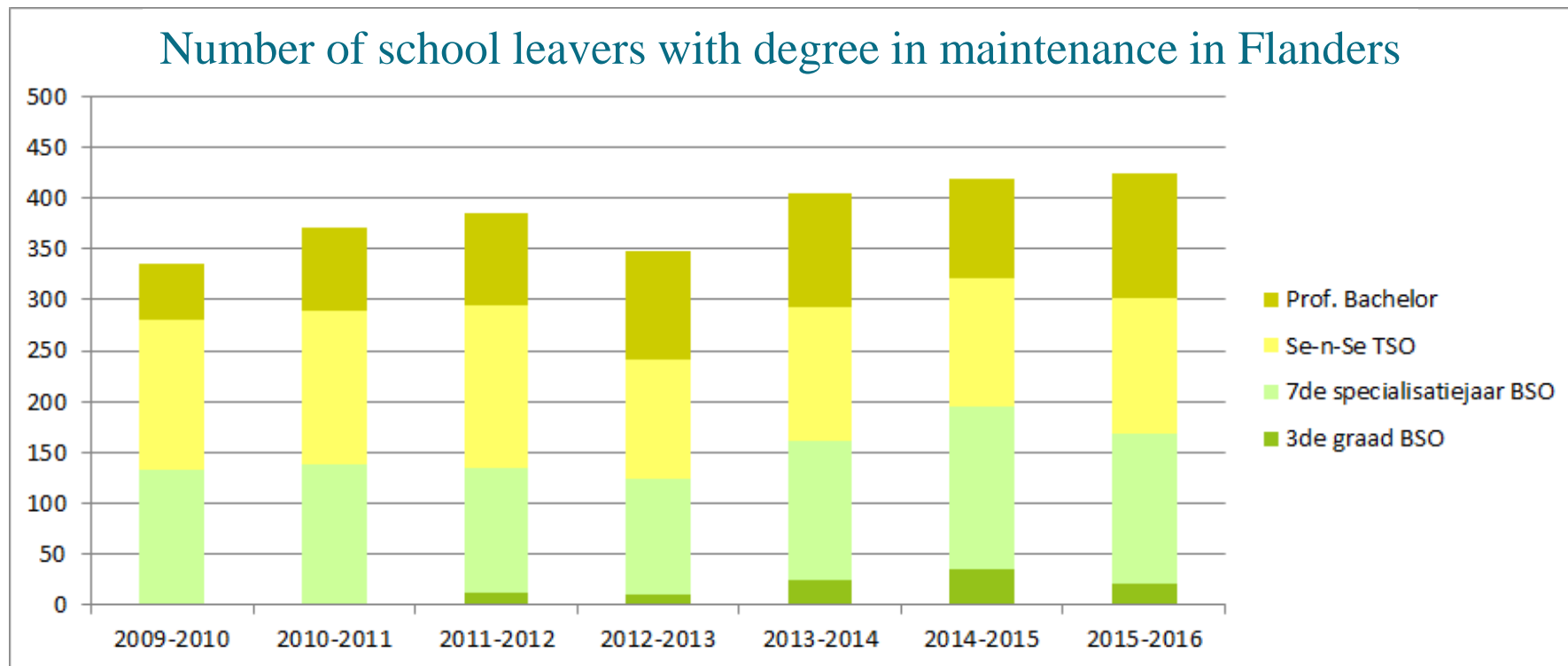
JOBAT



**Dries
Zijn lo**

Some figures from the VDAB report in 2016:

- 1.231 job vacancies for maintenance mechanics
- 808 job vacancies for maintenance electricians
- **1.915** job vacancies for technicians electromechanics
- **626** job vacancies for technicians in process & production
- 444 job vacancies for technicians in HVAC
- 2.623 job vacancies for technical supervisors & managers



In 2015-16:

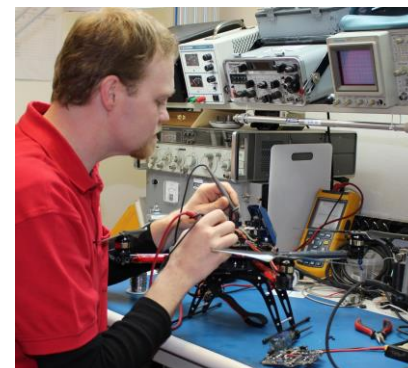
- Record number of 424 graduates and school leavers in maintenance, (with electromechanical skills).
- Still only 17 % of the number of job vacancies !!!

Technical education has strong levers:

- A purposeful and activity-oriented approach
- A lot of possibilities for specialisation
- Stimulating the sense of responsibility
- Stimulating collaboration.

Certainly **maintenance oriented education** is future proof:

- Maintenance technicians are already in high demand on the labor market
- The world is getting more and more dependent of more complex **technology** ...
... **which needs to be maintained!**

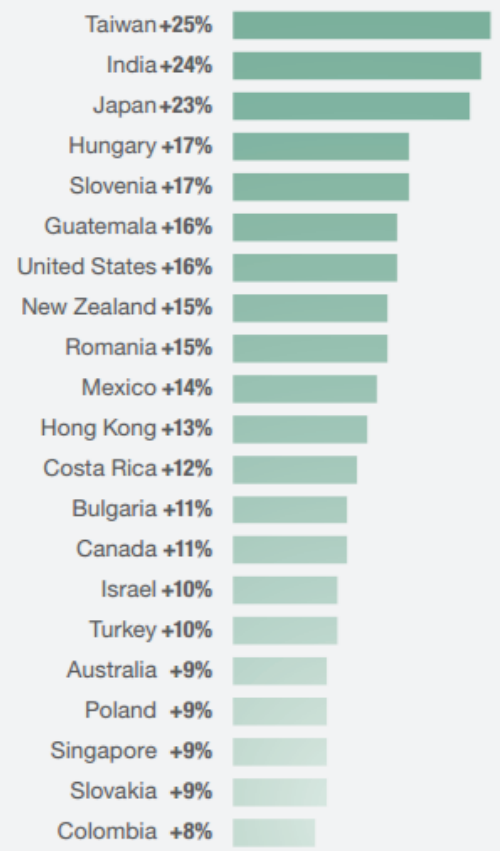


Q1 2017

MANPOWERGROUP EMPLOYMENT OUTLOOK SURVEY

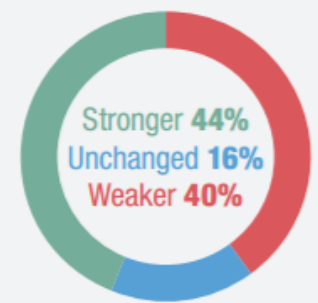
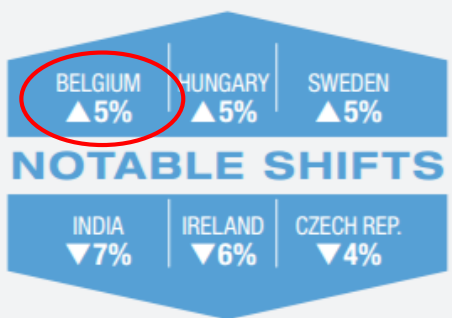
WHERE will hiring be strongest? will it be weakest?

Net Employment Outlooks



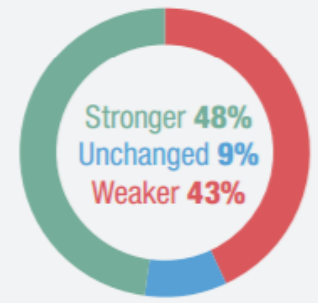
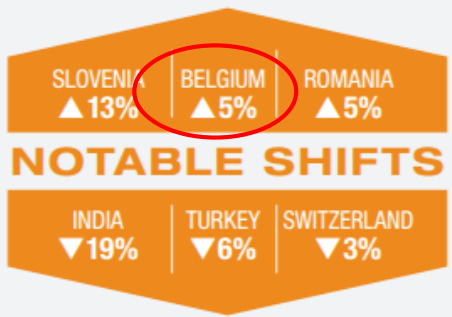
How Are Employer Hiring Plans Changing?

QUARTER-OVER-QUARTER



Compared to 43 countries & territories surveyed for Q4 2016

YEAR-OVER-YEAR



Compared to 42 countries & territories surveyed for Q1 2016*

* NOTE: Portugal first joined the survey in 3Q 2016, so its data is not included in the year-over-year comparison.

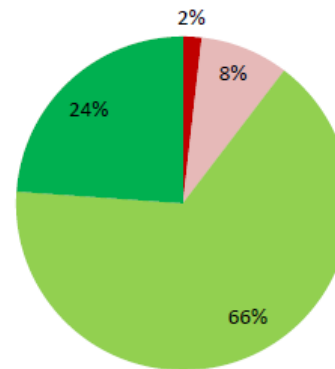
Ask

- Increased need for technician efficiency (HOTT / Wrench Time)
- Increased need for technician effectiveness (OTE)
- Increased need for worker Flexibility & Mobility
- Increased need for job retention

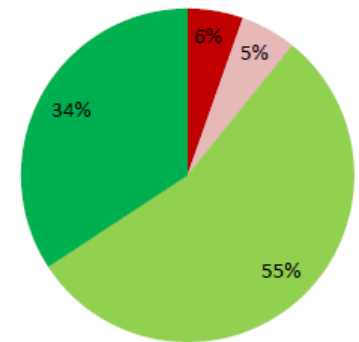
Give

- Higher wages ?
- More training ?
- **Job satisfaction !**

90% is satisfied with job !



Technicians @ asset owner

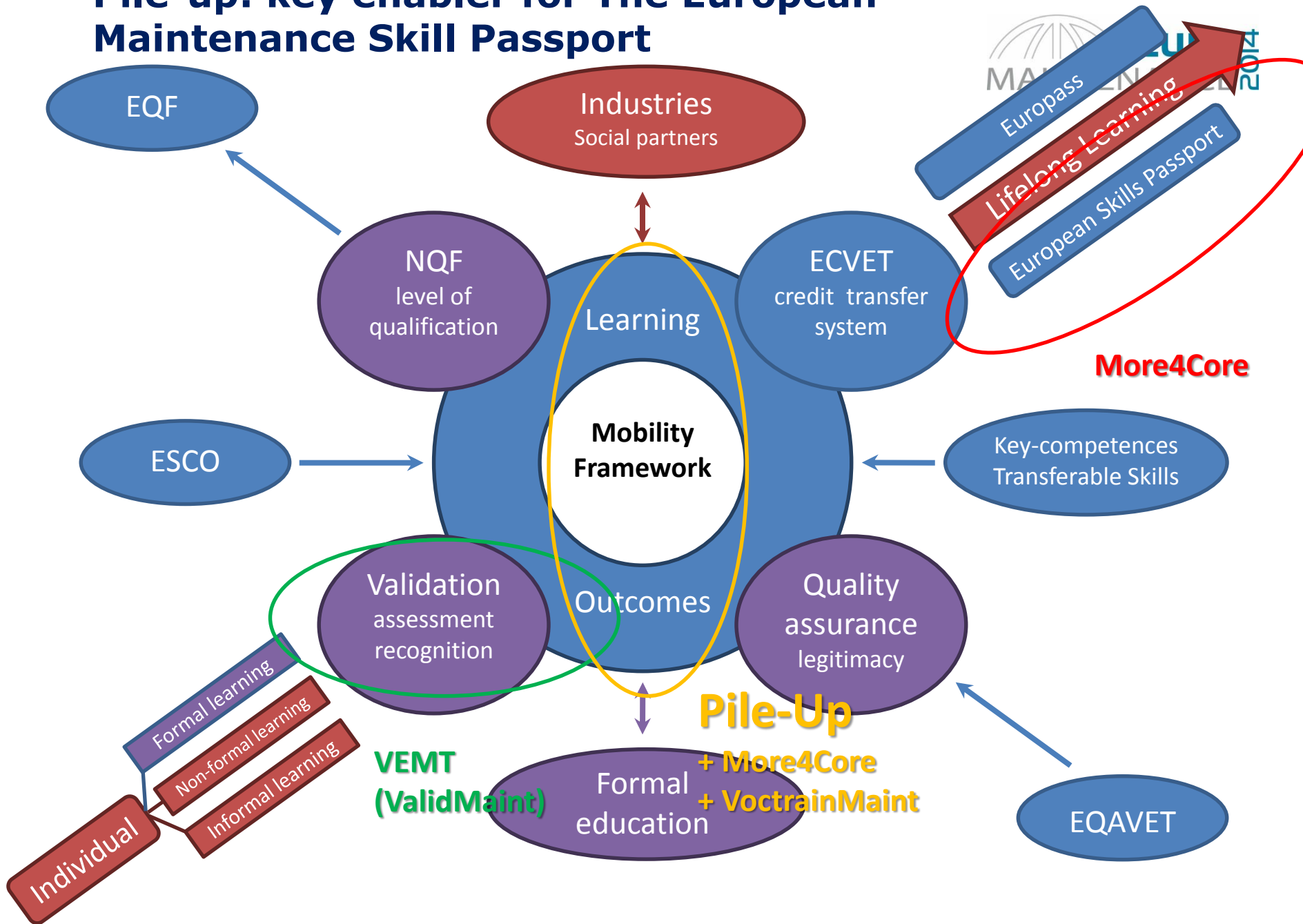


Technicians @ contractor

What is the consequence?

- Increased need for technician efficiency (HOTT / Wrench Time)
 - Increased need for technician effectiveness (OTE)
 - Increased need for worker Flexibility & Mobility
-
- => **Need for SKILL TRANSPARANCY**

Pile-up: key enabler for The European Maintenance Skill Passport





MAINTENANCE FOR
COMPETITIVENESS

European Maintenance Skill Passport

EMSPass

René Strijbosch

21 February 2014

Partners: Bax & Willems



WORLD CLASS
MAINTENANCE

Maintenance
Education
Consortium

Brabant Development Agency



Wirtschaftsverband
für Industrienservice e.V.



efnms
European Federation of
National Maintenance
Societies e.V.



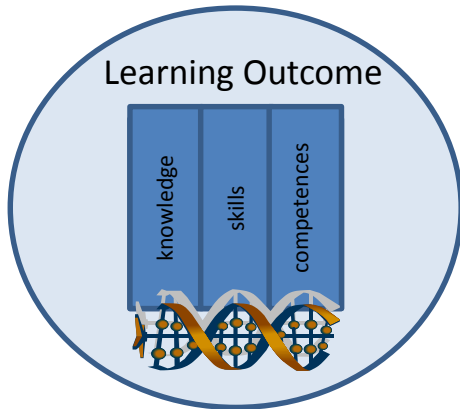
Chamber of
Commerce and Industry
Antwerpen-Waasland



INTERREG IVB

Existing products

Skill Passport = Work task based



*DNA of the
worktask*

61 work tasks
for Maintenance Technician EQF level 4
in process industry
PileUp project

CEN 15628 European Standard
Maintenance-Qualification
of maintenance personnel

Scheduled in M4C: shut down Technician

Unit 1		Title		
a)	He/she is able to.....			
	Knowledge	Skills	Competence	
	He/she knows ...	He/she is able to...	He/she is responsible for ...	
b)	He/she is able to.....			
	Knowledge	Skills	Competence	
	He/she knows...	He/she examines ...	He/she monitors ...	
c)	He/she is able to.....			
	Knowledge	Skills	Competence	
Unit 2		Title		
a)	He/she is able to.....			
	Knowledge	Skills	Competence	

Learning Outcome (example)

Mount and dismount different types of bearings

DRAFT version 2013-03-12 – Please do not distribute



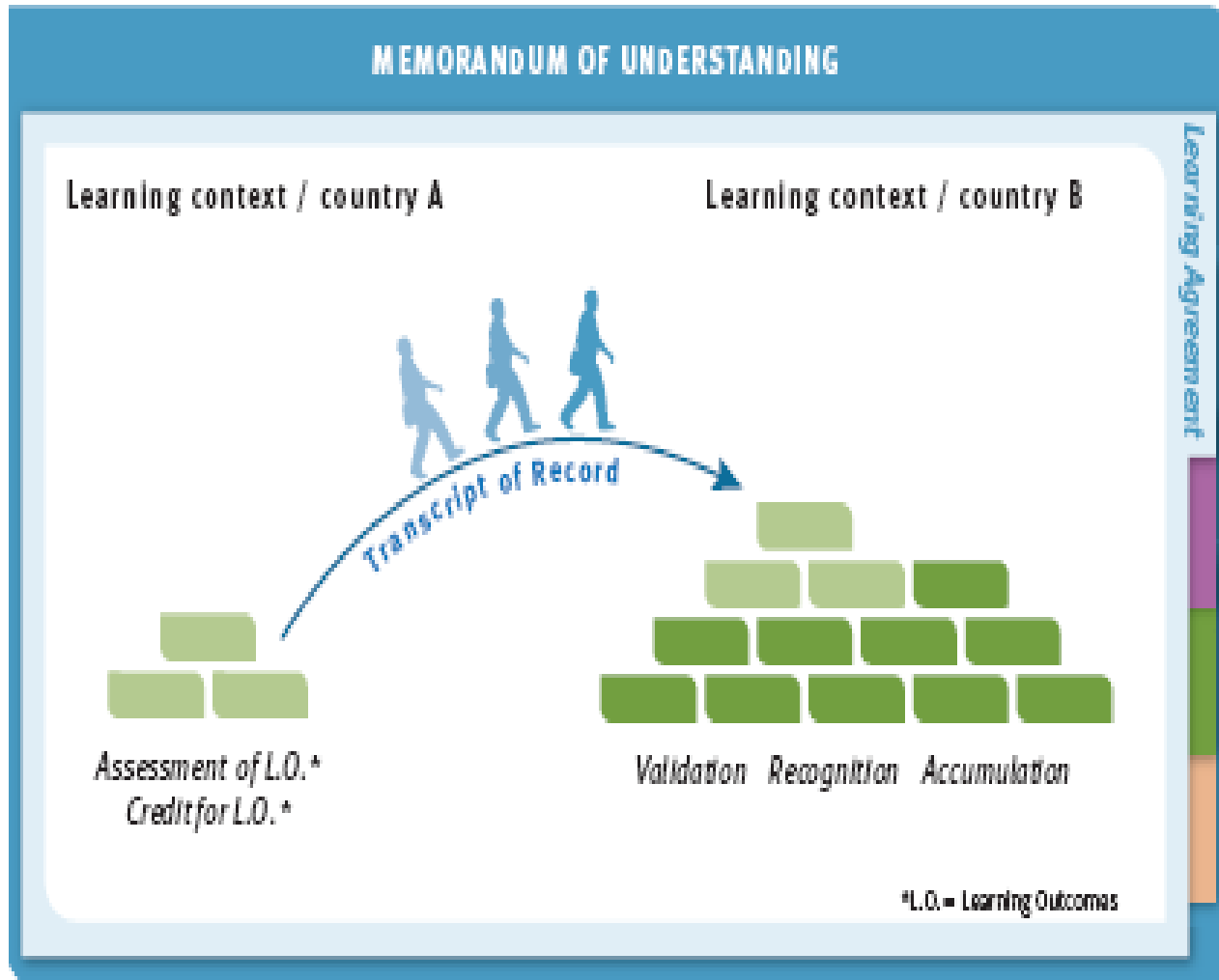
Learning Outcomes Maintenance Technician in the Chemical industry – EQF level 4

LO 1.1.1.1	Bearing replacement	<i>Source: Learning Outcomes for maintenance technician in the chemical industry Version: 2013-03-12</i>
ULO 1.1.1	<i>Mechanical maintenance and repair - Mechanical Assembly - Mechanical Power Transmissions</i>	
Work task:	Mount and dismount different types of bearings	
Purpose and resultant of the work task:	<ul style="list-style-type: none"> • correctly replace bearings in equipment without damaging the bearing, the housing nor the shaft • extend bearing lifespan • limit vibration 	<i>Ref. Tempera/VOKA: NA</i>
Technological context:	<ul style="list-style-type: none"> • Different types of bearings with outer diameters ranging from 20mm till 200mm • Different tools for (dis)mounting bearings (pully, heating, freezing, hydraulic, impact, press...) 	<i>Ref. VocTrainMaint: 3.1.2</i>

Learning Outcome:

Knowledge (theoretical + factual) Scientific Context Theoretical context	Skills / Abilities practical + cognitive (= use of knowledge)	Competence: Role and level of responsibility and autonomy
<ul style="list-style-type: none"> • State relevant terminology and technical jargon for bearings • Identify different types of bearings (roller bearing, sliding bearing, ...) • Describe the different bearing (dis)mounting techniques (pully, heating, freezing, hydraulic, impact, press, ...) • Recognise and interpret bearing identification numbers and propose alternative bearings (using manufacturer catalogue) • Determine the applicable tolerance and fit using the system of tolerances, deviations and fits (ISO 286 - EN20286) • Calculate bearing lifetime (using manufacturer catalogue) • Relate to different types of bearing damage and their possible causes 	<ul style="list-style-type: none"> • (Dis)mount bearings using various methods (pully, heating, freezing, hydraulic, impact, press...) autonomously • Use the specific bearing (dismounting) tools autonomously • Verify and measure the internal bearing ball clearance (radial and axial play) • Find the correct applicable technical information in manuals and standards autonomously • Select suitable tools and use these tools in safe and correct way autonomously 	<p>Starter from school:</p> <ul style="list-style-type: none"> • Execute all necessary work steps autonomously • Follow the (safety) instructions of a work permit • Assume responsibility of his/her own safety • Coordinate his/her own work schedule • Assume responsibility of the cost efficiency of his/her own work • Monitor the quality of his/her own work • Report on the executed work <p>Experienced:</p> <ul style="list-style-type: none"> • Instruct a (contractor) team on all necessary work steps autonomously • Monitor that the (safety) instructions of a work permit are followed by all members of a (contractor) team • Assume responsibility of his/her own safety and of a (contractor) team

ECVET basics



- Learning outcomes
- Unit based
- Mutual trust

European Maintenance Qualification

European Maintenance Skill Passport
European Maintenance Profile Family Tree



European Qualification Structure
European Certification
Recognition of Skills and Competences
Comparison of Skills and Competences

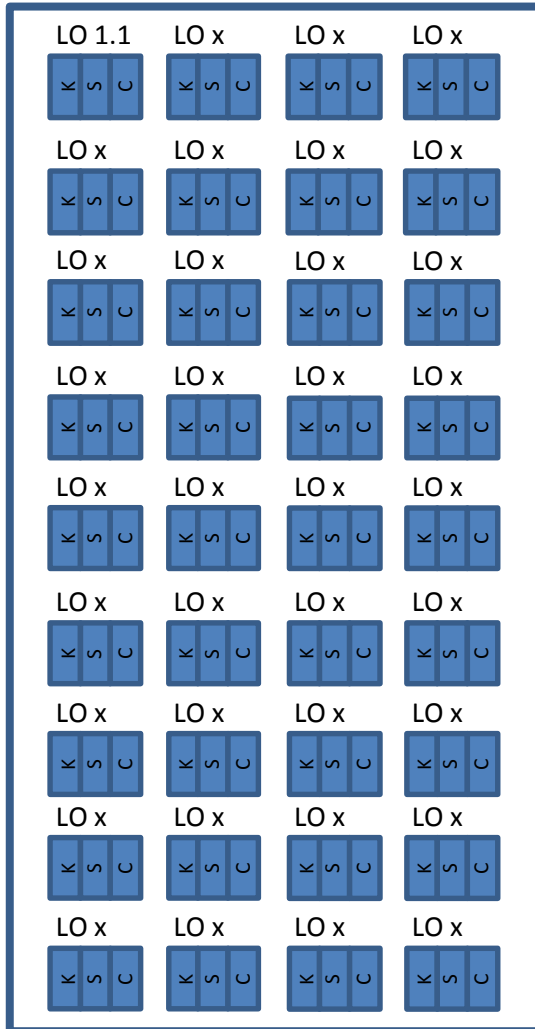


National Qualification Structure
National Certification
National recognition of skills and competences
National Education and Training

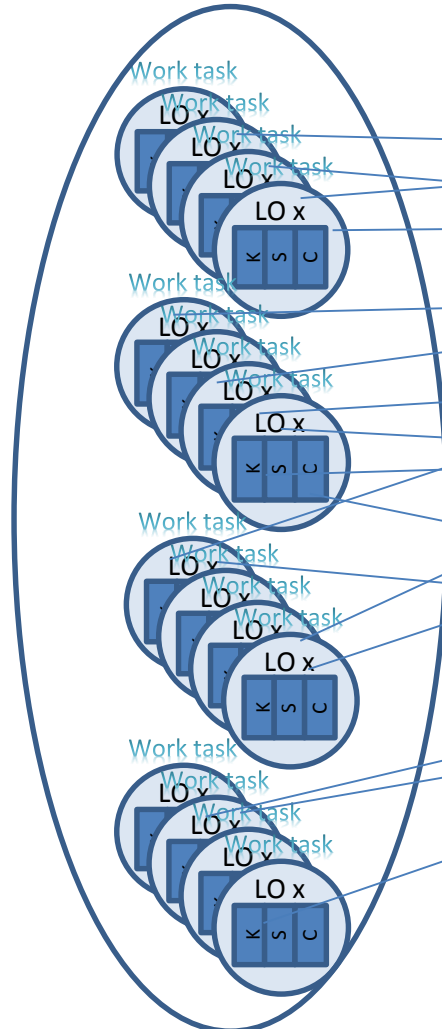
recognition

Learning Outcomes vs Worktasks

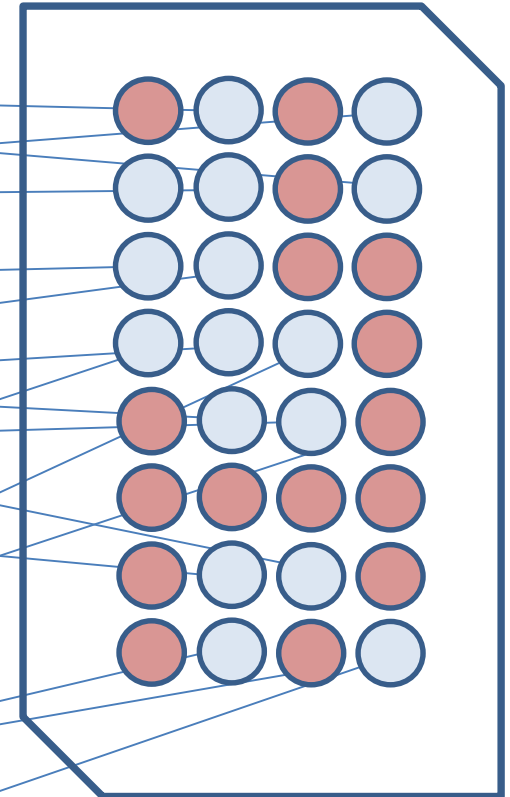
Learning Outcomes
PileUp



Work task
Function X

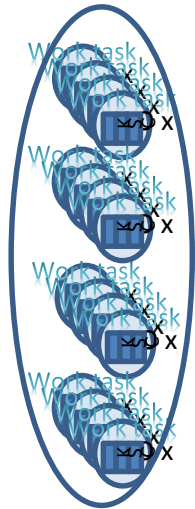


European Maintenance
Skill Passport

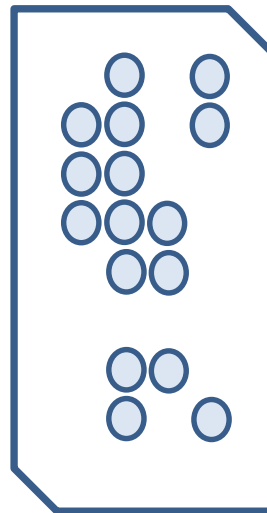


Worktasks vs EMSPassport

Work task
Function X

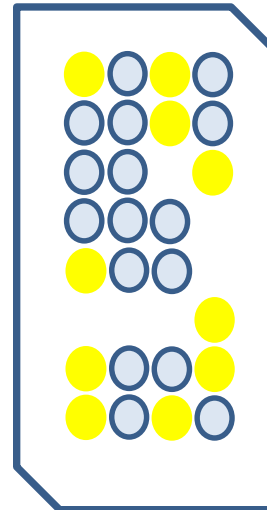


Personal
European Maintenance
Skill Passport



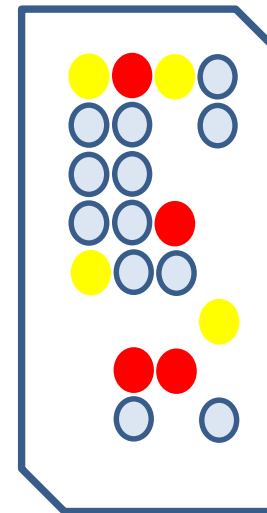
needed skills
=
personal skills

match






needed skills
<
personal skills

overqualified

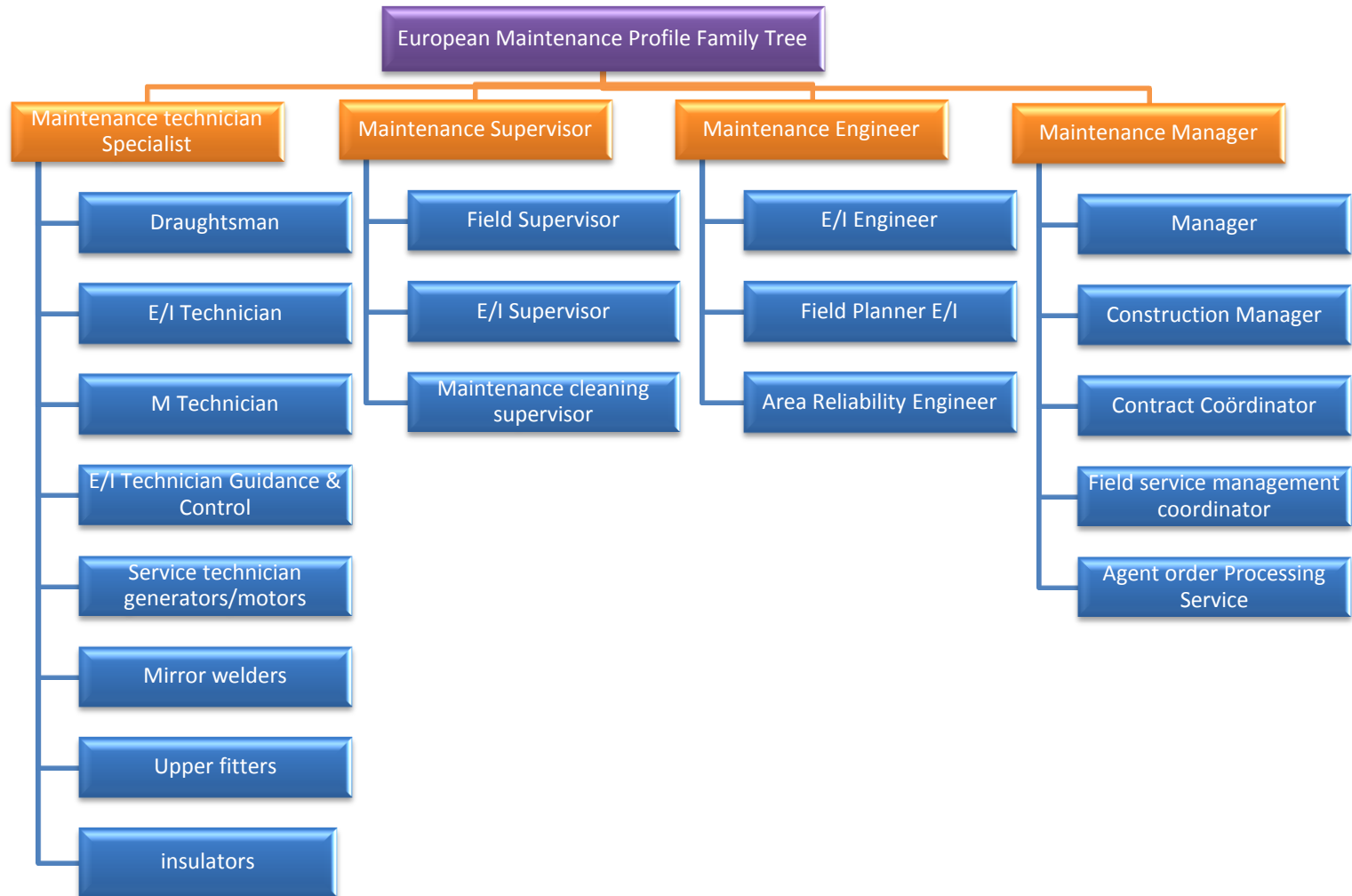


needed skills
>
personal skills

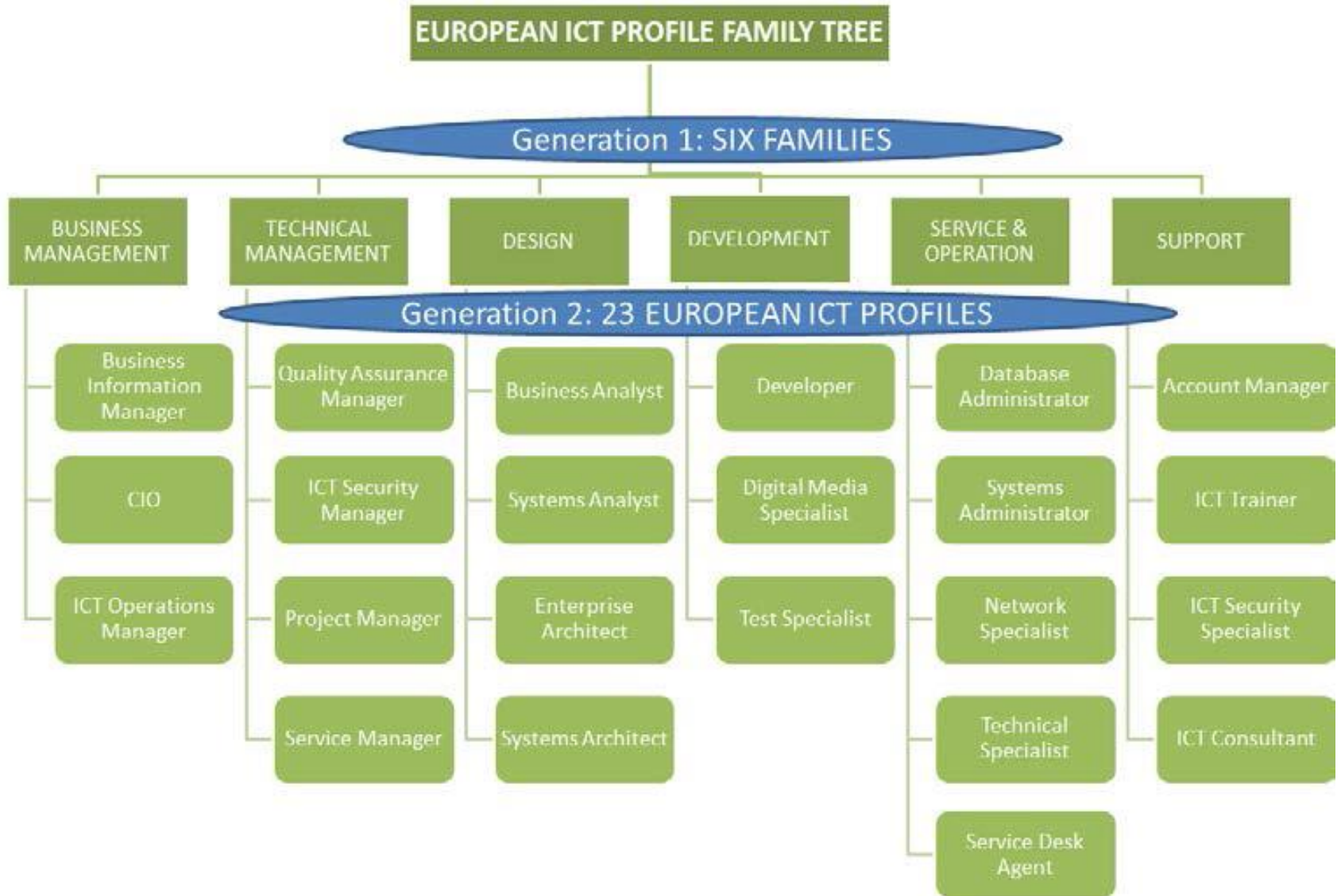
underqualified

-  needed skills
-  not needed skills
-  missing skills

European Maintenance Profile Family Tree



Example ICT branch



Example ICT branch

Dimension 1	Dimension 2	Dimension 3				
5 e-Comp. areas (A – E)	36 e-Competences identified	e-Competence proficiency levels e-1 to e-5, related to EQF levels 3-8				
		e-CF levels identified per competence				
		e-1	e-2	e-3	e-4	e-5
A. PLAN	A.1. IS and Business Strategy Alignment					
	A.2. Service Level Management					
	A.3. Business Plan Development					
	A.4. Product or Project Planning					
	A.5. Design Architecture					
	A.6. Application Design					
	A.7. Technology Watching					
	A.8. Sustainable Development					
B. BUILD	B.1. Design and Development					
	B.2. Systems Integration					
	B.3. Testing					
	B.4. Solution Deployment					
	B.5. Documentation Production					
C. RUN	C.1. User Support					
	C.2. Change Support					
	C.3. Service Delivery					

The European Maintenance Skill Passport

Benefits the individual worker :

1. Increased mobility: the uniform interpretation of skills
2. Transparent value of diploma in the field of maintenance
3. Possibility to continuously upgrade and validate skills and competences acquired through experience
4. increased personal safety

The European Maintenance Skill Passport

Benefits for the employer / third parties :

1. Increased safety and reduced risks
verification if a certain employee or contracted maintenance worker has the required set of skills and competences (LO's) to execute a certain job or task.
2. Specify training needs
task based and exactly described in terms of knowledge, skills and competences.
3. Hire (foreign) maintenance workers without risks
thanks to the **transparency and uniformity** of well described and assessed LO's, the capabilities of a certain person are very clear.

1. Definition of the required skills must be executed on EU level – validation on national level
2. Not only skills must be determined. Also knowledge and competence must be determined (= the complete Learning Outcome).
3. The learning outcomes (knowledge, skills and competences) have to be described in detail
4. An European Maintenance Profile Family Tree makes clear the various job titles are used. They can be composed of different LO's with different maturity levels. It is up to companies to define what LO's they need for a certain function.
5. How can we make sure that it will be widely accepted in the industry?

Our technicians...

... are the key to succes of our enterprises tomorrow !

Thank you

Wim Vancauwenberghe

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[@MaintEvangelist](#)

Free download of benchmark results:

<http://bit.ly/M4CBook>



BEMAS

BRIDGE TO
WORLDCLASS MAINTENANCE & ASSET MANAGEMENT

open network not-for-profit member association
inspiration **helps you to improve** knowledge sharing
asset management maintenance reliability engineering
field service asset integrity **energy management** facility maintenance
online suppliers index **lobbying** training courses **advice** plant visits
certification **promoting technical careers** personal support
world class **manufacturing** competitiveness

www.BEMAS.org

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