Plataformas de excelencia

CONTEXTO: 2017- 2018 investigación de la comisión Europea.

Elementos clave para una FP excelente:

- Excelente para el alumnado.

- Excelente para el profesorado.

- Excelente para las empresas.

Tres Elementos clave:

- Alineados con las estrategias regionales de innovación y Especialización Inteligente (RIS3).

- Amplia variedad de servicios.

- Parte de un ecosistema formado por empresas, gobiernos regionales y centros de investigación universidades.

EUSKO JAURLARITZA · GOBIERNO VASCO

HEZKUNTZA, HIZKUNTZA POLITIKA
ETA KULTURA SAILA
Lanbide Heziketako Sailburuordetza

DEPARTAMENTO DE EDUCACIÓN,
POLÍTICA LINGÜÍSTICA Y CULTURA
Viceconsejería de Formación Profesional

Fp
EUSKADI
LANBIDE HEZIKETA

Tras el estudio:

En 2018 lanzan la convocatoria " EAC/A03/2018, Key Action 3 Sector Skills Alliances of the Erasmus+ Program".

Con el objetivo de conectar el trabajo regional de las diferentes plataformas a nivel Europeo.

Promoviendo que regiones de Europa que cumplen con esos tres elementos clave, formen plataformas en las que compartir conocimientos y desarrollar proyectos conjuntos.

The Excellent Advanced Manufacturing 4.0 -EXAM 4.0

Exam 4.0 is a projects approved within the call Sector Skills Alliances for the development of sectoral approaches through transnational platforms of vocational excellence skills needs identification,

 EAC/A03/2018, Key Action 3 Sector Skills Alliances of the Erasmus+ Program

Budget : 799.332€
Duration : 24 months.

Partnership: **6 academic partners**   **3 industrial partners,**

BASQUE COUNTRY

NETHERLANDS

CROACIA

GERMANY

SWEEDEN

+ 3 affiliate partners + 14 associate partners

The Excellent Advanced Manufacturing 4.0 initiative – EXAM 4.0 HUB

EXAM 4.0 HUB as a EU HUB of Excellence Centres for Advance Manufacturing

…will be built a common space where to

- Support the introduction of new **technological trends** in AM for the educative and industrial fields
- Anticipate **skills needs** in the AM sector and adapt the training provision
- Develop innovative **learning methodologies** and implement joint initiatives and projects
- Enhance the continuing **professional development of trainers** and facilitating their participation in joint research projects
- Support **regional development** and Smart Specialization Strategies
- Create effective protocols for **transferring new knowledge to SMES.**

Tknika
LH-REN APLIKATUTAKO IKERKETA ETA BERRIKUNTZAKO EAE-KO ZENTROA
CENTRO DE INVESTIGACIÓN E INNOVACIÓN APLICADA DE LA FP DEL PAÍS VASCO
BASQUE CENTRE OF RESEARCH AND APPLIED INNOVATION IN VET

MIGUEL ALTUNA
Lanbide Heziketa
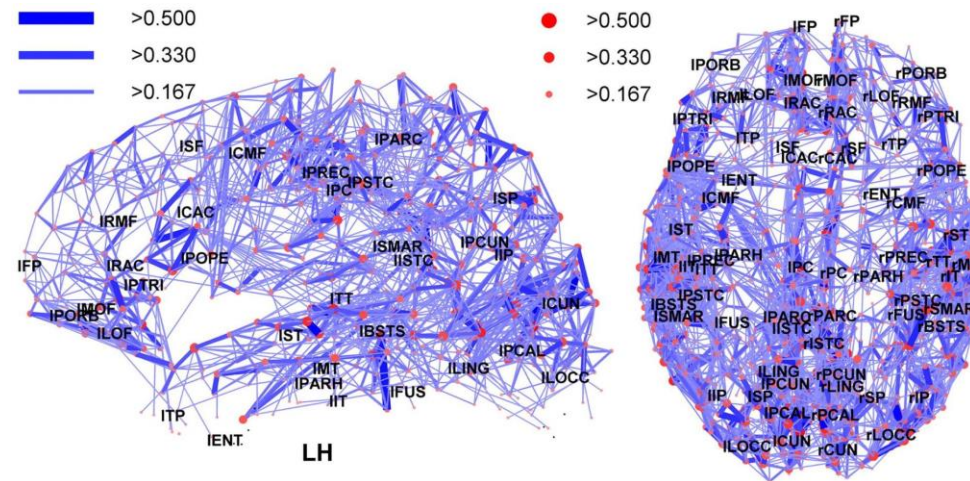
EXAM4.0
THE EXCELLENT ADVANCED MANUFACTURING 4.0

EXAM 4.0 HUB / What's an Advance Manufacturing HUB??

Network representation of brain connectivity

Hubs are highlighted. ●

A hub is a component of a network with a high-degree node.

Hubs have a significantly larger number of links in comparison with other nodes in the network.

Centres of VET Excellence in Advanced Manufacturing   would be

REGIONAL HUBs Connecting a large number of agents related to Advanced Manufacturing

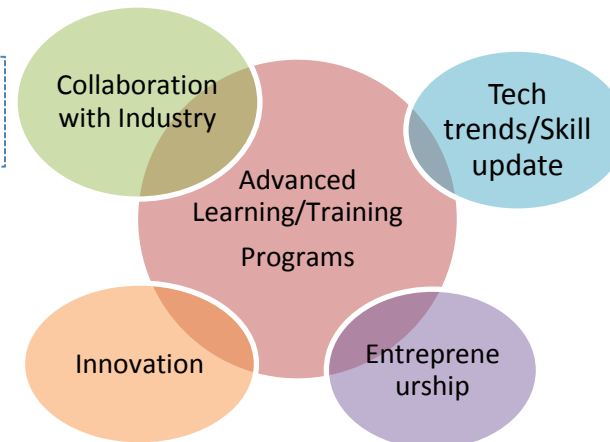**EXAM 4.0 HUB   aims to create an EU HUB connecting a an important amount of CoVEs in Advanced manufacturing**

The Excellent Advanced Manufacturing 4.0 initiative – EXAM 4.0 HUB

- Anchored in the regional strategies for Smart Specialisation, **RIS3 strategies.**
- Participates in national and international Advance Manufacturing related **networks,** both academic and industrial
- Training VET provider for the AM sector, with the **ability to adapt and create new specialized programs,** to give quick answers to the AM sector's technological demands
- Access to cutting edge facilities **and laboratories in advance manufacturing**
- Provides a set of **technical services** and applied innovation apart from just training.
- Carry out **Collaboration projects** with Universities, Research and Development Centres, Businesses, and other local stakeholders.
- Part of the staff is devoted to **research activities,** specially focused in activities with industrial partners

Regional HUBs in Advanced manufacturing CoVE

Collaboration with Industry

Tech trends/Skill update

Advanced Learning/Training Programs

Innovation
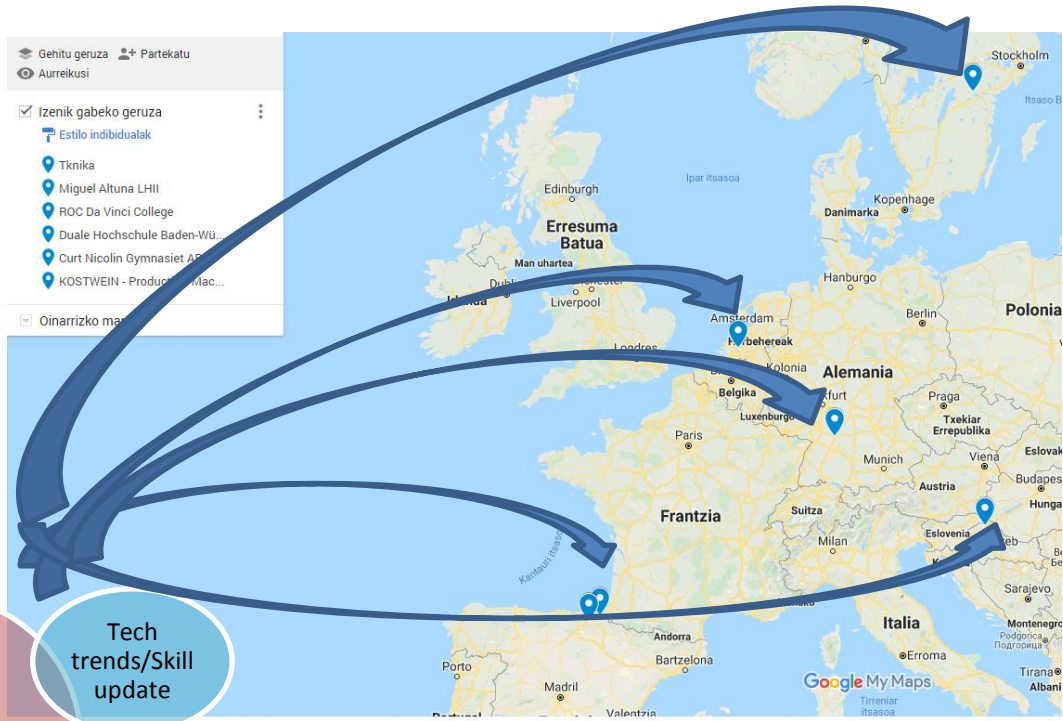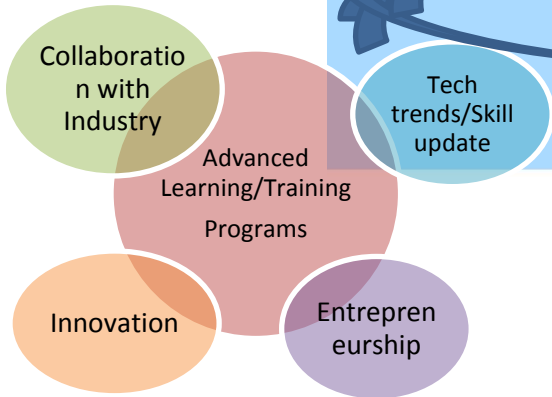
Entrepreneurship

Tknika

MIGUEL ALTUNA Lanbide Heziketa

The Excellent Advanced Manufacturing 4.0 initiative – EXAM 4.0 HUB

EU HUB of Advanced Manufacturing CoVEs

Exam 4.0 is open to other CoVEs in AM across EU

Regional HUBs in Advanced manufacturing CoVE

Collaboration with Industry

Advanced Learning/Training Programs

Tech trends/Skill update

Innovation

Entrepreneurship

What would be found in an Advance Manufacturing HUB for HVET?

Potential activities of a EU HUB of CoVE in Advanced Manufacturing

- **Mapping** Advanced Manufacturing CoVEs all across EU & worldwide
- Organize crossed **Study visits**
- **Technology repository,** Contents exchange.
- **Best practices** exchange
- Labs concepts exchange. **Piloting of experimental learning labs.**
- **Skills observatory**
- Organize AM related **Thematic workshops** / conferences
- Launch **collaboration projects** among CoVEs
- **Mobility** of trainers. Train the trainers
- **Students exchange**
- Create a **virtual AM platform**
- ….
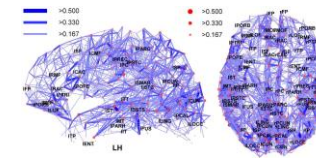
Some features of Industry 4.0 in industry

Digitalization

Technologies

4.0

4th Industrial Revolution

- People, equipment's and systems are connected throughout the entire value chain

- All relevant information is available in real time "through suppliers, manufacturers and customers

- Parts of the value chain can be constantly optimized based on different criteria, eg. ex. costs, use of resources, customer needs
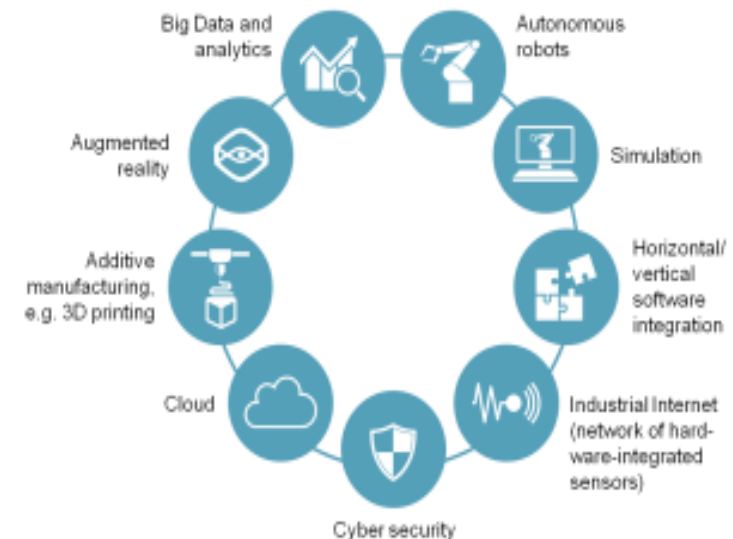
Sources: BITKOM, BCG

HOW TO TRASFER THIS ENVIROMENT TO TRAINING ECOSYSTEMS?

EUSKO JAURLARITZA · GOBIERNO VASCO
HEZKUNTZA, HIZKUNTZA POLITIKA ETA KULTURA SAILA
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The Excellent Advanced Manufacturing 4.0 initiative – EXAM 4.0 HUB

Advanced manufacturing technologies targeted (so far) in HVET education programs within EXAM 4.0

- Advanced manufacturing processes.
- Automatization. Connectivity. Industrial communication
- Industrial IoT
- Learning factories concepts.
- Additive manufacturing. Metallic / plastics. Topological design
- Robotics. Collaborative Robotics
- Data acquisition. Big data analysis.
- Data management systems.
- Advanced material testing.
- Lightweight concepts. Composites design and production.
- Advanced metrology
- Digital twins/ Virtual commissioning
- Machine learning
- Process simulation. FEM analysis.
- Cybersecurity
- Energy efficiency systems
- Augmented reality/ Virtual reality.

 -Knowledge management systems.
- Social & green innovation
- Trainers digitalization. Digital skills in learning methodologies.
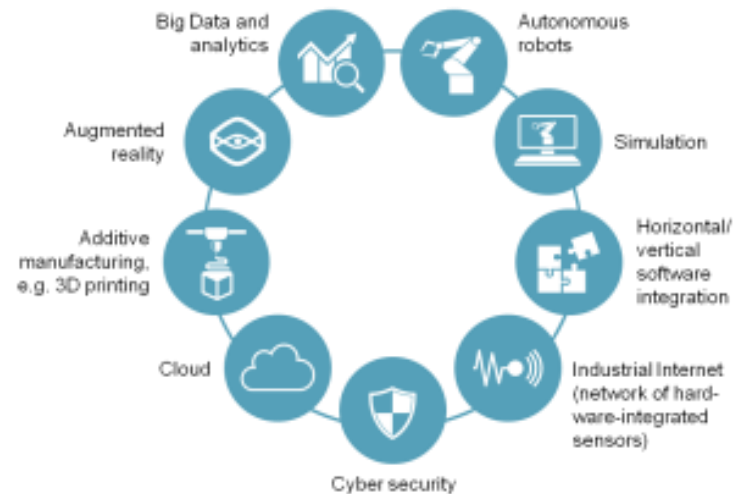
SMART factory → **SMART workshops/lab at HVET centres**

Smart workshops at VET.   Learning Cyber Physical Spaces

Goal

Integration of Industry 4.0 technologies in VET centre's advance manufacturing workshop to get students and trainers used to work in "intelligent" environments

To deal with technical competences + transversal digital skills

What should we integrate at an Learning Cyber Physical Space?

Main Features
- Connected machines
- Data acquisition systems
- Access control
- Intelligent Warehouses
- Stock's control
- Augmented reality
- Maintenance
- Integrated robotics
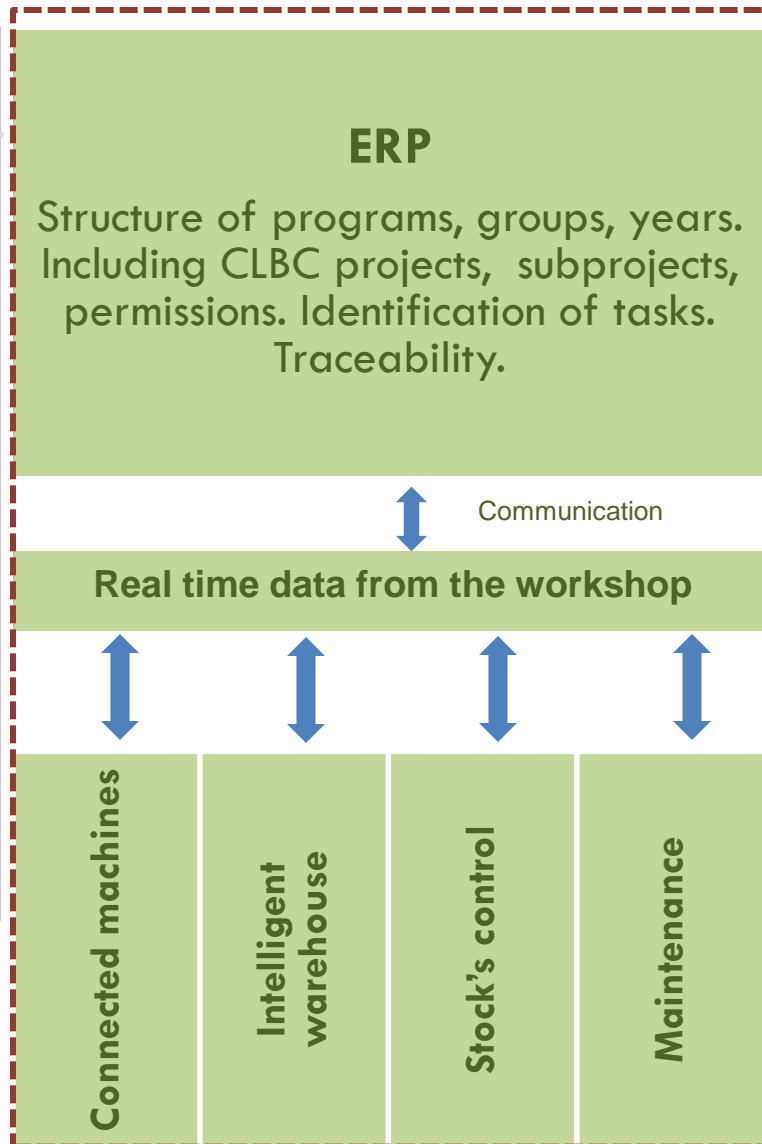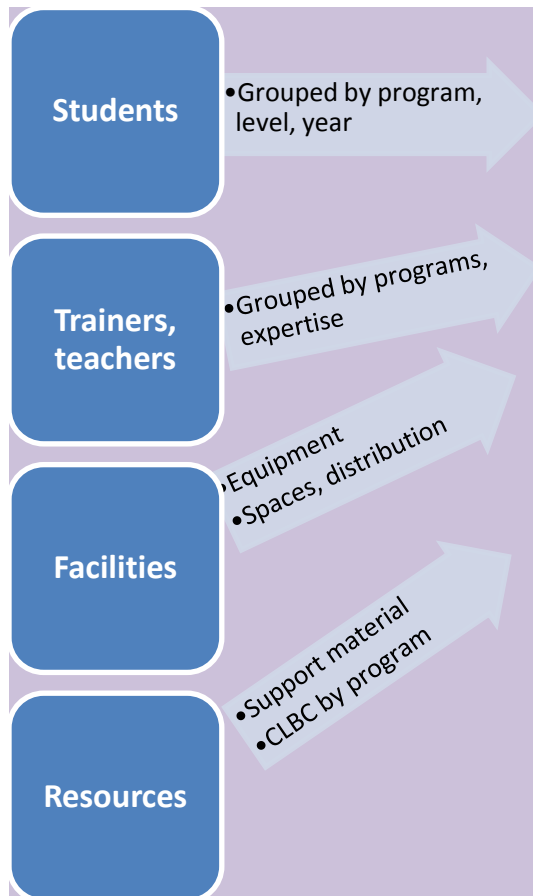- Cibersecurity (local)
- Big-data systems (local)
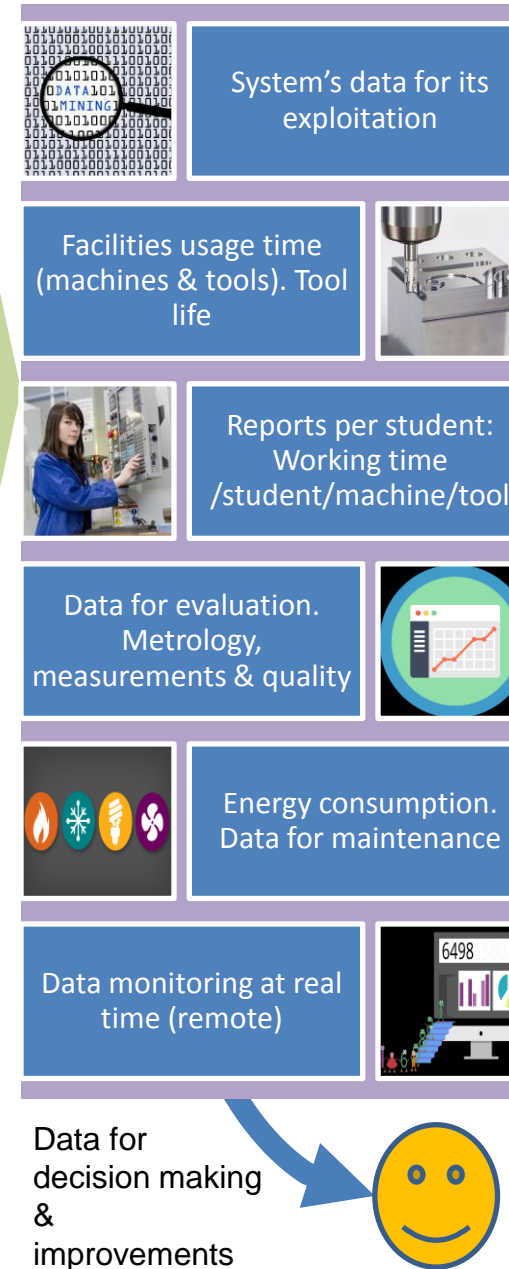
ERP (*Enterprise Resource Planning*)

Other Workshops
- *Specific workstations for Mehcatronic's*
- *Aditive manufacturing*
- *Flexible robotic*
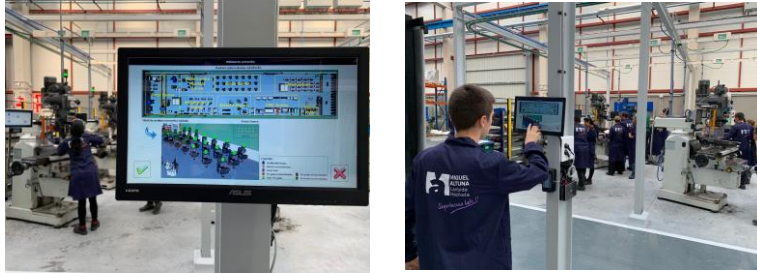
SMART ADVANCE MANUFACTURING
workshop in VET

Students

•Grouped by program, level, year

Trainers, teachers

•Grouped by programs, expertise

Facilities

•Equipment
•Spaces, distribution

Resources

•Support material
•CLBC by program

ERP

Structure of programs, groups, years. Including CLBC projects, subprojects, permissions. Identification of tasks. Traceability.

Communication

Real time data from the workshop

Connected machines

Intelligent warehouse

Stock's control

Maintenance

System's data for its exploitation

Facilities usage time (machines & tools). Tool life

Reports per student: Working time /student/machine/tool

Data for evaluation. Metrology, measurements & quality

Energy consumption. Data for maintenance

Data monitoring at real time (remote)

Data for decision making & improvements

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Machine booking control

Workshop's connetivity. Industrial wifi network and Server

Connected CNC areas

Intelligent warehouse   RFID systens for tool control

Automatized areas

Process monitoring systems

Mechatronics and robotics labs

Expected results from Smart Manufacturing Lab
- Student's work in **4.0 environments** so that they get used to new ways of working.
- Acelerate the adquisition of **digitalization skills.**
- Students, equipment's and systems are **connected throughout the entire process chain**
- **All relevant information is available in real time** for trainers and students
- **CBCL methodology** approached as an industrial process.
- **Student's progress individual traceability.** Accurate information for the evaluation plans.
- **Machine's working time information,** time machine's on/off and real machining time. Exact information about machine's use.
  - o Accurate Maintenance planning
  - o Booking of machines, usage of the facilities
  - o Tool control. Information available about who is using the tool, what machine, what task is carrying out, material, process. Data for life analysis.
- **Stock control.**
- **Cybersecurity managed** in a local environment. Basics applied.
- **Big data managed** in a local environment. Basics applied
- **Showroom for SME's and microSMEs**

Thank you for your attention