Activities with regard to Production System Evolution

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Mission and Objectives

Mission

The mission of CENI relies on the creation of a dynamic information, knowledge and learning network that will provide collaboration between Higher Education Institutions and Technology Organizations to join research and strategic knowledge transfer activities in projects of Industrial Logistic and Organizational Process in a way to improve the qualification of human resources and technology development.

Objectives

- To promote technology transfer to industrial companies through research and development projects and other actions;
- To offer advanced engineering services to companies;
- To develop software tools as part of systems and innovative solutions for companies and industrial sectors;
- To contribute to the development of human resources skills through training actions.

Stakeholders

- Industrial companies
- Students
- Researchers
- Instituto Politécnico de Setúbal
- Service industries
- Industrial Associations
- Local government
- Research societies and foundations

CENI is a member of the Portuguese Alliance for Science-based Innovation in Manufacturing Industry (PAM)
Location
Associate members and Organization

- Private and non-profit R&D association

Organisation

- General assembly
- Board of directors
- Scientific board
- Industrial board
- Accounting board

Portuguese Alliance for Science-based Innovation in Manufacturing Industry (PAM)
Opportunity and Motivation

- The challenges can only be met by a responsive, qualified organisation that bring scientific knowledge together with valued solutions for companies.

- Production systems evolution challenge small and medium industrial enterprises to search for skilled people and engineering support.

- Industry, generally, has been very open to invest in technology and in new management concepts.

- The sustainable development of the region of Setúbal and Palmela requires innovative projects to attract technical and scientific expertise.

- Industrial companies perceive the need for cooperation in a global base.
**Skills and capacity**

CENI relies on a network of researchers, engineers, managers and skilled people from complementary knowledge areas.

### Integration

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### Information systems

- Planning models
- Control and monitoring techniques and communication technology
- Product data management
- Process simulation
- Supply chain management
- Integration systems
- Data analysis and processing

### Logistics and organization

- Production systems modelling and planning
- Analysis and optimization of materials flow
- Logistic systems for industry and services
- Design and implementation of production networks
- Reverse logistics

### Process Development

- Product and process modelling, planning, control and analysis
- Product lifecycle and management
- Environmental, social and economic sustainability
- Evaluation and process improvement
- Simulation of manufacturing systems
- Process optimization
- Collaborative work

### Activities

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### Innovation

- Research Services Training
- Skills and capacity
- CENI relies on a network of researchers, engineers, managers and skilled people from complementary knowledge areas.

**Knowledge Transfer Development Applied**

- Production technologies
- Statistic
- Operational research
- Quality
- Computer science

- Materials
- Maintenance
- Environment
- Management

- Information systems
- Logistics and organization
- Process Development

- Innovation

- Activities

- Research

- Services

- Training

- Skills and capacity

- CENI relies on a network of researchers, engineers, managers and skilled people from complementary knowledge areas.
Skills and capacity

*Synergies of existing skills* within the network *powering new skills and services:*

- Feasibility studies
- Factory design
- Industrial Architecture

Study through virtual visualisation of production flows extends logistics design and factory modular design.
**Projects**

"Manufacturing System Energy Consumption Evaluation"

**Objective:**
Material flow and the energy consumption analysis and evaluation; saving actions and reporting of attained value.

**Method:**
Material Flow Analysis and Process Industry Energy Analysis: a) Specification of needs, b) Analysis of data results from different perspectives (product-, process-, equipment -...), b) Saving actions definition and c) report the findings.

**Results:**
Yearly report, energy policy, energy audits, follow-up and monitoring, information and training.
Objective:
- Factory reorganization and processes improvement.

Method:
- Definition and implementation of a system to evaluate the performance of the manufacturing system.
- Characterization of a performance "baseline" for comparison.
- Promotion of empowerment improvement at different organizational levels.
- Availability of data to support decision making and to drive actions for process improvement and for actions evaluation.

Results:
- Promotion of empowerment at different organizational levels.
"Manufacturing Reorganization"

**Results:**
- A framework for the evaluation of a manufacturing system performance.
**Objective:**
Place the company in a more competitive position in the global market of construction materials supplying engineering solutions with the reduction of the construction time per square meter, decreasing the construction costs per square meter, assuring the reliability of the product/solution and assuring the adaptability of the solution through its modularity.

**Method:**
Develop a new concept for building design, construction, installation and use.

**Results:**
It is expected:

i) The development of an integrated, modular and pre-manufactured and assembled system;

ii) Variant of uses such as Services, Industries and Residences;

iii) The design and implementation of a new industrial process for manufacturing and assembly;

iv) “Portability”: The development of a “packing” solution for expedition; v) Definition of a architecture with a modern and industrial design.

v) Development of a product/label where everything is conceived from the constructive elements to the packaging solution.
Objective:
Integration of maintenance with production planning, taking into account the needs of both production planning and maintenance systems and accommodating the equipment/system reliability forecasting.

Results:
The operational schedules contribute for an effective exploitation and performance of equipment/system and optimizes the cost function and will calculate the optimum frequency to perform preventive maintenance.

Method:
Development of a new model to integrate the historical data of equipment/system failures and its use, giving inputs data for an effective product life cycle management and promoting the linkage between the design or manufacturing and assembly functions.

Projects
“Productive services planning and control system”

Projects
“Productive services planning and control system”
**Objective:**
Development and implementation of an information system that is conceived in order to support the decision and documentation in the design and manufacturing of tools and dies.

**Method:**
Process mapping and operational requirements definition to tackle the needs of tool and dies business unit.

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Projects

“Information system to support the design, manufacturing and tryout of tool and dies”

- Project management
- Data management
- Process planning
- Tool lifecycle management
- DB
**Objective:**
To support the production processes and the production management tasks with an information system for planning and control.

**Method:**
Based on a full process mapping and operational requirements, a system was designed to tackle the needs of aquiculture activity, using processes parameters, forecasting, and other operational data.
Other Initiatives

Technology

Human Resources

Organisation

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tecnologia e inovação
Industry ecosystems: Beyond Lean manufacturing

- New organizational models.
- Change management.
- Disperse and grid manufacturing.
- Resource efficient, sustainable production systems.
- Challenges in lean management; leanness and agility.
- Human resources and technological factors.
- Extended value chains and cash flow modelling.
- Performance management.
Alliance for Science in Manufacturing Industry

Portuguese Alliance for Science-based Innovation in Manufacturing Industry (PAM)
Thanks for your attention

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