

Pilot Research Study

PLM: The Development of SkillsNet Based Competency Model for Engineering Education

Module 19

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Overview

- *Change* the only workplace constant
 - Technological innovations
 - Cross-functional teamwork
 - Virtual, sometimes global, teams
 - Implementation of Product Lifecycle Management (PLM)
 - New, results-oriented emphasis in the workplace.
- Need for Reconceptualization
- Competency Model

Overview (cont.)

- Industry's demand for professionals who are PLM-proficient at time of hire
- Development of a competency model for entry-level engineers in a Product Lifecycle Management (PLM) environment.

Product Lifecycle Management

- Focuses on eliminating inefficiency
- Substitutes information for wasted time, energy, and material
- Follows product through entire life-cycle
- Well-known companies beginning to implement PLM

Method

- Tool
 - SkillsNet
- Collaborators
 - 5 PLM Subject Matter Experts
- Task
 - Isolate 30-40 *SkillObjects* for development of Competency Model

Method (Cont.)

- Definition of *SkillObject*:
 - detailed description of what people do in order to accomplish work
- Selection of *SkillObject* criteria:
 - In industrial setting
 - ❖ Done by top-tier job incumbent
 - For this project
 - ❖ Assistance of Subject Matter Experts

Method (Cont.)

- The Work Element Editor
 - Eliminate redundancies
 - Clarify all verbiage
 - Check for errors
 - Reduce without losing information
- SkillsNet
 - Compatible with O*Net
 - Web-enabled

PLM Competency Model

- Engineering-specific
 - Conform to standards of Society of Manufacturing Engineers
 - Ground-breaking research into “competency gaps”
 - ❖ Defined: Competencies needed by industries but not being adequately taught within academia
- Our project goal: Competency Model
 - SME & PLM compatibility

Example *SkillObject* Report

- Occupation: Mechanical Engineer
 - Job Family: Architecture and Engineering
 - Economic Sector: Business, Manufacturing
- *SkillObject*: Engineers' Tasks and Enabling Skills and Abilities
 - Read and interpret various types of technical documentation
 - ❖ *Primary skill*: Information organization
 - ❖ *Secondary skill*: Critical thinking
 - ❖ *Primary ability*: Information ordering

***SkillObject* Example (Cont.)**

- Communicate with others concerning operational procedures and technical information
 - ❖ *Primary skill*: Writing and speaking
 - ❖ *Secondary skill*: Operations analysis
 - ❖ *Primary ability*: Written and oral expression
- Research proposed designs and analyze relevant data
 - ❖ *Primary Skill*: Writing
 - ❖ *Secondary Skill*: Information Organization
 - ❖ *Primary Ability*: Category Flexibility

Skill Object Example (Cont.)

- Recommend product modifications in compliance with desired specifications
 - ❖ *Primary skill:* Writing and speaking
 - ❖ *Secondary skill:* Identification of key causes
 - ❖ *Primary ability:* Originality
- Apply engineering principles to products and systems in conformity with requirements
 - ❖ *Primary Skill:* Critical thinking
 - ❖ *Secondary Skill:* Information Organization
 - ❖ *Primary Ability:* Information ordering

SkillObject Example (Cont.)

- Tools/Software/Equipment
 - Flowmeters/Interferometers
 - CAD Software/Analytical or Scientific Software
- Unique Knowledge
 - Practical application of engineering and technology
 - Designs, uses, repair, and maintenance of machines
 - Manufacture and distribution of products
- Resources
 - Computers and Electronics
 - Blueprints
 - Manuals

Project Deliverable

- Competency Model
 - Based on 30-40 *SkillObjects*
 - Designed for entry-level engineering professionals
 - PLM proficiency at time of hire

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