Cloud Software Development in a Mixed Academic-Industrial Setting

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GOAL:
Evolving a methodology for project management in a mixed academic-industrial environment
OPCloud
Web-based tool for modeling in OPM
OPCloud

https://www.opcloud.tech/

OPM

OPD - Object Process Diagram

Collaboration

OPD tree

Things list

OPL - Object Process Language
OPCloud main features

Cloud-based Application
Ability to work from anywhere, any time

Collaboration
Simultaneous work of multiple distributed users, one editor at a time with built-in edit right transfer

Connectivity
with to other systems (DOORS, ARAS, PTC...) using OSLC

Latest Web Dev. Technologies:
Firebase, Angular, Rappid...

Correctness-by-Construction
via context sensitivity for choice of links and other features

Backward Compatibility
for OPM models prepared with OPCAT
The Mixed Academic – Industrial Project Setting
## Mission and feature differences

### Industry
Develop new products to maintain their competitive advantage and stakeholder value
- Addressing entire system/product/service lifecycle
- Commercial value-driven
- Organized and structured

### Academia
Carry out basic and applied research projects to advance science and technology
- Innovative, highly variable
- Discontinued after the prototype stage
- High-risk nature
- Academic freedom
OPCloud Contributors Population is Highly Heterogeneous:

- **Post-doctoral fellows**: Research-oriented development
- **Grad students**: PhD, MSc, Research-oriented development
- **Undergraduate students**: A Team Project-Based Learning (PBL) online course (edX, CAMPUS)
- **Researchers**: Working on research, instructing development
- **Software developers**: Dedicated, paid, report to project manager
- **Part-time student developers**: Paid, report to project manager, do smaller tasks
What are the success factors of project management?
Project management success factors categories

- Project management success
  - Project manager competencies
  - Organization
  - Project management methodologies, methods, tools and techniques
Project management methodologies, methods, tools and techniques

- Methodologies
- Software
- Decision making techniques
- Risk assessment & tools
- Information, communication technology support tools
What is a Project management methodology?
**Project Management (PM) Methodology**

- A set of methods, techniques, procedures, rules, templates, and best practices used on a project (Project Management Institute, 2008).
- A set of guidelines and principles that can be tailored and applied to specific situations, where guidelines could be as simple as a task list, or a specific approach to a project with defined tools and technique (Charvat, 2003).
- A structured set of techniques and tools used for solving a specific problem (Introna and Whitley, 1997)
- Any principle that a project management team relies on in order to successfully deliver a project result (Cockburn, 2003).
Our Academic Agile PM Methodology

**Scrum**
- Weekly meetings
- Monthly Iterations and product deployments
- Retrospectives

**Tools**
We use Zoho, a tool for agile development. It includes
- whiteboard (with Kanban),
- issue tracking
- milestone setting
- Releases
- ...

**Approach**
The Project Manager handles OPCloud development while considering various group objectives. Each contributing group focuses on its own goals (e.g. graduate students on their thesis)
Insights from Applying our PM Methodology

- **Project Goal Attained**
  - Milestones achieved, with some delays
  - Customer expectations met
  - OPCloud is an operational and evolving software product
  - On Budget

- **Different Contributing Groups Attained Goals**
  - Postdoc becoming faculty at a US university
  - PhD, MSc progressing
  - Peer reviewed papers published
  - Students become full time developers

- **Academic Startup Model Sustainment**
  For three years, this entrepreneurial model has been self-sustainable with proven successes stories:
  - Whirlpool
  - Airbus
  - Volkswagen (current)
OPM Resources


- **ISO Standard:** ISO 19450 OPM

- **edX Course:** https://www.youtube.com/watch?v=l9RFM4ybDGg

- **Website:** Enterprise Systems Modeling Laboratory contains
  - journal & conference papers,
  - presentations
  - projects
  - more...

- **OPCloud:** https://www.opcloud.tech/
Thanks for listening!

Visit our Lab site: http://esml.iem.technion.ac.il/

Experience OPCloud, Cloud-based OPM modeling: https://www.opcloud.tech/

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