

Requirements management in students' software development projects

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Requirements management– What?

- *A continuous process throughout the projects life span of*
 - *Documenting, analysing, tracing and prioritizing requirements*
 - *Controlling and communicating the changes*

Requirements management– Why?

- Software projects do fail
 - Standish Group Survey (CHAOS Manifesto 2013)
 - only **39%** of projects succeeded (i.e. in time, in budget, all the requirements fulfilled)
 - **18%** failed (i.e. terminated or never deployed)
 - One of the most important reasons for project failure was vague requirements.
 - Quality of requirements
 - Prioritization
 - Change management
 - Tracing
 - Communication
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Research questions

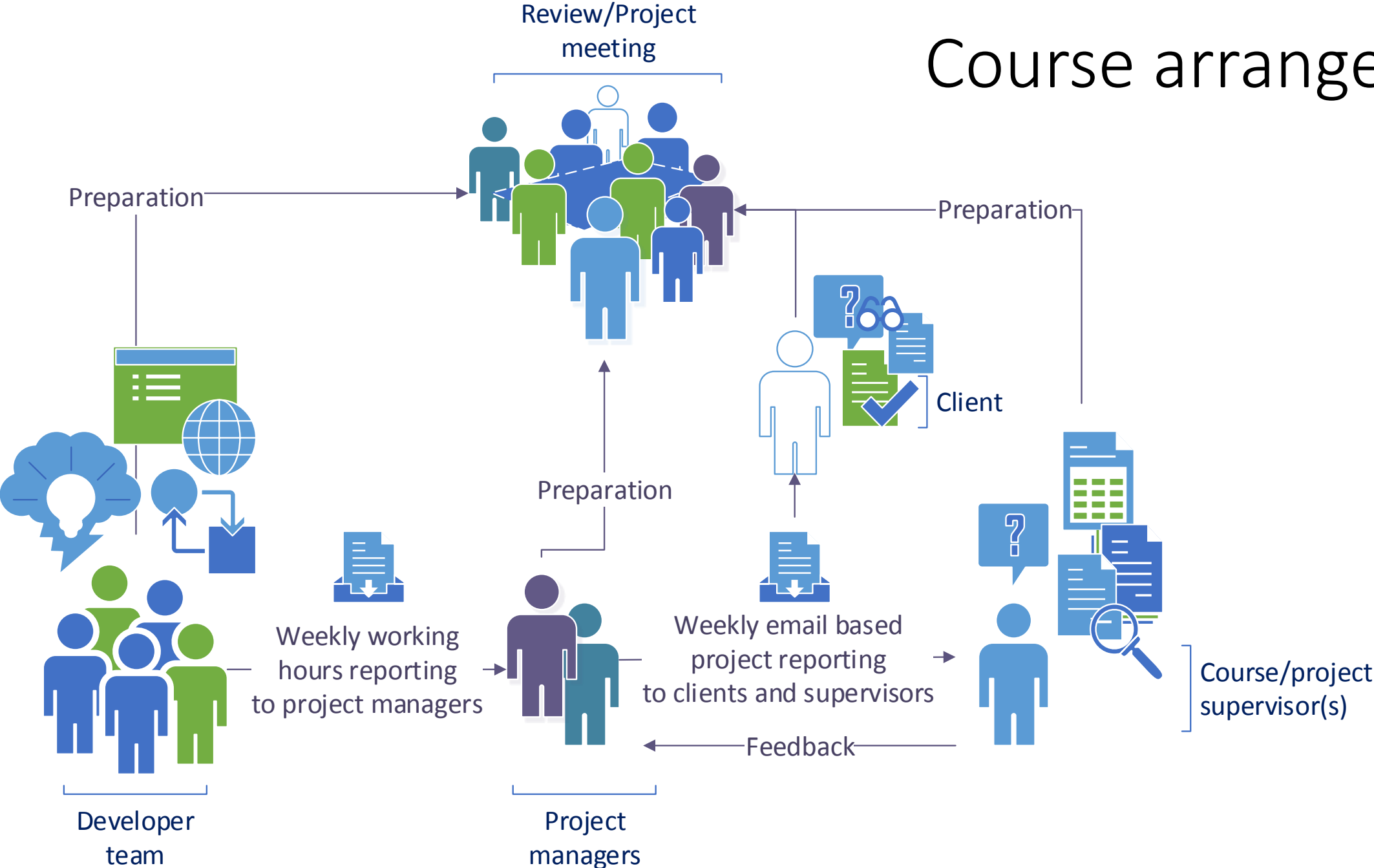
- RQ1: What are the common challenges of requirements management in student projects
- RQ2: What are the tools used in students project and how they applied for requirements management

=> Guidelines for requirements management in student projects.

Background

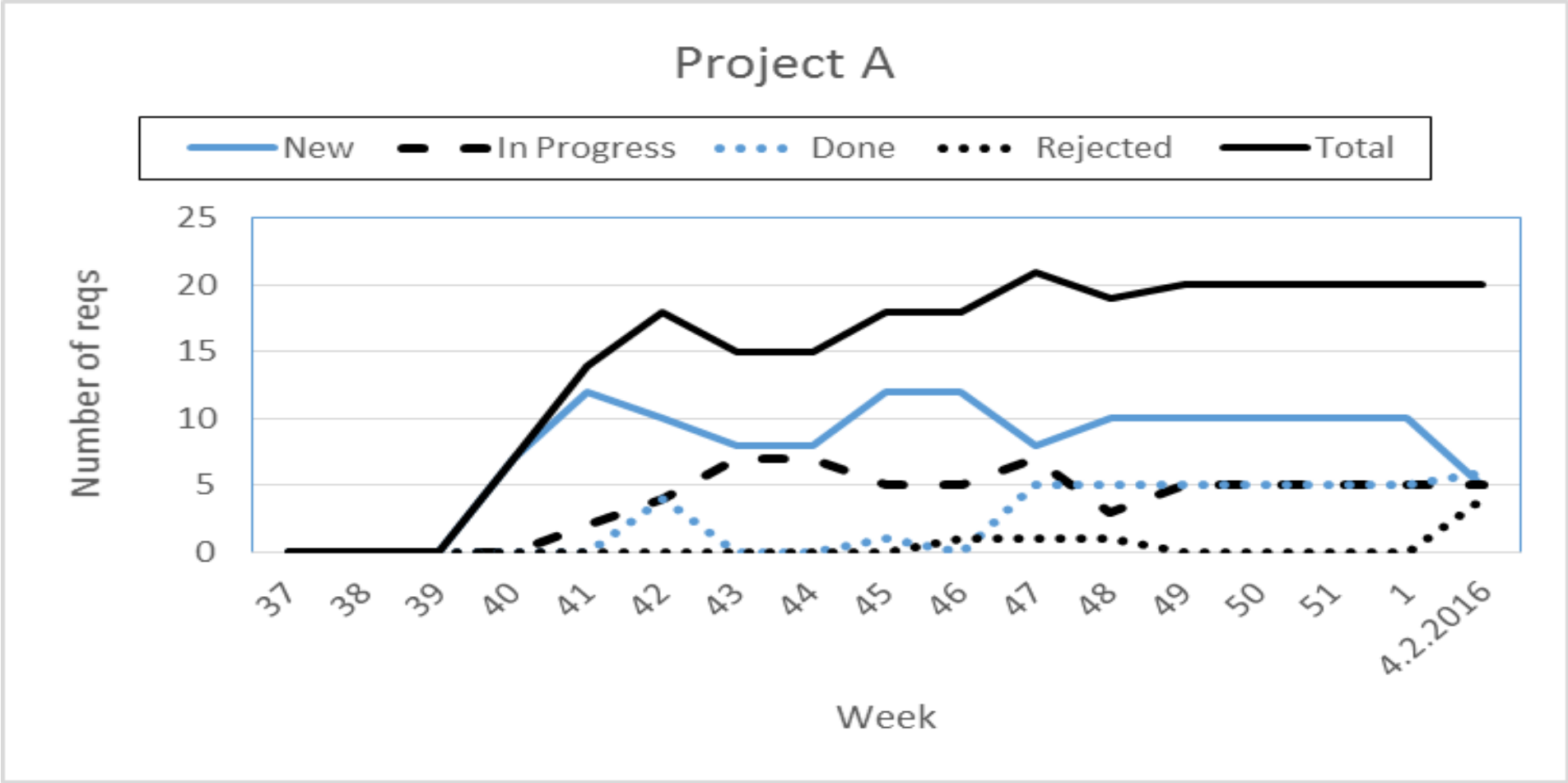
- **Project Work** and **Software Project Management** courses at University of Tampere, fall 2015
 - Undergraduate (40) and graduate (22) **students** formed 12 software project teams
 - **Goal:** to design and implement a functioning piece of software for a real client during one semester
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Course arrangements

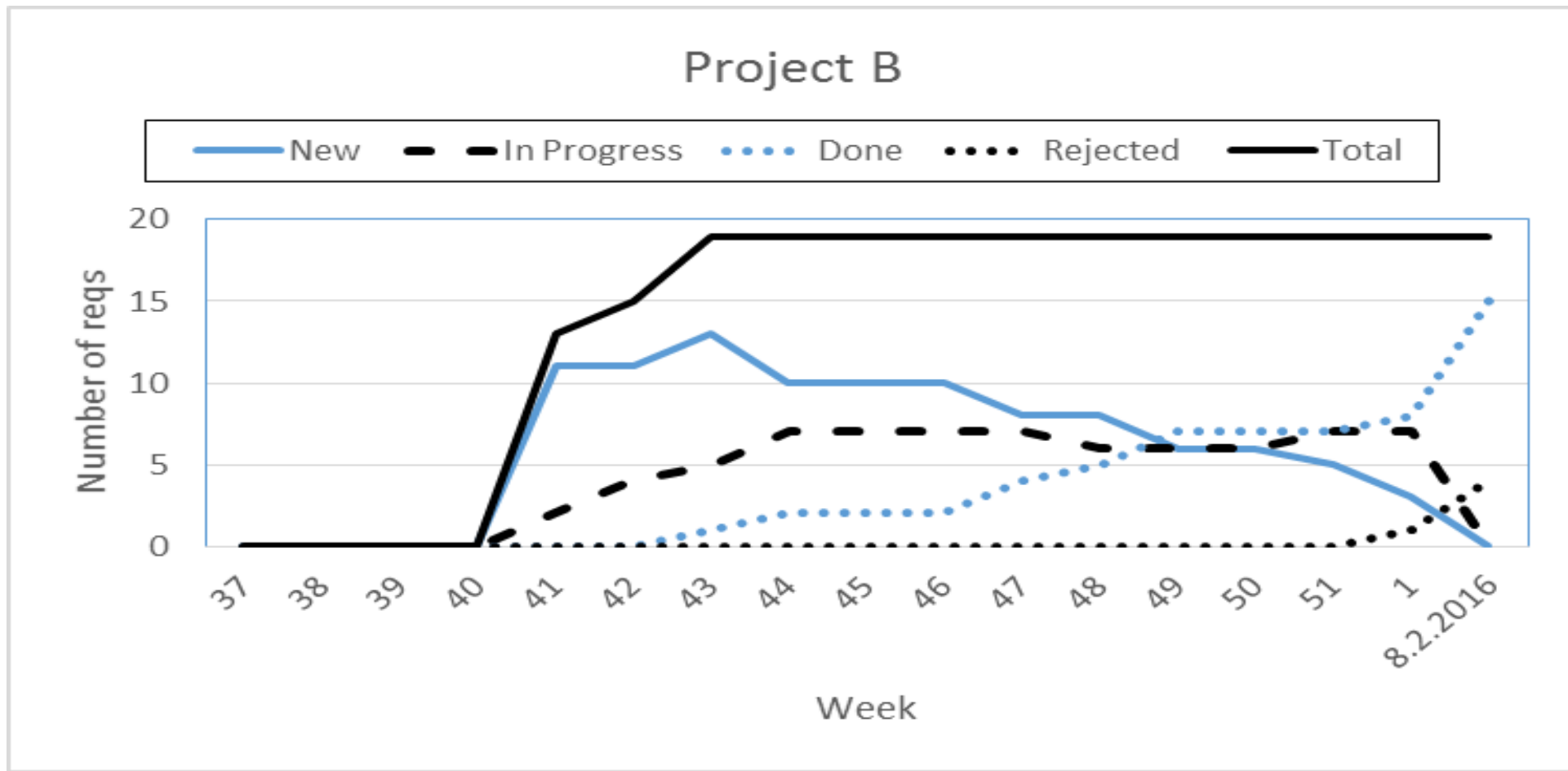


- Two moodle questionnaires
 - 1st in the middle of the courses
 - 2nd after the course
 - Questions to all and some extra questions to project managers
 - Requirements statuses from weekly reports
 - New (product backlog)
 - In Progress (implementing)
 - Closed (implemented and tested)
 - Rejected
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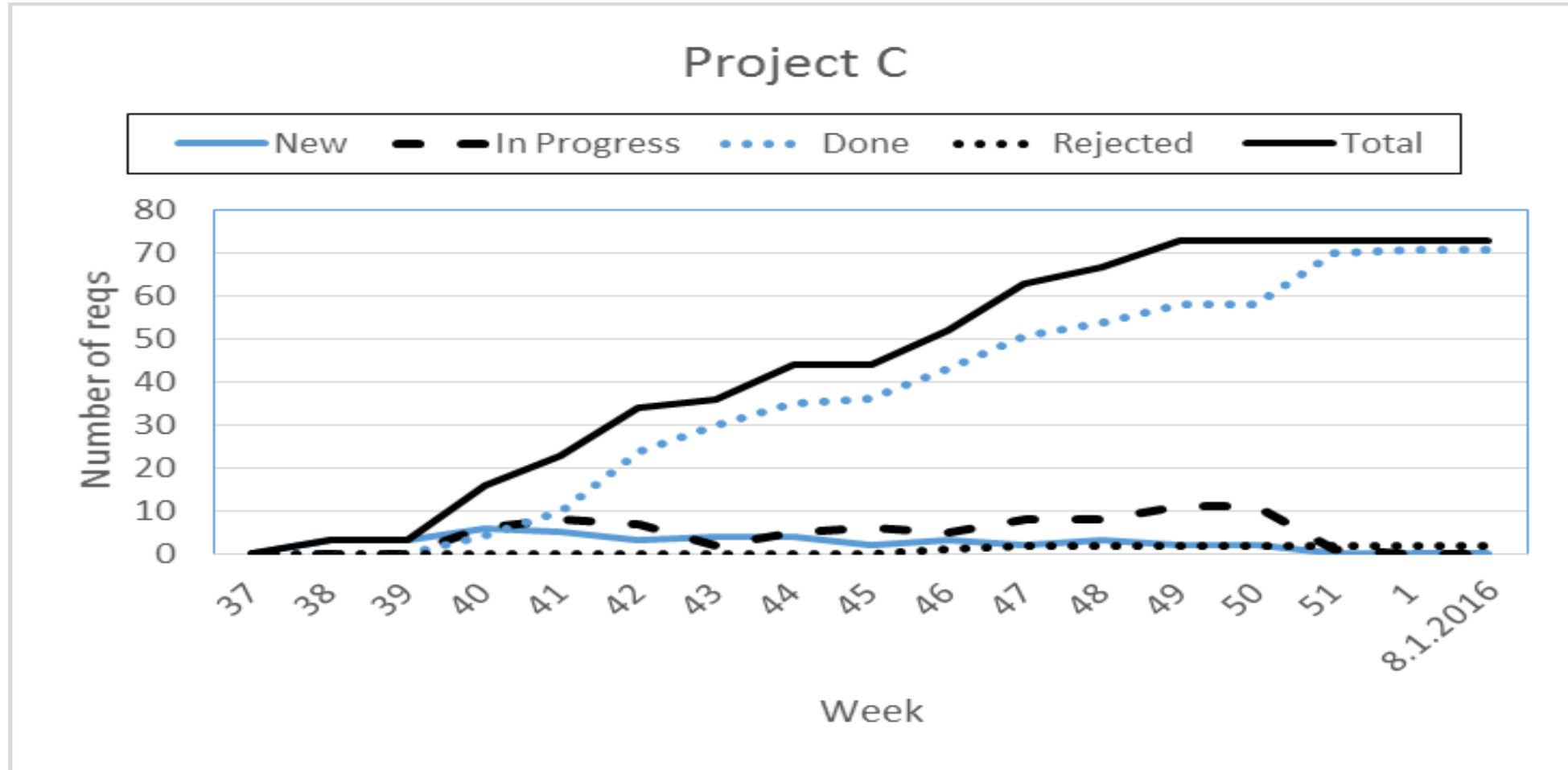
Example project A



Example project B



Example project C



- Requirement management processes
 - 7/12 no process for RM
 - Not reported changes on the RM-processes
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- Requirement source and elicitation
 - Main source was the client – exception the research project C
 - Techniques for elicitation
 - Interviews (4 groups)
 - Use cases (4)
 - Brainstorming (3)
 - Prototyping (5)
 - Evaluation of the application's preview version (1)
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- Change management and prioritization
 - No significant changes in the requirements (9/12)!
 - Either so well specified or on so high level that new requirements had to be elicited.
 - Two teams reported on implementing simplified version
 - A symptom of requirements had not been properly defined as sub-requirements.
 - Priorities together with the client (6/12)
 - Importance and difficulty level
 - The rest group had more informal ways
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- Requirement management tools
 - Traditional documenting tools (Word, Excel) were used by two groups
 - Shared documents (GoogleDrive, etc.) 6 groups.
 - Redmine (6)
 - Trello (3)
 - Github (2)
 - VisualStudio
 - BitBucket
 - Changes on the selected tools reported only 2 teams out of 12.
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- Challenges reported by students
 - Incomplete specification (7 teams out of 12)
 - Communication (5)
 - Client did not understand the importance of prioritization (3)
 - Difficulty of estimating the work amount (3)
 - Problems with the RM-tool (2)
 - Lack of motivation because of huge amount of requirements (2)
 - Changing of the requirements (2)
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Summary and conclusions

- A kind of 'waterfall mind-set' tends to prevail: changes on requirements are reported as problems.
 - -> It could be highlighted to students that agile welcomes the change
 - A team with motivation problems because of 'huge amount of requirements'. Not clear separation between the product and sprint backlogs.
 - -> The **principles** of agile methods could be revised at the beginning of the course
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Summary and conclusions

- Only two teams out of twelve did not use pure requirement management tools.
 - The team with the lack of prioritization was the other which did not.
 - When studying the graphs afterwards, one can easily notice that in project A there were reporting problems and that the number of **New** requirements kept increasing but the number of **Done** did not.
 - Currently there is a tool for showing the state of requirements visually to the project team and supervisors. (<http://metricsmonitoring.sis.uta.fi/>)
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Thank you!

Any questions?

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