

MMT – a Tool for Observing Metrics in Software Projects

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Contents

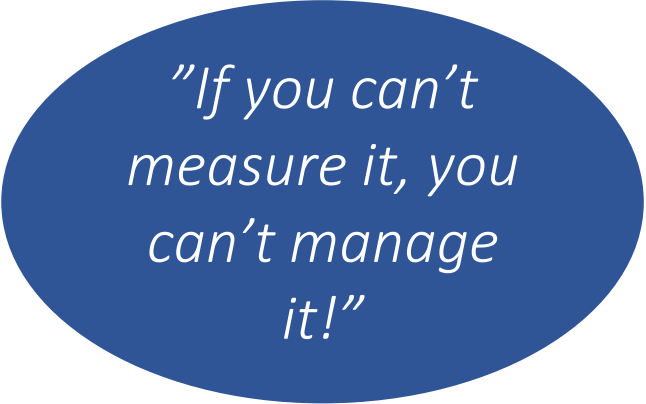
- Software metrics, what and why?
 - Research problem
 - Methods
 - Findings
 - Conclusions
 - Further work
-

Software metrics – What?

- The measurement of
 - "a particular characteristic of a software", or
 - "a software project and process" (P. Goodman, 1993)
 - Process/Project metrics (i.e. controlling metrics)
 - Process and project related
 - **Examples:** *average time for bug fixing, working hours used*
 - Product metrics (i.e. predicting metrics)
 - Product related
 - **Example:** *total lines of code (LOC)*
-

Software metrics – 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 is **poor reporting of the project's status** (Why Software Fails)
 - Management does not know the right status of the project, and thus does not execute right actions
 - Projects fails on monitoring and controlling phases
- **Metrics monitoring** can be used to help to know the status of the project and product

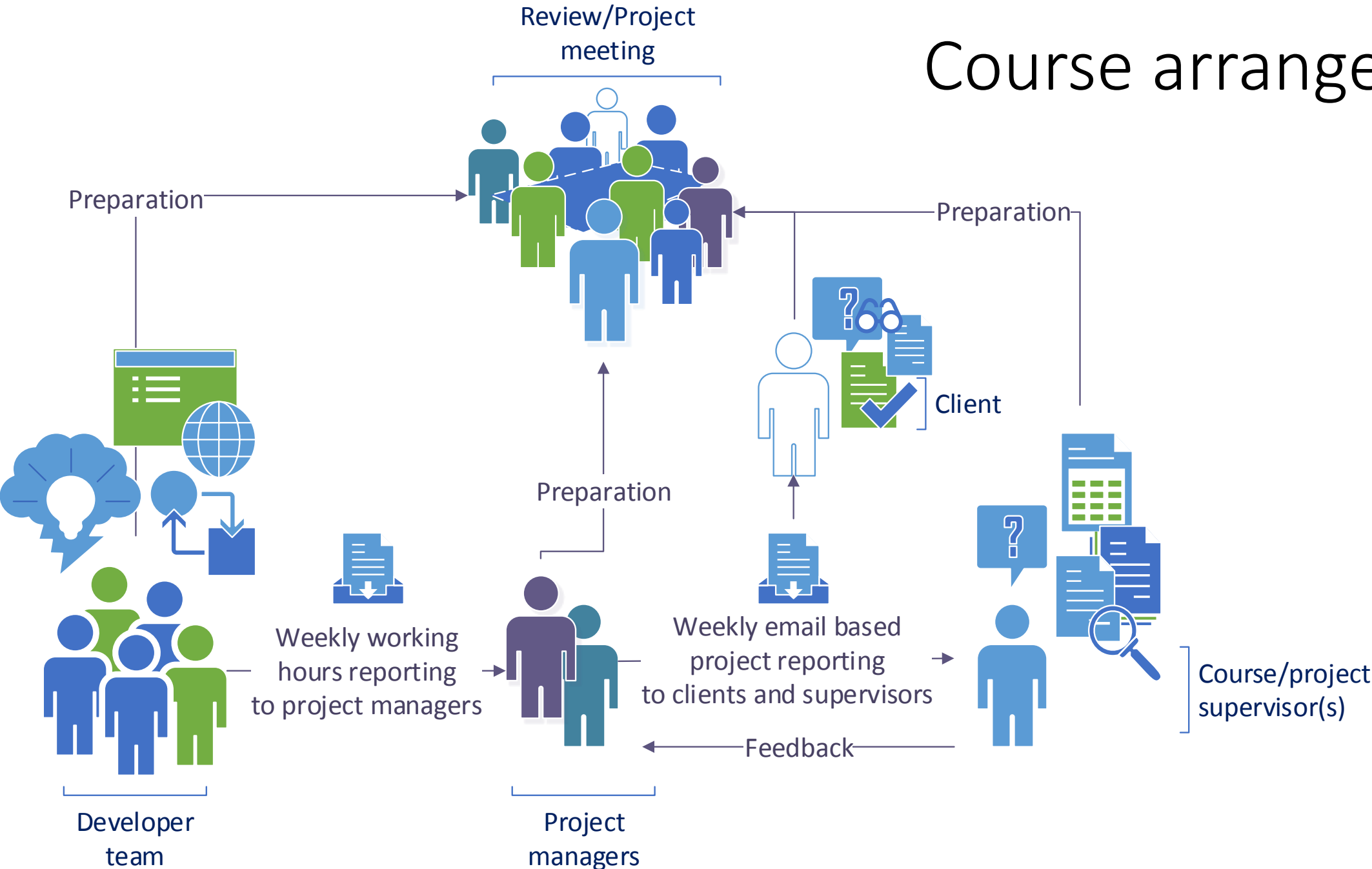


*"If you can't
measure it, you
can't manage
it!"*

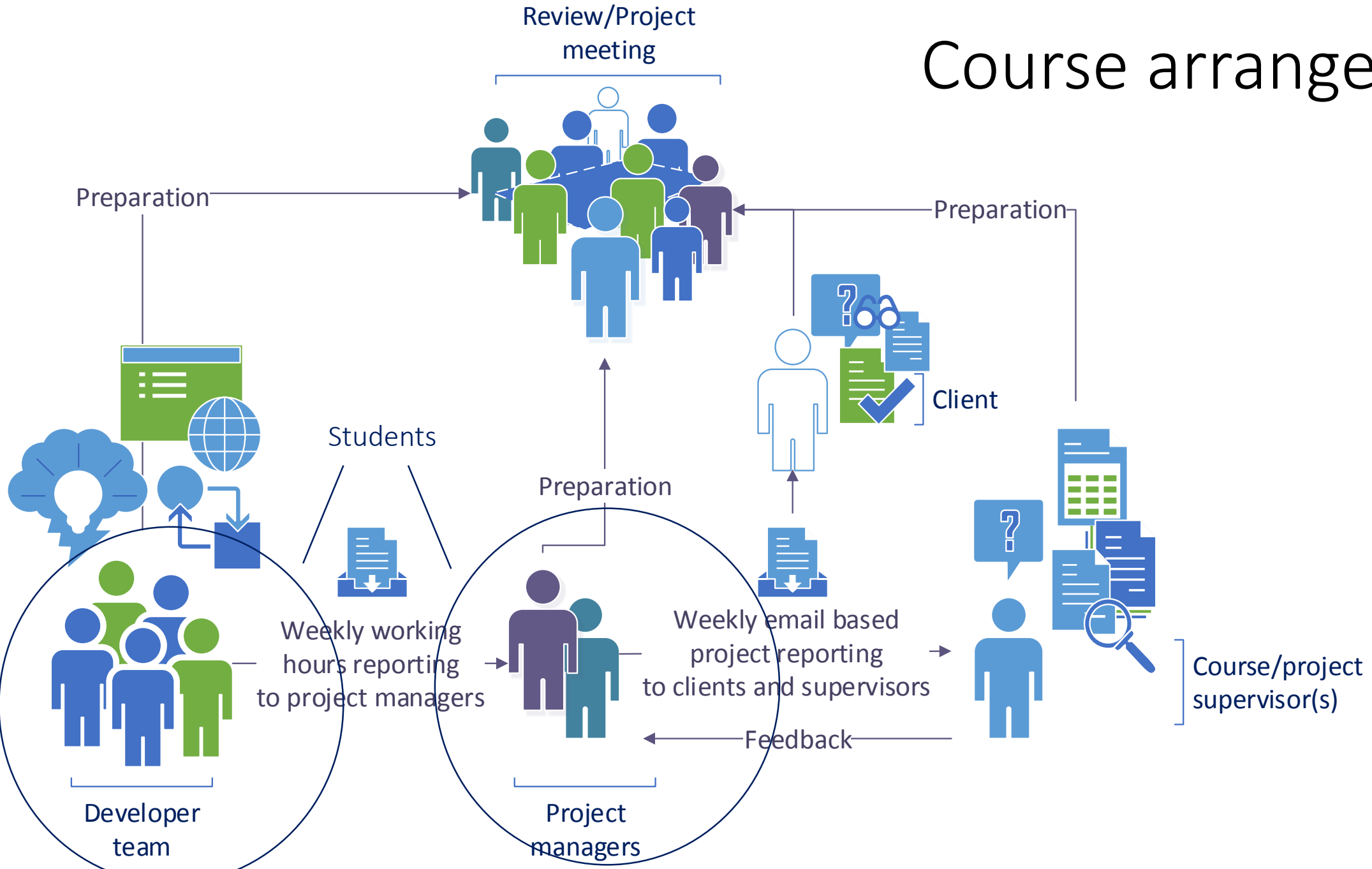
Background for our research problem

- **Project Work and Software Project Management** -courses at UTA
 - Undergraduate and graduate **students** form software project **teams**
 - **Goal:** to design and implement a functioning piece of software for a real client during one semester
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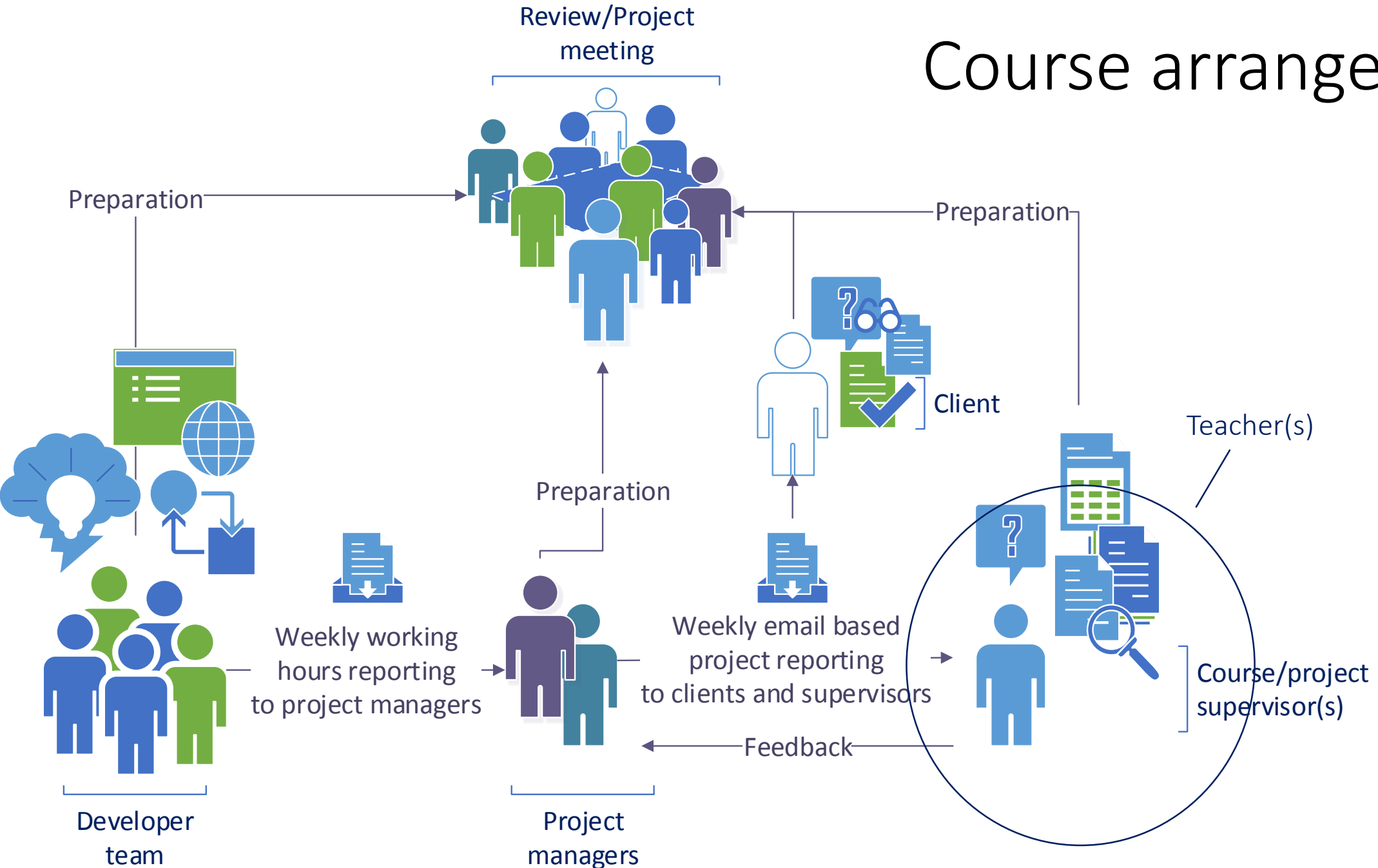
Course arrangements



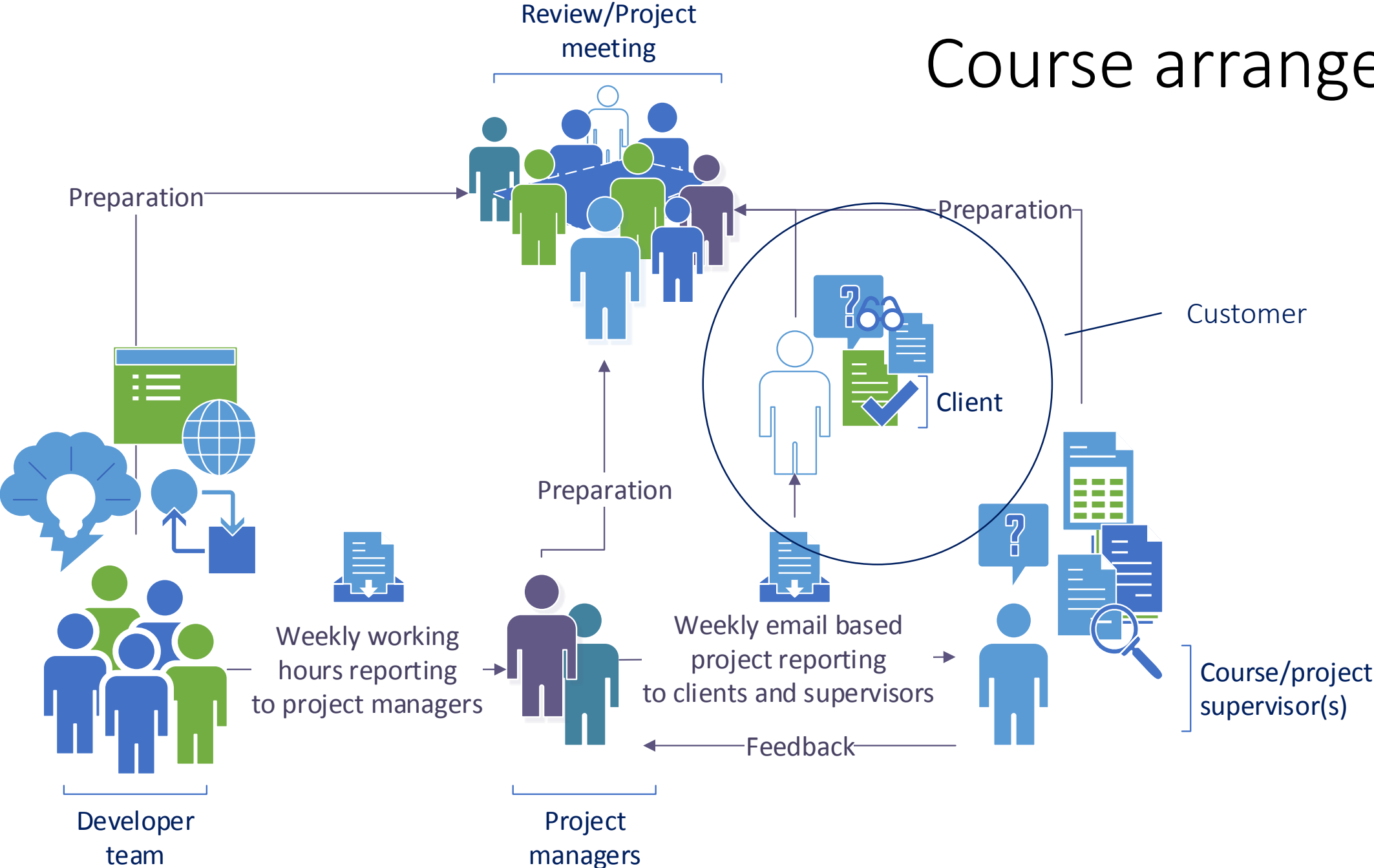
Course arrangements



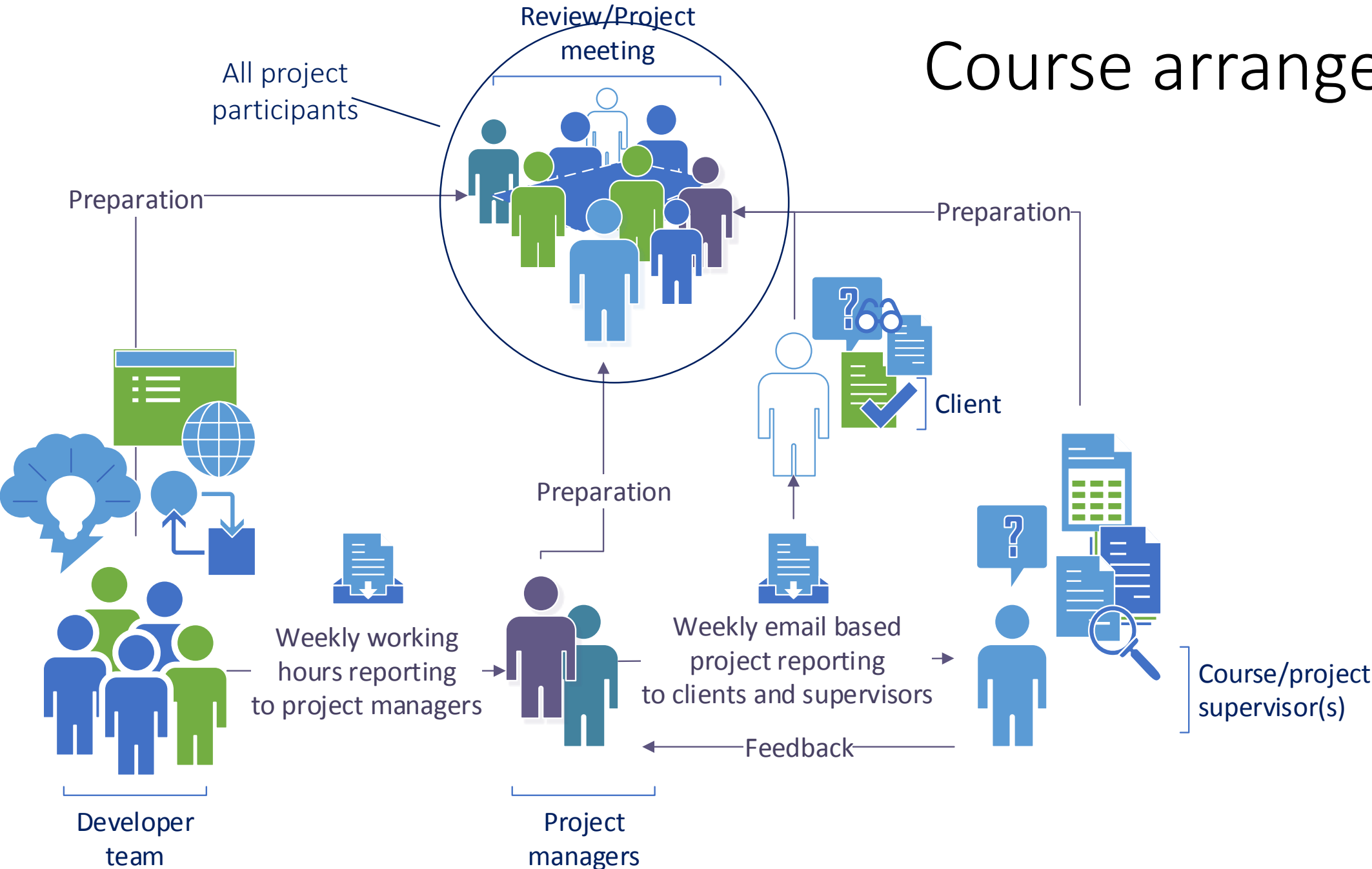
Course arrangements



Course arrangements



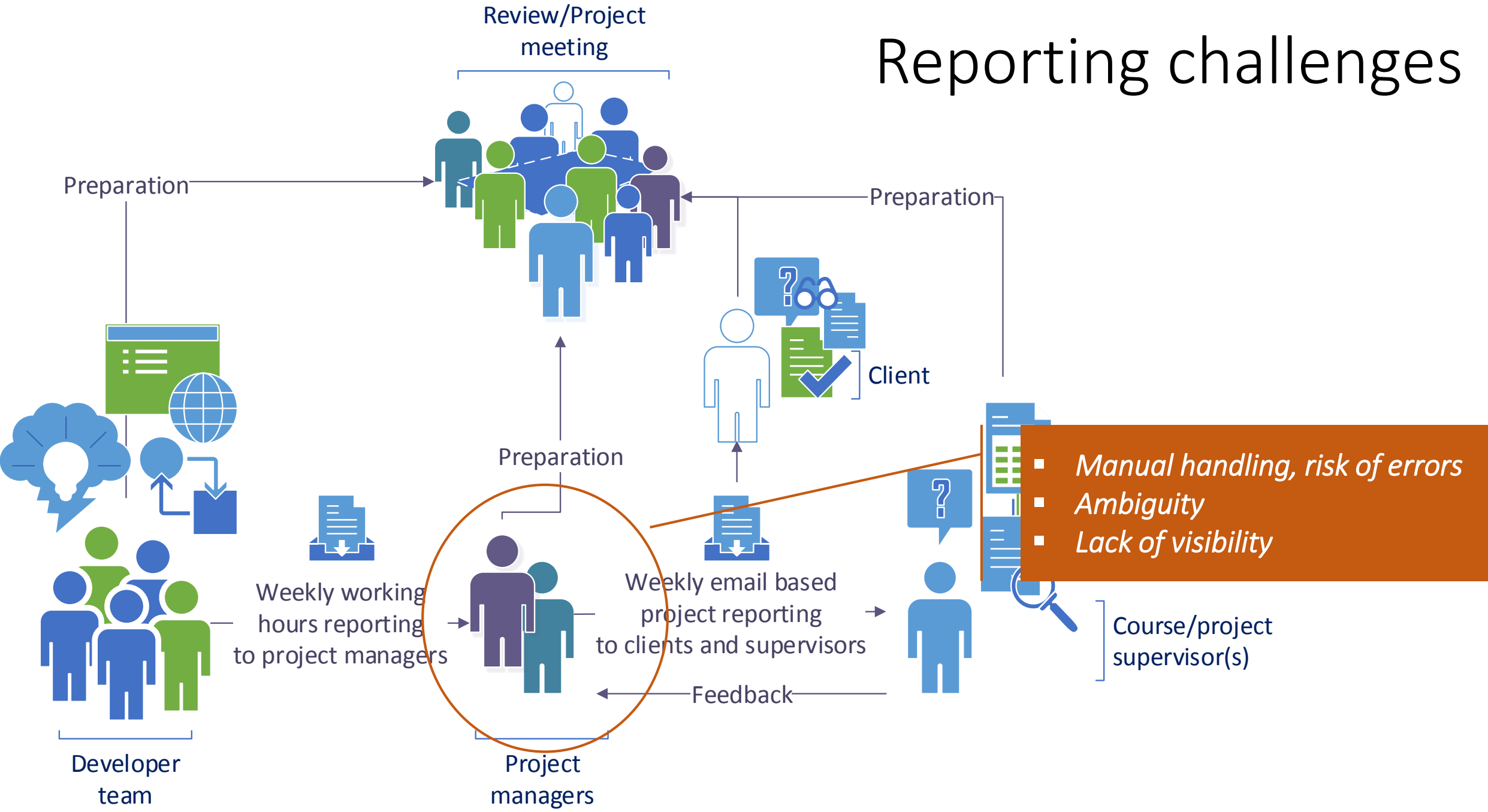
Course arrangements



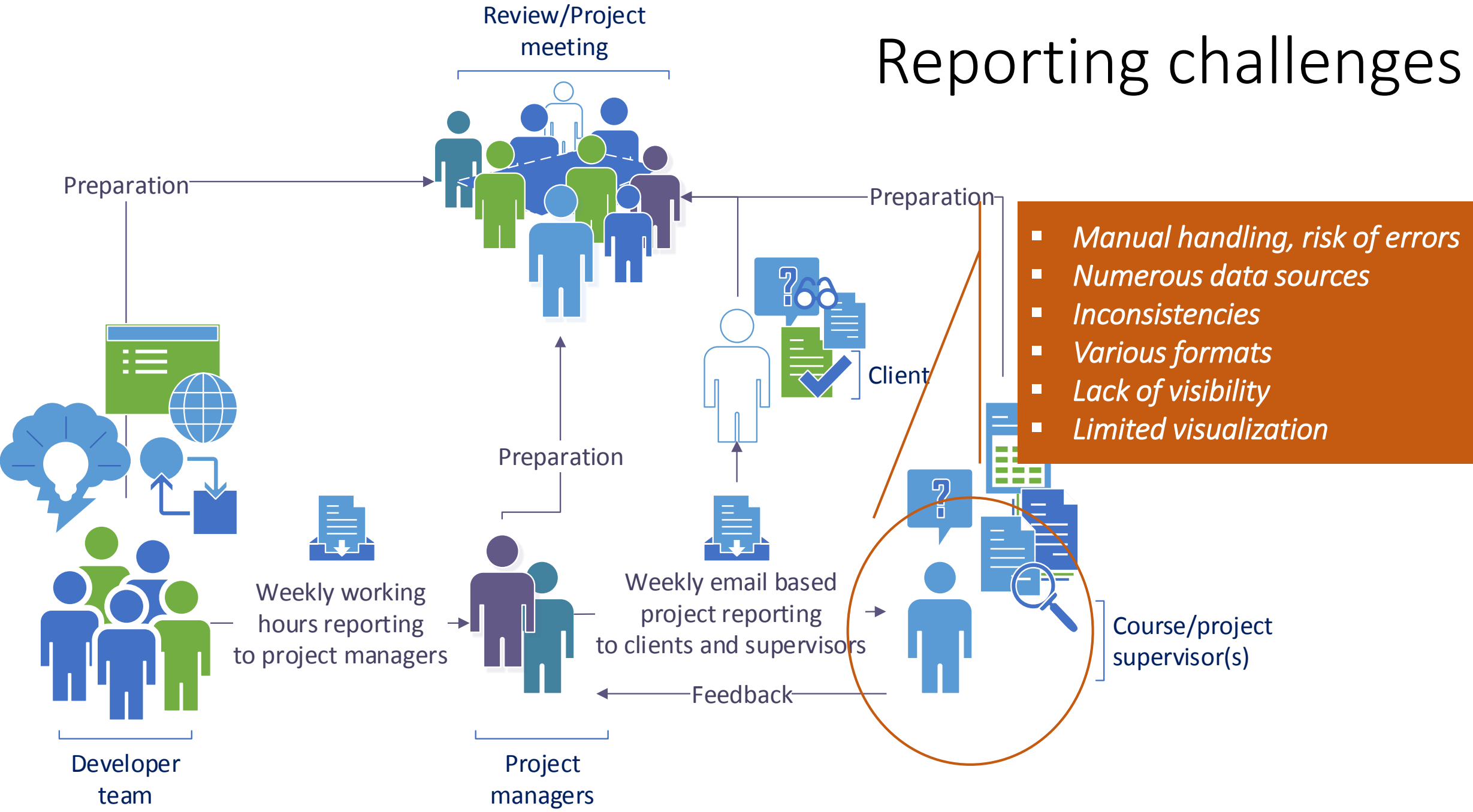
Reporting challenges



Reporting challenges



Reporting challenges



Reporting challenges



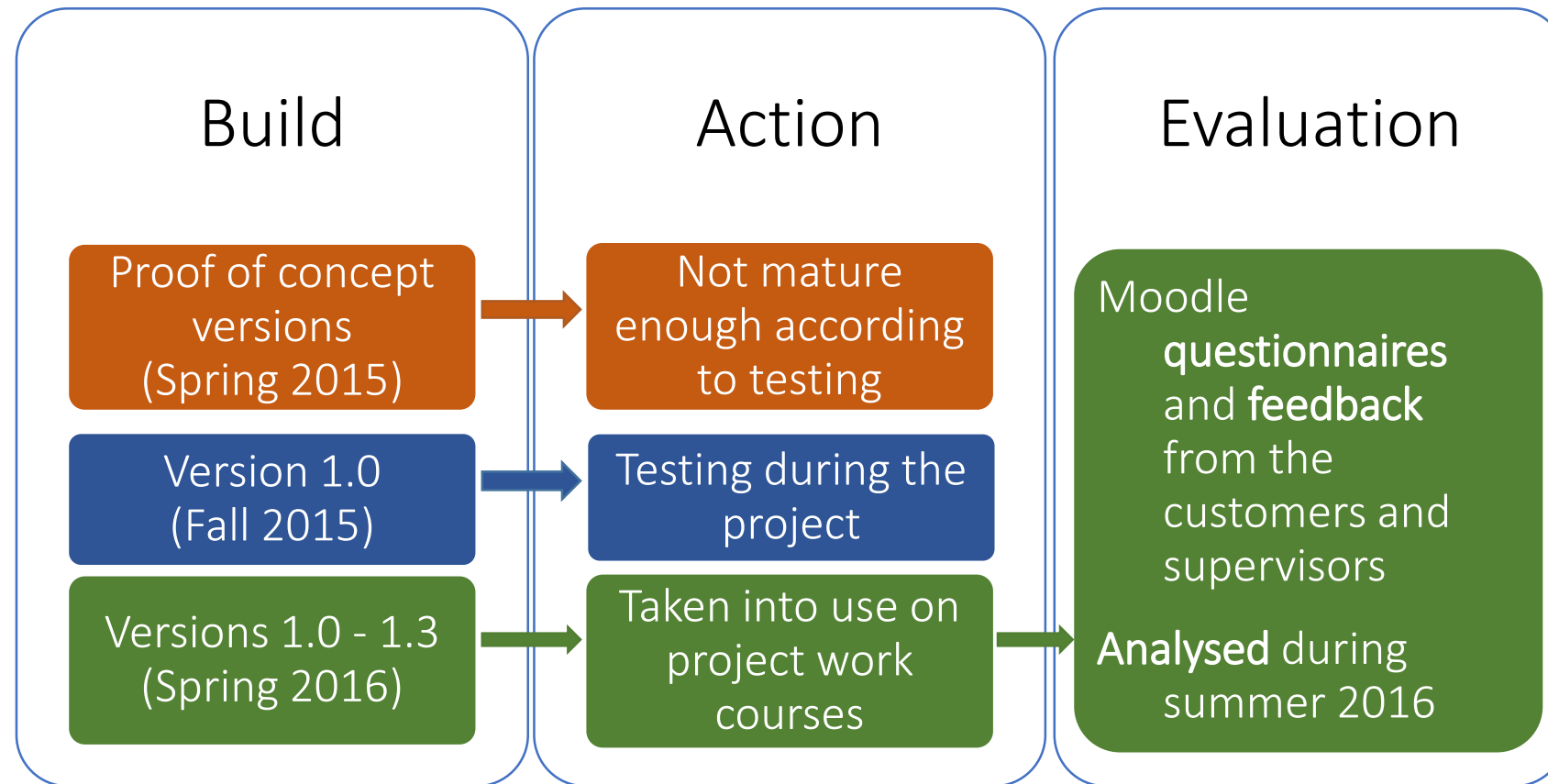
Reporting challenges



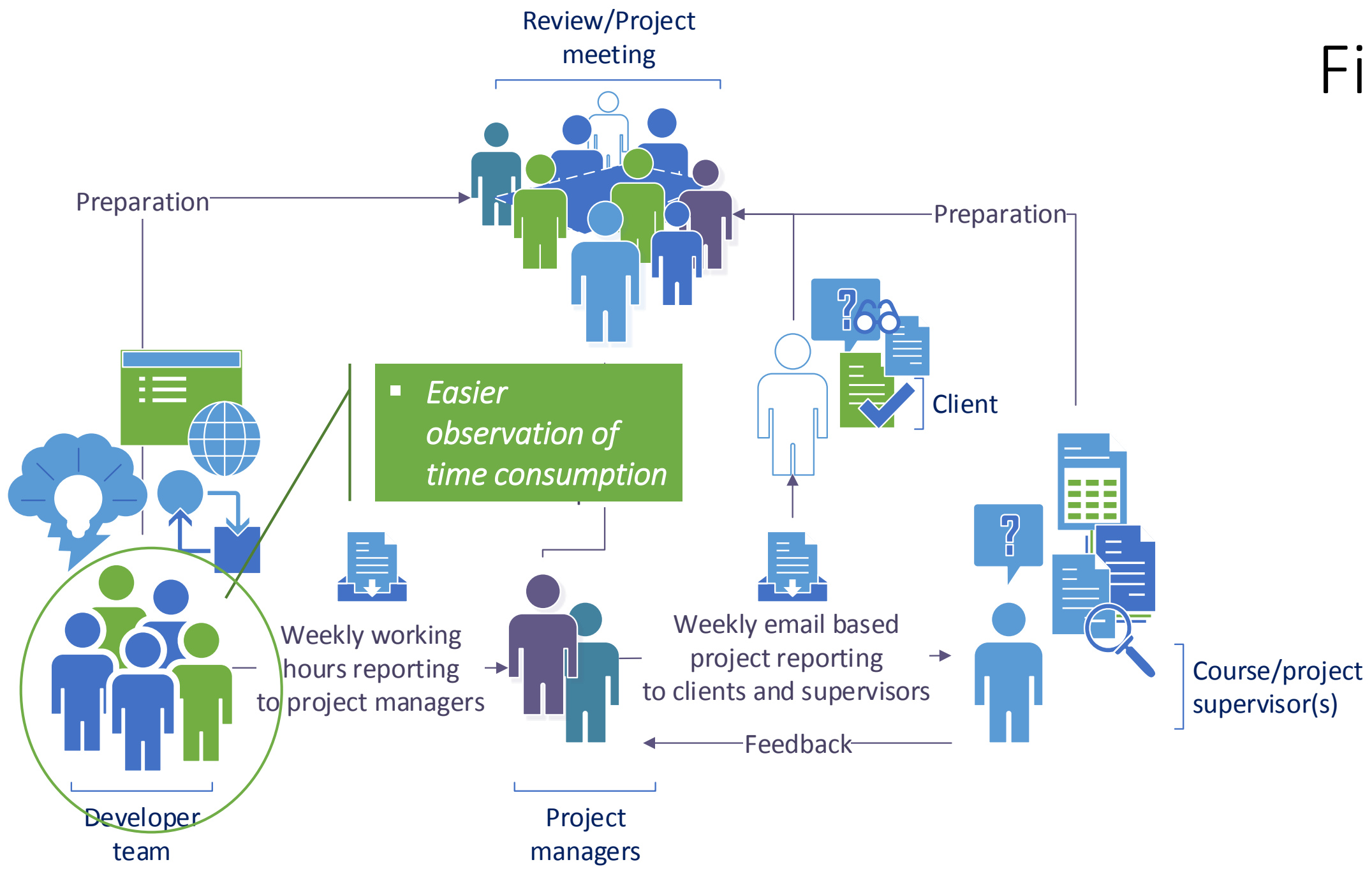
Research problem

- To construct a software tool, **Metrics Monitoring Tool (MMT)**, for **observing** and **reporting** project metrics in software projects
 - To **improve teaching practises** on the software project courses
-

Method: Build – evaluate



Findings



In practice: Logging hours

Log time

Date *
September 5, 2016

Description *
Studying new programming libraries

Duration *
3.5

Worktype
Studying

SUBMIT

Tim Team-Member

Logged tasks

Date	Week	Description	Duration	Worktype
05.09.2016	36	Studying new programming libraries	3.5	Studying
02.09.2016	35	Coding new features	4.5	Coding and testing
31.08.2016	35	Bug fixes	2	Coding and testing
29.08.2016	35	Testing new functionality	1.5	Coding and testing

Tim Team-Member

Project Role

Starting Date

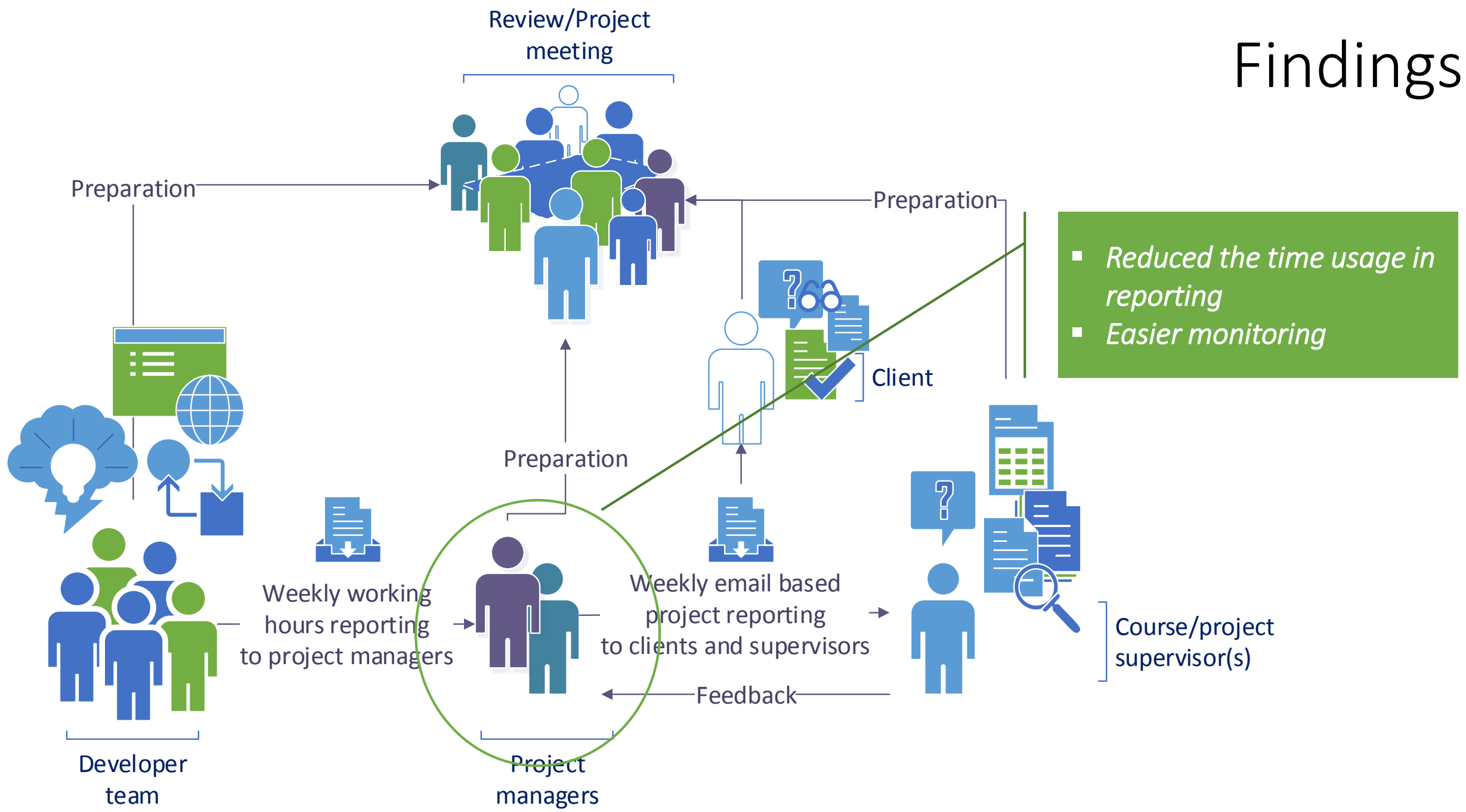
Ending Date

Email

Working hours

Worktype	Hours
Planning and management	0
Coding and testing	8
Studying	3.5
Documenting	0
Other	0
Total	11.5

Findings



In practice: Weekly reports

Add Weeklyreport, Page 1/3

Title *
Metrics, weekly report

Week *
35


Year *
2016

Meetings *
on 5 Sept with the project team

Requirements link
www....

Challenges, issues, etc.
Req # 4 is still challenging

Additional information
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NEXT PAGE 

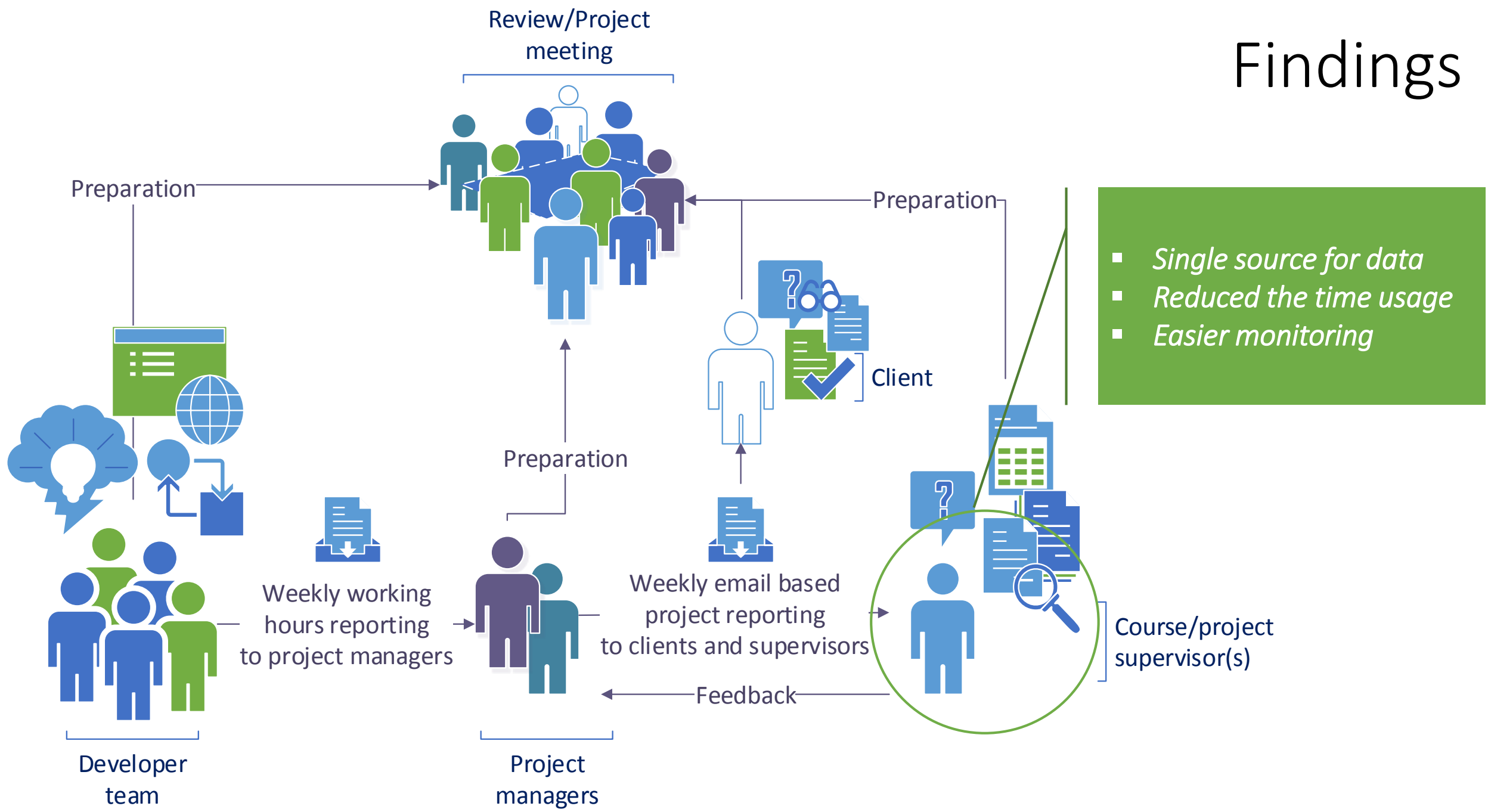
Weeklyreports

Title	Week	Year	Created On	Actions
Week 53	53	2015	03.01.2016	View
Week 52	52	2015	28.12.2015	View
Week 51	51	2015	18.12.2015	View
Week 50				
Week 49				
Week 48				

Metrics

Metrictype	Value	Date
Current phase	6	03.01.2016
Total number of planned phases	6	03.01.2016
New requirements	3	03.01.2016
Requirements in progress	7	03.01.2016
Closed requirements	8	03.01.2016
Rejected requirements	1	03.01.2016
Commits to the source code repository	90	03.01.2016

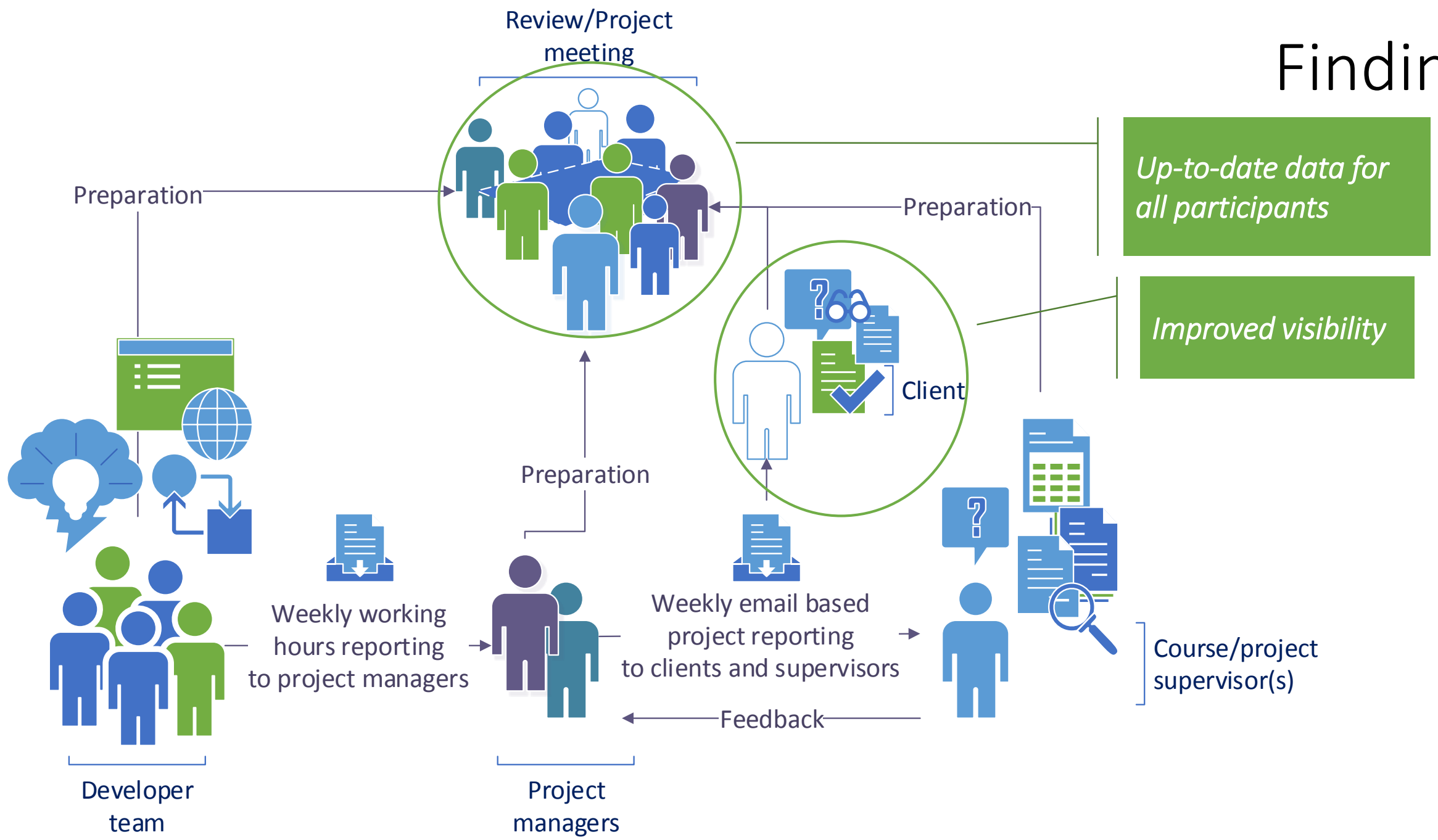
Findings



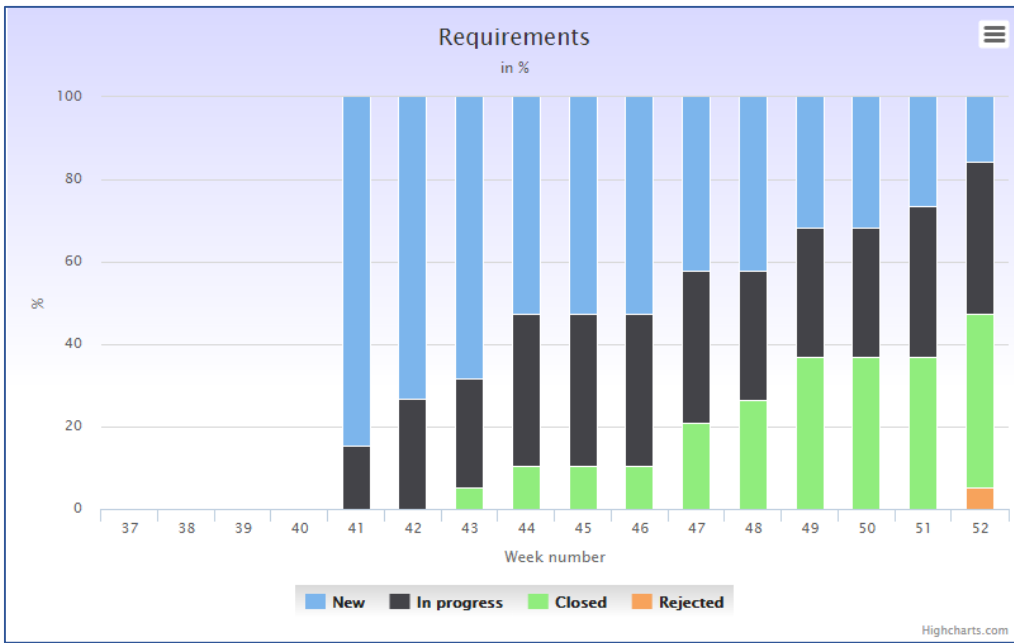
In practice: Single source for project data

ACTIONS	Projects		
New Project Manage Users Metrictypes Worktypes Public statistics FAQ	Project Name ↓	Description	Actions
	Jouluprojekti	Jouluprojekti 2	Select
	Metrics	Metrics Monitoring Tool / Project Work - course, fall 2015	Select
	MMT2016	Metrics monitoring tool piloting and further developing	Select
	PilotProject1	Pilot project 1 - do not amend any data / Project work -course, fall 2015	Select
	PilotProject2	Pilot project 2 - do not amend any data / Project work -course, fall 2015	Select
	PilotProject3	Pilot project 3 - do not amend any data / Project work -course, fall 2015	Select
	PilotProject4	Pilot project 4 - do not amend any data / Project work -course, fall 2015	Select

Findings



In practice: Visualization



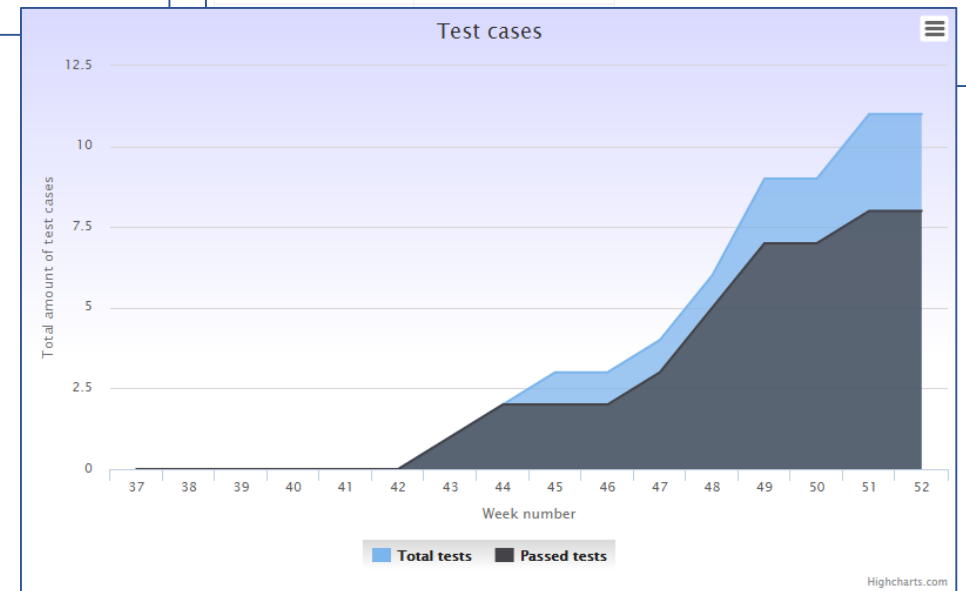
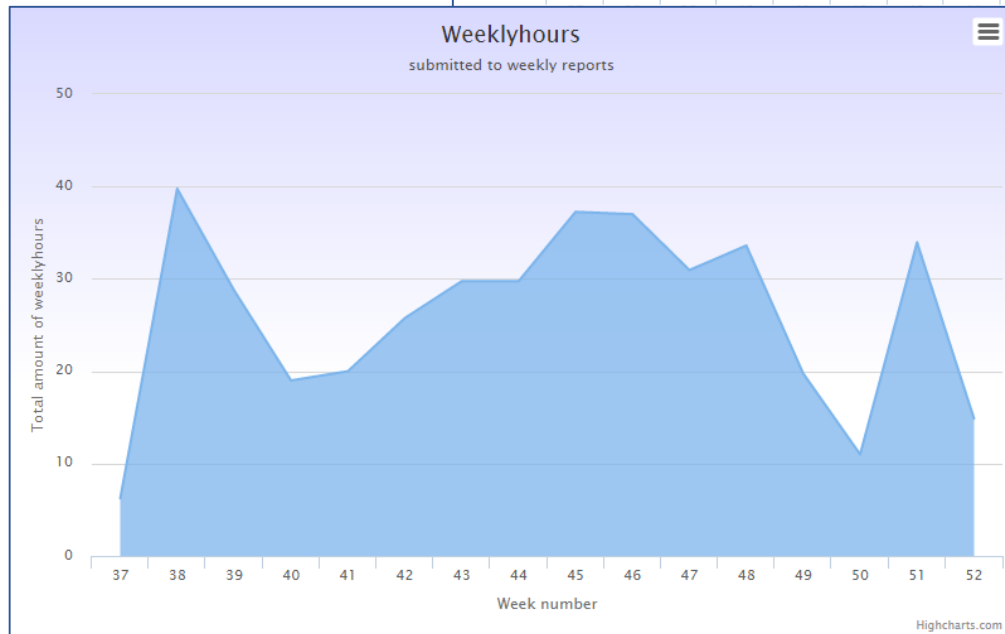
Public statistics

Weeklyreports

	2	3	4	5	6	7	8	9	10	11
Metrics										
MMT2016	-	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	L (view)	L (view)
Playfull360	-	-	X (view)	L (view)	X (view)	X (view)	X (view)	L (view)	L (view)	L (view)
Pohtiva2	-	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)
Potilassimu2016	X (view)	L (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)	X (view)

Total weeklyhours

Metrics	567.15
MMT2016	609.5
Playfull360	749.5



Findings graded

- The average grade (1-5) given to each feature and its attributes by questionnaire respondents

Feature/ Attribute	Logging hours	Viewing reports	Viewing charts	Composing reports	MMT as a whole
Usability	4.5	4.3	4.75	4.3	3.2
Functionality	4.5	4.0	4.5	4.0	3.6
Usefulness	5.0	4.0	4.5	4.3	4.0
Overall	4.2	3.9	3.7	3.3	3.8

Conclusions and further work

- Metrics Monitoring Tool **benefits** different user groups:
 - **Logging hours** feature helps to observe own time usage (→ project members)
 - MMT reduces the time needed for **creating weekly reports** (→ project managers)
 - MMT reduces the time for preparing to **project reviews** (→ supervisors)
 - Visualizing the metrics helps to **monitor the projects** (→ supervisor, project managers, clients...)
-

Conclusions and further work

- Development **needs**:
 - **Material** (videos, online help, lectures) for introducing the tool to the users to help and motivate them to utilize the useful features
 - A **feedback system** for communication between teams, supervisors and client (implemented in version 1.3)
 - A new **user role** “client” (implemented in version 1.4)
 - **Predicting** the project’s state (e.g. in product’s backlog) would help in teaching and software development
 - **Next steps**: Version 1.4 being developed
 - New proposed features implemented based on feedback and the analysis
 - Will be taken into use in Fall 2016
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Thank you!

Any questions?

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