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Requirements Engineering

Vision, scope, and stakeholders

Zheying Zhang

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Outline

Product vision and project scope

Stakeholder analysis

(Wiegers and Beatty, 2013) Chapters 5 and 6

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Vision and scope

Vision

- Describes what the product is about and what it eventually could become
- Communicates the strategic intent for product development
  - Why are we building this product, system, or application?
  - What problems will it solve?
  - What feature and benefit will it provide?
  - For whom does it provide these features and benefits?
  - What performance, reliability and scalability must it deliver?
  - What platforms, standards, applications, etc. will it support?

Scope

- work content of a project
- activities

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Product vision_Cafeteria Ordering System

Captures the essence of the product – aligns all stakeholders in a common direction

1.5 Vision Statement

For employees who want to order meals from the company cafeteria or from local restaurants online, the Cafeteria Ordering System is an Internet-based and smartphone-enabled application that will accept individual or group meal orders, process payments, and trigger delivery of the prepared meals to a designated location on the Process Impact campus. Unlike the current telephone and manual ordering processes, employees who use the Cafeteria Ordering System will not have to go to the cafeteria to get their meals, which will save them time and will increase the food choices available to them.

(Wiegers and Beatty 2013, p.577)

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Elements in a vision statement template

For [target customer] **Need**	• employees
Who [statement of the need or opportunity]	• wish to order meals from the company cafeteria or from local restaurants on-line
The [product name] **Approach**	• Cafeteria Ordering System
Is [a product category]	• an Internet-based and smartphone-enabled application
That [key benefit, compelling reason to buy or use] **Benefits**	• accept individual or group meal orders, process payments, and trigger delivery of the prepared meals to a designated location on the Process Impact campus
Unlike [primary competitive alternative, current system, or current business process]	• the current telephone and manual ordering processes
Our product [statement of *primary* differentiation and advantages of new product] **Competition**	• will not have to go to the cafeteria to get their meals, which will save them time and will increase the food choices available to them

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Need

What are our client's needs?

A need should relate to an important and specific client or market opportunity, with market size and end customers clearly stated.

The market should be large enough to merit the necessary investment and development time.

Benefits

What are the client benefits of our approach?

Each approach to a client's need results in unique client benefits, such as low cost, high performance or quick response (better, faster, cheaper).

Success requires that the benefits be quantitative and substantially better - not just different. Why must we win?

NABC
by SRI

Approach

What is our compelling solution and unique advantage to the specific client need?

As the approach develops through iterations, it becomes a full proposal or business plan, which can include market positioning, cost, staffing, partnering, deliverables, a timetable and intellectual property (IP) protection.

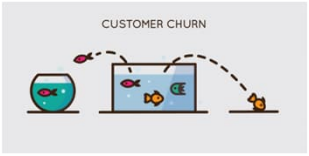
Competition

Why are our benefits significantly better than the competition?

Everyone has alternatives. We must be able to tell our client or partner why our solution represents the best value.

To do this, we must clearly understand our competition and our client's alternatives.

We must be able to clearly state why our approach is substantially better than that of the competition. Our answer should be short and memorable.



An example NABC template: https://www.innovationcanvas.ktn-uk.org/resources/value-proposition-nabc

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Project scope

- Functionality of the product
- Resources available to the project
- Time to deliver the product

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Features_COS

- Features are services provided by the system that fulfill one or more stakeholder needs.
  - It consists of one or more logically related capabilities that provide value to users and are described by a set of requirements
- Features are written as product backlog items (PBIs) (e.g. epics, user stories) in an agile project

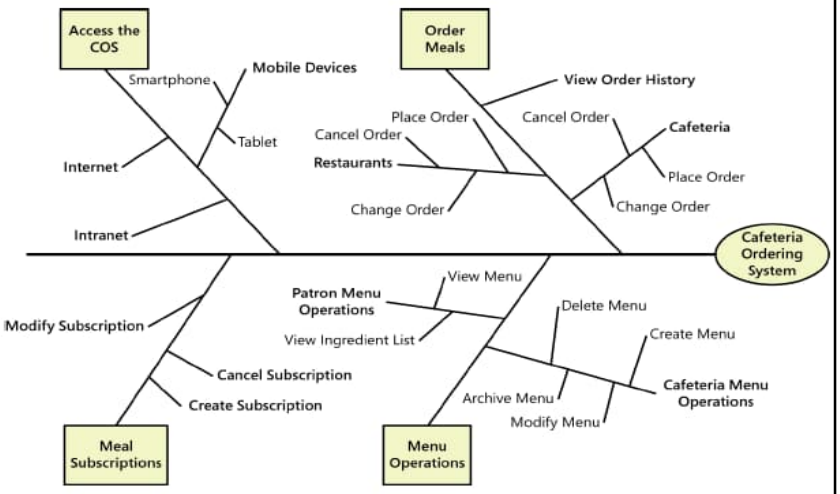

FIGURE C-1 Partial feature tree for the Cafeteria Ordering System.

(Wiegers and Beatty 2013, p.578-579)

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Releases or a product roadmap

2.2 Scope of Initial and Subsequent Releases

Feature	Release 1	Release 2	Release 3
FE-1, Order from cafeteria	Standard meals from lunch menu only; meal orders for delivery can be paid for by payroll deduction only	Accept credit and debit card payments	Accept meal orders for breakfasts and suppers
FE-2, Order from restaurants	Not implemented	Delivery to locations on	
FE-3, Meal subscriptions	Not implemented	Implemente permits	
FE-4, Menus	Create and view menus	Modify, dele menus	
FE-5, Ingredient lists	Not implemented	Fully implen	
FE-6, System access	Intranet and outside Internet access	iOS and And and tablet a	

(Wiegers and Beatty 2013, p.578-579)

Roadmap – a themed, prioritized ”plan of intent” (Leffingwell 2010)

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Context Diagram_COS

FIGURE C-2 Context diagram for release 1.0 of the Cafeteria Ordering System.

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Vision and scope document (Wiegers and Beatty 2013)

- Business requirements
  - Background
  - Business opportunity
  - Business objectives and success criteria
  - Vision statement
  - Business risks
  - Business assumptions and dependencies
- Scope and limitations
  - Major features
  - Scope of initial release
  - Scope of subsequent releases
  - Limitations and exclusions
- Business context
  - Stakeholder profiles
  - Project priorities
  - Operating environment

A sample vision and scope document is available at: (Wiegers and Beatty 2013, p.576-580) . Such a document can be also called a project charter or a business case document.
A vision document template for agile software development (Leffingwell 2010)

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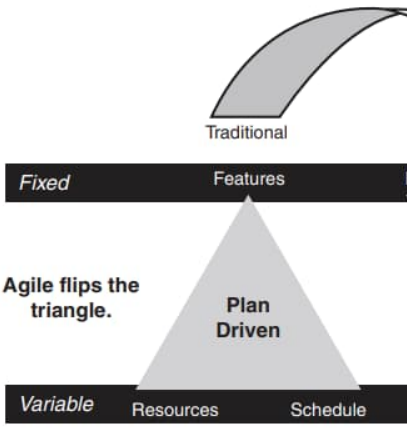
Waterfall vs. Agile: scope management



- Scope in agile project is defined and redefined in the interative and incremental process – ensure timely completion
  - New stories and existing ones are prioritized before the iteration – referencing the business objectives
  - User story allocation for an iteration is done at the beginning of each iteration
- "Stick to the scope" vs. "Are we providing value to our customer?"

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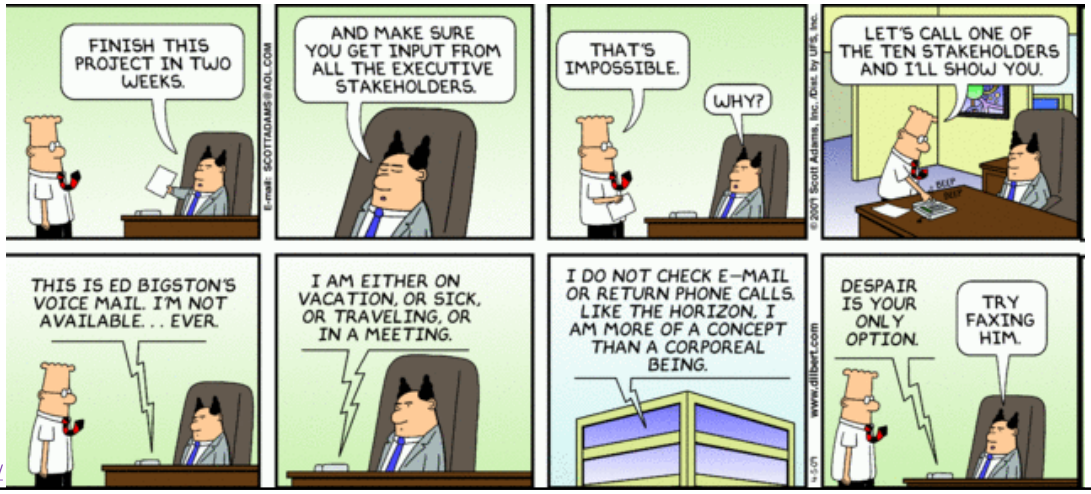
Outline

Product vision and project scope

Stakeholder analysis



https://dilbert.com/

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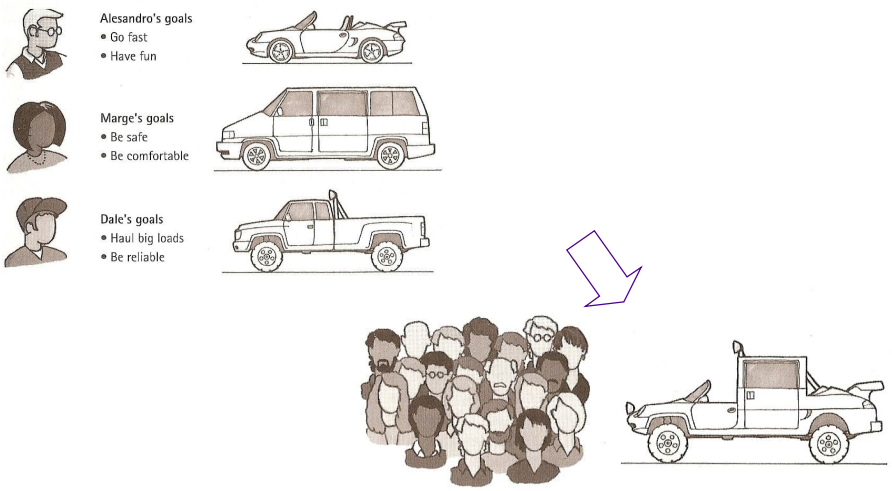
Participants



- About Face 2.0, Alan Cooper and Robert Reimann, Page 56

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Why stakeholder analysis

- Assessing how project objectives and activities relate to the *different Interests* of various people, groups and organzation
- Understanding how different groups will be *affected* by the project
- Assessing the importance of stakeholders that may *influence* (positively or negatively) the project success
- Providing the basis for developing strong *communications*, for preventing conflicts, and for developing strategic relations throughout project implementation

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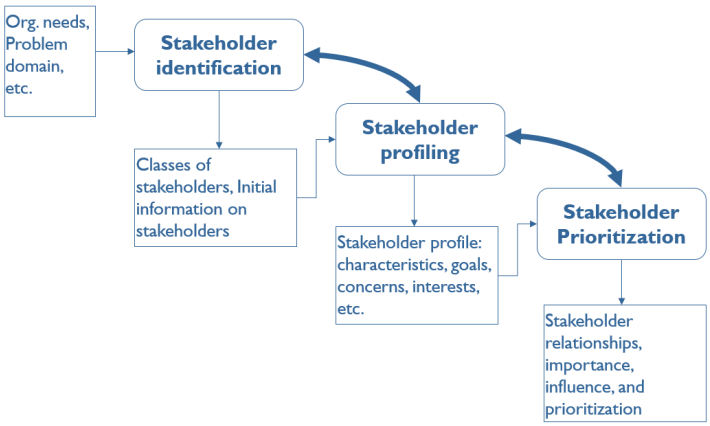
Stakeholder analysis

Stakeholder analysis is an approach for understanding a system by identifying the stakeholders in the system, and assessing their respective interests in, or influence on the system



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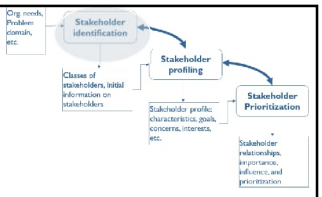
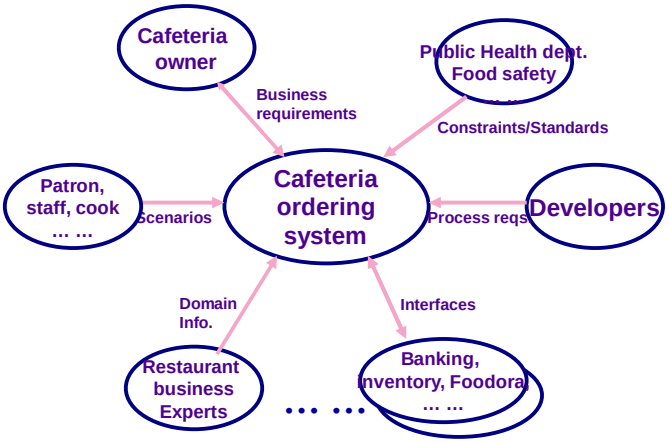
Stakeholders in the cafeteria ordering system





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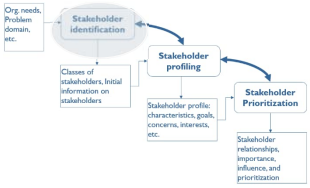

Stakeholder identification

- Baseline stakeholders → the network of stakeholders
- A combination of following techniques/sources is useful for exploring the network of stakeholders
  - By asking your sponsor or client
    - e.g. “who else should we talk to about that?”
  - With a template such as the checklist
  - By comparing with the similar projects
  - By analyzing the *context* of the project
  - Using data-driven approach
    - E.g. applying EFA (exploratory factor analysis) to extract types of user using the user profile data (Li et al. 2019) accessible at: http://urn.fi/URN:NBN:fi:tuni-201910244073

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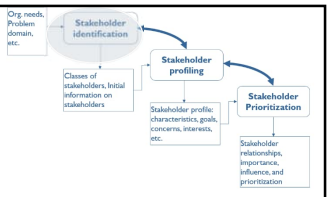

Example of checklist questions

- Who are the user groups of the system?
- Who is the customer (economic buyer) for the system?
- Who are involved in developing the system?
- Who will evaluate and approve the system when it is delivered and deployed (who constrain the system as regulators)?
- Who will maintain the system?
- Is there anyone else who cares or is negatively affected?
- What other systems interact with this system?

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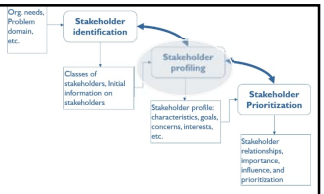

Stakeholder profiling

- The stakeholders profile records their own concerns of the system, including their interests, characteristics, etc.
  - Major value or benefit the stakeholder receives from the product
  - The likely attitudes towards the product
  - Major features and characteristics of interest
  - Know constraints that must be accommodated

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An example of stakeholders' goals

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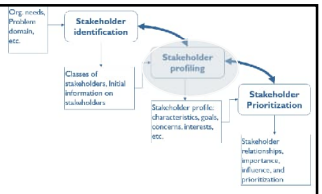

Stakeholder profiles_COS

3.1 Stakeholder Profiles

Stakeholder	Major value	Attitudes	Major interests	Constraints
Corporate Management	Improved employee productivity; cost savings for cafeteria	Strong commitment through release 2; support for release 3 contingent on earlier results	Cost and employee time savings must exceed development and usage costs	None identified
Cafeteria Staff	More efficient use of staff time throughout the day; higher customer satisfaction	Concern about union relationships and possible downsizing; otherwise receptive	Job preservation	Training for staff in Internet usage needed; delivery staff and vehicles needed
Patrons	Better food selection; time savings; convenience	Strong enthusiasm, but might not use it as much as expected because of social value of eating lunches in cafeteria and restaurants	Simplicity of use; reliability of delivery; availability of food choices	Corporate intranet access, Internet access, or a mobile device is needed
Payroll Department	No benefit; needs to set up payroll deduction registration scheme	Not happy about the software work needed, but recognizes the value to the company and employees	Minimal changes in current payroll applications	No resources yet committed to make software changes

(Wiegers and Beatty 2013, p. 579)

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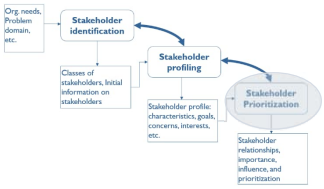

Stakeholder relationship identification and prioritization

Understand the relationships between stakeholders

Identify conflicts of interests between stakeholders	Identify relations between stakeholders that may enable "coalitions" of project sponsorship, ownership and cooperation

Assess the importance and influence of each stakeholder on the project

How stakeholders problems, needs, and interests coincide with the aims of the project	How powerful the stakeholder is	Stakeholder prioritization – Power/Interest grid

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Support and conflict among restaurant stakeholders' goals

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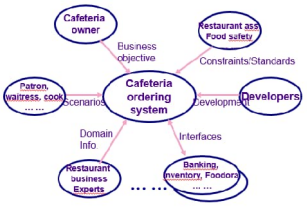
Power/Interest grid (1/2)



	Low interest	High interest
High power	Public Health Dept. Regulatory body, e.g. GDPR	Cafeteria owner Product Owner Project Sponsors Developers
Low power	Suppliers Cook	Cafeteria staff Customers/Patrons Maintenance

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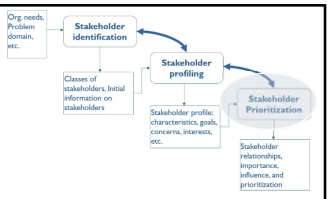
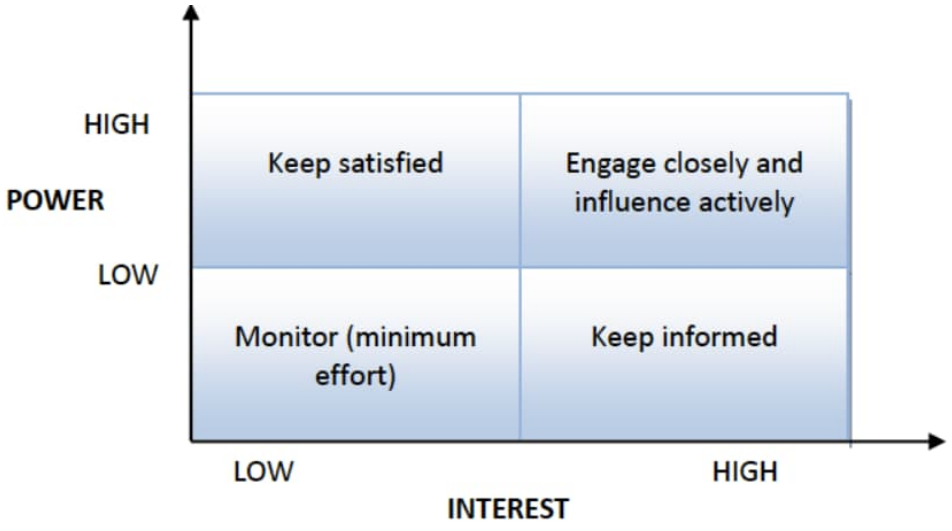
Power/Interest grid





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Analyzing stakeholders' influence on an open source software ecosystem's requirements engineering process

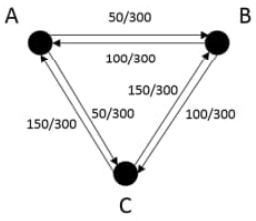
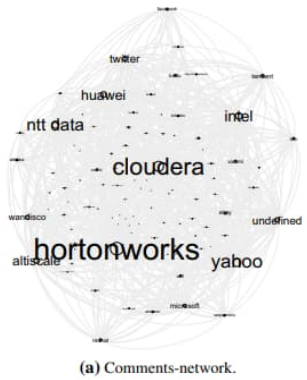


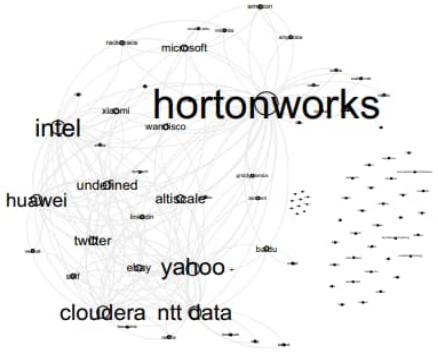
Fig. 2 Example of network with three stakeholders v_A, v_B and v_C, and connecting weighted edges. Adopted from [30]

Fig. 2 where three stakeholders v_A, v_B, and v_C each created various number of patches that were contributed to a certain issue. v_A's patches contain 50 LOC in total. v_B's patches contain 100 LOC in total, while v_C's patches contain 150 LOC in total. Aggregated, 300 LOC were contributed to the issue. Resulting in the following edge weights:

- $W(v_A, v_B)\&W(v_A, v_C) = 50/300$
- $W(v_B, v_A)\&W(v_B, v_C) = 100/300$
- $W(v_C, v_A)\&W(v_C, v_B) = 150/300$



(a) Comments-network.



(b) Patch-network.

Fig. 5 Visualization of the **a** comments and **b** patch networks. Labels are of firms and of relative size of their weighted out-degree to other firms in each network

Linåker, J., Regnell, B. and Damian, D., 2020. A method for analyzing stakeholders' influence on an open source software ecosystem's requirements engineering process. *Requirements Engineering*, *25*, pp.115-130.

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Readings

- *Ian F. Alexander*, (2005), A Taxonomy of Stakeholders: Human Roles in System Development, *International Journal of Technology and Human Interaction (IJTHI)*, **1**, (1), 23-59
- H. Sharp, G.H. Galal, and A. Finkelstein, "Stakeholder Identification in the Requirements Engineering Process," Proc. 10th Int'l Workshop Database and Expert System Applications, IEEE CS Press, 1999, pp. 387–391.
- Blincoe, Kelly, Jyoti Sheoran, Sean Goggins, Eva Petakovic, and Daniela Damian. "Understanding the popular users: Following, affiliation influence and leadership on GitHub." *Information and Software Technology* 70 (2016): 30-39.
- X. Li, C. Lu, J. Peltonen and Z. Zhang. A statistical analysis of Steam user profiles towards personalized gamification. International GamiFIN Conference (GamiFIN). CEUR-WS. 2019. accessible at: http://urn.fi/URN:NBN:fi:tuni-201910244073

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Reminder ☺

- Assignment 1: the element of value, answering by **Today** (19/9) and reviewing by 20/9
- Assignment 2: stakeholder analysis is ready to do (24/9, 25/9)
- Teaming up with a group work topic

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