

Establishment and Planning

IT Architecture and User Driven Software Design (UITA)

4. September, 2018

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At a glance

- 10 ECTS
- 13 weeks,
- twice weekly in September - Tuesday and Thursday
- once weekly in October+November
- 4 core areas of informatics
- Supporting portfolio project work packages

Learning goals - knowledge

- ...of central theories within the core areas
- ...of the methods and techniques used for analysis of complex usage situations within each core area
- ...of methods and techniques for innovative IT designs focusing on users' needs and competencies within each core area

Informatics core areas

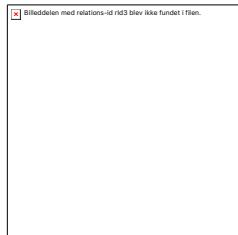
- System development
- Implementation, including change management
- Evaluation of IT usage
- IT security

Learning goals - skills

- ...to choose and use proper methods and techniques from the core areas for analysing complex usage situations
- ... to choose and use proper methods and techniques for designing innovative IT that focuses on users' needs and competencies within each core area

Learning goals - competencies

- ... to be able to work with IT related problems and challenges, individually as well as in a team
- ... to be able to critically and systematically learn new approaches within each core area
- ... to be able to independently take responsibility for own professional growth



Literature:

- Rozanski, N. and E. Woods. *Software Systems Architecture - Working with Stakeholders Using Viewpoints and Perspectives* 2nd ed. Addison-Wesley, 2011. Print.
- State-of-the-art research articles: *get yourself through REX*: <http://kub.kb.dk/c.php?g=202959>

Architect skills

”You must have an **across-the-board understanding of technology** at a high level and of the **real-world issues and problems** the system is required to solve. You should have **real experience with designing and building systems**, although it may not always be possible to have direct, practical knowledge of the specific technologies you plan to use.

[...] People skills are very important, such as **the ability to build consensus, facilitate change, and rapidly learn** about unfamiliar business areas and technologies.”

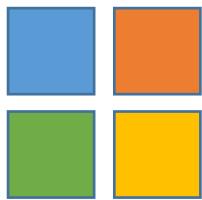
– Rozanski and Woods, 2012, pp. 76-77

Engage organisational change as a systems architect

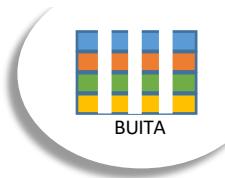
- Defining the project and scope
- Engaging stakeholders in the organisation
- Building understanding between multiple stakeholders (e.g.):
 - Top management, middle management, users and developers
 - Sales people, business analysts, and technical operations
 - Network architecture, database management, software suites and graphical user interface design
 - Being the design authority, team manager and tester of the new architecture

Learning the importance of a team

- Taking on specified team roles
- Managing time-boxed work packages with strict deadlines
- Using planning and iterations to measure work progress
- Sharing knowledge through strict configuration management
- Creating relations and team spirit



in 4s

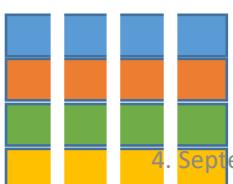


Core area

1. System development and design
2. IT security
3. Implementation and change management
4. Evaluation

Concrete problems, e.g.:

- How to choose and use methods and techniques for the design of IT use?
- How to communicate and collaborate in the team?
- How to determine values, security risks, and costs etc. for an organisation?
- How to design architectural solutions with privacy in mind?
- How to handle implementations of large scale technologies?
- How to motivate and entrench change between stakeholders and different user groups?
- How to choose and use an evaluation method that will fit a given situation?
- How to evaluate in a structured manner while gaining situated learning?



4. September 2018

Requirements

- 1 semester = 30 ects = 825 hours,
- BUITA: 10 ECTS = 275 hours
- 15 lectures, each with (appr.)
 - 4 hours of confrontation
 - 10 hours of reading course material and preparation
 - Total: 14 hours/lecture = 210 hours in total, leaving 65 hours (= 2 weeks) for your exam preparation

Prerequisites

- BSc with Informatics
- At RU it means the following courses
 - BD (user driven design)
 - OFIT (organisational change and IT)
 - MKM (modelling and knowledge management), now renamed to SE
 - WITS (Web-based IT systems)
 - ...or II (interactive installations)
- And a project
- From other uni's
 - "similar"

Course roles and responsibles

- Magnus Rotvit Perlt Hansen - Associate professor, PhD.
- Keld Bødker, Associate Professor, PhD.
- Niels Jørgensen, Associate Professor, PhD.

Exam

- Individual oral examination
- External censorship
- 30 minutes including grade assessment
- 7 grade scale
- End of January 2019 (24.-25. January)

Textbook: Software Systems Architecture

- Guide for the software architect
- Who is interested in your architecture?
 - Stakeholders and their concerns
- Design an architecture that reflects and balance their different needs
- How to communicate the architecture (Architecture Description - AD)
- Important activities:
 - Identify and engage stakeholders
 - Use scenarios
 - Create models
 - Document and validate the architecture

Textbook: Software Systems Architecture

- Part I: fundamentals (ch. 2-5)
- Part II: the process of software architecture (ch. 6-14)
- Part III: the viewpoint catalog (ch. 15-23)
- Part IV: the perspective catalog (ch. 24-29)
- Part V: putting it all together (ch. 30)

Three central concepts

- Stakeholders
 - The people affected by the system
- Viewpoints
 - An architectural view is a description of one aspect of a system's architecture
 - Functional structure, information organization, deployment environment
 - Viewpoint = a template for developing the views
- Perspectives
 - Cross-structural quality concepts (performance, security, availability)
 - Proven architectural knowledge

Stakeholders

- A person (or a group of persons) with something *at stake*
 - *stake, interest, concern*
 - *users, developers, testers, maintainers, sponsors*
- User
 - Management user
 - Daily user, end-user
 - Indirect user
- Netbanking application?
 - who are the stakeholders?
 - who are the users?



DEFINITION A **stakeholder** in the architecture of a system is an individual, team, organization, or classes thereof, having an interest in the realization of the system.



DEFINITION A **concern** about an architecture is a requirement, an objective, a constraint, an intention, or an aspiration a stakeholder has for that architecture.

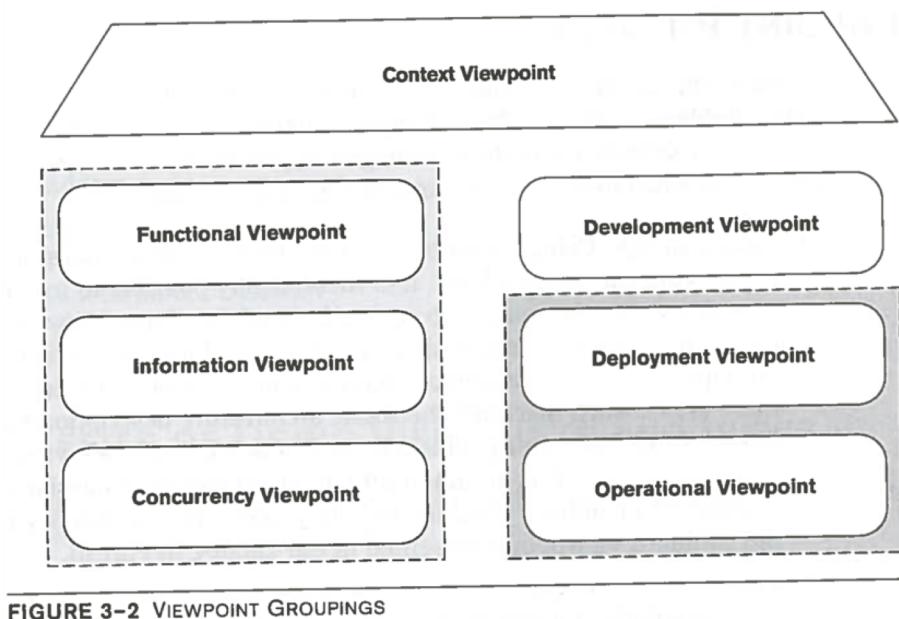
Specifying the architecture is a key opportunity for the stakeholders to direct its shape and direction. You will find, however, that some stakeholders are more interested in their roles than others, for a variety of reasons that have little to do with architecture. Part of your role, therefore, is to engage and galvanize, to persuade people of the importance of their involvement, and to obtain their commitment to the task.

Stakeholders in project management

Influence/ Need for participation	little	big
+	"Hostages"	"Resource persons"
-	"Others"	"Grey eminence"

Viewpoints and views

DEFINITION A **viewpoint** is a collection of patterns, templates, and conventions for constructing one type of view. It defines the stakeholders whose concerns are reflected in the viewpoint and the guidelines, principles, and template models for constructing its views.



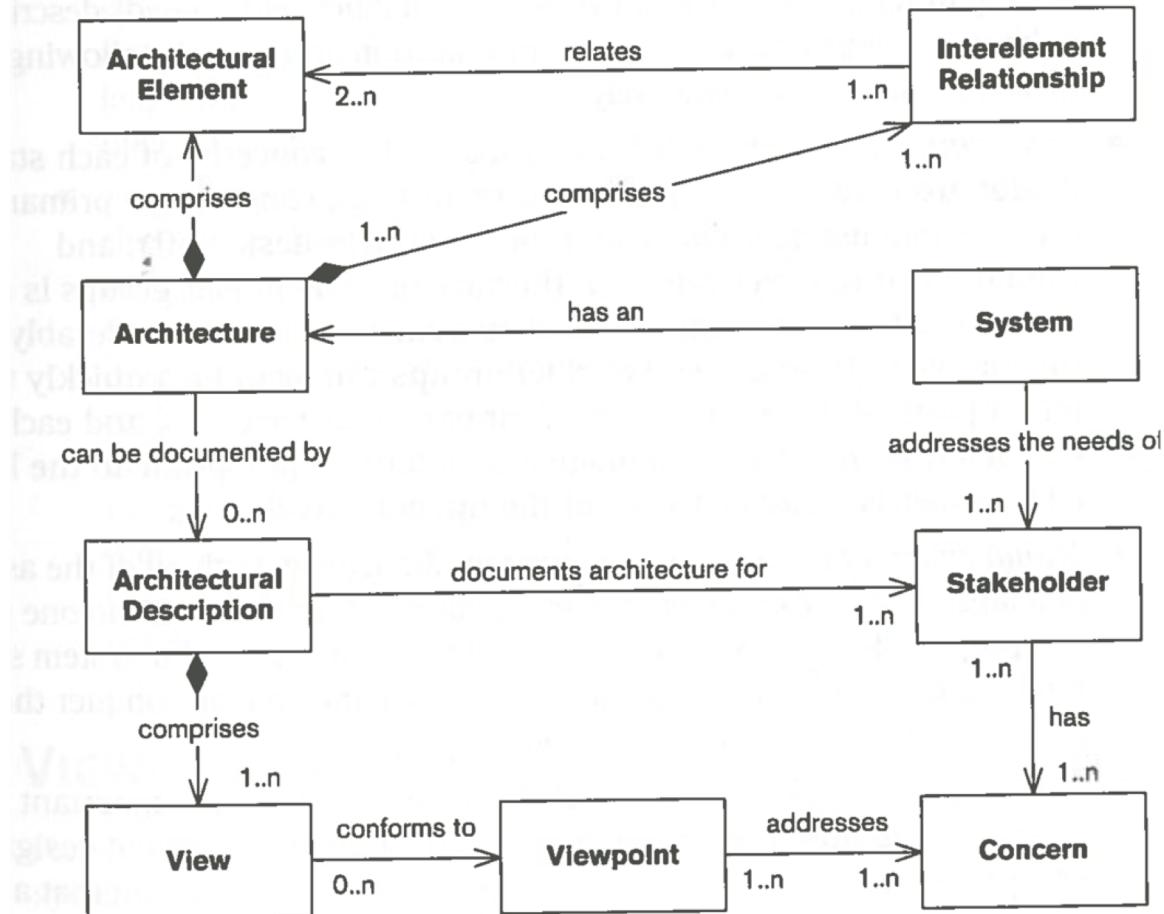


FIGURE 3-1 VIEWS AND VIEWPOINTS IN CONTEXT

Viewpoints and perspectives

Perspectives/ Viewpoints	Security	Performance Scalability	Availability Resilience	Evolution	Location	Development resource	Internalization
Context							
Functional							
Information							
Concurrency							
Development							
Deployment							
Operational							

Exercise – choosing viewpoints for different types of systems

- Discuss Table 3-2 (p. 42) with your neighbor(s)

A Solution in Search of a Problem

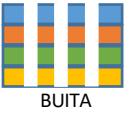


To a hammer everything looks like a nail
- try to avoid this



RU Parking

- New parking rules from Feb 1 2018
- Are you aware?
- Look at <https://parkering.ruc.dk>
- "hammer-nail"??
- In groups of 2 or 3:
 - start listing stakeholders
 - Pro and cons of the solution for each stakeholder
- 10 mins.



BUITA learning goals

Stakeholders, viewpoints and perspectives (in general)

Stakeholders (in some more detail)

INF PP case companies

- Christina: investigate the quality of the Pronestor (case company of BD-project)
- Szymon: reflect on the product owner in a big company
- Michelle: RU/IT dept. and/or Ballerup Municipality
- Jonas: Chryptia (BD-project)

INF PP case companies (2)

- Niels: BEC contact
-
- Andrei: Earlier project
-
- Zoltán: Phase1 (student worker in IT) and family company
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- Tjalfé: BEC