

Software Engineering Roles

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Agenda:

Role catalogue

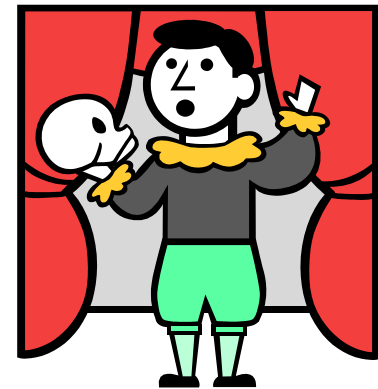
Process of assigning roles

Gap analysis

Role catalogue

Roles are needed to:

- identify and develop knowledge
- make sure that nothing is forgotten
- plan hiring and personal development
- avoid detailing everything



Formal responsibility for an area is not the same as doing all the work

Role families



The diagram consists of seven blue ovals arranged in a circular pattern. The ovals are labeled: Management (top), Analysis (top-right), Development (bottom-right), Validation (bottom), Customer Services (bottom-left), and Asset management (top-left).

Management

Asset
management

Analysis

Customer
Services

Development

Validation

Management(1)

- Product managers
 - Strategic product manager*:
(aka Product Owner or Project Sponsor)
 - Is responsible for market communication and analysis.
 - Has the budget responsibility both in long and short term.
 - Decides which features that shall be scheduled when from a customer's perspective.
 - Often needs to negotiate with other roles since it might be hard and costly to provide everything at the time wished.

Management(2)

- Product managers
 - Operational product manager:
 - Is responsible for the technical management of a coherent product.
 - Acts as a technical expert to the Strategic product manager.
 - Collects effort estimation of features.
 - Decides which features that shall be implemented when from a development and maintenance perspective.
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Management(3)

- Project manager*
- Ensures that the project goals are met by planning and leading the work.
- Manages resources given to the project.
- Communicates with company leadership.
- Must be a great motivator, but also have high technical competence.
- Has the final word in all matters.

Management(4)

- Configuration manager*
- Decides on which work-products to be put under version control. (in current practice: everything)
- Guides others in the relations between work-products
- Ensures the availability of all work-products for a release.
- Selects and maintains tools for SCM.
- Ensures that the tools are used properly.
- Works closely with development manager.

Management(5)

- Line manager*
- Represents the legal employer.
- Recruits people to the projects.
- Ensures competence development and good working environment.
- Makes sure that the competence provided is suited to the current and future projects.
- Handles formal communication with the company leadership such as bookkeeping.

Management(6)

- Process manager*
- Decides on which processes to use for different work.
- Educates people in the process.
- Collects data on process adherence.
- Alters the processes when needed.
- Works closely with project leader, development manager, and quality coordinator.

Analysis (1)

- Lead analyst*

(aka Requirements engineer)

- Defines and describes the requirements to be met by the system.
- Handles contacts with customers, end-users, product managers, and other stakeholders.
- Interprets the requirements when needed.
- Selects tools and methods for elicitation and analysis.

Analysis (2)

- Analyst*
- Assists the lead analyst.
- Can be specialized for certain tasks, such as, working with technical standards.
- Data scientist
- Specialist used in big data analytics
- Query and explore data to discover findings
- Builds statistical models
- Finds out how to leverage value based on insights from data
- Selects algorithms for processing

Development(1)

- Architect*
- Specifies and decides on the target environment, components to be used, and the high-level architecture.
- Ensures that functional and non-functional requirements are met, by simulations, review and experiments.
- Must be a technical expert with good judgment of future capabilities of the selected solutions.
- Has the final word in technical matters.
- Coordinates with other teams on technical matters.
- Lead designer
- Decides on design issues not covered in the architecture, for instance, the realization of individual components.
- Leads design and implementation of prototypes.
- Works closely with the architect.

Development(2)

- UX Designer*
- Specializes in setting targets and realizing the User eXperience of a system.
- Multi-disciplinary role
- Usability designer
- Very much related to UX
- Specialist in designing the dialogue, information need, and navigation.

Development(3)

- Development manager
- Plans and controls the development effort.
- Works closely with the project leader in handling development resources.
- Decides on implementation rules.
- Manages technical risks.

Specialized organization

Depending on the process framework used several new roles come close to the development manager, for example:

- Team leader
- SCRUM master
- Kanban master

Development(4)

- Developer*

(aka Designer, Implementer or Programmer)

- Develops the system. Informs managers about technical risks.
- There is sometimes a need for developers who are specialized in certain important technical systems. It depends on the domain, but can be:
 - Database
 - GUI
 - Network

Development(5)

- Data engineer
- Specialist used in Big Data applications
- Prepares the infrastructure to be used by data scientists
- Integrates data from various sources
- Optimize performance

- Environment manager
- Creates and maintains the development and test environments.
- Keeps the technical environment under configuration control.

Development(6)

- Procurement responsible
- Buys components and acquires free-ware.
- Specialized in licenses and contracts.
- Must know a lot about the market.

- Component adaptor
- Adapts reused or procured components to their use in the system.

- Integrator *
- Puts the various pieces of the software together to a complete system.
- Can be the creator of "glueware".
- Works closely with testers.

Validation(1)

- Test leader*
- Evaluates requirements.
- Feeds information back to the team.
- Decides on the tested status of the product.
- Organizes the testing work.
- Selects and maintains testing tools.
- Works closely with development manager, environment manager, and integrator.
- Tester*
- Assists the test leader and performs the manual testing work.
- Develops automated tests
- Can be specialized.
- Nowadays these persons have to have programming skills, and work as developers.

Validation(2)

- Quality coordinator*
- Measures the product quality and initiates necessary changes of product and process.
- Determines the quality of the final product.
- Organizes software reviews.
- Collects all means of quality work and makes sure that they fit together.

Customer services(1)

- Deployment manager*
 - Ensures that the product is made available to the customer.
 - Coordinates manufacturing, installation, distribution, and training.
 - Cooperates much with architects, development manager, environment manager, and test leader.
 - Trend: automation moves responsibility to the architect

 - Technical writer*
 - Decides the format and style of the documentation delivered to the customer.
 - Ensures good readability and correct content of user documentation. Works closely with developers with help texts.
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Customer services(2)

- Course developer
 - Creates training material and plans training of customers, operators, and users.
- Course leader
 - Performs and assures training to customer, end-user and operation personnel.
- Helpdesk
 - Supports intended usage of the product.
 - Documents customer issues.

Customer services(3)

- Operations manager
- Ensures that customer services are provided on the agreed service level.
- Acquires hardware and software necessary for the service.
- Works proactively.
- Cooperates with or leads the helpdesk workers.

- Systems engineer
- Performs maintenance and monitoring of systems providing customer services on in-house or third-party systems.
- Handles emergencies. Works together with the customer operators.
- Assists the Operations manager.

Asset management

- Librarian
 - Identifies reusable components.
 - Manages the component library.
 - Makes sure that there is an archive of relevant documentation.
 - Works closely together with the configuration manager.
- Document responsible
 - Decides on document and information standards.
 - Makes sure that responsible persons have access to templates and tools.
 - Today much on database modelling.

Agenda:

~~Role catalogue~~

Process of assigning roles

Gap analysis

Process

- Select your favorite role
- Write a short application for that role, 1/2 A4
- Append a CV, 1 page
- Merge this into a file, submit to your Teams, name it <studentID>_<1st hand role>_<anything>.pdf
ex. Jambo007_TestLeader_ExpertTypeScript.pdf
- Prepare a 30 sec pitch for yourself
- Think of your second-best choice
- Go to the meeting, TDDC88/725G64: already on
Friday



Process TDDC88/725G64

- Upload application under files in MS Teams.
- Browse the applications for 5-10 minutes
- Select a moderator for the meeting
- Start by appointing a project leader. If more people apply, let them give their 30 sec pitch and have a closed voting.
- Determine which roles and how many of each you need
- The project leader now helps the moderator. Start with positions that have more applicants than places. Let people shift their applications before or after voting
- On-line support for voting <https://www.poll-maker.com/>
- Change or merge roles if you think it is a good idea
- It is highly recommended that leading roles are given to people with experience

Roles of TDDD96 (Vt1-2)

- Team leader
- Lead analyst
- Architect
- Development manager
- Test leader
- Quality coordinator
- Document responsible
- Expert designer

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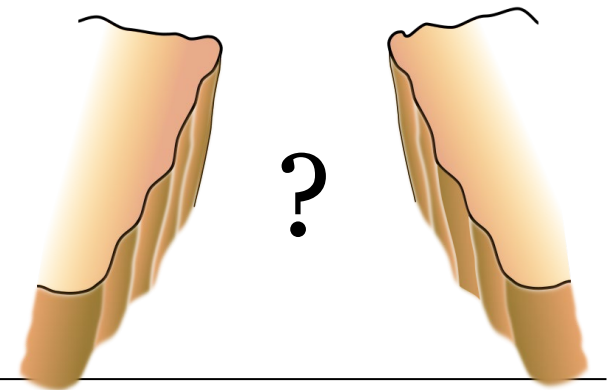
Gap analysis

Competency Levels

- Level 1 – Assists: basic understanding of the concepts and can follow instructions.
- Level 2 – Applies: apply the concepts in simple contexts by routinely applying the experience gained so far.
- Level 3 – Masters: apply the concepts in most contexts and has the experience to work without supervision.
- Level 4 – Adapts: judgment on when and how to apply the concepts to more complex contexts. Can enable others to apply the concepts.
- Level 5 – Innovates: extend the concepts to new contexts and inspire others.

Gap analysis

- Matching needs with present situation, for example
- We need to be 3 programmers with level 5
- We have 1 programmer at level 5 and 2 at level 4.
- The **gap** is to raise 2 people from 4 to 5.
- Training, recruitment, help on call,...



Summary

- Role catalogue, you adapt from there
- Role assignment, be active negotiate
- Gap analysis, for development of your organization
- Formal responsibility for an area is not the same as doing all the work

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