The role of the architect
Define use cases

CES▲M
COMMUNITY

Define use cases

Extract from the chapter **Black box architecture** of the white paper "The role of the architect"

Preamble

This activity aims to define the uses of the system. This can be done in 2 steps:

1. We first synthesize all the life phases of the complex system in a life cycle diagram,

2. We then identify the possible use cases of the system, associated with the different life phases, then we describe their dynamics using operational scenarios. We introduce the concept of exchange flow, which is very important. This highlights the expected behaviors of the system, seen by the stakeholders, in each of the use cases described.

THE ESSENTIAL

The architect performs both static and dynamic **analysis of the black box** of his system of interest in order to define how the complex system is used by its stakeholders and the behaviors it must achieve as seen by stakeholders.

THE MAIN PITFALLS

Among the main pitfalls:

- Seek to go too far in the analysis (aim for the impossible exhaustiveness) instead of focusing on the essential use cases,

- Focus on use cases where teams are ultimately most comfortable (core business)

- Forget dysfunctional use cases (i.e. only deal with nominal cases) or also detail them too much (at the risk of drowning out the cases that carry the most value)

BEST PRACTICES

Here are some good practices to consider:

- Choose a tool adapted to the semantics of the stakeholders and the maturity of the project phase,

- Aim for completeness in the list of use cases and interactions but only describe in the form of scenarios the use cases identified as "essential" according to value criteria (from a customer point of view) versus risks (in-house),

- Agree with stakeholders on the scope of responsibility for dysfunctional use cases deemed "essential",

- Time-boxing and reflection on the overall coherence of the architecture through an iterative practice,

- Sort & factorize the scenarios according to the expected behaviors of the system.

TESTIMONIALS

We have compiled here several verbatim statements from project managers or system architects from different companies, which echo this phase:

" We classify use cases into 4 categories:

- high value and low risk: we take care not to dwell on them because they are well known and mastered,

- low value and low risk: there may be a discussion with the customer but we do not go into the details of these use cases,

- high value and high risk: this is where we or our clients are least comfortable, but it is precisely where we must put the effort,

- low value and high risk: the objective is to negotiate or challenge the associated customer needs

" We apply the principles of frugality (voluntary limitation of the time allocated to the activity compared to the estimated time) to stimulate productivity: this forces us to go naturally to the essentials,

" We produced comic strips to help the client clearly visualize the proposed uses for certain scenarios.

-END

PRELIMINARY SUMMARY OF THE WHITE PAPER

– Architect assignments
- Manage the architecture lifecycle
- Black box architecture
  - ***Capture the needs of internal / external customers and consolidate them*** *(published)*
  - ***Analyze customer needs and translate them into requirements*** *(chapter published)*
  - **Define the uses** *(published)*
- White box architecture
  - Design a system that meets the needs/constraints of the stakeholders with the expected performance, justify the choice of architectures, propose alternatives and make the subsystems converge towards the overall optimal solution
  - Dysfunctional analysis
- Modeling of the system and value chains in architecture
- Proposal, justification and choice of competing architectures
  - Validate the technical choices
- Architecture assessment
  - Assess the maturity of the architecture definition
  - Evaluate the conformity of the architecture to the priority needs / values
- Interfaces
  - Manage internal and external functional and physical interfaces
- Link to product line
  - Ensure consistency with the standard product (when it exists)
  - Implement the product line strategy in the multi-project case
- Impact analysis
  - Analyze the impacts of modification and development requests
- V&V
  - Validate the technical configurations of the product/system
  - Check the design of the subsystems: it covers the needs with the expected performance
  - Compliance with requirements
  - Test
  - Prepare the deliverables of appropriate maturity according to the life phases: pre-project, development, production, support
- Contribution to project management
  - ***Sharing of responsibility between the architect and the project manager*** *(published)*
  - Contribution of the architect to the activities carried out by the project manager
- Ensure the technical coordination of the project
- Model architecture
- Competitive intelligence / open-mindedness
- System engineering support
- Tips for structuring an architecture team

– The architect in the company
- The architect's interfaces
- Focus on the interface with the business lines
- Focus on the interface with the product lines
- Focus on the interface with the projects
- Focus on the interface with customers

– How to start system architecture

– The profile of the architect
- Inventory in terms of training and certification
- Technical skills
- Transversal skills
- Typologies of architects
- Can everyone become a good architect?

ABOUT THE CERCLE CESAM

The CESAM Community has been developed by the CESAMES Association since 2010. Its objective is to share best practices in Enterprise Architecture and System Architecture. Through CESAM certification, it certifies the ability of players to implement these best practices. The CESAMES association has thus formed the largest community around the MBSE (today, more than 8,500 Professionals are trained or certified in the CESAM method). It relies on major partners, whether academic, institutional or professional.

The Cercle CESAM is a working group whose objective is to develop and share a pragmatic international system architecture standard and to apply it to each major industrial field. For the commercial benefit of its members.

Today the Cercle has about fifteen members, including ITER, Sagemcom, Safran (SHE, SAE, SED), Dassault Systèmes, Idemia, Airbus, Somfy.

The 2 areas of work of the Cercle are: Method and tools (formalization and sharing of applications of the CESAM method by major sectoral areas (case studies, good practices, method tools, etc)) and Professionalization (contribute to the professionalization of the profession as a system architect to promote architects within their organizations).

The Cercle is currently working on the white paper "the role of the architect" which will be published in 2023.

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