

EXCERPT FROM WHITE PAPER

The role of the architect

Assess the maturity of the
architecture definition



The Cercle CESAM
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CESAM
COMMUNITY

Assess the maturity of the architecture definition

Extract of the white paper "The role of the architect"

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Preamble

Throughout the architecture design cycle, it is necessary to control the confidence that one can have in the definition of the architecture on the basis of indicators that the architect defines himself or that are given to him, imposed by the project/organization. These indicators are useful for both the design project and stakeholders to track progress.

THE ESSENTIAL

It is important here to clearly define the objectives at the start of the project with regard to the indicators, to set up maturity indicators at the start of the project and to carry out peer reviews on a regular basis (both audit and collaborative engineering).

THE MAIN PITFALLS

Among the main pitfalls:

- Not piloting the rise in maturity of the definition
- Have indicators that relate only to the production of elements and not to their quality
- Link contractual progress only to document production indicators, which can lead to maintaining two sets of documentation or worse that the documentation is only used for reporting
- The reuse of existing architectures whose maturity is proven can prevent the identification of areas for improvement
- A poorly analyzed strict reuse hypothesis may not correspond to the real context of use and generate potentially costly readjustments
- Difficulty in identifying the maturity of subjects in terms of innovation or unknown areas
- The maturity of a system is not the sum of the maturity of its constituents (emergent properties, integration, etc.)
- Not following the maturity of the definition over the entire life cycle (especially during the downstream phases of the design)
- Forgetting the maturity of the interfaces when assessing the maturity of the definition of the solution

- Forgetting the maturity of the data model in the assessment of the maturity of the definition of the solution
- Failure to take into account the evolution of the issues in the monitoring of the evolution of the maturity

BEST PRACTICES

Here are some good practices to consider:

- Set up standard evaluation criteria, even at a high level, instantiable by the projects, and structuring to give a transversal vision of the projects to the management and the architects.
Here are some ideas:
 - Assess maturity against the entire lifecycle, use cases, functions and operational scenarios
 - Functionality: Are the use cases identified and do they correspond to the needs of the stakeholders? Are functions, decompositions and functional dependencies identified?
 - Structuring: Are the subsystems, components clearly defined and organized?
 - Organization: What is the level of correspondence between the organization (embodiment & communication) and the structuring of the solution?
 - Interfaces: identification of external and internal interfaces (functional/physical) and their number
 - Allocation: Are functions allocated to components? Are functional interfaces allocated to physical interfaces?
 - Reuse rate (of components, models, interfaces, etc.)
- Separate the documentation/deliverable (ex: word file) from the architectural elements that constitute it (ex: models, data, etc.)
- Perform regular solution definition maturity assessment reviews with the right stakeholders (technical team, full lifecycle experts)
- Take into account the opinion of experts and batch managers
- Plan for the development of progressive maturity loops

TESTIMONIALS

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

“ We have put in place an architecture completeness file which traces each expectation of the architecture analyzes in terms of deliverables and activities (e.g. life phase study rate, number of use cases, scenarios...) which makes it possible to define the progress on the architecture.

“ We follow the progress of the definition of the architecture on two axes: the number of macro-use cases studied (defined from the start of the design) on the one hand and the

quality of the analysis (based on the number reviews by peers) carried out on these use cases on the other hand.

“ Interesting tools available from INCOSE (SRL System Readiness Level) & NASA (ARL Application Readiness level) for instantiation

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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** (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** (published)
 - Dysfunctional analysis
- Modeling of the system and value chains in architecture** (published)
- Proposal, justification and choice of competing architectures** (published)
 - Validate the technical choices
- Architecture assessment
 - Assess the maturity of the architecture definition** (chapter published)
 - Evaluate the conformity of the architecture to the priority needs / values
 - Assess the technical maturity of the solution choices
- 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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