Radboud Universiteit Nijmegen

Project plan

Master Thesis

Which effect will a given strategy have on formulating principles?

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Table of contents

1. Introduction

This is the plan for a research project which will apply a given strategy on formulating principles in a real life project. This research project is within the framework of the Information Retrieval and Information Systems (IRIS) department of the Radboud University Nijmegen and the Denver International Program (DIP) department of the University of Denver. It is meant for my thesis to complete my Master Information Science and for the development of a new information system for the Denver International Program.

In this document the research project will be explained in terms of a problem statement by both parties. In the next chapter the way of working will be described and the stakeholders will be identified.
The literature will be used to support the research and the project plan will conclude with global planning and project conditions.

2. Problem statement

"Which effect will a given strategy have on formulating principles?"

Increasingly, organizations make use of enterprise architecture to direct the development of the enterprise as a whole and the development of their IT portfolio in particular. This steering and directing is done by means of principles, which are essentially regarded as constraints on the design space for enterprise engineers, thus guiding them in their design efforts. [LAND2007]

Therefore the IRIS group has developed a method to develop enterprise architecture, in particular the architecture principles. This method will handle the design constraints by controlling and measuring it. This method makes principles specific and measurable enough to allow them to control design space.

The workshop will be based on a real-life application of working in the D.I.P. project for finding and formulating principles, ensuring shared understanding and shared commitment for the impact of these principles and taking both collaborative and cause-effect reasoning into account.
There are two important perspectives on architecture [PROP2007]:

Regulating perspective: Architecture is regarded as a pre-scriptive notion limiting the design freedom with regards to the design of a system. When taking this perspective one will focus on principles, leading to rules/principles limiting designers in their design freedom.

Designing perspective: Architectures are actual specifications of high level system designs focusing on `architecturally relevant' design decisions. When taking this perspective, one typically produces architectural models that describe the design of actual system artefacts.

In this project we focus on principles and thus on regulating perspective on architecture.

D.I.P. uses a legacy system that is more than 15 years old. This system cannot handle new information and is outdated. The legacy system has been upgraded several times in the last several years; each update has lead to new problems which will cause dilemmas in the future. Because of major changes in technology and information, there is a need for a whole new information system which will handle the new and old information.

3. Way of working

This workshop will be conducted at the D.I.P. on the University of Denver where the development of a software architecture is needed. The research project for the IRIS group and the D.I.P. project will be combined by applying the method of developing the software architecture.

Research will start by identifying concerns and issues by working in the organization through my workshop, reading literature and by interviewing the stakeholders. This information will be gathered from The Council of International Programs USA (umbrella organization of D.I.P.), D.I.P. itself, interviews with my mentor / important persons / stakeholders (users, administrators and security people) within the project. The collected information will flow from concerns to informal principles which will be measured on quality afterwards.

Subsequent to collecting the relevant information, the formulation and prioritizing phase (consultation the management) of the principles (rules, guidelines and standards) will start. After fully understanding and shared commitment of these principles by stakeholders, they will be formalized in Object Role Calculus (ORC) and Object Role Modeling (ORM). The formulization phase will track faults and give a better insight into contradictions. So after this phase the principles will be verified and will be set for implementation in the architecture.

In a more formal way of working the use of "The Principles Arena" [PARE2007] will be used. In the development of the Principles Arena as a laboratory environment for running experiments with the formulation of architecture principles, we identify the following steps:

1. **Creation of an initial process and support** The goal of this first step is the creation of an initial way of working and way of supporting guiding/supporting the creation of architecture principles. This way of working will take us from concerns to informal principles. The tooling will mainly support the capturing of the deliverables, as well as the logging of the executed process.
2. **Measuring the quality of the process:** The goal of the second step is to be able to measure the quality (a way of evaluating) of the way of working followed in the creation of the principles. This involves the identification of quality properties to be evaluated, evaluation mechanisms and tool support to enable these quality evaluations.
3. **Experimentation with different processes:** This step demands the laboratory to be flexible enough to experiment with different configurations/variations of the way of working.
4. **Extension with formalization:** The goal of this step is to extend the way of working, way of evaluating and way of supporting to also cover the creation of formalized principles, define measuring metrics and create associated enforcement strategies.
5. **Extension with rationalization:** The first steps took concerns as a starting point. Principles must indeed address concerns, but they should ultimately be motivated in terms of goals of the business/stakeholders, risks that may hamper the attainment of these goals, etc. These will all influence the selection and further elaboration of principles.
6. **Integration of model builder abilities:** This step involves the integration of a model builder. The formal representation of architecture principles in terms of ORC requires an underlying ORM model. The creation, and validation, of this model should be integrated into the laboratory, also enabling an integration of the associated modelling process.

7. **Reasoning about process strategies:** In the final step we want to be able to include a reasoning mechanism that will suggest different strategies to the facilitator and mediators of the principles formulation process.

3.1 Stakeholders

Denver International Program

Mentor
Sue Koontz

DIP Executive Director
Claudia Thesis

Project Assistance
Matthias Hoekert

Board of Directors
Debbie Jones, President

The Council of International Programs USA
Umbrella organization of D.I.P.

4. Relevant literature

Bommel, P. van, Hoppenbrouwers, S.J.B.A., Proper, H.A., and Weide, Th.P. van der (2006). Giving Meaning to Enterprise Architectures - Architecture Principles with ORM and ORC. In Proceedings of the OTM Workshops 2006, (R. Meersman, Z. Tari, P. Herrero et al., Eds.), LNCS, Springer Berlin Heidelberg.

Dietz J.L.G. (2005). The third wave. Plenary presentation for the Dutch National Architecture Congress 2005 (LAC2005). See http://www.lac2005.nl/Uploads/Files/Dietz.pdf.

Formalizing Architecture Principles using Object-Role Modelling
G.J.N.M. (Guido) Chorus , Y.H.C. (Yves) Janse, C.J.P. (Chris) Nellen, S.J.B.A. (Stijn) Hoppenbrouwers and H.A. (Erik) Proper

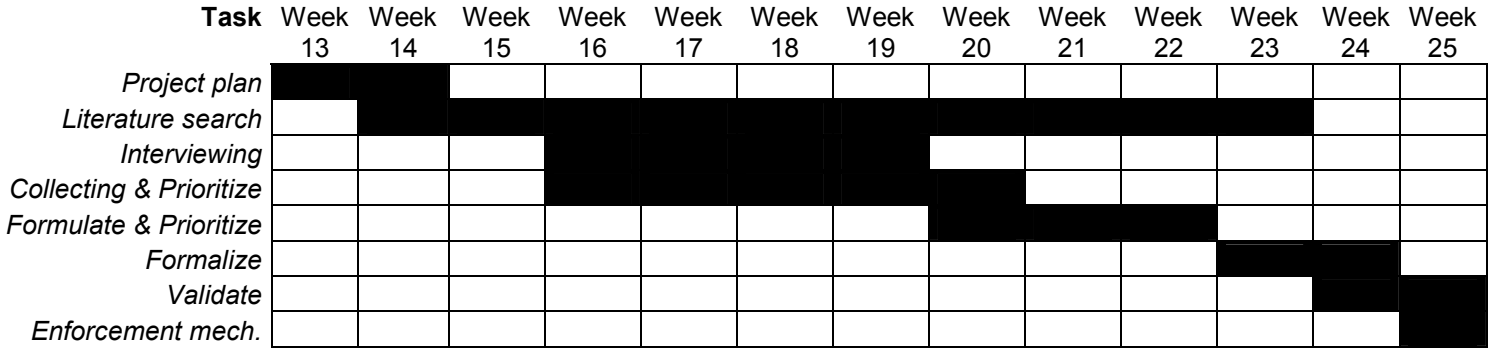
Halpin, Terry (1999)
Data modeling in UML and ORM revisited
http://www.orm.net/pdf/orm-emm99.pdf

M. Op ‘t Land and H.A. (Erik) Proper.
Impact of Principles on Enterprise Engineering. Technical Report ICIS-R07001, Radboud University Nijmegen, January 2007.

Recommended Practice for Architectural Description of Software Intensive Systems. Technical Report IEEE P1471-2000, The Architecture Working Group of the Software Engineering Committee, Standards Department, IEEE, Piscataway, New Jersey, USA, September 2000

xAF (2003). Extensible Architecture Framework version 1.1 (formal edition); report of the NAFworking
group xAF. See http://www.naf.nl/content/bestanden/xaf-1.1_fe.pdf

5. Global planning



6. Project conditions

The following specific project conditions will apply.

I. *The frequency of meetings with my supervisor*
Meeting are not possible through the period, March till June. Contact will be conducted through E-mail or telephone.

II. *The way in which my supervisor gives feedback*
E-mail and is specials cases by telephone

III. *The periods in which I will be absent*
March 10 till June 18

IV. *The periods in which my supervisor will be absent*

7. References

[LAND2007]
M. Op ‘t Land and H.A. (Erik) Proper.
Impact of Principles on Enterprise Engineering. Technical Report ICIS-R07001, Radboud University Nijmegen, January 2007.

[PARE2007]
https://wiki.science.ru.nl/ArchitectureInstitute/Principles_Arena

[PROP2007]
https://wiki.science.ru.nl/ArchitectureInstitute/Motivations