

# A Value-Based Maturity Model for IT Alignment in Networked Businesses

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**Abstract.** Business-IT alignment can be achieved at various levels of maturity. Supposing that an organization has tried to achieve business-IT alignment, a question to face is: how is that organization going to know the level of maturity of its alignment situation in order to plan future ways of action? That organization will need a guide for determining the maturity of its business-IT alignment, and for evolving toward a culture of process improvement excellence. There have been some proposals for architecture alignment maturity models but these are oriented to single enterprises and do not incorporate the value viewpoint. In this research, we will study architecture processes in networked businesses and develop a maturity model for this that incorporates the value viewpoint.

## 1 Introduction

Business-IT alignment is the problem of matching services offered by IT with the requirements of the business. In businesses of any significant size, business-IT alignment is a hard problem that commonly is not completely solved. In [08], Hoque establishes that the so-called strategic application of technology projects are, with rare exceptions, little more than large experiments which demonstrate a disconnect between business and technology instead of help to increase their alignment.

With the advent of networked businesses, the problem gets a new dimension. In a network, there is not a single decision point regarding IT. “*Networks exist when different businesses decide to cooperate by means of IT networks, but they also exist in large corporations, which often consist of nearly independent business units*” [24], p.1. For us, a networked business is a web of profit-and-loss-responsible business units, or independent companies, connected by IT that work together for a unifying purpose for a specific period of time.

“*Technology is not R&D. It is an integral part of how companies create value. It needs to be understood and managed this way*” [08], p.1. In VITAL [23], we will investigate an economic value-based approach to align business and IT in networked businesses. The value perspective in VITAL is based on e<sup>3</sup>-value [06],

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a method developed in earlier research by one of the VITAL researchers. In e<sup>3</sup>-value, a business network is modeled as a constellation of economically independent actors who exchange objects of value. This represents the principle of economic reciprocity.

The VITAL project consists of three projects which will investigate:

- techniques to describe IT services as economic value objects from a consumer (i.e., business) perspective, and ways to match these services in a value-oriented way with IT services described from a supplier (i.e., IT) perspective.
- techniques to design a networked IT architecture that supports services required by the business, taking the value offered by those services, and the costs incurred by the architecture, into account.
- models of decision processes about IT services and their architecture, to develop a maturity model for that.

This last line of research is the topic of the Maturity Model (MM) subproject of VITAL. Whereas subproject 1 (value oriented requirements engineering) will investigate value-based IT services specification and subproject 2 (business-IT architecture design) their realization by networked business processes and business systems, this subproject will investigate the process architectures of entities at each of the services provision layers defined in the GRAAL project<sup>1</sup>, by which these specifications and design activities can be realized, to develop a maturity model for that. These processes are not inevitably carried out in one organization. For this reason, next to the value viewpoint, we need to take into account the networked business viewpoint.

## 2 The Problem

Business-IT alignment can be achieved at various levels of maturity. Nowadays, there is no maturity model to assess business-IT alignment in a networked business environment, and from a value perspective [23]. Supposing that a networked business has tried to achieve business-IT alignment, such a business will need a guide for determining the maturity of its alignment, planning future ways of action, and evolving toward a culture of process improvement excellence.

Maturity models have been around for some time. The basic idea of a MM is to assess a specific area of an organization against a ‘norm’ to identify fields of possible improvements that must connect to business benefits [01].

### Research Questions

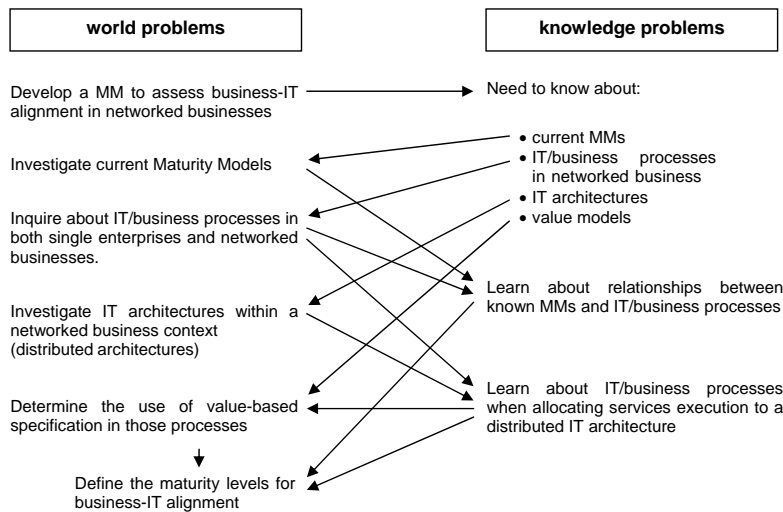
To discuss our research questions, we use the distinction between what we call world problems and knowledge problems [19]. A world problem relates to a situation where some change needs to be enacted according to the way we think the world should be. In contrast, a knowledge problem consists of lack of knowledge

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<sup>1</sup> For more information, please refer to <http://is.cs.utwente.nl/GRAAL>

about an aspect of the world. To solve knowledge problems, we need to study the world to obtain knowledge related to the particular aspect.

The objective of this research is to make possible assessing business-IT alignment in networked business organizations by developing a maturity model for this that incorporates the value viewpoint. This goal is a world problem and to solve it, we should gather knowledge. We can see the mutual recursion of world problems and knowledge problems of this research in Fig. 1.



**Fig. 1.** World problems and knowledge problems.

The problems identified in Fig. 1 led us to formulate our research questions. We know that a maturity model has two dimensions<sup>2</sup>: the maturity levels and the areas to which these levels are applied. For maturity of business-IT alignment, the first dimension leads to the following research question:

- How can maturity levels for business-IT alignment be defined? What areas are needed at each level of the maturity model?

Starting from the assumption that investment decisions are based on the value all participating parties of a networked business are going to obtain, we can also define research questions from the second dimension perspective:

- Which decision processes take place in networked businesses when allocating services execution to a distributed IT architecture?

<sup>2</sup> Take for example CMMI [04]. In CMMI the first dimension consists of five levels: initial, managed, defined, quantitatively managed, and optimizing; and the second dimension distinguishes four aspects: process management, project management, engineering, and support.

- How can we use value-based specification and allocation techniques in these processes?

Beside these questions, we also want to identify:

- What is the relationship between those processes and known maturity models such as CMM, CMMI and IT Service CMM?

Next, our last research question is related to the validation of the maturity model we will develop. This question is:

- How can we judge the fit of a maturity model in real-life cross-organizational settings? How do we know that the model we propose is valid?

These research questions will help us answer things we have not been able to look at before and will possibly lead into more questions during the research process.

### 3 Problem Justification

To show why the problem identified in Sect. 2 is indeed a problem, we discuss what an organization would be able to do with such a maturity model.

First, a maturity model will make it easier for organizations to establish goals for process improvement and identify opportunities for optimization. The maturity model will describe essential attributes that are expected to characterize business-IT alignment in a networked business at a particular maturity level. By comparing an organization's characteristics and attributes with the maturity model, an organization will identify which level of business-IT alignment it has in order to increase its process capability: first, establishing goals for the improvement of processes and then, taking action to achieve them.

A maturity model will also:

- allow an organization to benchmark itself with other internal or external organizations for the purpose of improving its own processes.
- offer an improvement path to the firm so that it can set priorities for process improvement actions. These improvement actions will permit an organization to achieve a higher level of maturity increasing its possibility of predicting. If an organization's maturity increases, then the definition of results becomes more accurate [05].
- allow a possible interested party to have certainty on the potential of the organization. Depending on the level of maturity that an organization has, an external party (another organization, a stakeholder, a client, or a supplier) can have a clear idea about the organization's capabilities, in order to decide to have economic dealings with such an organization.

Given all these things, it is indeed important to have a maturity model. It should, however, provide support for these three points.

## 4 Theoretical Context

This research is related to some subject areas which will help us to understand more terms and concepts associated with the research problem. Such subject areas can indicate what knowledge can help us to come near to our solution.

### The GRAAL Project

Van Eck et al. [22], in research preceding the VITAL project, studied business-IT alignment in a number of large transaction-processing organizations in The Netherlands. Their analysis framework (which they called the GRAAL framework) will be our starting point in this research. They also provide interesting insights in relation between IT architecture decisions and the structure and organization of the IT process.

### Alignment MMs

Another important topic for our research is “Alignment Maturity Models”. There have been some proposals for architecture alignment maturity models but these are oriented to single businesses and do not incorporate the value viewpoint [23]. A good example of alignment maturity models is developed by Luftman [10]. Luftman’s strategic alignment assessment presents an approach for determining a firm’s business-IT alignment based on six variables, namely skills, technology scope, partnership, governance, competency/value measurements, as well as communications.

An additional model is the model proposed by Laagland, et al. in [09]. They establish that business architecture and IT architecture need to be integrated in order to gain effective total results in the organizations.

### Other Literature

Further theory with which we are going to start the research is:

- IT Processes: ITIL [21], ASL [15], BiSL [16]
- IT Governance: CobiT (see [www.isaca.org/cobit/](http://www.isaca.org/cobit/))
- MMs: CMM [14], CMMI [04], IT Service CMM [13]
- Networked business literature (e.g., [07, 11, 20])
- Transaction cost theory (e.g., [02, 03, 25])

## 5 Research Approach and Methods

This research is conceptual, qualitative and interdisciplinary. It is a formulative investigation [12, 17] that is going to involve synthesizing and integrating information in order to develop a final model, i.e., a maturity model to assess business-IT alignment in networked businesses from a value perspective.

Except for the questions how to use value-based decision techniques and how to define the maturity levels, these questions are empirical, not normative, and we will investigate them by means of case studies research that are going to take place in networked businesses.

We will start with a review of literature in order to learn about current maturity models, and to identify common IT/business process architectures from two perspectives: the single enterprise and networked businesses. Next, we will try to recognize what the relation is between such maturity models and the IT/business processes investigated by conducting case studies. At this point, we will have recognized what IT/business processes take place in organizations having an idea concerning how such processes are managed in real-life settings.

Another reason to choose for case studies is to identify IT architectures in established networked businesses. Such knowledge will lead us to recognize which decision processes take place in networked businesses when allocating services execution to a distributed IT architecture.

Investigation of value models and specifications will be needed in order to identify how the value perspective could be included in the maturity model we will develop.

Having (i) the results of the case studies, (ii) some results of the other sub-projects of VITAL, and (iii) the knowledge obtained from the review of literature as basis, we will determine the maturity levels for business/IT alignment in a networked business environment trying to design a complete maturity model. The next table shows the research methods that we intend to use for each research question:

Research question	Research method
How can maturity levels for business-IT alignment be defined? What areas are needed at each level of the maturity model?	Synthesis/integration of information <sup>3</sup>
Which decision processes take place in networked businesses when allocating services execution to a distributed IT architecture?	Case study and Literature review
How can we use value-based specification and allocation techniques in these processes?	Literature review
What is the relationship between these processes and known maturity models such as CMM, CMMI and IT Service CMM?	Case study and Literature review
How can we judge the fit of a maturity model in real-life cross-organizational settings? How do we know that the model we propose is valid?	Simulation Field experiment

We assume the solution can be validated with simulated case studies and field experiments exploring what the use of the developed maturity model would

<sup>3</sup> This information will be obtained from the case studies and the literature review.

be in the case studies, i.e., by showing how the developed model could be used in the case studies.

## 6 Current State of Affairs

Currently, the research is in the initial phase. We already surveyed IT process architectures for single enterprises development from a maturity model perspective [18]. We are collecting some worthwhile literature over networked business to continue our research in this direction.

In terms of the future of this research, we now have a pressing need to define the areas that are going to be included in the MM.

## 7 Conclusion

In this paper, we showed the problem justification, the theoretical context, and the research approach of the Maturity Model subproject of VITAL.

As specified in the VITAL research proposal [23], in this research we are going (i) to make an inventory of relevant maturity models, and (ii) to analyze process architectures of organizations in order to propose maturity levels for the business-IT alignment. Because VITAL is about business-IT alignment for networked businesses and is not limited to alignment in a single enterprise, we will take a network point of view and produce, with the information obtained in the case studies and literature review, a maturity model that incorporates both the business viewpoint as well as a value viewpoint.

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