Enhanced ICoNos Maturity Model

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Enhanced ICoNOs Maturity Model

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By

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Management Summary

Organization's concerns as controlling costs, improving quality, increasing effectiveness, and managing risk have become increasingly important. Business-IT alignment (B-ITa) is a known solution for such concerns. Maturity Models (MM) came into being for considering improvement actions in B-ITa. MM describe the evolution of an entity over time. We can find considerable literature on MM for B-ITa in single organizations. However, to the best of our knowledge at the time of writing this thesis, IT-Enabled Collaborative Network organizations (ICoNOs) MM is the one that specifically addresses the processes needed for achieving B-ITa in networked organizations. The ICoNOs MM provides improvement routes in four domains for achieving B-ITa in CNOs. These basic domains are Process Architecture, Information System Architecture, Partnering Structure and Coordination.

The author of ICoNOs MM evaluated the ICoNOs MM design elements in six case studies (with the help of documentation and interviews with professionals) in specific regions (in Europe and Nord-America). Specific-region-based evaluation of ICoNOs MM motivated us to evaluate it in a setting in a different region that has not been previously studied. We have evaluated the presence/absence of ICoNOs MM domains and processes in an Asian CNO. We have selected the National Database and Registration Authority (NADRA) of Pakistan as our case study. Results not only validate the existence of the four domains of ICoNOs MM but also compel to introduce a new domain named as "Cost Management". Introduction of this new domain is the reason for the title "Enhanced ICoNOs MM".

While preparing for the interview-based evaluation of ICoNOs MM in an Asian case study, we faced a great deal of difficulty in arranging the appointments with professionals. This difficulty provides the basis for reflection on how difficult it could be to carry out an interview-based maturity assessment and also for thinking of evaluating B-ITa in an alternative – and independent, way i.e. without interviewing professionals. The idea of an independent evaluation motivated us to collect B-ITa information from publically available information e.g. downloadable documentation or websites. For evaluating B-ITa in ICoNOs MM it is necessary to interpret and understand publically available information (website & documentation) correctly. We have developed interpretation rules in order to avoid the misinterpretation of information available on website.

For the development of interpretation rules, we got the inspiration and insight from the field of web analytics as well as from the ICoNOs MM B-ITa assessment

procedure. Finally we came up with interpretation rules for evaluating B-ITa in the Enhanced ICoNOs MM context. Facebook and Amazon are selected as case study for evaluating the interpretation rules. After carefully analyzing the case studies of Facebook and Amazon we come to know that these rules are strong enough to get basic understanding of the maturity of B-ITa in a CNO by using the Enhanced ICoNOs MM model. However, for higher level processes, website-based evaluation by using rules seems to be inefficient in providing conclusive results for B-ITa maturity. So as an overall conclusion we can say that these rules can provide the preliminary knowledge needed for conducting efficient and comprehensive interviews for B-ITa maturity evaluation by means of ICoNOs MM/Enhanced ICoNOs MM.

Acknowledgement

This thesis is the result of the final assessment of my master study in University of Twente. Two years ago I started my master study with a great excitement of studying abroad, in the Netherlands. I owe to a number of people who helped me in successfully carrying out my studies in general and project in particular. It is my honor and pleasure to mention some of them who always proved helpful, cooperative and spared their valuable time for me.

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List of Abbreviations/Acronyms

AIMM	Adaptive Infrastructure Maturity Model
ATF	IS architecture target formulation
AVV	IS architecture verification and validation
B-ITa	Business-IT Alignment
BAD	Baseline IS architecture description
BMD	Business model definition
BPD	Baseline process architecture description
CAR	Causal analysis and resolution
CeRA	Cost effective risk analysis
CM	Cost Management
CMM	Capability maturity model
CNOs/CNO	Collaborative Network Organizations
CO	Coordination
COC	Communication-oriented coordination
CRM	Customer relationship management
CRD	Centre for Reviews and Dissemination
CSlA	Cost based service level agreements
DTS	Direct supervision
E2A	Extended enterprise architecture
EBMM 2.0	e-business maturity model 2.0
EFC	Event logs formal consistency
EIMM	Enterprise interoperability maturity model
ERRA	Earthquake Reconstruction & Rehabilitation Authority
G2C	Government to Citizen
G2B	Government to Business
G2G	Government to Citizen
GSC	Governance structure and compliance
HP	Hewlett Packard
ICoNOs	IT-Enabled Collaborative Networked Organizations
ICMA	International City/County Management Association
IESCO	Islamabad Electric Supply Company
InCA	Informal communication adjustment
IoPD	Inter-organizational policies definition
IoPO	Inter-organizational process optimization
IR	Investment reason analysis
IS	Information System
ISA	IS Architecture
IsCD	IS capabilities definition
IsPM	IS portfolio management
IsRM	IS requirements management
IT	Information Technology
MM	Maturity Models
MRE	Metric-based exploration of roles
NADRA	National Database and Registration Authority

NIC	National Identity Card
NOs/NO	Networked Organizations
OPP	Organizational process performance
OSD	Organizational structure definition
PFA	Profitability Analysis
PA	Process Architecture
PAD	Process architecture definition
PAF	Process architecture target formulation
PFP	Organizational process focus planning
PO	Process optimization
PPM	Process portfolio management
PS	Partnering Structure
PTCL	Pakistan Telecommunication Limited
QPM	Quantitative IS portfolio management
QRA	Quantitative coordination analysis
RAM	Risk analysis and mitigation
ROI SMF	ROI strategy and management formulation
RRS	Roles and responsibilities specification
SaaS	Software-as-a-service
SLA	Service level agreements definition
SCM	Supply chain management
SMB	Small and mid size business
SNGPL	Sui Northern Gas Pipe lines
SPD	Standards and principles definition
STD	Standardization

1 Introduction

This chapter provides an overview of the work presented in this thesis. It explains what the problem is, how it comes up, and what techniques were used to tackle the problem. It also formulates the research questions and specifies the scope of this master thesis.

1.1 Problem Background

With the development in business, it is believed that a business organization is not a stand-alone entity; it has to communicate and collaborate with other businesses. In the recent years the development of Information Technology (IT) resulted in inventing a variety of collaboration and coordination models based entirely on inter-organizational systems. For communications and collaboration, to add value to the business, businesses need to align its business and IT sides.

Organizations that work together are termed as networked organizations (NOs/NO). A NO is precisely defined as: "A network organization is a situation that come up when independent people and groups, linked across boundaries, work together for achieving a common goal" [1] [2]. Different network organizations behave differently for achieving their goals based on their collaboration. Thus the relationship of network organizations when studied in perspective of business-IT alignment (B-ITa) gives rise to the question of how to measure the maturity of the relationship. Maturity models (MM) are newly emerging measurement strategies for businesses/organizations that can help to measure the maturity of the relationship.

To assess the maturity of NOs there exist a number of MMs [3], [4], [5]. Considering which one is the best and which one provides us an efficient way to conclude how B-ITa in NOs/collaborative network organizations (CNOs) work is a demanding task. In this master thesis, we will start with the most recently developed MM: the IT-Enabled Collaborative Networked Organizations Maturity Model (ICoNOs MM) [6].

1.2 Problem Statement

Assessing B-ITa in NOs is a significant challenge. MM are considered important instrument to access that. Among many, in this thesis we are considering the most recent one: the ICoNOs MM, developed by Santana Tapia [6]. This model has been evaluated by its author in terms of its suitability on European and American CNOs. However, the previously published evaluation studies are preliminary only and Santana Tapia [6] acknowledged that more evaluation research is needed to confirm the suitability and the usefulness of the ICoNOs

model for both government and non-government NOs. The author [6] deemed any follow-up evaluation studies necessary and important to build up a body of evidence that helps practitioners and fellow researchers assess for themselves whether or not the model could possibly be used as a B-ITa maturity assessment instrument in their organizations. This thesis takes on the challenge to evaluate the suitability of ICoNOs in a variety of settings, to derive lessons learnt from each evaluation study, and to use the learning to enhance the ICoNOs model so that its applicability to organizations is extended.

1.3 Research Goal

Our goal is to evaluate the ICoNOs MM by using two qualitative approaches. The first involves subject experts (e.g. interviews). The second is a documentation-based approach. The first approach is considered as a 'traditional' way of evaluating ICoNOs, while the second one is a 'non-traditional' approach where subject experts are not involved for gathering data (in this non-traditional approach, we use only websites or publically available documentation as data sources). Santana Tapia [6] produced the ICoNOs MM and evaluated the design elements of the model by interviewing people (i.e a 'traditional' approach). Our goal is to continue validating the ICoNOs MM while using both 'traditional' and 'non-traditional' approaches. In this master project, we use the ICoNOs model to assess the B-ITa of government agencies located in Asia. We enhanced the model and used 'non-traditional' approaches to evaluate its suitability in two international settings.

1.4 Research Model

Figure 1.1presents the research model used in this thesis. First, we will conduct a literature review for analyzing the existing maturity models, and then we will particularly study the ICoNOs maturity model in detail. Literature study of e-government will provide us with the understanding of the concepts that are specific to B-ITa in government settings. After that, we will need to select some case studies which will later help us to evaluate the model and our understanding of the concepts.

As shown in the Figure 1.1, after the literature study, ICoNOs MM will be evaluated on the Asian government organization's case. The qualitative approach of interviewing the people and studying the documentation will lead us to learn about the validity of ICoNOs MM in Asian government organization. These results may lead to some modifications in the ICoNOs MM.

Some interpretation rules will also be developed in parallel as the original ICoNOs MM does not provide rules for mapping the data from the studied context to the MM elements. These rules along with the modification of the ICoNOs MM (if necessary, based on the Asian e-government case study results)

will be evaluated on the selected websites. The literature review, the observations of websites and the possible interviews with experts will be employed as mile stones towards the enhancement in ICoNOs MM. We can move back and forth between interpretation rule formation and evaluation step. This iterative process will continue until we are able to judge about the maturity of CNOs by using interpretation rules.

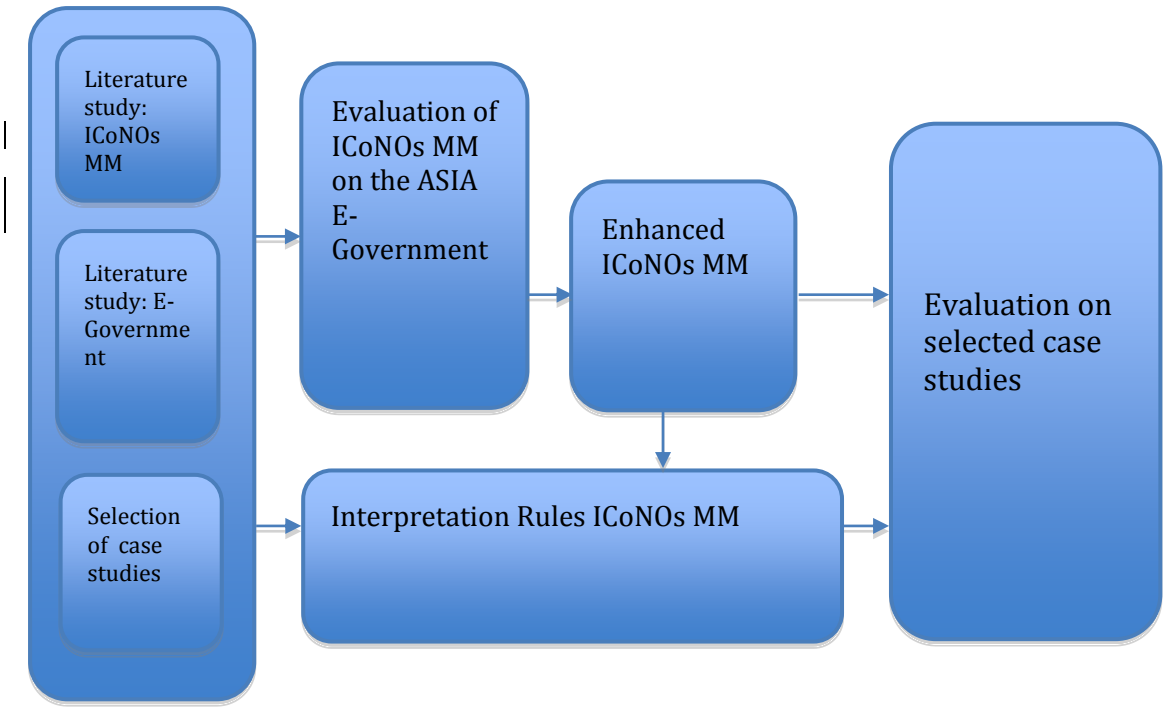

Figure 1.1 : Research Model

1.5 Research Questions

Our main goal is to evaluate the ICoNOs MM by using two types of qualitative research techniques: traditional and non-traditional, on both government and non-government websites. To achieve this goal, we have formulated our research question which is given below:

> *What is the suitability of the ICoNOs MM to contexts of government NOs/CNOs in developing countries for assessing their B-ITa? And if experts are not available for interview-based evaluation of B-ITa maturity, in which way can we use information from websites and publicly available documentation for the purpose of evaluation of B-ITa by means of the ICoNOs Maturity?*

This research question is an abstract question, i.e., it contains many details. Before continuing decomposing the question into sub-questions, we need to understand the scope of the ICoNOs MM.

In Figure 1.2 gray color boxes show the areas where our main research question is focused. There are several aspects of the research question that can be redefined in sub-questions to create simpler, more concrete questions. Research question is divided according to the various parts of the research that need to be explained or elaborated.

> *Question#1: Is the ICoNOs MM suitable for NOs/CNOs contexts in developing countries, especially in Asian e-government NOs/CNOs, by using the traditional approach?*

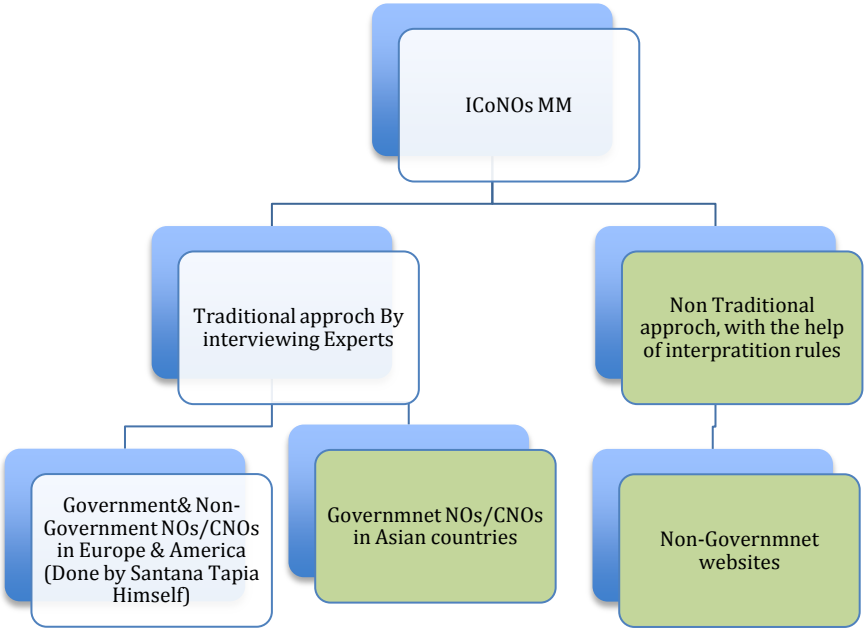

Figure 1.2: ICoNOs MM Research Directions

The purpose of this question is to analyze the B-ITa of e-government NOs/CNOs of developing countries (especially of Asian countries), and try to figure out that the MM developed by Santana Tapia [6] is suitable for Asia too.

> *Question#2: Does the evaluation of the ICoNOs MM bring into focus the new aspects of MMs?*

We will consider each and every domain, necessity of its existence (and non-existence) then finally we will conclude about the ICoNOs MM's domain.

> *Question#3: How to interpret what you have seen on a website in the light of the constructs of the ICoNOs MM when publically available information in websites is the only possible source of information in the evaluation of B-ITa maturity of CNOs?*

In the previous case studies conducted to validate the ICoNOs MM [6] a questionnaire has been used when interviewing people. But if experts are not available, or if they do not have enough time, to explain each and every aspect of the business, then how to collect maximum basic information concerning B-ITa. This question will help us to build our interpretation rules.

> *Question#4: Is there any difference of results while evaluating the ICoNOs MM on a website with the help of interpretation rules instead of interviewing people?*

This question is a follows up on Question#3. We will evaluate the interpretation rules developed in the previous question. With the help if interpretation rules we will deduce B-ITa related information from publically available non-government websites.

1.6 Research Plan

For planning this research we draw on Wiring's problem analysis and solution design approach [7]. We chose this research approach because of its broad use in master and PhD projects at the University of Twente and also because of its suitability to the problem we are investigating. Applying this approach, we are using the distinction between two types of questions: design research questions and knowledge research questions [7]. Once we are able to identify the question type, it will be straightforward to follow the research method based on the research question types. Based on the paper by Wieringa and Heerkens [7] a design research question is a "How-to-do" question which asks us a way to get a desired output from the given set of inputs. The other type of research questions is called as "knowledge research question". This type of questions can be explained in one sentence as "what-is-the-case" and "why-is-it-the-case". A knowledge research question tells us what we want to know about the world based on what we already know about the world. Conceptual modeling questions make the foundation for the knowledge research questions.

In Section 1.5 we have divided our central research question into sub-questions. We have identified the type of these questions as shown in Figure 1.3. In this thesis, we used the steps of Wieringa and Heerkens [7] to formulate research questions.

Research Plan
Legend: D: Design Question K: Knowledge Question C: Conceptual Modeling Question A: Action
"What is the suitability of the ICoNOs MM to contexts of government NOs/CNOs in developing countries for assessing their B-ITa? And if experts are not available for interview-based evaluation of B-ITa maturity, in which way can we use information from websites and publicly available documentation for the purpose of evaluation B-ITa by means of the ICoNOs Maturity"?
Q1: *Is the ICoNOs MM suitable for NOs/CNOs contexts in developing countries, especially in Asian e-government NOs/CNOs, by using the traditional approach?* K: Selection of Asian e-governance NOs/CNOs A: Interview the experts A: Evaluate the ICoNOs MM on Selected NOs/CNOs A: Conclude the results
Q2: *Does the evaluation of ICoNOs MM bring into focus the new aspects of MMs?* K: Evaluate the B-ITa on the basis of results obtain in Q1 A: Conclude the results
Q3: How to interpret what you have seen on a website in the light of the constructs of the ICoNOs MM when publically available information in websites is the only possible source of information in the evaluation of B-ITa maturity of CNOs? C: Produce interpretation rules K: *Selection of Non government NOs/CNOs* A: Apply the rules on the selected websites.
Q4: Is there any difference of results while evaluating the ICoNOs MM on a website with the help of interpretation rules instead of interviewing the people? K: Apply the interpretation rules produced in Q3 A: Identify the differences in results

Figure 1.3: Research Plan of Study

1.7 Research Approach

This research focuses on evaluation of the ICoNOs MM. While the overall research process has been presented in Figure 1.1, in this section we describe in more detail those specific research techniques that will be used for the specific tasks included in this projects. These techniques are the following:

Literature Review: Purpose of this literature review is twofold; one is to find the most recent MMs and to study the aspects these new MMs have discussed.

The second purpose of this literature review is to create a base for developing the interpretation rules.

Case study: There are two scenarios for which we have to choose case studies. One for the evaluation of the ICoNOs MM on developing country CNOs/NOs, and other one for the evaluation of the interpretation rules and some possible modification of ICoNOs MM(in case we came across during the evaluation process).

Interviews: For evaluating the ICoNOs MM we need to conduct interviews. We have planned that we will conduct structured interviews [8]. The reason for selecting structured interviews is to save time, because this evaluation will be conduct in Pakistan and we will have limited time over there. Also structured interviews let us get more information in efficient way.

Interpretation methods: So far the ICoNOs MM has been evaluated by interviewing experts and studying documentation. We will evaluate the ICoNOs MM using websites; so, we will follow web analytics techniques [9].

1.8 Research Scope and Relevance

This research is relevant for the further development of MMs to assess B-ITa. Evaluation studies are deemed important in that they provide a body of evidence that confirms or disconfirms claims published in previously carried out research. This is necessary because Santana Tapia [6] (see p. 230) discuss many open issues like:

- How ICoNOs MM will behave if it is not a cross organization framework.
- There is a need to evaluate the ICoNOs MM on other case studies too.
- ICoNOs MM discusses four domains based on the case studied but new domains may arise with new case studies.
- A need for a model assessment tool is also there.

Such broad perspectives are difficult to achieve in such limited time and scope of master thesis, therefore we have selected only some parts of that.

1.9 Thesis Structure

This master thesis entitled “Enhanced ICoNOs Maturity Model “consists of seven chapters. Each block in Figure 1.4 states the chapter number along with the sub-question number that is dealt in the respective chapter.

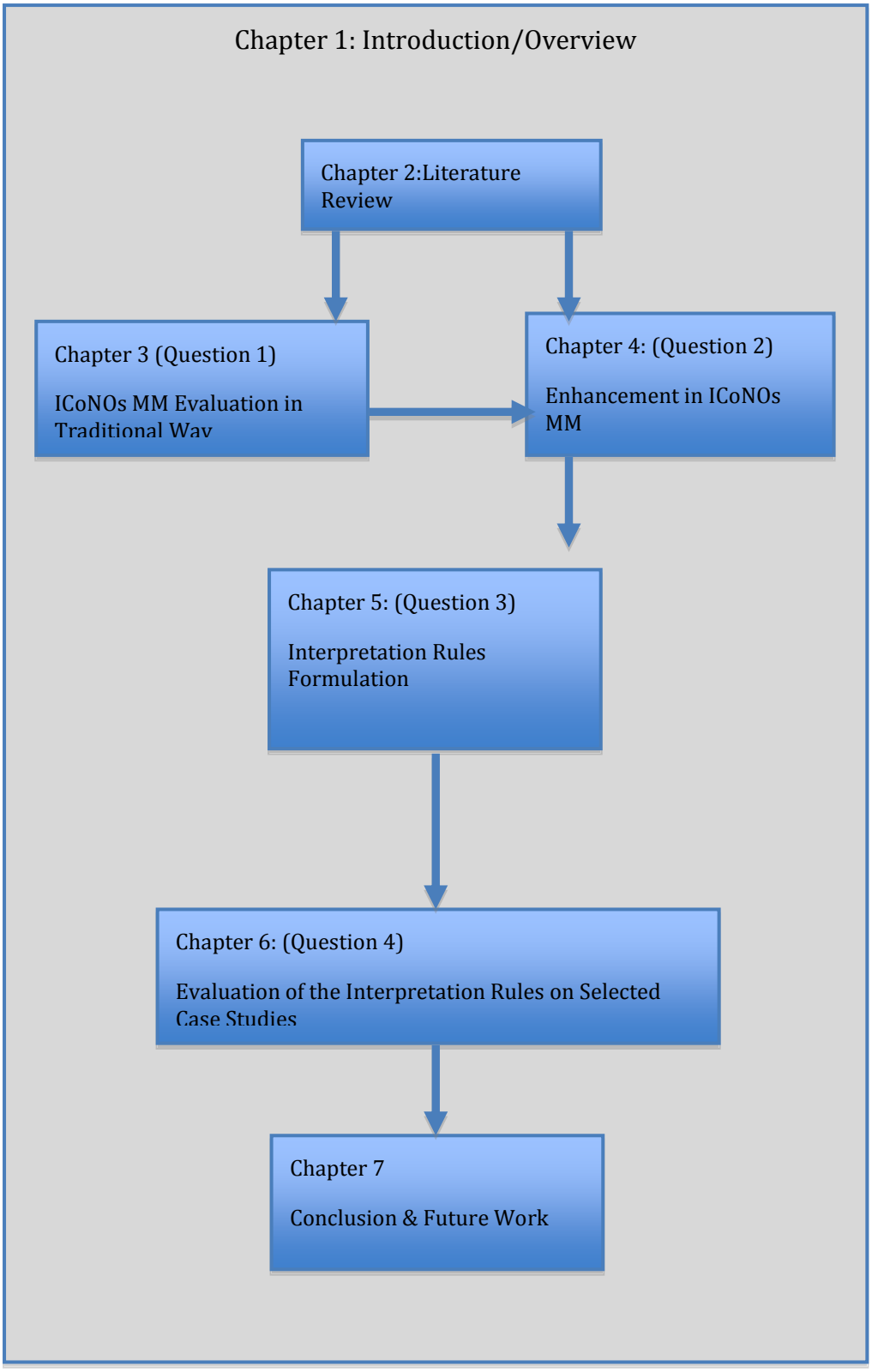

Figure 1.4: Thesis Structure

2 Literature Review

As discussed in the Chapter 1, this thesis is based on the ICoNOs MM proposed by Santana Tapia [6] . Because the literature sources on B-ITa MMs,that have already been reviewed by Santana Tapia [6], are dated up to 2006, we considered it worthwhile to complement his literature review with a new one that aims to uncover and analyze more recent literature sources published between 2006 and 2009. The purpose of our complementary review is twofold: (i) to extend the Santana Tapia's review by including MMs specific to e-government and (ii) to identify MMs for B-ITa at CNOs dated 2006-2010.

2.1 Systematic Review

Systematic review synthesizes the related work on a research topic in a fair way. Kitchenham [10] provides a detailed procedure for the systematic review process. In Information System (IS) community, Webster and Watson [11] gave set of detailed steps for "writing the analysis of the past in order to prepare for future". In this thesis we will consider Webster and Watson's guidelines and Kitchenham's systematic review phases. The description of our review explicitly follow the Kitchenham's systematic review phases, a review consist of three phases,

- Planning the review
- Conducting the review
- Reporting the review

In the following sections we present these steps.

2.2 Planning the Review

CRD Report [12] suggest in its checklist that if we understand the objective of research then we can identify the need of review. In this thesis we are going to evaluate the ICoNOs MM on Asian government CNOs. Because a literature review on MMs has already been used to inform the design of the ICoNOs MM, we are not going to execute a full scope literature review on MMs in this thesis. Instead, it makes sense to search, identify and analyze recent MMs that have been published after the ICoNOs MM's publication date and then, to compare these models with ICoNOs MM.

Furthermore, as our interest is in applying ICoNOs MM to Asian settings. We also focus on searching literature on MMs which have addressed any specific aspect on B-ITa and CNOs in Asia. In this way, we will use our review to inform our case study of any existing related work.

Moreover, later in this thesis, we plan to develop some interpretation rules for understanding B-ITa maturity aspects based on information available from the websites of CNOs. Our literature review finds some MMs, which are in some ways based on web-analytics [9].

Our review plan included searching in (i) ACM digital library, (ii) IEEE Xplore, (iii) Scopus, (iv) Springer Link, and (v) Goolge Scholar. We used the combination of the following key words: 'maturity models', 'e-government', 'e-business', 'web analytics', 'B-ITa', 'online government'. We chose these terms because we deemed them to be important for describing both the topic of B-ITa in CNOs in the government sector and the matter that we are interested in using a web-analytics-based approach. The choice of key words was finalized in multiple iteration process and discussed on regular basis with the first supervisor who also did a search in digital libraries to judge the results that these key words brought. We considered the following inclusion criteria: (1) the paper is about a MM that explicitly addresses some B-ITa aspects and (2) the paper is published after 2006 and is not included in the literature reference list in Santana Tapia's dissertation[6].

2.3 Conducting the Review

We have performed search between 1st September 2009 and 1st October 2009 by applying the search query individually to each of the five databases. After applying our inclusion criteria, we identified six MMs that met these criteria. We present each one in the next section. After that, we compare them with respect to ICoNOs MM. Our comparison is of qualitative nature and is presented in 2.4 .

2.4 Summary of the results

We identified six models that were published between 2006 and 2009, that are related to this master project. Figure 2.1 depicts the models that we found in our review. We provide a brief description of each of them is given in Figure 2.1.

2.4.1 The Adaptive Infrastructure MM [13]

This model was designed by Hewlett Packard (HP). The authors created it to address problems related to updating your data center, from existing to an upgraded version, while keeping in view the rigid financial constraints is recognized as a significant problem. Keeping in view this problem HP has provided an adaptive infrastructure maturity model (AIMM) for next generation data center. For next generation data center HP AIMM is the best approach being in use by HP. AIMM consists of standard building blocks, automated by using modular software and delivered through comprehensive services. HP AIMM is not only restricted to just data center systems and technologies. It can be also upgraded to facilities in terms of design, construction, operations, staffing, and

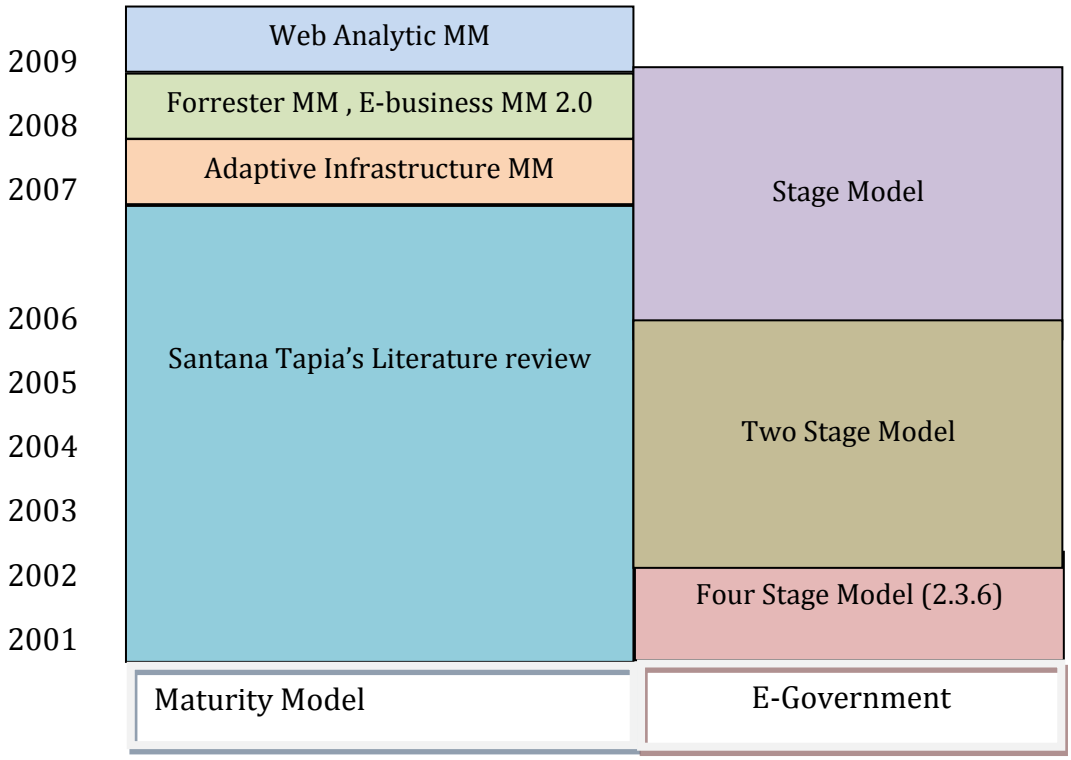

Figure 2.1: Results at a glance

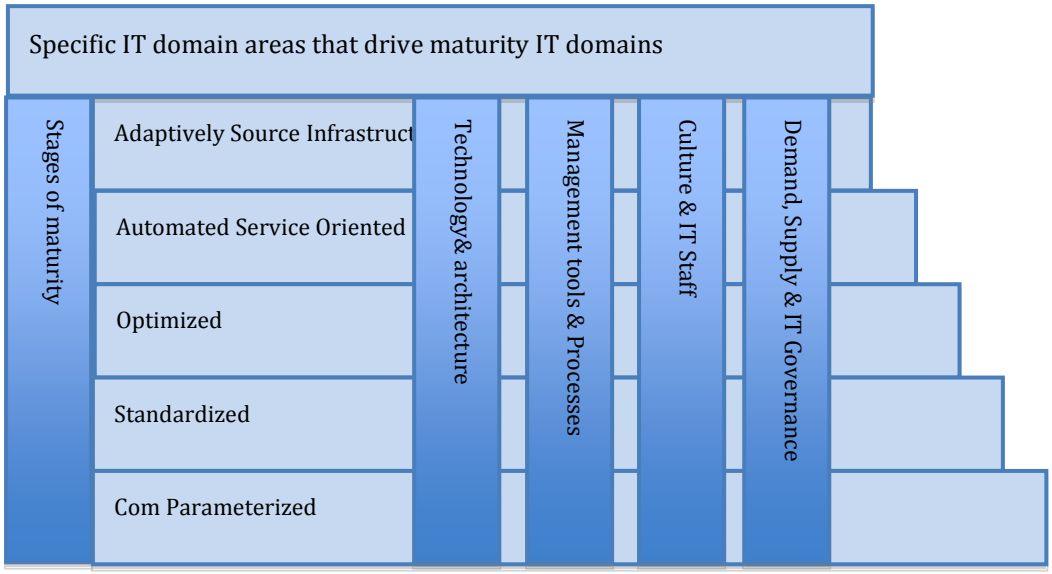

Figure 2.2: Adaptive infrastructure MM [13]

processes.

The HP AIMM helps to manage evolution. HP AIMM have recommendations that can help to identify the types of initiatives that should be consider for driving the current state of maturity to a desired state. These recommendations and stages of maturity vary from organization to organization depending on the current state of IT, business itself, business constraints and priorities. For example an

organization which has compartmentalize and legacy IT environment. This environment can indicate that it is on a least mature stage or it may want to move to a more standardize environment, technologies and tools. **Error! eference source not found.** shows a brief study of the stages involved in the AIMM.

2.4.1 The Forrester MM [14]

This model addresses the software-as-a-service (SaaS) context, an important trend in customer relationship management (CRM) in particular and in the small and mid size business (SMB) market in general. Forrester's SaaS MM provides an assessment of the SaaS solutions that CNOs can adopt to streamline their collaboration. This model provides the guidance to software vendors and services providers for realistic strategy transformation. Forrester implies that the SaaS vendor is a central partner in a CNO relying on SaaS. It's interesting also to note that Forrester explicitly states that targeting the highest maturity level by such a CNO is not necessarily the best fit for every vendor.

2.4.2 The E-Business MM 2.0 [15]

This model is emerged in 2001 and is based on the concept of organizing for e-future. It can be said safely that the world of e-business is changing dramatically since 2001 so there is a need to manage and understand e-business with respect to current state. In order to meet the requirement for current e-business, in 2008 e-business maturity model 2.0(EBMM 2.0) is introduced.

The main purpose for the development of EBMM 2.0 is to help organizations understand their current status and future goal. This model also helps to understand the factor that influence their way to their desired state. These factors are (i) Processes, (ii) Infrastructure, (iii) Management & Organization (iv) People & Culture. EBMM 2.0 consists of five levels and four factors shown in Figure 2.3 respectively. It is based on the well-known capability maturity model (CMM).

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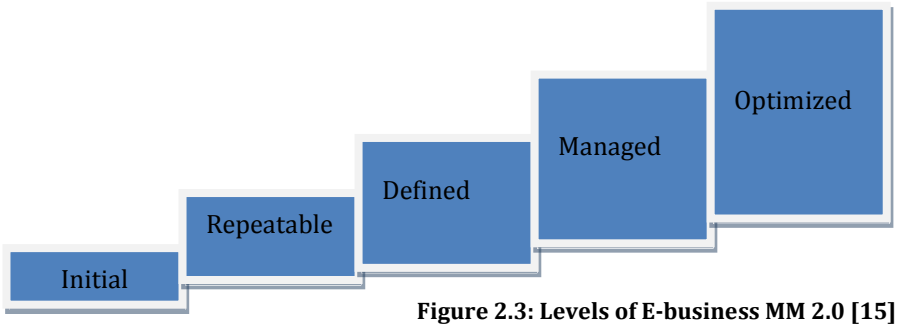

Figure 2.3: Levels of E-business MM 2.0 [15]

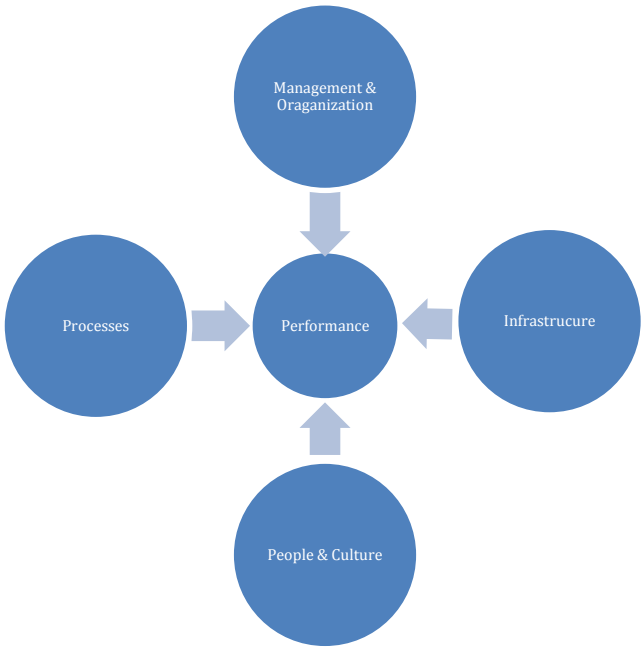

Figure 2.4: Factors effecting on E-business MM 2.0 [15]

In 2008, a quantitative research was performed by the Atos Consulting Trends Institute. Its aim is to validate the EBMM 2.0 across sectors, establishing sector benchmarks

2.4.3 The Web Analytic MM [16]

A web analytic model is the analysis of the web developed in 2009. Jim Sterne, founder of the Web Analytics Association revealed that "it was a mistake to call it web analytics, it is business analysis". So the aim of web analytics is to "arrive at an optimal or realistic decision based on existing data". In turn, analysis is "the process of breaking a complex topic or substance into smaller parts to gain a better understanding of it". The Web Analytics MM provides the processes needed by CNOs to carry out web analysis. . This model let the analyst to speak the language of stakeholder and to see the existing and previous business dimensions. This model can be used by CNOs to optimize online marketing activities, which is ultimately based on the analysis of business and process optimization at each of the partner organizations participating in a CNO. Figure 2.5 outlines of the model along with the short description of its maturity levels.

The Web Analytics MM is deemed to be able to help for the advancement of the field by making an easy communication and change management framework.

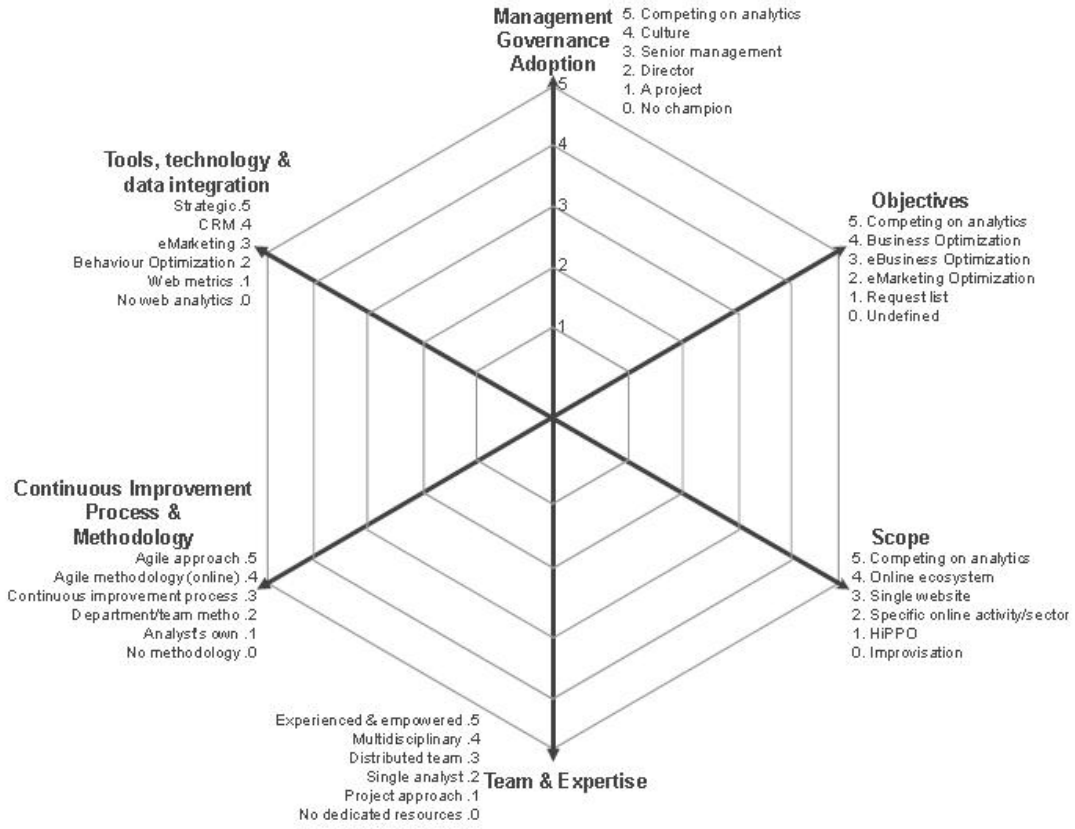

Figure 2.5: Web Analytic MM Worksheet [16]

2.4.4 A four stage model for developing fully functional E-government [17]

E-government is a challenge at different levels of public administration. For public administrators think about e-government and their organizations, 'stages of growth'. This model describes different stages of e-government development. These stages give an overview of the multi-perspective transformation within government structures and functions as they make transitions to e-government through each stage.

For each stage this model describes technological and organizational challenge. This model tells how the e-government becomes amalgamated with traditional public administrative structure. In addition these stages identify the citizen as the user of the government services. A four stage model is shown in the Figure 2.6.

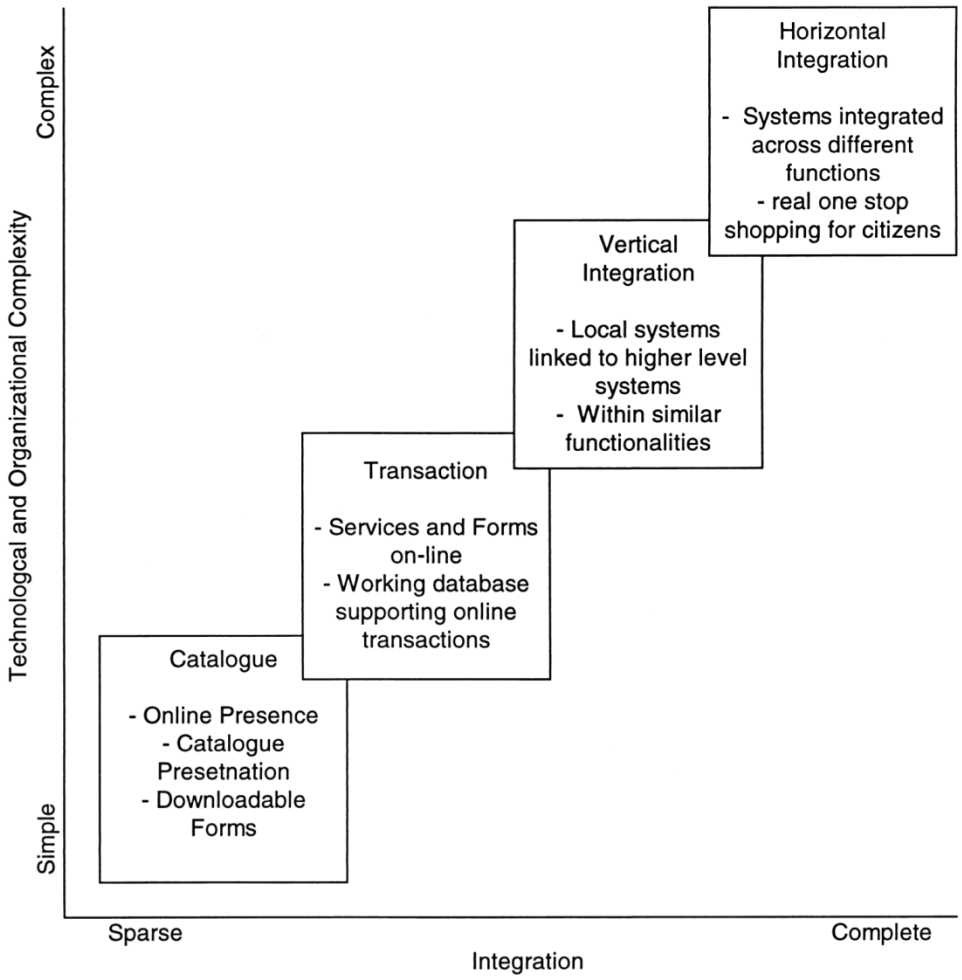

Figure 2.6: Four stage Model [17]

2.4.5 A two-stage model of E-government growth [18]

This model is based on a four-stage model presented in the previous section but it examines current stages of development of e-government growth in American cities. A two-stage model is an evolution of the four-stage model. This two-stage model is applied on the municipalities for e-government growth.

- ❖ Stage I is the cataloging of information online
- ❖ Stage II is transactions being completed online

These two stages are being studied with the e-government relationships being government to citizen (G2C), government to business (G2B), or government to government (G2G) as shown in Figure 2.7. It is applied to data from the 2002 International City/County Management Association (ICMA) electronic government survey. The studies show that G2C web sites are primarily in Stage I. So these don't have much movement outside of the information dissemination stage of e-government. For G2G relationships, many transactions completed over the city's Intranet. The benefit taken in G2B relationship, in most of the websites

procurement of equipment and office supplies was done by Internet among half of the surveyed cities. So it is concluded that e-government growth is more pronounced in some areas than others.

Stages of e-government growth and type of government relationship

Type of government relationship	Stages of e-government growth	
	Stage I: Cataloguing	Stage II: Transactions
G2C	Online presence of information about government and its activities for citizens. Example: Council meeting minutes online	Services and forms online and databases to support online transactions for citizens. Example: Online payment of taxes
G2G	Online presence of information for other levels of government and its employees. Example: Intranet with benefits information	Services and forms online and databases to support online transaction for other levels and government and employees. Example: Provide online training
G2B	Online presence of information for businesses about government. Example: Online product review of office supplies	Services and forms online and databases to support businesses transactions with government Example: Make purchases of office supplies online

Figure 2.7: Stages of e-government [18]

2.4.6 Stages of growth in e-government: An Architectural Approach [19]

This model acknowledges that there is gradual evolution in all the organization, including evolution in governmental agencies. All over the world government organizations are migrating from traditional systems architectures to more horizontally and vertically integrated architectures. This model presents the development of information architectures for local government. By analyzing discontinuities in the architectures and coordinating back and front office applications, five stages are derived. The five-stage model consists of

i. No integration,

ii. One-to-one messaging,

iii. Warehouse,

iv. Broker

v. Orchestrated broker architecture.

These stages can be considered as guidance and direction in architecture development in order to communicate changes to the rest of the organization and to reduce the complexity of the progression of e-government initiatives. Moreover it provides milestones to evaluate and control cost of architecture development.

2.5 Comparison of the six models and ICoNOs

While Santana Tapia's review is based on the models especially designed for the B-ITa, in this review we explicitly included e-government and e-business models in which B-ITa is one of the key components (but not the only one). While in Santana Tapia's review, the author found that his surveyed MMs mostly relate to B-ITa in a single enterprise and few with B-ITa in CNOs. In case of CNOs the main focus is on processes and integration levels (such as page 81 EIMM[20], SCM MM [21] , E2AMM [22]), relationship (such as IT outsourcing MM [23]), IT sharing and information (such as in extended CMM [24]).

We must note that the six models, we have reported, are all geared to the networked settings. When comparing ICoNOs and any of the six models, we observe that mappings can be found between the ICoNOs design elements and the design elements of the models in our review. For example, the Four Stage Model [17] (see Figure 2.6), the HP AIMM model [13] and the Forrester model [14] suggest a strong emphasis on processes and integration levels, on relationships, on information sharing, as ICoNOs does. We are however able to point out to areas that fall beyond the scope of ICoNOs. These are: culture, cost management, quality assurance. We trace the inclusion of these areas back to the objectives with which the six models were created. For the purpose of our research project and our research model (see Figure 1.1), we also think that those areas that are beyond the ICoNOs MM's scope, can be considered as candidates for inclusion in ICoNOs MM, if one considers investigating the possible ways to extend the ICoNOs MM. We make a note of this because it is well possible that replicated evaluations of ICoNOs MM suggest needs for extending it. If this happens, then a researcher would not only use his/her observations coming out of his/her evaluation of ICoNOs MM, but also the observations that are provided through this literature review. Indeed, in the rest of this thesis (for the overall thesis structure see Figure 1.4), we will see how we identified the need for one specific enhancement to the original ICoNOs MM model and how we responded to this need.

Last but not least, we make the note that with respect to the six MMs we found no information in digital libraries about their possible use in Asian settings. We also could not find any information pertaining to the cost-effectiveness of the maturity assessment procedure itself. We looked for example to get evidence on using any of the six models in a specific assessment procedure (be it interview-based, or documentation-based, or website-based) and our search yielded only fragmented details which were not enough to make any conclusion. Therefore, we could say that to the best of our knowledge, this research is one of the very first investigations aimed at evaluating maturity of B-ITa in Asian settings and at improving the B-ITa assessment process itself (by including – as we will see, websites and web analytics techniques).

2.6 Summary

This chapter presented related work on MMs in e-government and e-business settings. The related work was identified and analyzed by means of a literature review. We executed the review in a systematic way, applying as close as possible the guidelines by Kitchenham [10] and Webster and Watsons [11]. We found six MMs related to our research and we compared them with respect to ICoNOs MM, the MM that is subject to evaluation in this thesis. Our findings serve as informative input to the case study that follows in the next chapter.

3 ICoNOs MM Validation in an Asian Government Organization

This chapter presents a case study for evaluating the domains of ICoNOs MM on Asian CNOs. This evaluation process is done by using a case of National Database and Registration Authority, (NADRA) Pakistan[25]. In what follows, we will introduce the case study research approach for this validation process.

3.1 Background

The ICoNOs MM is designed on the basis of B-ITa processes organized in the so-called domains. ICoNOs consists of four most common domains and five levels of maturity. Santana Tapia validated his proposed model on different case studies [26], [27]. He concluded that his proposed MM [6] works very well with the case studies shown in the Figure 3.1.

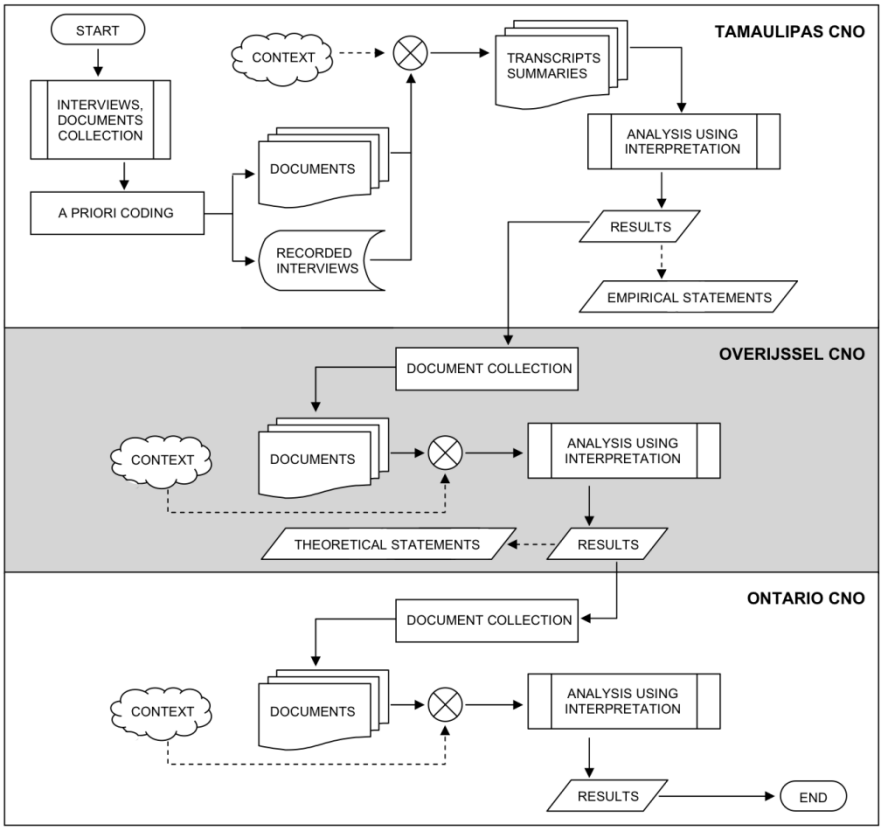

Figure 3.1:Multiple Case Study Approach [28]

Tamaulipas, Overijssel and Ontario all are CNOs in which Santana Tapia evaluated the validity of the claim, the claim states:"for any successful B-ITa processes, partnering structure, IS architecture, process architecture and

coordination are the basic building stones than any other domain". The author has validated this claim in his PhD dissertation and in his publications to which we refer interested readers for more details [6] [26] [29]. In this chapter, we go a step further and extend the evaluation efforts by including a case that describes an Asian CNO. The case study organization is the NADRA, Pakistan. It is a system integrator for global identification sector in developing country. NADRA designs, implements and provide operating solutions for corporate and public sector clients. NADRA offers customizable solutions for identification, e-governance and secure documents to its clients. NADRA has implemented the Multi-Biometric National Identity Card (NIC) & Multi-Biometric e-Passport in Pakistan[25].

Local Clients	Projects
Ministry of Interior	National Identity Card System
Directorate General of Immigration and Passports	Multi-Biometric Card System
National Highway Authority	E-Toll System
Benazir Income Support Program	MNA/MPA/Senator Forms Processing Project Emergency Relief (ER) for IDPs Project Smart Card Project World Bank Scorecard Survey Project
Earthquake Reconstruction & Rehabilitation Authority	ERRA
UNHCR Pakistan	Registration of Afghan Refugees

Table 3.1: Local Clients [25]

Sector	Companies
Telecom	Mobilink, Ufone, Telenor…
Financial Institutions	Barclays, Royal Bank of Scotland, Standard Chartered…
Utility Bill Companies	PTCL, IESCO, SNGPL, SSGPL…

Table 3.2: Corporate Clients [25]

Clients	Projects
Government of Sudan	Civil Registration Project
Government of Kenya	Passport Issuing System
Government of Bangladesh	High Security Driver's License

Table 3.3: International Clients [25]

NADRA purchased its solution with the help of its strategic partners. Which includes Terawatt, ORACLE, Safe ID solutions[25]. With the help of these partners NADRA is in its current state of development. NADRA have its local, international and corporate clients.

Detailed client information about NADRA is given in Table 3.1, Table 3.2 and Table 3.3.

3.2 Case Study Research Plan

We have planned to apply traditional approach (namely the interview-based approach) for evaluation of ICoNOs MM on NADRA. We started by conducting the interviews and concluded that as NADRA is originally developed by its strategic partners, so the administration don't know the details of technical terminologies evolved behind it. The overall case study plan was inspired by Yin [30] and other researchers [31] [32]. We devised the following research cycle [31] [32](see Figure 3.2). In the following sections we will go through the research cycle step by step.

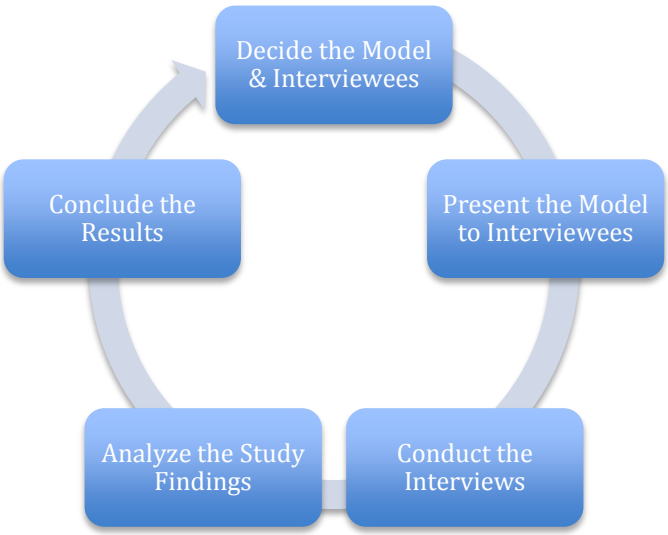

Figure 3.2: Research Cycle

3.2.1 Decide the Model and Interviewees

As shown in the section 3.1, we have selected NADRA, Pakistan as a case study to evaluate ICoNOs MM. The targeted interviewee groups are the professionals from NADRA and from its government and corporate clients. We have included five professionals from NADRA,

- Two are senior IT experts working with NADRA for more than ten years.

- Two are NADRA system specialists who are working with NADRA for four years; their responsibility is to manage the servers of NADRA.
- One person is from the "National Passport Authority" which is a client of NADRA.

3.2.2 Present the Model to Interviewees

This step means educating the interviewee about the technical terminologies and details included in the case study that would be carried out. Most of the professionals we had to interview are those who were not directly involved in the development of NADRA. Instead they are the users and administrative staff of NADRA and its clients. So they needed to learn few terms and basics about ICoNOs MM. For this purpose, we organized an information-and-orientation meeting with all participants where we have given a presentation for the purpose of bringing all participants to a common level of understanding of the ICoNOs MM and its maturity assessment procedure. See Appendix A for presentation details.

3.2.3 Conduct the Interviews

We carried out semi-structured interviews based on the interviewing practices recommended in [8]. For the interviews, we used the questionnaire presented in Appendix B. There in, our questions are adapted from Santana Tapia's thesis [6], (see Appendix D). We got an opportunity to meet five professionals. Four of them were from NADRA and one was from its local client. For the better understanding and convenience of the professionals, most of the interviews were conducted in Urdu (Pakistan's National Language). In this thesis, instead of writing a detailed question-answer-session of each professional, we are dividing the interviews into three parts based on our three broad questions. Below, each question, the views of each interviewee are presented.

Question 1: How NADRA judges the strengths and weaknesses of the relationship with its partner organizations (namely, its clients)?

- **1st Interviewee:** "As NADRA is the Pakistan's largest database for the citizen, from the start of partnership all the clients change themselves according to NADRA. NADRA is not flexible enough to the adoption with respect to clients. So if there is some platform incompatibility then it is obligatory for client to adjust with NADRA".
- **2nd Interviewee:** "NADRA provide the citizen's data to other authorities. NADRA has no competitor so clients have to struggle to adjust with NADRA. NADRA allow no negotiation but clients have to accept its terms and conditions".

- **3rd Interviewee:** "NADRA consider its strong and weak clients by considering the level of coordination that they have among them".
- **4th Interviewee:** "Capability of data exchange is the basis for the strong and weak relationship with its clients. For data exchange basic infrastructure need to be the same. For example in case of NADRA and Pakistan Passport Authority".
- **5th Interviewee:** "The requirement document provided by NADRA to its client is in fact the base of the judgment, for seeing the existing and future possibility of alignment between them".

Question 2: What are the aspects needed, for NADRA to work successfully with its clients?

- **1st Interviewee:** "The coordination on the 'architectural information' is required data".
- **2nd Interviewee:** "Cost considerations and quality control is the building stone of the successful relationship. As there exist no competitors for NADRA therefore NADRA demand whatever it wants".
- **3rd Interviewee:** "Coordination and communication among the clients and the NADRA is one of the major considerable aspects. Because lack of communication produce different outcome then expected or required".
- **4th Interviewee:** "Process architecture and business rules and data flows are the considerable aspect for NADRA's success".
- **5th Interviewee:** "There exist many aspects but the most important among them are cost management and coordination".

Question 3: Does these recommendations (ICoNOs MM Domains) suits to NADRA?

We make the note that the names of the ICoNOs MM domains were not provided in the orientation presentation (Appendix A) explicitly, because we wanted the interviewees to give us the necessary domain names from NADRA themselves. We wanted to see whether the domain names and the meanings that would come up in the minds of the professionals, when thinking about B-ITa, would converge with or diverge from the original names and meanings used in the ICoNOs MM.

- **1st Interviewee:** "Maturity consideration with respect to coordination suits to NADRA but IS architecture and Process architecture are not much

important. So we can say among ICoNOs MM domain coordination and partnership structure (partnering structure in ICoNOs terminology) are basic recommendations".

- **2nd Interviewee:** "To measure the maturity of the NADRA with its clients all the recommendations are important but there should also be some cost consideration".
- **3rd Interviewee:** "Still there was no way by which NADRA can consider maturity aspect and these recommendations provide very practical and convenient framework".
- **4th Interviewee:** "Yes, they suits to NADRA".
- **5th Interviewee:** "Not only these recommendations suits to NADRA but these are also helpful for the clients. Because in this way client can also find out about themselves, that at which level of maturity are they with NADRA or with any other organization".

3.2.4 Analyze the Study Findings

NADRA provides us with great deal of information for evaluating ICoNOs MM. The terminologies used by NADRA and by ICoNOs MM are different but have same meanings. For example the terms "Partnership, Partnership Structure and Partnering Structure" have same meanings. We note that the first two terms are from NADRA and last one is an original ICoNOs MM domain name.

In this section we will analyze the information gathered from interviews and documentation while keeping in view the ICoNOs MM domains. We will consider two important, inter-dependent projects of NADRA: one is NIC system and the other is Multi-Biometric Card System, for discussing the ICoNOs MM domains.

Partnering Structure: NADRA is a semi-government organization. So it has a hierarchy of authority and always has new government projects with new demands. The client companies handle these new projects. The contract among these companies and NADRA provide a detail partnering structure. For the NIC system, NADRA have a partnering structure or workflow structure that describes the constraints which IS architecture and process architecture need to fulfill.

- Identify the person with its finger prints
- Identify the person with family hierarchy
- According to Pakistan's customs change in social status (Single, Married, Divorce, Dependent) change the family hierarchy.
- NIC system has:

(i) A good definition of roles and responsibilities,

(ii) An established governance structure

Although they have assigned responsibilities to the individual actors collaborating in the network, Multi-Biometric Card System is dependent on the NIC system so they also have the same partnering structure provided by NADRA.

IS architecture: Most of the interviewees have demonstrated that detailed documentation, briefing and training are necessary for IS architecture. Only IS architecture is not enough for project success, it needs detailed infrastructure and technical information that can be termed as IT infrastructure architecture. As in case of NIC system NADRA provide the system for data entry but additional hardware is required for that data entry because each person is being identified by his fingerprints and NIC system needs a fingerprint input device. It can be a finger-print scanner, or a simple scanner which can read ink based fingerprints from the paper. For NADRA, this architecture was necessary to align the new systems. For immigration, passports are needed and a system known as Multi-Biometric Card System exists for this purpose. Data collected by the NIC system is being utilized for the passport processing by Multi-Biometric Card System. This is an example of data collaboration among the organizations based on IS architecture.

Process Architecture: Another important domain but none of the interviewee discussed about it directly, is Process Architecture. They used different terminologies as Process Rules, Business Architecture but all of them were indicating toward a single aspect termed by ICoNOs MM as Process Architecture. All interviewees agreed on that if there is cross-organizational collaboration then process architecture is a basic building stone for such collaborative network organizations. As in case of NIC system, the process architecture domain was identified in the context of the organization delivering the Multi-Biometric Card System. The Multi-Biometric Card System organization need the details of the citizen, if data is not being provided and the process architecture is not same then it can happen that a person will have its passport first then he will get his NIC. Which indicates a miscommunication in the 'process architecture' of the system? This also indicates contradiction of the saying that "Multi-Biometric Card System is dependent on NIC system".

Coordination: Almost all of the interviewees discussed about coordination in one way or other way around. Some of them called it as "Communication among collaborative network organizations". Our interviewees converged on the use of the following mechanisms:

(i) Coordination enabled through shared goals,

(ii) Coordination enabled through agreements specifications,
(iii) Definition and communication of mutual expectations.

Preceding the example we have considered in the previous paragraphs, for NIC and Multi-Biometric Card System if no coordination exist then the information can be duplicate or can be erroneous. As there exist that basic information of a person can be provided by the NIC system, Multi-Biometric Card System can only re-check the credential given by NIC system and add extra details like purpose to going abroad, latest photograph etc.

3.2.5 Conclude the results

In our case study research, we came across with following important findings,

- Coordination is fundamental among all the dimensions; we found that any other dimension like Partnering Structure, IS architecture or Process architecture are related to the Coordination. We can say that all the other three domains lie under the cover of Coordination.
- IS architecture and process architecture are being used but at NADRA, both architectures didn't have any distinct boundaries, in-fact they have overlapping boundaries in NADRA.
- There exist different terms but have same meaning. Examples are shown in the Table 3.4.

	Terms by ICoNOs MM	Equivalent Terms used in NADRA
1	Partnering Structure	Partnership Structure , Partnership
2	Coordination	Coordination and/or Communication
3	Collaborative Network Organizations	Network Organizations, Partnering Organizations

Table 3.4: Examples of different names people use for concepts with the same meaning.

3.3 Evaluation of Validity Threats in the Case Study

We have validated the ICoNOs MM on one of the government organization in Pakistan and found that the ICoNOs MM is equally suitable to Asian government organizations too. There can be chances to challenge our conclusions by asking a number of questions, which are as follows:

- Was the organization (NADRA, Pakistan) very much developed government organization and, thus, a typical for Asian countries?
- Will ICoNOs MM be equally applicable to other Asian CNOs?

- If we apply ICoNOs MM on other government organizations, will the results be same?

Below, we address these questions in more detail.
First, NADRA is a large provider of government solutions serving many Asian countries and its solution delivery processes are developed and elaborated in a way similar to a solution provider organization in the Western countries (e.g. US or the European countries). This might pose a threat to the generalizabiity of our results in the sense that they might be specific to large Asian CNOs where one much developed partner (in terms of organizational design) instills its discipline, processes and cooperation rules over its collaborators (in this case, its clients). We however think that the impact of this threat is minimal as NADRA seems to be a typical organization in the Asian market of government system delivery. We did a search for evidence on the characteristics (in terms of collaboration) of Asian e-government projects as available in web sites of market research firms in Asia (e.g. Gartner Asia, eGovAsia - www.egovasia.com), the United Nations [33] and the Economist magazine. Specifically, we looked into what kinds of partners are included in Asian vendor and partnership ecosystems. We found that in a number of Asian countries, e-government is built-up with the participation of large solution providers collaborating with country-specific government authorities. We also acknowledge the Asian countries have similar e-government demands [33] and, as it is the case of NADRA, it is well possible for a solution provider to have as clients the governments of several countries. We, therefore, think that we could possibly expect results similar to ours if we carry out a maturity evaluation in e-government contexts that are similar to ours. If we, for example, asses the maturity of the NADRA CNO formed with the Earthquake Reconstruction & Rehabilitation Authority and the Registration of Afghan Refugees, then we could expect to get results similar to those presented in this chapter.

Second, we can say that we have selected NADRA for convenience (in a way randomly) and without any prior analysis. The author of this thesis had a previous work relationship with NADRA and was employed in an internship in a Pakistani government organization. The author was, thus, familiar with the government processes in the country and in the business areas for which NADRA delivers IT solutions. We acknowledge that other researchers might choose other country's organizations for the reasons similar to ours. We, however, think that this choice is reasonable in the light of the deadline constraints imposed in a master project.

Third, we make the note that the interviews were carried out and transcribed in Urdu language, and also analyzed by one researcher only (namely, the author of

this thesis). Two senior researchers participated in planning the case study, but because they were not familiar with Urdu, there was no way for them to get actively involved in the data analysis. This poses a threat to the accuracy of the data collected and the analysis as the interpretation of the author could have been different from what the interviewees actually wanted to say. This threat was mitigated by a checking step in which the first supervisor of the author asked questions and attempted to triangulate the data with the information from official documents partly available in English from the web sites of NADRA and its clients. This triangulation step strengthened the feeling that the level of bias of the first author is reduced.

3.4 Summary

In this chapter, we have presented the NADRA case study that we have conducted to empirically validate the B-ITa domains by means of interviews with a group of professionals. We have followed the research plan presented in the section 3.2. Based on our learning we confirm the presence of same four key domains proposed by Santana Tapia[34]:

- Partnering structure,
- IS architecture,
- Process architecture and
- Coordination.

CNOs involved in B-ITa projects consider these domains to have an insight and to strive for B-ITa maturity. During the interviews we found one additional domains that is “Cost Management”. But the most important are the four discussed by the ICoNOs MM. We came across another important aspect that cost management is effected by the type of organization. If it is a non-government organization then cost of B-ITa is very important factor to consider. On the other hand if it is government organization then cost will be managed by government. B-ITa of CNOs (Government) will not have much concern with cost management domain.

We explain this point by considering the Figure 3.3 for NADRA:

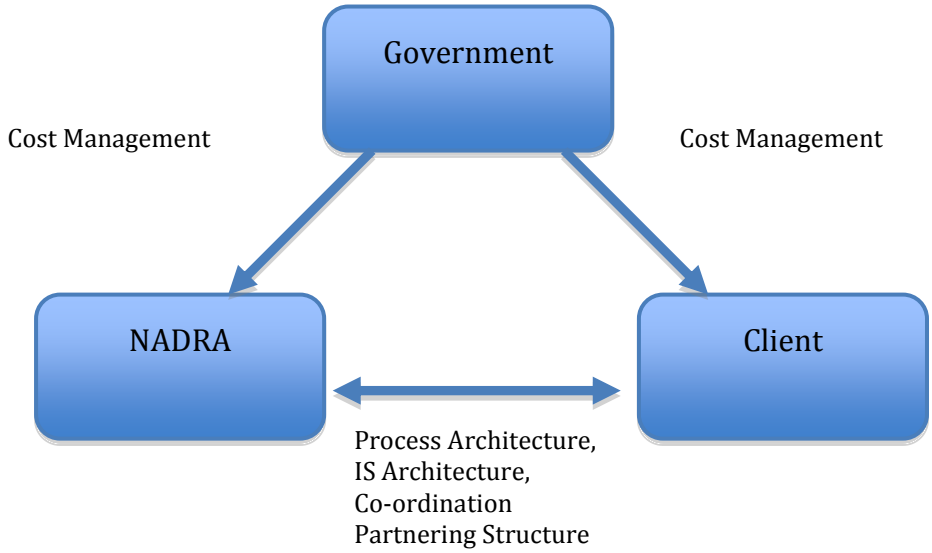

Figure 3.3: Cost Management

As shown in the Figure 3.3, government is responsible for managing cost in both the client organizations (these are government authorities) and NADRA. NADRA and clients have to deal with process architecture, IS architecture, coordination and partnering structure (ICoNOs MM Domains). So we can say in government level CNOs sharing of revenue, profit and loss are not much concerned but in non-government sector they are a big deal to think about. Therefore we can conclude that in non-government CNOs cost management need to be considered as an independent domain.

4 Enhanced ICoNOs MM

This chapter focuses on an enhancement in the ICoNOs MM [34]. In the previous chapter, ICoNOs MM is evaluated on NADRA [25] case study. For this purpose we have conducted interviews and studied some documentation. We have reported the results obtained and we indicated that there is a need to enhance the ICoNOs MM.

4.1 Brief Introduction to MMs

MMs describe evolution of an entity (Organization/ NOs/ CNOs etc). These models are designed for the purpose of assessment and prediction of some attributes for an entity. With the help of these models, entities become aware of the current state of different areas. MMs are usually level based approaches. Domains and levels characterize each MM. Domains define the specific area or direction and levels define the improvement path. Each MM has tried to answer some specific questions. Question like "How maturity of CNOs can be measured" is answered by ICoNOs MM. It helps CNOs to access the maturity of B-ITa activity to identify lack of efficiency that can have negative impact [34]. Like other MMs, it is a two dimensional framework and consists of domains and levels. In the following sections, we will summaries ICoNOs MM domains and levels.

4.1.1 ICoNO's Levels[27]

ICoNOs MM consist of five levels, which are used to describe the improvement path for CNOs to achieve B-ITa. These levels are,

- **Level 1: Incomplete.** At this level processes for a B-ITa domain are not performed or partially performed.
- **Level 2: Isolated**. Processes for particular B-ITa domain are planned and executed at initial levels. But these processes are isolated not managed form CNOs perspective.
- **Level 3: Standardized**. Processes are heading for standardization of a particular B-ITa domain from a CNOs perspective.
- **Level 4: Quantitative Managed**. Processes about a particular B-ITa domain use statistical and other quantitative techniques for quality measurement.
- **Level 5: Optimized**. Processes are improved for B-ITa based on common causes and interests.

4.1.2 ICoNO's Domains [27]

All the levels defined above are used on certain domain. A domain is a group of processes used to improve a particular area in CNOs. ICoNOs MM consist of four domains which are as follows:

- **Partnering Structure:** Defines where the work will be done and who will be involved. For CNOs it describes organization structure, work division, roles and responsibilities.
- **IS Architecture**: It is about information management function their relationship to each other and the environment. It also describes the principles, guiding the design, and evolution of CNOs.
- **Process Architecture:** Describe about all the individual and collaborative processes needed to reach a shared goal of CNOs.
- **Coordination:** It is about managing the interaction and work among the CNOs while considering the dependencies among the processes.

4.2 Implication of results from NADRA: Introduction of the Cost Domain

The recommendation obtained by interviewing people from NADRA suggests that cost is an important factor to consider. Indeed, when searching the literature on the role of cost consideration in B-ITa. One can deduce that many theories and models [16], [35], [36], [37], [38], [39], [40], [41] are cost based. The literature survey done in the chapter 2 of this thesis and the literature survey done by Santana Tapia [6] (Chapter 4) provide the bases for introducing the cost domain.

Our goal of introducing this domain is to improve the completeness and performance of ICoNOs MM. For the purpose of introducing this domain, we have to answer following questions:

- **What will be the name of the new domain?**

  From NADRA we have concluded that B-ITa is affected by cost. Among many terms used by NADRA (Financial Constraint, Cost effects, Cost management, Financial regulations) we have selected "Cost Management" as the name of this new domain [42]. We think that this choice is justified because we found it was intuitive not only to our NADRA case study participants but also it converged with the terminology used in the B-ITa literature.

- **Will the name of the ICoNOs MM be changed after introduction of new domain?**

  Yes it will change; we will name it as Enhanced ICoNOs MM.

- **How to define this domain?**

  The Cost Management domain can be defined as "the discipline of ensuring IT is obtained in the most effective price – which does not necessary mean cheapest – so that the CNOs can understand the cost of its services and/or products (based on ITIL [41]).

- **Why is it necessary to introduce it?**

  Cost constraints always affect the progress of an organization. Despite the fact that all the other domains help us to understand the B-ITa, if financial constraints/standards of the partnering organization are not comparable (w.r.t organization's size, type, financial state. etc) then the ICoNOs MM domain may not be enough to make the right decisions.

- **Will the ICoNOs MM domains be affected by the introduction of a new domain?**

  We think that they will be affected partially. Coordination is the heart of the B-ITa, without it two CNOs can never be aligned. If two CNOs have different cost considerations then how the coordination is possible at equal level? For example, the domain of partnering structure incorporates all aspects related to "IT governance" too. There are always some costs of governance.

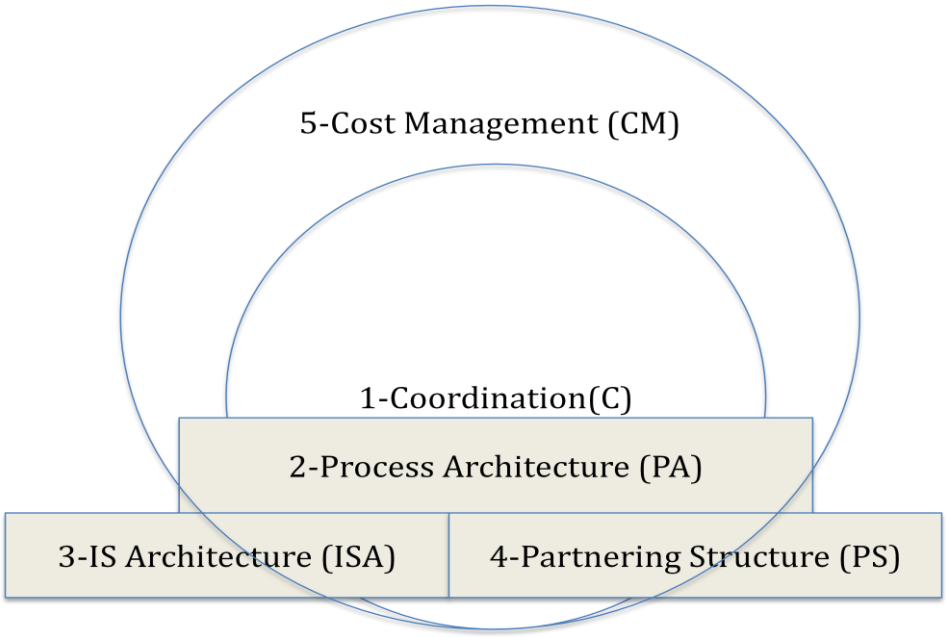

Figure 4.1 Relationship of Cost Management with other domains

Suppose A and B are two organizations and organization A consider that governance cost for coordination is an important direction to get alignment, while the organization B always think that it is not important. Therefore organization B don't want to spend on it. Ultimately the coordination among the organization A & B will be affected by the cost consideration standards. IS architecture and process architecture are also two ICoNOs MM domains and

these are partially dependent on cost. These two domains are in fact dependent on information and process flows, information and process flow are affected by cost. From the case study results we found the relationship between the existing domains and new domain. Figure 4.1 shows relationship of cost domain with ICoNOs MM domains.

We make a note that, in the Figure 4.1, the relationships among the four ICoNOs MM's domain are borrowed from Santana Tapia's work [27]. We have introduced only the relationship of "Cost Management" domain with ICoNOs MM's domains. Coordination and Partnering Structure are completely dependent on cost management domain. IS and process architecture are partially manipulated by cost management domain.

Our literature review let us think that the effect of cost on domains would vary with respect to organization type. According to de Koning and van der Marck [36] the decision of making an investment in an organization is dependent on the organization type/strength/status/maturity. For NOs/CNOs cost is important but how much the cost is important for NOs/CNOs would dependent on this organization's business rules. For CNOs where profit and lost is being shared among the partnering organization [27], cost considerations become important automatically.

CNOs can be divided into two broad categories based on their type of ownership. They can either be government organization or non-government organization. When government deals with all the affairs of the organization, then governmental rules and policies effects the functioning of the organization. In such cases (like province Overijssel and Tamaulipas [6]) cost is not a considerable constraint, but for non-government organization (like Ontrio) the cost constraints usually become the base of important decisions which affects process/IS architecture, partnering structure and coordination.

4.3 B-ITa Processes for Enhanced ICoNOs MM

ICoNOs MM maturity gives an insight to understand B-ITa in CNOs. B-ITa in CNOs can be better known with the help of related processes. There was a need to join those related models, theories and process for B-ITa in CNOs. We have borrow the processes and their references provided by Santana Tapia [6] for four domains and for the fifth domain we will introduce the processes pertaining to cost management which is the contribution of this thesis. Following are the details of the processes that need to consider in each domain.

4.3.1 Original ICoNOs MM Processes

Santana Tapia [27] reproduces a map for the four B-ITa domains. These domains

are the base of ICoNOs MM domains.

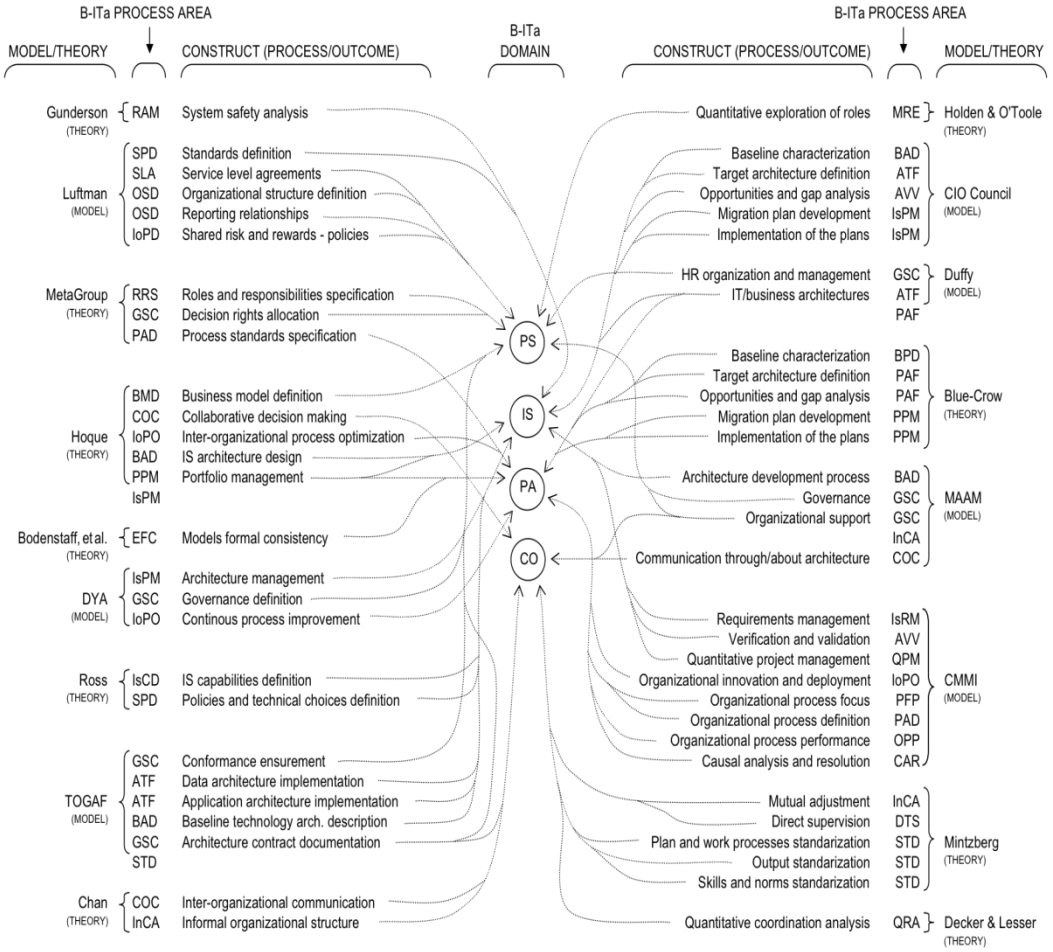

Figure 4.2: Map modeling Theories applicable to B-ITa domains [27]

In the Figure 4.2 abbreviations PS, IS, PA and CO are used for partnering structure, IS architecture, process architecture and coordination respectively. Some other abbreviations are used under the heading of B-ITa processes will be explained one by one in following tables. There exist some theories and models names on the left most and right most corners of the modeling map Figure 4.2. All the B-ITa processes are grouped under the domain headings. For each ICoNOs MM domain Santana Tapia[6] introduced the process with respect to each level and provide a set of references from where he derived it. These processes are as follows,

❖ **Partnering structure**

It includes seven process areas; explanation of each is as follows,

Level	Process	Description
2	**(BMD)** Business model definition [39]	It describes how CNOs works and collaborate for creating value based on different variables.
2	**(OSD)** Organizational structure definition [43]	Cross-organizational ties for decision-making and authority regulation, which in result regulate the CNOs work.
2	**(SLA)** Service level agreements definition [43]	About the agreements regarding services which includes deliverables, quality and many other factors.
3	**(GSC)** Governance structure and compliance [35], [44]	Governance structure includes priorities, decision rights, allocation of resources under some policies and procedures while compliance deals with definition of effective policies and procedures.
3	**(IoPD)** Inter-organizational policies definition [43]	It define the plan of action needed to increase the mutual benefits and shared commitment.
3	**(RRS)** Roles and responsibilities specification [45]	To specify the roles and responsibilities and their related guiding principles, of the participants in the CNOs after defining its organizational structure.
4	**(MRE)** Metric-based exploration of roles [46]	To employ approaches to understand the organizational communication, its structure and roles in the collaboration

Table 4.1: Partnering Structure Processes

❖ **IS architecture**

In ICoNOs MM nine processes are related to IS architecture. These are as follows,

Level	Process	Description
2	**(BAD)** Baseline IS architecture description [39], [44], [47]	Defines the current state of CNOs based on ISs and create a view of the existing ISs and data.
2	**(IsRM)** IS requirements management [48]	It manages the change in IS requirements in engineering process and in development of the required ISs.
2	**(SPD)** Standards and principles definition [43], [49]	Tells about the ISs collaboration and define technology standards, policies and development principles for collaboration.
3	**(ATF)** IS architecture target formulation [47], [35]	It decides the ISs needs for desired To-Be state of the process of support and IS architecture while considering business and IT drivers.
3	**(AVV)** IS architecture verification and validation [48]	It is a process of verification and validation for effective IS target formulation.
3	**(IsCD)** IS capabilities definition [49]	Defines the collaboration for achieving new forms of competitive advantage by ISs with respect to its business environment.
3	**(IsPM)** IS portfolio management [39]	Provide the execution of the other IS processes effectively and create the mix of ISs investments with limited resources.
4	**(QPM)** Quantitative IS portfolio management [48]	Uses quantitative techniques for analyzing, assessing, and controlling IS portfolio assets, from quantitative perspective.
5	**(RAM)** Risk analysis and mitigation [38]	Identify sources of flaws and other problems in ISA also take the actions to prevent it in future. Manages risks such as requirements inconsistencies, poor portfolio management, lack of IS principles and others.

Table 4.2: IS Architecture Processes

❖ **Process architecture**

The ICoNOs MM covers nine process areas in process architecture, these process areas are,

Level	Process	Description
2	(BPD) Baseline process architecture description [50]	For understanding the existing processes, and analyzing what the current state of the CNOs is?
3	(PAD) Process architecture definition [48], [45]	Defines the processes, assets and work environment standards for CNOs. Its definition depends on an effective baseline process architecture description.
3	**(PAF)** Process architecture target formulation [50], [35]	Processes needed to support the desired To-Be state of the Process Architecture while considering business and strategy drivers.
3	**(PFP)** Organizational process focus planning [48]	Process planning will be performed by process architecture definition. Plan process improvements on the basis of strengths and weaknesses of the collaboration's processes.
3	**(PPM)** Process portfolio management [50], [39]	In order to direct limited resources like funds, people, etc., into the processes to create a holistic process orientation.
4	**(EFC)** Event logs formal consistency [40]	During collaboration, use of event logs for checking traceability of execution processes.
4	**(OPP)** Organizational process performance [50], [48]	It is about quantitative understanding of the performance of the standard processes set in support of quality and process-performance.
5	**(CAR)** Causal analysis and resolution [48]	Identify sources of flaws and other problems in process architecture also take the actions to prevent it in future.
5	**(IoPO)** Inter-organizational process optimization [48], [39]	For cross-organizational efficiency and competitive advantage it evaluates the Process Architecture to deploy incremental and innovative improvements. A successful process optimization relies on effective process focus planning and process architecture definition.

Table 4.3: Process Architecture Processes

❖ **Coordination**

Following five process areas are covered by ICoNOs MM under this domain,

Level	Process	Description
2	**(DTS)** Direct supervision [51]	It is about providing instruction, monitoring actions and supervising the work by specific persons who take the responsibility for the processes.
2	**(InCA)** Informal communication adjustment [52], [44]	Deals with informal communication across participating organization and outside the imposed hierarchical constrains for day-to-day operations.
3	**(COC)** Communication-oriented coordination [52], [53], [39], [44]	About communication channels, shared knowledge and learning for responding effectively to immediate client's needs. It also determines what future markets will require.
3	**(STD)** Standardization [51], [47]	For standardizing the processes, outputs and/or skills among the participating organizations.
4	**(QRA)** Quantitative coordination analysis [54]	It links the inter-relationships, called coordination relations, to the local scheduling constraints of the participating organizations.

Table 4.4: Coordination Processes

4.3.2 Enhanced ICoNOs MM: Cost Management Domain

We have introduced a new B-ITa domain into the ICoNOs MM based on the results of chapter 3. The domain is "Cost Management", the results is the "Enhanced ICoNOs MM". For Cost domain we have to introduce new process.

Figure 4.3. shows the addition of new process for cost domain on the map. The underlined process names and dotted lines shows the Cost management domain processes in the modeling map.

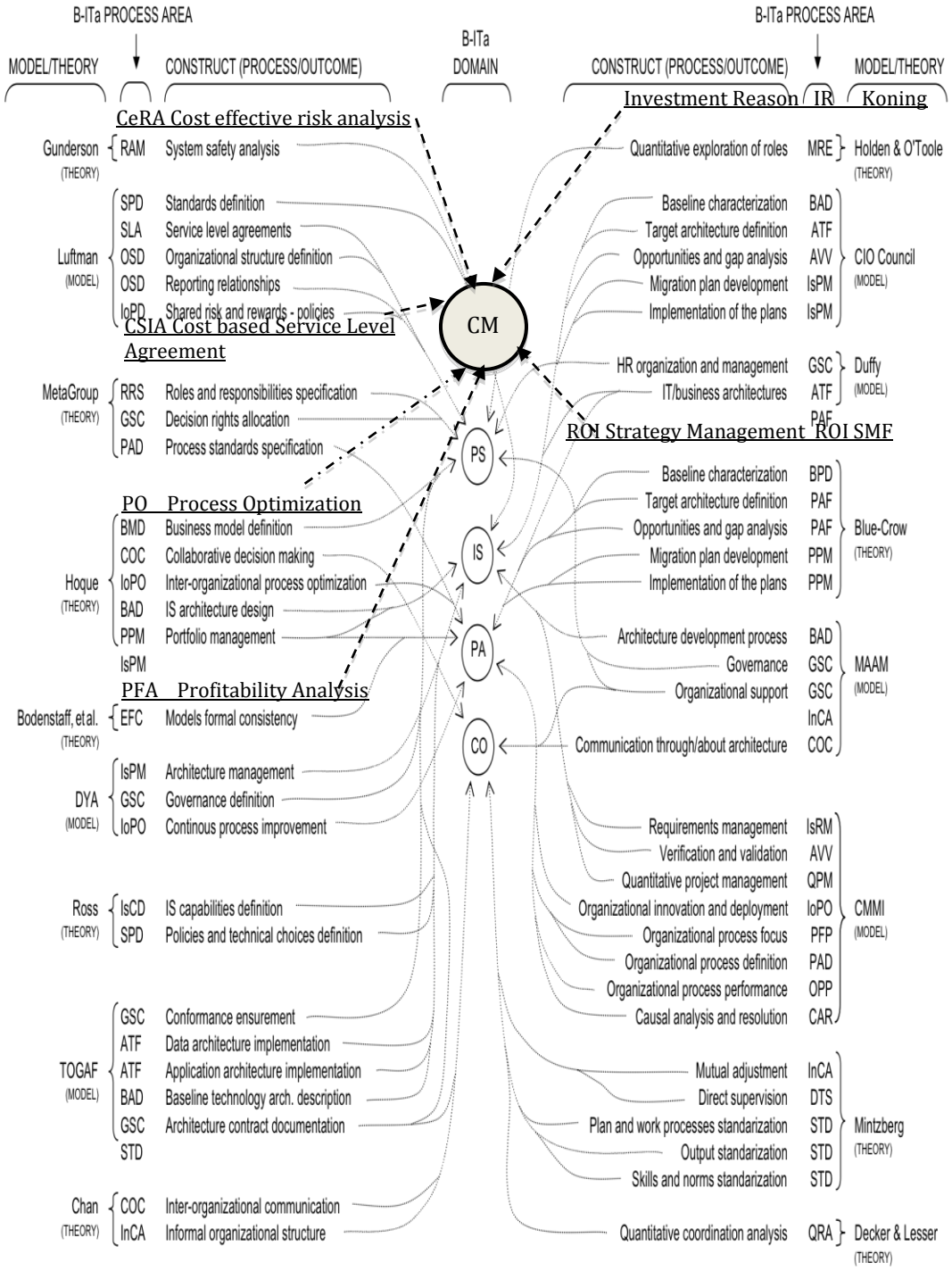

Figure 4.3 Map modeling Theories applicable to Enhanced ICoNOs MM domains[27]

Following are the six cost management processes:

Level	Process	Description
2	(CSlA) Cost-based service level agreements [43]	Describes cost-based cross-organizational ties for decision-making and authority regulation, which in result regulate the CNOs work.
3	(ROI SMF) ROI strategy and management formulation [35]	It refers to the processes required for the financial management of the organization without separating the IT cost and benefits.
4	(PO) Process optimization [39]	It provides the principles that support the alignment between business and IT by optimizing the cost based business process.
4	(PFA) Profitability Analysis [40]	This process is about how a CNO use the profit model in combination with process model and event log to track a snapshot to analyze the profitability of the CNO.
5	(IR) Investment reason analysis[36]	This process will provide the knowledge to other parties that are external to the CNO. For potential investors, it also gives a reason to invest in the CNO.
5	(CeRA) Cost effective risk analysis [38]	Identify sources of cost-based problems in business also take the actions to prevent it in future.

Table 4.5: Cost Management Processes

4.5 Summary

This chapter describes the major contribution we have made to the ICoNOs MM. Santana Tapia discusses the possibility of the introduction of a new domain in his dissertation [6] (Section 10.3). ICoNOs MM when evaluated on NADRA [25] leads us to conclude that "Cost Management" is an important domain. The following equation tells us how Enhanced ICoNOs MM came in to being:

Enhanced ICoNOs MM= ICoNOs MM+ Cost Management Domain

The introduction of new domain transforms the ICoNOs MM into Enhanced ICoNOs MM. Each domain has its processes. For the new domain we had two directions to search for processes. (i) From the literature available (ii) From the literature used by the ICoNOs MM for its domain's processes. We have followed the second source to keep us in accordance with the existing processes of the ICoNOs MM. The following six processes are introduced for "Cost Management" domain.

- Cost based service level agreements
- ROI Strategy & Management formulation
- Process Optimization
- Profitability Analysis
- Investment reason analysis
- Cost effective risk analysis

5 Interpretation Rules/Guidelines

This chapter focuses on interpretation rules for the Enhanced ICoNOs MM. For ICoNOs MM evaluation on NADRA [25], we had made interviews and studied some documentation and the results found are presented in chapter 4. If we could not find any experts to interview or we feel it hard to fix an appointment with experts then we still can do a preliminary evaluation of B-ITa maturity based on information publically available via websites. This chapter provides us a way by which we can apply Enhanced ICoNOs MM without interviews. Some systematic steps will help us to understand the B-ITa of the CNOs.

5.1 Background

As Business and IT both are continuous processes, so B-ITa can also be considered as continuous process as well. Several processes of B-ITa need to have continuous settlement and monitoring [55] [56] [57]. Thus B-ITa is not something to start and then reach to its end in some specific time frame, it is in fact a continuous process,[35], [58], [59], [60], [61], [62]. If CNOs are serious about evaluating its level of B-ITa maturity, they may well find it important to carry out maturity evaluations on a continual basis. Ideally, interviewing people is one good way to collect information and get analysis so that a maturity level is determined. Indeed, in Santana Tapia's dissertation [6] there are several examples of interview-based studies that evaluated the various design elements of the ICoNOs MM. However, as B-ITa is a continuous process and - due to interviews, the B-ITa maturity assessment seems dependent on people, it might be difficult and expensive for CNOs to assess maturity by using interviews. If we couldn't find an opportunity to meet and directly ask professional about B-ITa, then to avoid the dependency on professional's involvement as well, there should be an alternative way by which we can understand the maturity of B-ITa in CNOs. Organizations usually have websites and these websites provide details and comprehensive views about the organization's business. So, to this end, for a B-ITa maturity assessment, we consider that there exist three sources of information:

- **Interviews:** Provide details and reliable source of information but these makes us dependent on people and rendered the maturity assessment more expensive.
- **Documentation:** Organization/project documentation helps us to understand the business, with all its nutty gritty details [30] but these documentations are usually classified and we cannot access them.
- **Website:** It is the third source of information, although it is difficult to have all the detailed information through this source but it is totally

independent, it's easily available, and it's cheap. An important problem with this source is the accurate interpretation/ understanding/ meaning of the information available on the website. Therefore some rules/ patterns/ guidelines are needed for understanding the website. We will name these rules/ patterns/guidelines as interpretation rules.

For independence**,** we will utilize third source of information. Dependence on human source of information not only slows the maturity analysis for B-ITa but also makes it more complex.

5.2 Terminology Used

In this section, we provide the basic terms used in this chapter.

- **Interpretation rules/guidelines:** Interpretation is an act or process of interpreting or explaining elucidation conceptualizing. The result of interpreting is an explanation of anything. Rules and regulations, patterns and way for interpretation are termed as interpretation rules/guidelines.
- **Government/Non-Government organizations:** Government is a form or system of rules, which is used to govern a state/country, community, etc, and the organizations belong to state are called as government organizations. In such organizations all the decision and financial affairs are managed by government while non-government organizations are owned by people. Some government business laws are applicable on them but ultimately decisions are made by the owner/group of owners.
- **Hypothesis Driven-Research**: In this type of research first of all we make hypothesis and then take steps either to validate it or invalidate it [42].

5.3 Proposed Interpretation Rules/Guidelines

When we don't have anyone to ask about the organization then we have only websites available. Business research or market research by using online data from a website can be called as web analytics [9]. This approach can also be used for B-ITa maturity research. As we argued earlier, analyzing B-ITa through a website is cost-effective as well as efficient. While we were carrying out the literature review (chapter 2), we observed that not much literature is available for B-ITa analysis based on information in a website; this motivated use to include this topic in the scope of the present thesis. In this section, we propose that a web-analytics-based approach can be used to understand the level of B-ITa maturity of CNOs. This approach is beneficial in situations when we have solely access to materials available via websites. We termed this website-based type of a study as "non-traditional" approach. We will present our approach in a step-by-step process. These steps will help us to understand the B-ITa in an organization from general to specific details. The steps are described as follows.

5.3.1 Step-1: Snapshot Development

In this step we will develop a snapshot of the NOs/CNOs. The guidelines presented below are based on the following general practice ”as soon as we open a website we **observe** about the website, when we surf website, move forward and backward then it is an **experience**. If we decide to do something important and search on the website to do that, then it is **research**”.

- **Observation:** After opening the website in a browser, the first aspect that attracts human attention is the interface of the website then we observe the contents. Contents help us to develop an image of the website. Organization/Business type and targeted audience of the website can be observed at first instant. These observations lead us to data collection about the organization. Targeted audience of the website tells us about the customers of this business. Business partners can be guess by intuition after surfing through two or three web pages.
- **Experience:** For understanding a business, it is recommended that one should go and see how it works. In case of website we cannot go and see how business works. For this purpose we can just experience it. For example Home India (URL: http://www.homeindia.com/)is a cloth selling website, but how they sell, can be better understood if we buy a product. The first step for buying is to make a choice of a dress. Once you make the selection then the website takes you to the customization section where you can alter color, material, design and size according to ones needs. Then it asks for the payments, payment medium need to be selected. Some shipping information will be asked too. All these steps are experience. If someone only sees the clothes then she/he cannot judge that there is customization available. Thus we can say experience opens new horizons of information about a business.
- **Research:** Research is the phase where we search for knowledge on which we can establish some facts. For research on the website we will follow the hypothesis driven research method [42]. This method is mostly used in social sciences and medicine. In this type of research you make a hypothesis1 and then perform different steps to justify the hypothesis. For our particular case we have to design many hypotheses and then make research for their justification. Basic hypothesis are:

    - Objective of the business provide an initial insight of the business;
    - Type of organization (CNOs, NOs etc) can be identified by studying management type;

[1] Control point is another term used in the thesis alternative to the hypothesis.

- Scope of business helps us to create a snapshot of the business;
- Tools and technology analysis gives an insight of the alignment;

Research for web-analytic (step-2 of interpretation guidelines/rules) will help us to understand this hypothesis and let us take a step towards B-ITa process defined by ICoNOs MM.

5.3.2 Step-2: Research for Web-Analytic

The second step of the interpretation rules/guidelines is based on the **Research** (that has been already mentioned at the top of this page). In this step we will define the guidelines for directions of research and will validate or invalidate the hypothesis developed in previous step. Figure 5.1 shows the four basic sub-topics for web-analytic and their dependency among each other to evaluate the maturity of the CNOs/NOs. We will term these sub-topics as "domains of web-analytic"

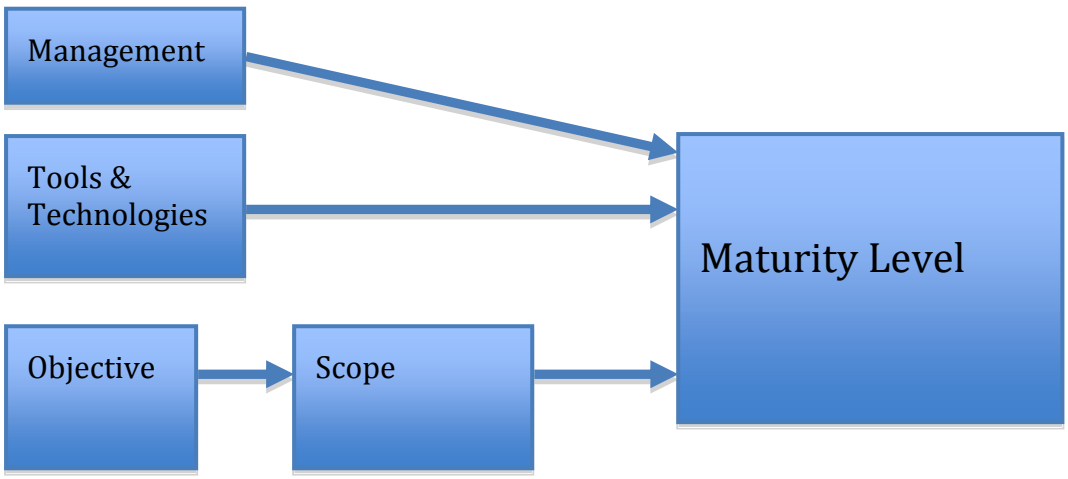

Figure 5.1: Domain for web-Analytic

Maturity of the Scope is dependent on objective. Until objective is not mature enough then scope cannot be mature. Since management, tools & technologies are independent domains; following are the four domains for doing the web analysis and exploring the B-ITa among CNOs by considering the hypothesis.

- **Objectives:** Goals that an organization sets for itself are termed as organizations objective. Our research will be directed to find out the business/organization objective. Organizations objective can be found in step 1 through observation, but how much it is mature is based on the objective analysis. We can divide objective into five levels of maturity based on Table 5.1.
- **Management:** Management is the term applied to the CNOs when we want to consider who is monitoring the business and who is responsible

for the decision-making and taking actions in case of emergency. From the website it is difficult to understand maturity level of management but Table 5.1 provides a detail maturity level description.

- **Scope:** Scope of a business is hard to find when we don't have anyone to interact with. We can judge by observation and can do research to find the exact scope boundaries. Some businesses don't have very defined boundaries.
- **Tools and technologies:** For development of website and business, some tools and technologies are needed depending on the type of business. Different businesses tools and technologies need to be similar for successful B-ITa.

Levels	Objective	Management	Scope	Tools and Technologies
5	Clearly defined	Totally manages on a single websites	Clearly defined boundaries	Same tools and technologies.
4	Clear	More than 50% Partially manages on a single website	Clear	Slightly Different
3	Defined	Less than 50% Partially manages on a single website	Defined	Moderately Different
2	Understandable	Partially manages on separate websites	Understandable	Extremely Different
1	Ambiguous	Totally Manages on separate websites	Ambiguous	Totally Different

Table 5.1: Maturity Level Description

Research for web-analytics evaluated the hypothesis developed in step-1 and gives level of maturity too. After step 2, our research about an organization through a website will provide us levels of maturity about objective, management, scope and tools and technologies. For better understanding consider a CNO "A" having a clearly defined objective and defined boundaries. Tools and technologies of the CNO are slightly different. Moreover CNO is more than 50% partially manages on a single website. Keeping in view the Table 5.1

we can conclude that Objective is "Clearly defined " so it is at level 5, management is at level 4, Scope is at level 3, tools and technologies are at level 4.

5.3.3 Step-3: B-ITa Processes

Both models, ICoNOs MM and the Enhanced ICoNOs MM, provide an overall maturity assessment by first assessing a set of individual B-ITa processes. Thus, the presence or the absence of a B-ITa process that is associated to a certain domain is the first judgment that is done in a maturity assessment exercise.

Figure 4.3 gave an overview of Enhanced ICoNOs MM's B-ITa processes. To analyze these processes, we use the data that came out in step1 and 2 of the interpretation of website information and we deduce a conclusion about the presence or the absence of each B-ITa process included in the Enhanced ICoNOs MM. In doing so, we apply the same procedure that has been proposed by Santana Tapia in [6]. We, however, extend it by including its application in the newly added domain of Cost Management. For the purpose of completeness, we list briefly the B-ITa processes that are to be assessed as follows:

- **Partnering structure**
  It can be defined as the cross-organizational work division, organization structure, roles and responsibilities which tell where and how the work gets done and who will be involved. Seven process areas are considered in this domain. Which includes BMD[39], OSD [43], SLA [43], GSC [35], [44], IoPD [43], RRS [45] and MRE [46].
- **IS architecture**
  It can be defined as basic organization of the information management of the CNOs embodied in ISs. It describes its functions, their relationship with each other and with its environment. In ICoNOs MM nine processes are related to IS architecture domain. Which are BAD [39], [44], [47], IsRM [48], SPD [43], [49], ATF [47], [35], AVV [48], IsCD [49], IsPM [39], QPM [48] and RAM [38].
- **Process architecture**
  In process architecture all the processes are considered. These include both primary business processes of the CNOs and processes needed for exchange of information. Process architecture can be defined as composition of all the required processes for reaching the shared goal of CNOs. The ICoNOs MM covers nine process area in process architecture. These process are BPD [50], PAD [48], [45], PAF [50], [35], PFP [48], PPM [50], [39], EFC [40], OPP [50], [48], CAR [48] and IoPO [48], [39].
- **Coordination**
  In CNOs coordination plays an important role, this domain can be defined as the mechanisms for managing the interaction among the CNOs while considering the dependencies and shared resources among the processes.

Following five process areas are coved under this domain, DTS [51], InCA [52], [44], COC [52], [53], [39], [44], STD [51], [47] and QRA [54].

- **Cost Management**

  It is a newly introduced domain; processes for this domain are introduced and discussed in the previous chapter. We can define this domain as the one who manages the money matters among the CNOs. Following are the six cost management processes, CSlA [43], ROI SMF [35], PO [39], PFA [40], IR [36] and CeRA [38].

5.4 Summary

This chapter describes the process of interpretation of information publically available in websites when one needs to study the B-ITa maturity in a CNO.

High-level view of the steps we have introduced for interpretation rules/guidelines is given in Figure 5.2.

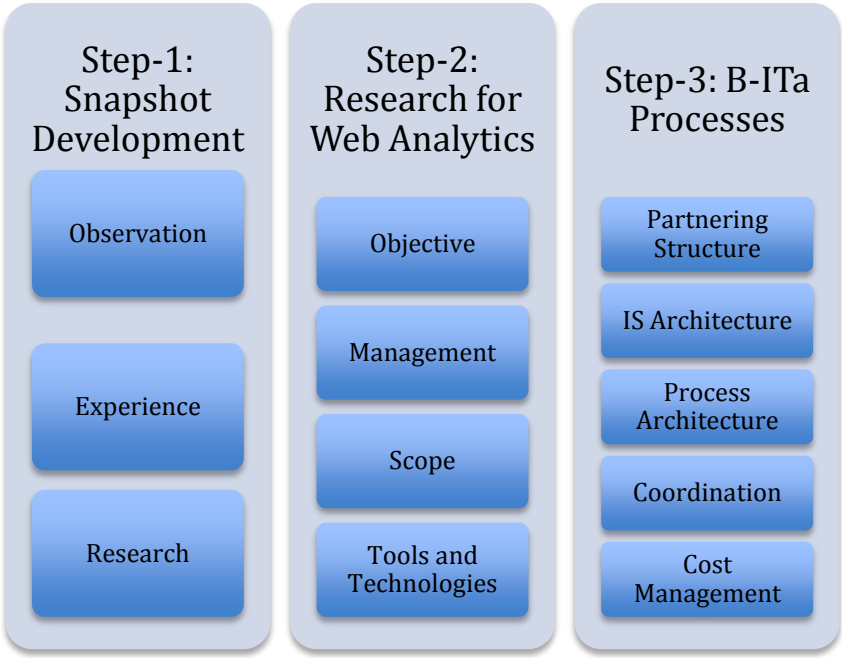

Figure 5.2: High-Level view of Interpretation rules/guidelines

In step -1, we only observe the website while ignoring all technical details, some basic surfing on the website will be sufficient to accomplish this step. For the second step hypothesis driven research [42]is needed in specified direction to find out basic facts about objective, management, scope, tools and technologies. Third Step is a detailed step which is mostly based on the Santana Tapia's work [27], for the newly introduced domain we have presented process to evaluate B-ITa in Chapter 4.

6 Validation of Enhanced ICoNOs MM

In this chapter, we will focus on the validation process of the enhanced ICoNOs MM with "non-traditional" approach. In this approach we will use the interpretation rules described in Chapter 5. Our purpose is to evaluate the validity of "non-traditional" approach developed for ICoNOs on real life scenario. In parallel we will evaluate the newly introduced "Cost Management" domain. Santana Tapia et al [26], [28] have evaluated their work on six case studies. We have evaluated it on a government organization in developing country in Chapter 3.

For the evaluation of "Enhanced ICoNOs MM" we have selected two non-government organizations. The first case study is "Facebook" [63], which is a social network website privately owned by Facebook, Inc [63]. The other case study is Amazon [64], which is a multinational electronic commerce company owned by Amazon.com, Inc.

6.1 Case Study 1: Facebook [63]

Facebook is a social network website having 400 million users till February 2010. It was founded in Harvard University (U.S.A) in February 2004. 70% of the Facebook users are from outside of USA thus this website can be called as international website. Facebook's business model can be called as network effects business model [65], which was common in the dot-com boom of the late 1990s. In network business a value to a potential customer is dependent on the number of customers already owning that thing or service. Facebook fits best to this model because more registered users ensure that site will be more useful. Also Facebook's major source of earning is advertisements; in fact earning through advertisements is also dependent on the network effects of the Facebook.

6.1.1 Step-1: Snapshot Development

Facebook is a social network website, it provides the opportunity for social interaction among people (one may know or come to know through Facebook) around the world, and it also provides a platform for business in the form of advertisements. There exist a community "Facebook developers" which provide a place to develop and share. Facebook is very vast business but in this case study we will limit our focus to only Facebook's social network area. Anyone who is above 13 years of age and have a valid email address can join Facebook's social network.

- **Observation**: When we log on to Facebook website the first thing we observe is its homepage. The homepage is divided into sections as shown in the Figure 6.1. All of the sections have meaningful names, which seems

to attract and facilitate users. In the middle it have "News Feed" panel where you can see the activities of your family and friends. On the right-hand side there are many sections named as requests, suggestions sponsors, pokes and get connected. Under "Request" section all the requests are listed, these requests can be a friend request or a game request or any other. "Suggestion" section contains suggestions about new friends, Facebook pages and other. "Sponsors" section is reserve for advertisements. Each section has its own details. In the bottom right corner we can see the chat option similar to messenger which helps you to chat with family, friends or anyone who is in our friends list and is currently available online. If we observe on the left side of the screen then there exists your profile information along with profile photo. Underneath that there are some tabs which show Inbox massages, events, photos and friends. There are games and groups also.

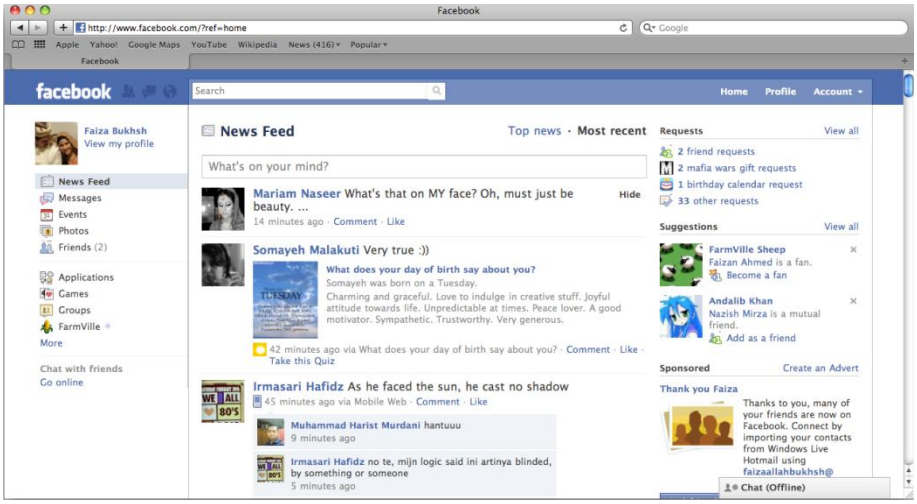

Figure 6.1: Facebook Home[2] page

One can also partially customize this area. Its interface can be called as standard interface because you can do task with the help of a menu as well as with the help of an icon.

- **Experience:** Next step is to experience. How to make network is our first experience, send requests to make friends and accept the friend's request will help us to make a social circle. For amusement there exist some groups. If someone joins groups then he/she will be able to see the group activity in his/her news feed. Next important thing is the games of the Facebook. Some games can be played alone and in others you need help of friends. In single user games one can always compare its score with its community. So the social aspect is also maintained here. Among the many

[2] Accessed on February 15, 2010

games that Facebook have we will select “Farmville”. How Farmville looks like is shown in Figure 6.2. While playing Farmville, we came to know that we could buy “Farmville cash” by using credit cards or by cash vouchers. Users can earn fake money as one can “earn money” by real farming such as from animals and crops etc. We can go and do shopping as well. But purchasing land is affected by the number of neighbors. We can understand this experience by saying it as a “virtual farming”. Figure 6.2 illustrates the multiple tab for the categories of gifts, play, my neighbors and many more. There are many ways to earn fake money, we learn that if you go to the neighbor and help him in farming then we will earn money and game points also. These game points are the base for levels. As we accumulate game points during the game, we will progress in the levels. These levels will give us more privileges in the market for buying different crops and tools.

Figure 6.2: Farmville[3]

- **Research:** After playing the game and using this social network website, many questions arise and we need to find out the answers of them. The interpretation rules/guidelines we have develop in Chapter 4 leads us to hypothesis driven research [42]. We will make the hypothesis out of these questions and will justify them. Our hypothesis include standard

[3] Accessed on Feruaury 16, 2010

hypothesis and case study based specialized hypothesis, all of them are as follows,

- Objective of the business provide an initial insight of the business
- Type of organization (CNOs, NOs etc) can be identified by studying management type
- Scope of business helps us to create a snapshot of the business
- Tools and technology analysis gives an insight of the alignment Zynga owned Farmville. Facebook is an independent entity which make business with Farmville.

6.1.2 Step-2: Based on Web analytic

Till now we have developed a snapshot of the Facebook business. In the beginning we will use the pre-defined direction for the standard hypothesis. These hypothesis/control points will let us successfully go through the step two of interpretation. All the results will be based on educated guess.

- **Objectives:** Facebook data available in the "help" and in "about" menu provide us the base for knowledge. Objective of the Facebook is hidden somewhere in its slogan. Facebook's slogan is "Facebook is a social utility that connects you with the people around you". It says that it is a social utility that connects people, mostly it connect your old friends so that at some point the phrase "people around you" can misguide you. Overall it helps to connect with people. So the Facebook's main objective is to talk and share with people. Its objective is clearly defined so we can say objective of the Facebook is at level 5.
- **Management:** Management of Facebook is handled by Facebook Inc. All the decision and policy making is done by the organization with the help of its users. As we have seen Zynga [66] a game company, used the Facebook network for its games. Facebook itself does all the management of the games in Facebook. Games related affairs like new version development, cash purchasing and others is done by respected game owners for example Zynga. But the management of games is completely in the hands of Facebook, which we guess from news "Zynga's FishVille Sleeps With The Fishes For Ad Violations" [4] Facebook totally manages its concerns, while we have experienced that more than 50% of the users uses games through Facebook interface. Very few users go to the Zynga website and play games, this let us conclude that Facebook games business is at 4th level of maturity. .

[4] Arrington, Michael (2009-11-08). ""Zynga's FishVille Sleeps With The Fishes For Ad Violations". *TechCrunch*. Retrieved 2010-04-05.

- **Scope:** As discussed earlier if the objective is clearly defined then we can conclude that the scope is well defined. Although Facebooks's scope can have very vast domain in many direction. When Facebook was introduced it was only a social networking website. Now it is a very good source of earning money through advertisement. Moreover it is a productive developer's platform too. So we can say its scope is defined and is at level 3 but we cannot describe the exact scope boundaries.
- **Tools and Technologies:** We are working from the web-analytics perspective. We don't have any information that can tell us about exact platform details. But based on our experience, we can assume that the tools and technologies are very much similar. Zynga is relatively newer business then Facebook. So they made their tools and technologies decision on the basis of their business partners. Thus we can say with respect to tools and technologies Zynga and its partner Facebook are at level 5.

Above described research directions help to validate the hypothesis developed in step-1.

- **Objective of the business provide an initial insight of the business**
  Yes with the help of objective we know that Facebook's objective is to earn money by using social community. Now they are earning money by using the network effect business model [63].
- **Type of organization (CNOs, NOs etc) can be identified by studying management type.**
  Facebook is a CNO. The relationship of Facebook and Zynga's justify our hypothesis of Facebook being a CNO.
- **"Scope" of business helps us to create a snapshot of the business**
  Yes, we got a clear idea about the business.
- **Tools and technology analysis gives an insight of the alignment**
  Under the "Tools and technology" heading we have discussed that these two business are align because of their foundation timing.
- **Zynga ownes Farmville while Facebook is an independent entity which make business with Farmville [66]**
  In the beginning while playing Farmville on Facebook it seems Farmville is developed and owned by Facebook. Whenever we open this game or another game we can see the Zynga's logo on the top right corner. Which gives us a clue then further surfing on internet reveals that Facebook and Farmville are owned by two different companies.

6.1.3 Step-3: B-ITa Processes

For deeper understanding of B-ITa in CNOs we have considered the processes

described by Santana Tapia in ICoNOs MM [6]. Chapter 4 of this thesis has also introduced the processes for the "Cost Management" domain. These processes will collectively help us to have a detail insight in alignment of CNOs. Santana Tapia [6] (Chapter 9: Pilot Assessment) validated ICoNOs MM with the help of some questions [6] (Appendix D) based on defined processes . In the following section we will validate the domains of "Enhanced ICoNOs MM" on Facebook case study while keeping in view the B-ITa processes.

- **Partnering structure**

  This domain includes seven process areas. In Facebook we have selected the game section especially Zynga and Facebook. Explanation of each process for Facebook and Zynga are given in Table 6.1.
- **IS architecture**

  In IS architecture we have nine processes to consider. Table 6.2 will explain each process with respect to Facebook and Zynga.
- **Process architecture**

  Nine process areas are considered in process architecture. These process areas are evaluated in Table 6.3.
- **Coordination**

  The process areas covered under this domain are given in Table 6.4.
- **Cost Management**

  Cost Management as a new domain composed of six processes which we evaluated as in Table 6.5.

Level#	Process	Description
2	**(BMD)** Business model definition [39]	Information about this process came up from Step-1 through observation and experience, it tells us Zynga and Facebook combinely create value for the users in the form of games. They earn the money by selling cash to the players. The business model for Facebook and Zynga are network effect business model [65].
2	**(OSD)** Organizational structure definition [43]	Much information is available about how Facebook work and how Zynga works but we could not find any evidence about decision-making power in these CNOs. As the game is using the Facebook website, we make a knowledge guess by saying that mostly decision making authority is Facebook while Zynga follows it.
2	**(SLA)** Service level agreements definition [43]	In online available data no service level agreements are available. Services including quality, deliverables and others. We can say that deliverable from Zynga is a properly working game for the Facebook users. About other services we could not find enough information.
3	**(GSC)** Governance structure and compliance [35], [44]	Facebook is the governing body because it has the right to make online the Zynga game or stop it. Zynge have to follow the policies and procedures defined by Facebook. Facebook have many other partners for games, so Facebook have developed standard policies and procedures[5].
3	**(IoPD)** Inter-organizational policies definition [43]	About inter-organizational policies for mutual benefit, we have observed that Zynga improves the games every day and introduce the new appealing features which help them to keep the users.
3	**(RRS)** Roles and responsibilities specification [45]	Zynga and Facebook have a well-defined relationship, with clearly defined roles and responsibilities. It included a commitment to mutual goal that is earning money through Network Effect business model [65]. They have sharing of resources and reward in the form of users and earning.
4	**(MRE)** Metric-based exploration of roles [46]	On which terms and conditions Zynga and Facebook communicate cannot be discovered by us through the website. However the role in collaboration is clear from the games that Zynga produces new games and appealing feature in existing games. Facebook provide the users for those games so they collaborate and earn money ultimately.

Table 6.1 : Partnering Structure Processes for Facebook

[5] http://www.facebook.com/terms.php Retrieved on 15 April 2010

Level	Process	Description
2	**(BAD)** Baseline IS architecture description [39], [44], [47]	Facebook as a CNO have millions of user with different interests. Users with interest in games usually join the "groups of games" where they create lot of knowledgeable information/data about the CNOs. This gathered knowledge/data provide a baseline IS architecture description.
2	**(IsRM)** IS requirements management [48]	There exists a Facebook group[6] where users describe about their requirements. For each game on Facebook there exists a group where fans of that game give their suggestions and demands as well. This process deals with all that information.
2	**(SPD)** Standards and principles definition [43], [49]	As Facebook and Zynga are growing businesses so new principles and standards are develop every day. Current policies and principles are to entertain the users in such a manner that not only these CNOs keep the user but also grow the number of users.
3	**(ATF)** IS architecture target formulation [47], [35]	Desired To-Be state of the information system for Facebook and Zynga is defined by the users. Usually these demands are being fulfilled on the current environment.
3	**(AVV)** IS architecture verification and validation [48]	This process is usually executed by the users of the games, e.g the introduction of a new item ESTABLE in Farmville, it was got popular very quickly but it makes the Farmville performance slow. These types of verifications are being done quickly in our case.
3	**(IsCD)** IS capabilities definition [49]	The business environment we have is based on number of user; these users immediately accept or reject a change. The collaboration Facebook and Zynga made to achieve this task is clear that developer of Zynga provide the amendment in game or a new game and Facebook launches it. Target behind this collaboration is to earn more revenue.
3	**(IsPM)** IS portfolio management [39]	Just investment of a single idea creates lot of benefits. In our case purchase of cash (fake) is the main point where the same idea is executed in all the games.
4	**(QPM)** Quantitative IS portfolio management [48]	In our case study we couldn't manage to get information about this process.
5	**(RAM)** Risk analysis and mitigation [38]	There exist risks like wrong requirements are being considered, or platform compatibility issues etc. Risk analysis is surely being done by Facebook as well as by Zynga experts, but we couldn't get information about risk analysis and mitigation from the website.

Table 6.2: IS Architecture Processes for Facebook

[6] http://www.facebook.com/facebook?ref=ts retrieved on 15 April 2010

Level	Process	Description
2	**(BPD)** Baseline process architecture description [50]	This process is very much similar to Baseline information architecture description (BAD). Information collected for BAD goes on in this process.
3	**(PAD)** Process architecture definition [48], [45]	In this process basic process related to the Facebook and Zynga communication, their environment standards are discussed. What are the exact term and conditions for these CNOs to communicate is not mentioned on the website. They have clear process defining that game is being developed by Zynga and Facebook will provide its users.
3	**(PAF)** Process architecture target formulation [50], [35]	To-Be state of the IS system is defined in ATF. Processes need to achieve IS target are considered while keeping in view the business strategy.
3	**(PFP)** Organizational process focus planning [48]	This process deals with the strengths and weaknesses of the collaboration's processes. Form the website we can see the collaboration process but where they are weak or strong is not judged by us. It needs some more information which is not available on the website currently.
3	**(PPM)** Process portfolio management [50], [39]	Keeping in view the resources we have demand from the users, only those demand which lie under Facebook and Zynga resources like budgets, people, etc can be fulfilled. This process considers these resources as process to create a holistic process orientation.
4	**(EFC)** Event logs formal consistency [40]	On website there is no information available about event logs during collaboration.
4	**(OPP)** Organizational process performance [50], [48]	How standard processes are performed is being deduced by seeing the performance of the game. The introduction of new attractions in the game also helps us to see the process performances. As soon as Zynga introduces a new game, Facebook gives advertisement about it.
5	**(CAR)** Causal analysis and resolution [48]	Flaws can be found on the Facebook website but what are the reasons behind that and how to prevent them in future, is not possible to study form website only.
5	**(IoPO)** Inter-organizational process optimization [48], [39]	For this process again we are unable to find any information from our selected source.

Table 6.3 : Process Architecture Processes for Facebook

Level	Process	Description
2	**(DTS)** Direct supervision [51]	As observation (step-1 of interpretation rules) shows us that Facebook is the one who is doing the direct supervision of all the partners. A news about Facebook and Fishville[7] let us decide this fact.
2	**(InCA)** Informal communication adjustment [52], [44]	For day-to-day operations between Facebook and Zynga, it seems that Facebook gave partial authority to Zynga. Zynga can place improvement in the games by itself because in many games, in a single day Zynga have to put many improvements so Zayga do this job by itself.
3	**(COC)** Communication-oriented coordination [39], [44], [52],[53],	Knowledge is shared between the Zynga and Facebook. The login we use for the Facebook can be used to login on Zynga website. This fact indicates the existence of communication-oriented coordination between the Facebook and Zynga.
3	**(STD)** Standardization [51], [47]	There must exist standards between Facebook and Zynga, otherwise same login cannot be used on the two websites.
4	**(QRA)** Quantitative coordination analysis [54]	It is a high level process, which needs detail knowledge about the CNOs. From Facebook and Zynga website we could not gather information/data about this process.

Table 6.4 : Coordination Processes for Facebook

[7] Arrington, Michael (2009-11-08). ""Zynga's FishVille Sleeps With The Fishes For Ad Violations". *TechCrunch*. Retrieved 2010-04-05.

Level	Process	Description
2	**(CSlA)** Cost based service level agreements [43]	Service level agreements between Facebook and Zynga are not available on website. Zynga is partially dependent on Facebook for its business also it uses the platform of Facebook, so Facebook is in authority to make decision. Thus we can make an intelligent guess by saying that Facebook is the regulating authority.
3	**(ROI SMF)** ROI strategy and management formulation [35]	Facebook and Zynga shares profit obtain from games on percentages. As the cash in the Facebook games is purchased from Zynga so it seems that Zynga is the one who gives share to Facebook while in return Facebook provide the IT services and customers.
4	**(PO)** Process optimization [39]	The website information is not sufficient to decide about existence or non-existence of this process.
4	**(PFA)** Profitability Analysis [40]	Event-log information about CNOs is an organization record which is not available on the website. Same case exist with Facebook, profitability analyses is based on event-log therefore we cannot conclude about this process either.
5	**(IR)** Investment reason [36]	Facebook is a fast growing business and having a network effect business model [63] provide the very strong reason to invest in it.
5	**(CeRA)** Cost effective risk analysis [38]	Website information is not sufficient to decide about the existence or non-existence of this process.

Table 6.5 : Cost Management Processes for Facebook

6.1.4 Discussion on the case study results

After performing the interpretation steps, based on the Facebook case study we can say that step-1&2 are applicable and suitable for using in the interpretation of ratings for B-ITa processes. However, in step 3 we faced some difficulty in finding conclusive ratings from our selected source of data. We make the observation that the B-ITa process up to level 3 in all domains can be assessed form the website but in the higher level processes we face difficulty in finding the processes details. At higher maturity level we find details of few process, for example the Risk analysis and mitigation (Domain: IS architecture: Table 6.2) cannot be understood form the website. It is a level 5 process. Investment reason (Domain: Cost Management, Table 6.5). It is level 5 process to and from the

website we found the information about it. Similar results can be observed in Table 6.2, 6.3 and 6.4 in Level 4 and 5 processes. In the following section we will consider another case study and will draw new conclusions about the suitability and the applicability of our interpretation rules.

6.2 Case Study 2: Amazon [63]

Amazon is a multinational electronic commerce based company introduced as an online bookstore. Jeff Bezos founded it in 1994 and launched it in 1995. Initially it appears as an online book store but soon it was diversified to products such as VHS, DVD, MP3, Computer software's, Furniture, Food, Toys and so on. In January 2009, a survey was published by Verdict Research says that "Amazon was the UK's favorite music and video retailer, it came third in overall retail ranking[8]". When Amazon came into being it was a seller of new books, with the passage of time it has developed its business, now not only new products can be purchased from the Amazon but you can also buy used products. Amazon uses more than one-business model/strategy. We have found three operational strategies, which help Amazon to develop its business. These are cost-leadership, customer differentiation and focus strategies[67].

- In cost-leadership Amazon.com differentiate itself primarily on the basis of price. Amazon.com always guarantee the quality and price of its product.
- In customer differentiation strategy. Amazon.com consider current and prospective customers with differentiation though design, quality or convenience. All of these actions Amazon.com take by keeping the competitors in mind.
- The last strategy is a focus strategy. This strategy considers one of the two already discussed strategies and applies it to a niche within the market.

6.2.1 Step-1: Snapshot Development

Amazon is an online business that provides the opportunity to shop without going out. Due to its diversity in products, it is easy to buy most of the necessities of life from a single interface. Major source of earning for Amazon is the sale of goods but it also earns some money from advertisers. It is a very vast business, for our case study we will limit our focus to online sale and purchase of Amazon's products.

- **Observation:** As soon as you open the Amazon.com website, it will suggest you nearest location's website for you. When opening it in

[8] "Amazon is UK's third favorite retailer". theBookseller.com. Retrieved 15 January 2010.

Netherlands so it gives us nearest location in UK. Form this recommendation we have observed that Amazon have its regional offices and stores in UK. From this observation we have concluded that this nearest location suggestion is based on nearest regional office and store. You can search on the website as a new user, or you can personalize the home page by making your login account. On the right side of Amazon's home page there exist advertisements, these advertisement can provide information or guideline form Amazon or form any company who wants to advertise some item etc. Amazon earns from this source too. On the left side of the page there are list of departments from where you can shop, or can search about your required item. The middle section of the page is reserved for the advertisement of Amazon itself. The product Amazon wants to introduce are usually displayed here. Also there are search options from where you can search. From Figure 6.3 we can observe that Amazon shows the nearest location website to guide us for shopping. It is a way to guide the customers to get the shipment in less time and less money. This page is full of recommendation and information. Recommendations and many other type of information are for the convenience of customers.

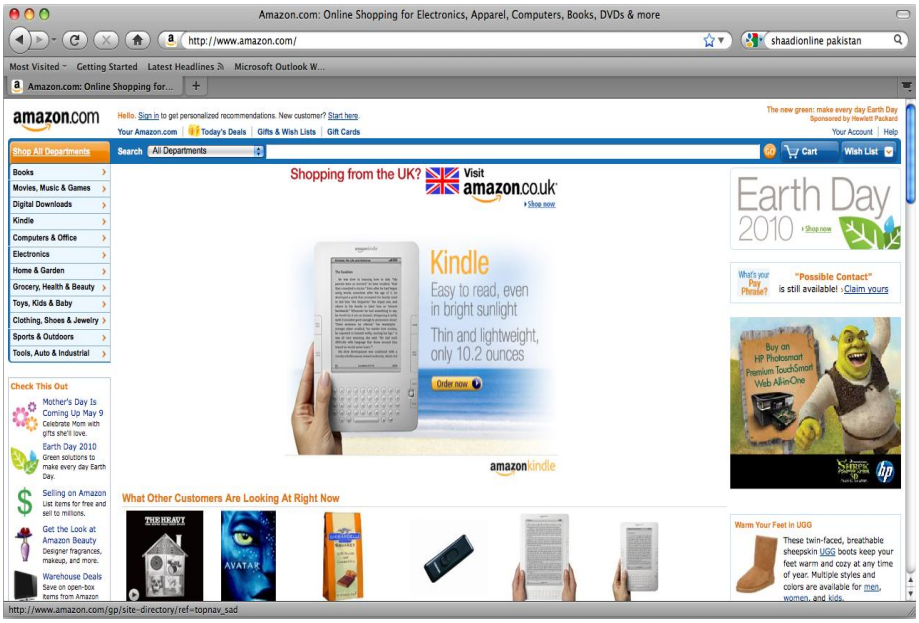

Figure 6.3: Amazon Home page[9]

- **Experience:** Next step is to experience. For gaining an experience we need to make an account, for making an account we need a valid e-mail address, by entering our e-mail address and some of our particulars we

[9] Accessed on 20 April 2010

will become the registered user of the Amazon. Once we made an account then we can start shopping. Amazon will ask to rate the retrieved item after your search, from these rating Amazon provides you the recommendations. There are many ways to be a customer of Amazon but we will limit our scope for buying/selling a product. Consider we are searching to buy Window-7 from Amazon. Once we have selected the item then Amazon will give us reviews about that item, these reviews help us to make decision of buying or not buying. There exists lot of other information like shipment details, or money saving option etc. After selection of Windows-7, we paid and got shipment details. In this experience we have seen that many companies have business with Amazon like product sellers, shipping companies, banks (take cares for the payments) etc. Among many shipping companies FedEx is one who collaborates with Amazon to earn money together[10].FedEx itself is an international business. Figure 6.4 shows the FedEx interface for Netherlands. They offer the services to ship the product in time with security and reliability while in time shipment is the base of Amazon's business. So they collaborate and jointly achieve a target.

- **Research:** After understanding the Amazon's business fully, we need to make research on the collaboration between Amazon and FedEx. There exist many partners with Amazon but we will consider only one partner that is FedEx. The interpretation rules/guidelines we have develop in the Chapter 4 leads us to hypothesis driven research [42]. We will make the hypothesis/control points out of these questions and will justify them. Our hypothesis/control points are as follows,

  - Objective of the business provides an initial insight of the business.
  - Type of organization (CNOs, NOs etc) can be identified by studying management type.
  - Scope of business helps us to create a snapshot of the business.

[10] All the details regarding FedEx and Amazon's collaboration are retrieved form

http://fedex.com/us/smallbusiness/updates/october2009/Amazon-services-discount.html

&

http://fedex.com/us/ebusiness/ecommerce/Amazon.pdf

Accessed 15 April 2010

- Tools and technology analysis gives an insight of the alignment.
- If Amazon is a CNO then how many types of partners it have?

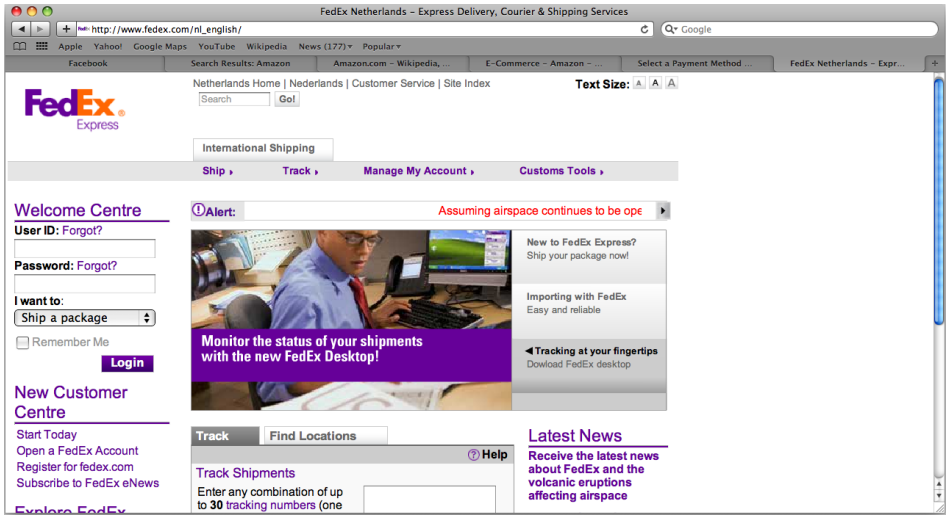

Figure 6.4: FedEx Interface [11]

6.2.2 Step-2: Based on Web analytics

Till now we have developed a snapshot of the Amazon's business. Now based on the control points we will identify the direction of research. All the results will be based on educated guess.

- **Objectives:** Amazon has a purchase and sales business. Only difference it have that it is e-commerce based business. Amazon is an online business or a warehouse that provide cheap and quality products to its customers. From the website we could not find any formal mission statement but it can be deduced from other information on website. We have found that mission of the Amazon.com is to leverage technology and the expertise of employees to provide the best buying experience on the Internet. Indeed, in its web site, Amazon.com provides the so-called 'vision' statement: "Our vision is to be earth's most customer centric company; to build a place where people can come to find and discover anything they might want to buy online". At this point we can say objective of Amazon is clearly defined and it is at 4th level of maturity.
- **Management:** The Amazon.Inc handles Management of Amazon. All the decision and policy making is done by the organization with the help of feedback, company get from users. FedEx is an independent company but they collaborate with Amazon to achieve the task of order delivery.

[11] Accessed on 20 April 2010

Management for the Amazon's task is handled by Amazon itself. Figure 6.5 show that a user when places an order on Amazon.com, its information goes to an Amazon distribution center. On the Amazon distribution center there exists FedEx ship manager workstation. This helps Amazon to deliver goods safely and in time. Overall Amazon is a well-managed organization but the internal processing of Amazon is not easy to guess from website. Such internal management issues are usually organizations secrets so they are not easily available from the website.

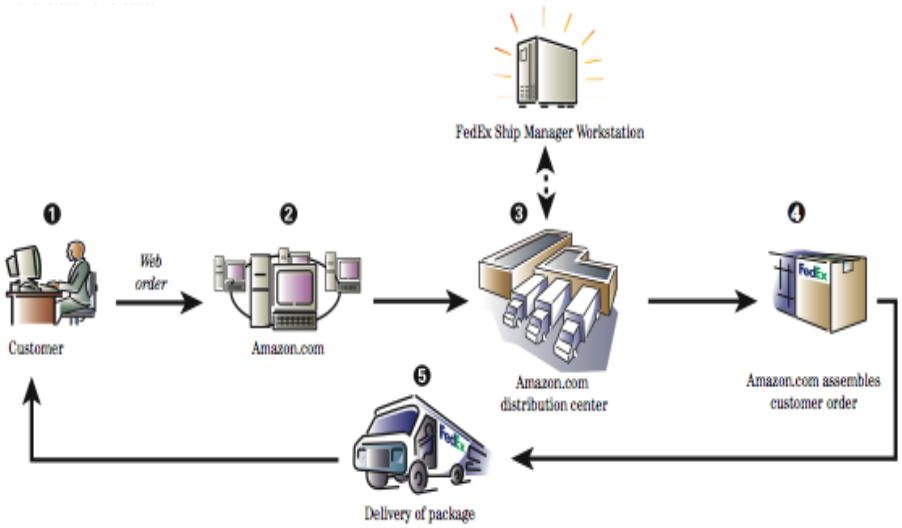

Figure 6.5: Amazon-FedEx collaborate for Order Management[12]

- **Scope:** As discussed earlier if the objective is clearly defined then scope can be defined as well. In the beginning Amazon emerged as a bookseller, but now it is continuously increasing its business. Many type of items as food, cloths, books, CDs, DVDs are available on the Amazon. Since Amazon is a vast business so it is difficult to clearly define the boundaries of scope.
- **Tools and Technologies:** We are working form the web-analytics perspective. We don't have any information that can tell us about exact platform details. But our knowledge based guess let us conclude that the tools and technologies are very much similar. Amazon is a big business it provide its partners a base to have a business therefore most of the partners have to adjust themselves according to Amazon's standards. In case of FedEx and Amazon business, they have aligned their business processes but we could not find information about the websites and other visible tools and technologies.

[12] Based on the document retrieved from http://fedex.com/us/ebusiness/ecommerce/Amazon.pdf on 17 April 2010.

Above described research directions could help to evaluate hypothesis developed in step-1.

- **Objective of the business provides an initial insight of the business**
  Yes, with the help of objective we know that Amazon's objective is to earn money by providing best online buying experience to the customers.
- **Type of organization (CNOs, NOs etc) can be identified by studying management type**
  We deem Amazon a CNO because many small and large businesses interact with it. Moreover it needs suppliers and shipper so it intermingles with many organizations. These facts lead us to the conclusion that Amazon is a CNO.
- **Scope of business helps us to create a snapshot of the business**
  Yes, we got a clear idea about the business.
- **Tools and technology analysis gives an insight of the alignment**
  Under the "Tools and technology" heading we have discussed that in case of Amazon and FedEx tools and technology-based alignment is not necessary. Unfortunately we are unable to find any information which can tell us about the alignment. Thus about this hypothesis we could not get any satisfactory answer.
- **If Amazon is a CNO then how many types of partners do they have?**
  Research on the website shows us that Amazon have three kinds of partners: (i) Large Partners that are companies who are selling their own merchandise on Amazon's buying and selling interface, (ii) Small Partners, which offer some of their products in existing Amazon stores. Their products appear side by side with Amazon's producers and other similar partners products, and (iii) Trusted Partners that offer products and/or services like cars or medications and services like booking travel and photo development, and so on.

6.2.3 Step-3: B-ITa Processes

In the following section we will validate the domains of "Enhanced ICoNOs MM" on Amazon case study while keeping in view the B-ITa processes.

- **Partnering structure**
  We will use FedEx and Amazon's collaboration as a context to evaluate the processes in the Partnership Structure domain. Our evaluation is given in Table 6.6.

Level#	Process	Description
2	**(BMD)** Business model definition [39]	Information about this process came up from Step-1 through observation and experience. It tells us that Amazon and FedEx in collaboration create value for the uses in the form of in time delivery of orders. Amazon earns money by selling products while FedEx earns by shipping them either to the customers or to Amazon.
2	**(OSD)** Organizational structure definition [43]	Lot of information is available about how Amazon work and how FedEx works, but we could not find any evidence about decision-making power in these CNOs. As the order generation happens in Amazon and FedEx takes care of the tasks that follow next, we could make a well-educated guess that Amazon is partially a regulatory authority.
2	**(SLA)** Service level agreements definition [43]	Form all available online data/information; no service level agreements are available. We learn from the website that deliverable from Amazon/customer is a proper order information. Responsibility of FedEx is in time delivery either to customer or to Amazon.
3	**(GSC)** Governance structure and compliance [35], [44]	Amazon is the governing body because it has the right to decide whether or not to give shipment orders to FedEx. FedEx have to follow the policies and procedures defined by Amazon. Amazon has many other partners for shipment so Amazon has developed standard policies and procedures[13].
3	**(IoPD)** Inter-organizational policies definition [43]	About inter-organizational policies for mutual benefit, we couldn't find any specified terms and condition. Only visible policy is in time delivery of product by FedEx.
3	**(RRS)** Roles and responsibilities specification [45]	Amazon and FedEx have a well-defined relationship, which defines the roles and responsibilities. It includes commitment to mutual goal that is earning money through customer service. Amazon and FedEx share resources and reward in the form of users and earning.
4	**(MRE)** Metric-based exploration of roles [46]	On which terms and conditions Amazon and FedEx communicate cannot discovered by us through the website.

Table 6.6 : Partnering Structure Processes for Amazon

- **IS architecture**

  In IS architecture we have nine processes to consider and our evaluations are presented in Table 6.7 (again with respect to Amazon and FedEx):

- **Process architecture**

  The evaluations of the nine process area are reported in Table 6.8.

[13] http://www.Amazon.com/gp/help/customer/display.html Retrieved on 15 April 2010

Level	Process	Description
2	**(BAD)** Baseline IS architecture description [39], [44], [47]	Amazon as a CNO has millions of user with different preferences. Users having complains or suggestions provide the feedback on the website. This feedback can be considered as the IS architecture description.
2	**(IsRM)** IS requirements management [48]	There exist the complain and suggestion section on each e-business website and the Amazon site is no exception. Complains and suggestions turn into IS Requirements later on.
2	**(SPD)** Standards and principles definition [43], [49]	Amazon and FedEx are well-developed organizations. Each has standards which are available for download in the bottom of the website main pages. Tabs related to policies, principles, standards give a summary of standards and principles of Amazon and FedEx. These standard and policies definitions help the CNOs in providing the desired services to the customers.
3	**(ATF)** IS architecture target formulation [47], [35]	Desired To-Be state of the information system for Amazon is defined by company based on users demand and expectation. User's demands and expectations are available on the website in the feedback section.
3	**(AVV)** IS architecture verification and validation [48]	This process partially executed by the CNOs but users of Amazon and FedEx do most of verification. Customers (of Amazon&FedEx) feedback tells about the success or failure of an IS architecture.
3	**(IsCD)** IS capabilities definition [49]	The business environment we have is based on number of users that immediately accept or reject a change. The collaboration between Amazon and FedEx made to achieve the task as soon as change in the collaboration arises, increase/ decrease in business shows the results of this change.
3	**(IsPM)** IS portfolio management [39]	In Amazon's case, the sale of a product is the main point. A portfolio of products gives us hints that there should be a portfolio of systems for managing various types of orders-execution tasks related to these products. We have however no evidence that Amazon applies a systematic portfolio management approaches to system management.
4	**(QPM)** Quantitative IS portfolio management [48]	About Amazon & FedEx we couldn't manage to get information about this process.
5	**(RAM)** Risk analysis and mitigation [38]	There exist risks like wrong requirements are being considered, or analysis of stock. Risk analysis is surely being done by Amazon as well as by FedEx experts, but we couldn't get information about risk analysis and mitigation.

Table 6.7 : IS Architectu re Processes for Amazon

Level	Process	Description
2	**(BPD)** Baseline process architecture description [50]	This process is very much similar to Baseline information architecture description (BAD). Information collected for BAD also applies to this process.
3	**(PAD)** Process architecture definition [48], [45]	In this process basic process related to the Amazon and FedEx communication, their environment standards are discussed. Exact terms and conditions for these CNOs to communicate is not mentioned on the website but they have clear process defined that 'on the Amazon's website there will be sale/purchase and FedEx will make sure its delivery in time'.
3	**(PAF)** Process architecture target formulation [50], [35]	To-Be state of the IS system is defined in IS architecture target formulation (ATF). Business strategy view let us decide about the processes needed to achieve IS targets.
3	**(PFP)** Organizational process focus planning [48]	This process deals with the strengths and weaknesses of the collaboration's processes. In the step-1 at the experience state we can see the collaboration process but where they are weak or strong is not judged by us. It needs source of data/information other than website.
3	**(PPM)** Process portfolio management [50], [39]	Sometime in the feedback section there exist some requirements, which Amazon and FedEx cannot fulfill with their resources. However, whether or not Amazon uses this information for process portfolio management purposes remains unclear.
4	**(EFC)** Event logs formal consistency [40]	There is no information available on website about event logs during collaboration.
4	**(OPP)** Organizational process performance [50], [48]	Blogs, feedback and complain from customers provide some information about the organization process performance. Consider the process of delivering the "Harry Potter and the Goblet of Fire"14 after its release. It was one of the biggest orders Amazon received. With the help of FedEx, Amazon achieves the target and feedback told about the organization process performance.
5	**(CAR)** Causal analysis and resolution [48]	Flaws can be found on the Amazon website/business during purchase/sale but what are the reasons behind that and how to prevent them in future, cannot be study form website only.
5	**(IoPO)** Inter-organizational process optimization [48], [39]	For this process we were unable to find any information.

Table 6.8 : Process Architecture Processes for Amazon

[14] http://fedex.com/us/ebusiness/ecommerce/Amazon.pdf retrieved on 17 April 2010.

❖ **Coordination**

The evaluations of the five processes in this domain are presented in Table 6.9.

Level	Process	Description
2	**(DTS)** Direct supervision [51]	In step-1 observation phase shows us that Amazon is the one who is doing the direct supervision of all the partners. Terms and conditions for partners on Amazon's website let us decide about this fact.
2	**(InCA)** Informal communication adjustment [52], [44]	For day to day order delivery, Amazon authorizes the FedEx to use their data and make the process automatic. They don't need to communicate on each order. For especial tasks they must have some defined rules which could not adjudicate from website.
3	**(COC)** Communication-oriented coordination [52], [53], [39], [44]	Knowledge (e.g Order information) is shared between the Amazon and FedEx. Shipment tracking can be done form the FedEx website although order is placed on the Amazon's website. This is the communication-oriented coordination between the Amazon and FedEx.
3	**(STD)** Standardization [51], [47]	Order from one website (Amazon) can be tracked on the other website (FedEx) gives us a clue that there exist standards between Amazon and FedEx.
4	**(QRA)** Quantitative coordination analysis [54]	From Amazon and FedEx website we could not get any information about this process.

Table 6.9 : Coordination Processes for Amazon

❖ **Cost Management**

Cost management process are given in Table 6.10.

Level	Process	Description
2	**(CSlA)** Cost based service level agreements [43]	Service level agreements between Amazon and FedEx are not available on the website. FedEx is getting business form the Amazon, so we can say cost based regulatory authority is Amazon because Amazon can hire anyone else other then FedEx for its shipment services.
3	**(ROI SMF)** ROI strategy and management formulation [35]	Amazon and FedEx share profit obtained from shipment of items. FedEx is the one who gives share to Amazon because Amazon provides the business to FedEx.
4	**(PO)** Process optimization [39]	Website information is not sufficient to decide about existence or non-existence of this process.
4	**(PFA)** Profitability Analysis [40]	Profitability analysis is based on event-log and it is the internal information of CNOs therefore we cannot conclude about this process.
5	**(IR)** Investment reason [36]	Rapid growth of Amazon is the one reason to invest but the biggest reason to invest the good name Amazon earned with the passage of time. With the help of this process we can find many other reasons for investment too.
5	**(CeRA)** Cost effective risk analysis [38]	Website information is not sufficient to decide about the presence/absence of this process.

Table 6.10 : Cost Management Processes for Amazon

6.2.4 Discussion on the case study results

After performing the interpretation steps we came to know that Amazon and FedEx are big business partners that collaborate and achieve a common goal. While applying the interpretation rules (steps 1 and 2), we made the note that the results we obtained at each step made sense to us in that they corresponded to our intuitive understanding of Amazon and FedEx. In step-3, we have faced the problems that we could not conclude the presence or the absence of some B-ITa processes. For example, quantitative IS portfolio management (Domain: IS Architecture, Table 6.7) is a level 4 process and we donot have any information about it. Based on our experience, we observed that those processes which require detail understanding of CNO's inter-partner relationships cannot be understood from the website alone. For example, the organization process of focus planning (Domain: Process Architecture, Table 6.8) is a level 3 process and it needs detailed CNOs information that goes beyond the type of information that is typically published in an organization's website.

6.3 Cross-Case Analysis

This chapter considers two case studies for evaluation of Enhanced ICoNOs MM. We have studied Facebook's and Amazon's websites with the help of interpretation rules.

Table 6.11 shows the results of each step and sub-step. In the following table a "Yes" means that we found the existence of this process from the website and "No" means we could not get any information on the website about the absence/presence of this process in the CNOs. There exist a number before each process name, which shows the level of that process, for example 2: BMD means that process BMD exist at level 2.

Steps			**Facebook**	**Amazon**
Step-1				
	Observation		Yes	Yes
	Experience		Yes	Yes
	Research		Yes	Yes
Step-2				
	Objective		Yes	Yes
	Management		Yes	Yes
	Scope		Yes	Yes
	Tools & Technologies		Yes	Yes
Step-3				
	Partnering Structure			
		2:BMD	Yes	Yes
		2:OSD	Yes	Yes
		2:SLA	Yes	Yes
		3:GSC	Yes	Yes
		3:IoPD	Yes	Yes
		3:RRS	Yes	Yes
		4:MRE	**No**	**No**
	IS Architecture			
		2:BAD	Yes	Yes
		2:IsRM	Yes	Yes
		2:SPD	Yes	Yes
		3:ATF	Yes	Yes
		3:AVV	Yes	Yes
		3:IsCD	Yes	Yes
		3:IsPM	Yes	Yes
		4:QPM	**No**	**No**
		5:RAM	**No**	**No**
	Process Architecture			
		2:BPD	Yes	Yes
		3:PAD	Yes	Yes
		3:PAF	Yes	Yes
		3:PFP	**No**	**No**
		3:PPM	Yes	**No**
		4:EFC	**No**	**No**
		4:OPP	Yes	Yes
		5:CAR	**No**	**No**
		5:IoPO	**No**	**No**
	Coordination			
		2:DTS	Yes	Yes

	2:InCA	Yes	Yes
	3:COC	Yes	Yes
	3:STD	Yes	Yes
	4:QRA	**No**	**No**
Cost Management			
	2:CSIA	Yes	Yes
	3:ROI SMF	Yes	Yes
	4:PO	**No**	**No**
	4:PFA	**No**	**No**
	5:IR	Yes	Yes
	5:CeRA	**No**	**No**

Table 6.11: Summary of cross case analysis

From the table we can conclude that when we attempt a website-based evaluation of B-ITa maturity in CNOs, it seems realistic to expect that the information would be enough to assess the presence/absence of level 2 and level 3 B-ITa processes. For level 4 and 5 processes, we were unable to find relevant information in the studied website so that it allows us to make a meaningful conclusion if a B-ITA process is present or not. For some cases we could possibly make well educated guesses based on prior knowledge or on findings in publications about the businesses we studied. The observations on the

Table 6.11 indicate the following:

- In the Enhanced ICoNOs MM, we had 36 processes in total. Among these we have 11 processes for which we could not make any judgment based on the information available on the website of the CNOs in our two case studies. All these processes are level 4 & level 5 processes. This indicates a limitation of our selected case studies that the website-based information cannot bring any conclusion regarding higher maturity levels.
- We have 32 processes for which both our case studies have “yes”. It means we concluded the existence of these processes based on facts/data/information publically available in a website. This is encouraging to know as researchers might feel now motivated to replicate this study in follow-up cases and bring new insights into how to improve the CNOs B-ITa maturity assessment as a practice.
- For the Process Architecture domain at level 3 processes (Organization process focus planning (PFP) we found “No” for both case studies. For the Process portfolio management (PPM) we found a “yes” in the Facebook case study but a “No” in Amazon case study. So, this observation could possibly suggest that information availability about the B-ITa processes on the website varies from case study to case study.

6.4 Summary

In this chapter we have deployed the interpretation rules in two real life CNOs. We conducted two case studies in which we used the rules to assess the B-ITa maturity in the case study organizations. The cross-case analysis lets us conclude that our approach to assess maturity websites information does help however is far from being free of concerns. We conclude that snapshot building based on websites plays a good role and provides details to assess the presence/absence of level 1 and level 2 B-ITa processes. We also found that for the assessment of those B-ITa processes where we have to understand the business, the websites provide satisfactory information. However, we noticed that for level 4 and level 5 processes, we could not find information in a web site that is enough for concluding the presence/absence of a process. The results obtained from the two case studies revealed that website knowledge from selected case studies is not sufficient to make any decision about the higher levels of B-ITa.

We must acknowledge that our proposed rules are evaluated on two case studies only and that one researcher carried out the two studies. Clearly, it's ideal if more researchers would have participated and provided their observations and interpretations. However, in the time available for this master project it was not possible to engage other researchers. We therefore think that follow-up studies on new website and replication studies on the Facebook and Amazon cases by other researchers will be of great value to increase the level of understanding of the opportunities and the challenges that accompany the B-ITa maturity assessment by using websites' information.

7 Conclusion

MMs seem to be a useful vehicle for understanding the alignment of the organization. Literature review in chapter 2 reveals that with the exception of ICoNOs MM, there is no MM, which specifically discusses B-ITa in CNOs. In this chapter we will discuss our contributions of how to assess B-ITa maturity in CNOs and will present some open questions for further research.

7.1 Reviewing the Research Questions

This master project set out to answer the question of

"*What is the suitability of the ICoNOs MM to contexts of government NOs/CNOs in developing countries for assessing their B-ITa? And if experts are not available for interview-based evaluation of B-ITa maturity, in which way can we use information from government websites and publicly available documentation for the purpose of evaluation B-ITa by means of the ICoNOs Maturity?*"

Overall, we found the the ICoNOs MM suits the context of Asian CNOs. Based on a case, we however found sufficient evidence that convinced us of the need to extend the original ICoNOs MM by including a new domain, "Cost Management". This led us to the Enhanced ICoNOs MM that includes 6 new B-ITa processes pertaining to the Cost Management domain.

In the rest of this section we provide answers to the four sub-questions that we formulated in the Introduction where we decomposed our central research question.

> *Question#1: Is the ICoNOs MM suitable for NOs/CNOs contexts in developing countries, especially in Asian e-government NOs/CNOs, by using the traditional approach?*
>
> This question is answer primarily in Chapter 3 where we have completed the NADRA [25] case study and applied the ICoNOs MM [6] to a Pakistani government CNO. We found that ICoNOs MM was suitable to this setting. We also found some similarities between Asian and Western CNOs context regarding the exposure of CNOs partners to disciplined processes. The similarities in the settings make us think that ICoNOs MM is suitable for Western as well as to Asian contexts.
>
> *Question#2: Does the evaluation of the ICoNOs MM bring into focus the new aspects of MM?*

This question is answered in the Chapter 4. A new domain is brought into focus by the evaluation of ICoNOs MM on Asian CNOs. This new domain is named as "Cost Management" domain. This new aspect let us name the ICoNOs MM as Enhanced ICoNOs MM. We identified six processes that are associated to this new domain.

Question#3: How to interpret what you have seen on a website in the light of the constructs of the ICoNOs MM when publically available information in websites is the only possible source of information in the evaluation of B-ITa maturity of CNOs?

A set of interpretation rules/guidelines is proposed in Chapter 5. These guidelines are intended to make the process of assign B-ITa less dependent of the availability of human experts and less expensive, while leveraging information that is readily available in public organizations' websites and companies' websites. Our proposed approach to use the rules/guidelines consists of three steps

- Step-1: Snapshot Development
- Step-2: Research for Web-analytic
- Step-3: B-ITa Processes

Question#4: Is there any difference of results while evaluating the ICoNOs MM from a website with the help of interpretation rules instead of interviewing the people?

The answer to this question is presented in detail in Chapter 6. There in, we have studied two websites with the help of interpretation rules. The results obtained by our website-based method revealed the following:

1. Using information from websites helped assess the presence/absence of level 2 and level 3 B-ITa processes. Step-1&2 are fully suitable for assessing processes at these two levels.
2. We could not find sufficient information to assess the presence/absence of a B-ITa processes that are at maturity level 4 or level 5. While for some processes at these two levels, some information may exist and give hints to the presence of the B-ITa processes, so that researchers can make a meaningful conclusion, we must note that there are processes at level 4 or level 5, for which in both case study it was impossible to make a conclusion.

Therefore we can say the results obtained by interviewing people are more complete and comprehensive then the results obtained from the interpretation rules/guidelines. However, we also can say that the interpretation rules help us to make a strong basis for carrying out a preliminary maturity assessment, and then conducting efficient and quick interview with questions that build upon the findings of the website-bases maturity assessment. This means that the key benefit of our approach is in its ability to provide maturity assessments for level 2 and level 3 B-ITa processes and to feed this info into an interview planning process that will follow. If our approach is used first, then it will inform the interview research process by providing a focus and concentrating on those areas where more information is needed for drawing conclusions about the presence/absence of B-ITa processes.

7.2 Our Contribution

This thesis makes a number of contributions. These contributions ranged from evaluation of ICoNOs MM to designing an enhancement of the ICoNOs MM. In summary, our contributions are the following:

1. **Evaluation of the ICoNOs MM in a new Context:** We used an Asian CNO to investigate the suitability of ICoNOs MM. This complements the existing body of evidence which consists primarily of findings accumulated through case studies in European and North-American organizations [6]. Our case study is the first Asian setting and the finding from this confirmed the suitability of ICoNOs MM.

2. **Enhancement of the ICoNOs MM:** The outcome from our Asian case study suggested us to consider cost management as an important factor in B-ITa. Therefore, we designed the Enhanced ICoNOs MM that introduced a new domain, “Cost Management”. It consists of six processes deduced form our review of selected literature sources.

3. **Interpretation Rules/Guidelines:** This important contribution is to reduce the costs of carrying out a B-ITa maturity assessment and make it less dependent on the availability of human experts. We have developed rules/guidelines for understanding B-ITa of CNOs from their websites. These rules form a three-step approach for interpretation of information pertaining to the B-ITa processes included in the the Enhanced ICoNOs MM. We completed two case studies by using the websites of two CNOs to understand the extent to which our website-based assessment approach works. We found important strengths and weaknesses that determine the cases in which our approach is helpful and those in which its use is suboptimal.

7.3 Future Work

This thesis identifies the following open issues:

1. This master project proposed a new domain as an extension of the ICoNOs MM. It includes six B-ITa processes. Our decision to include these six processes is based on our literature analysis. We however acknowledge that new scientific studies are being published each month on B-ITa and they may provide good argumentation for including new processes to our set of six. We therefore do not see our Enhanced ICoNOs MM for complete and we expect it be extended with more B-ITa processes whose evaluation may possibly add more precision into the final B-ITa maturity assessment itself. Follow-up qualitative case studies are also an important line of future research, so that the findings from literature are triangulated with insights from practitioners. This will build strength in the claim that Cost Management is an important domain to consider when assessing B-ITa maturity.

2. We acknowledge that the maturity assessment is a labor-intensive and time-consuming process as it depends on the involvement of experts. We think that researchers can balance light-weight approaches to maturity data gathering and analysis with more 'traditional' approaches (e.g. interviews). What represents the right balance and how to achieve it remains an open question for the future. In this thesis we hoped that we could accomplish the data gathering and analysis tasks by using information readily and freely available in the websites of the CNOs. We devised an approach to identify, collect and interpret this information. We however found that this brings value mostly when we assess B-ITa processes that are associated with maturity level 2 and level 3 of the Enhanced ICoNOs MM. We observed that more often than not B-ITa processes that are associated with level 4 or level 5 are near to impossible to assess. This study, thus, gives us clarity on what kind of B-ITa processes we can assess by what means. However, a promising line for future research remains to define a sound and systematic process on complementing the website-based approach and an interview-based approach so that the maturity assessment is more cost-effective.

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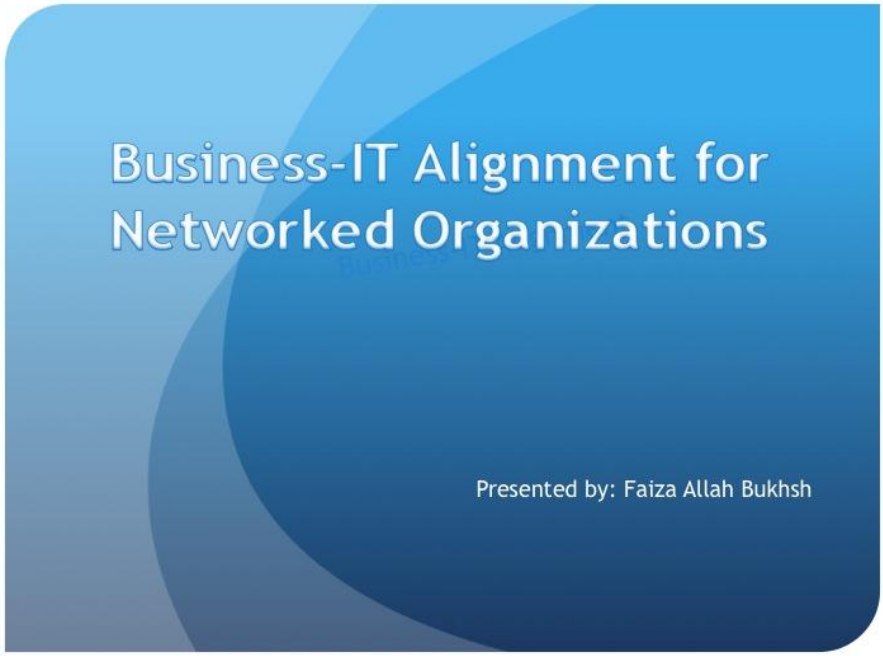
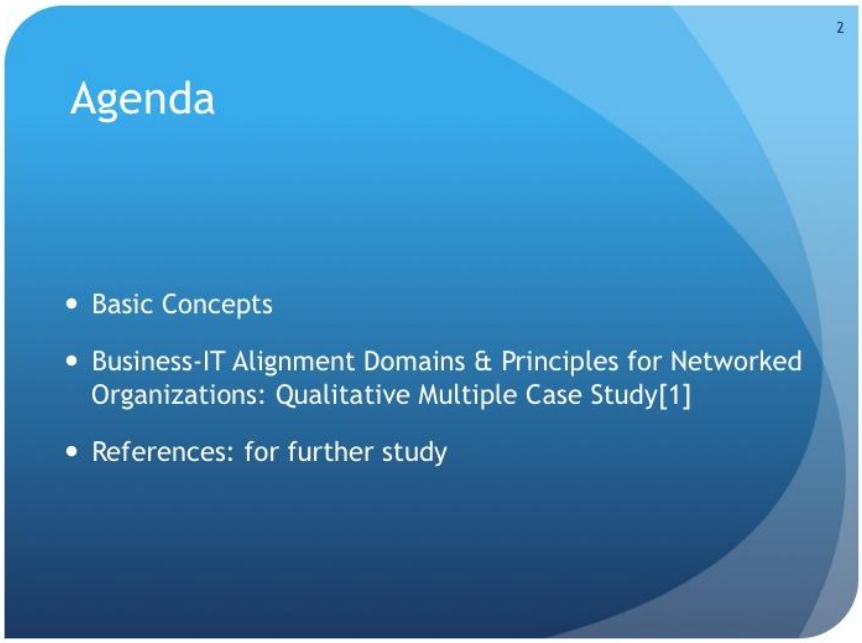
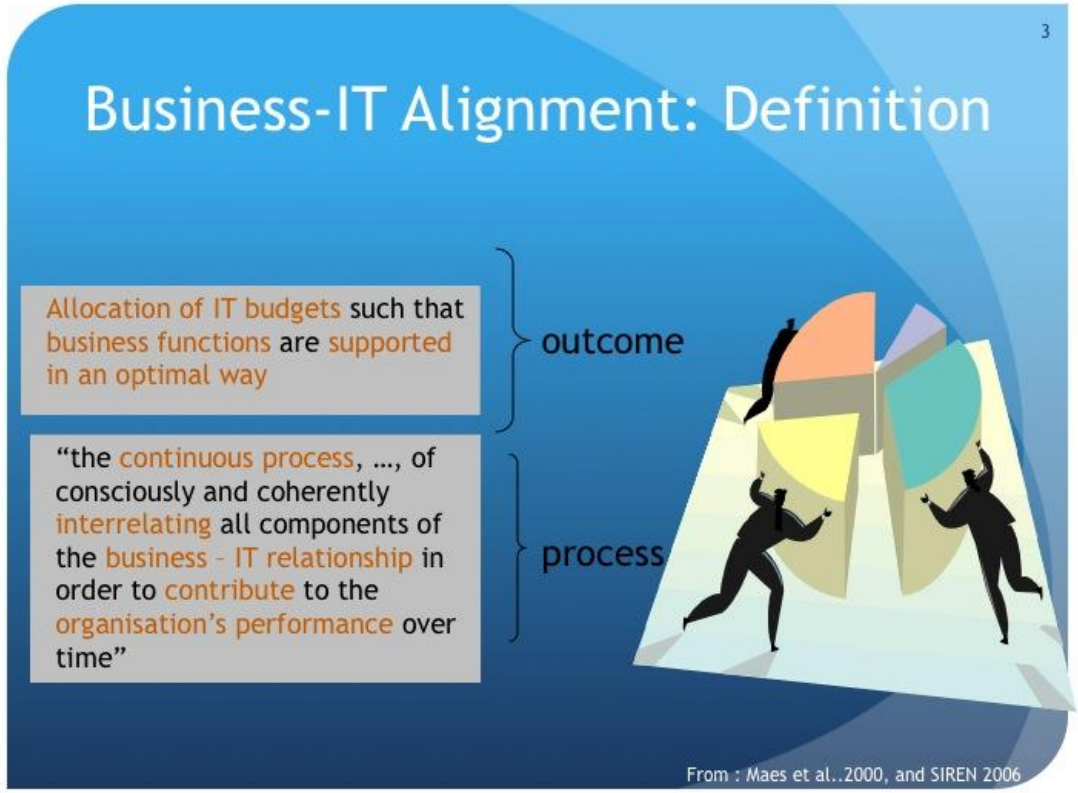
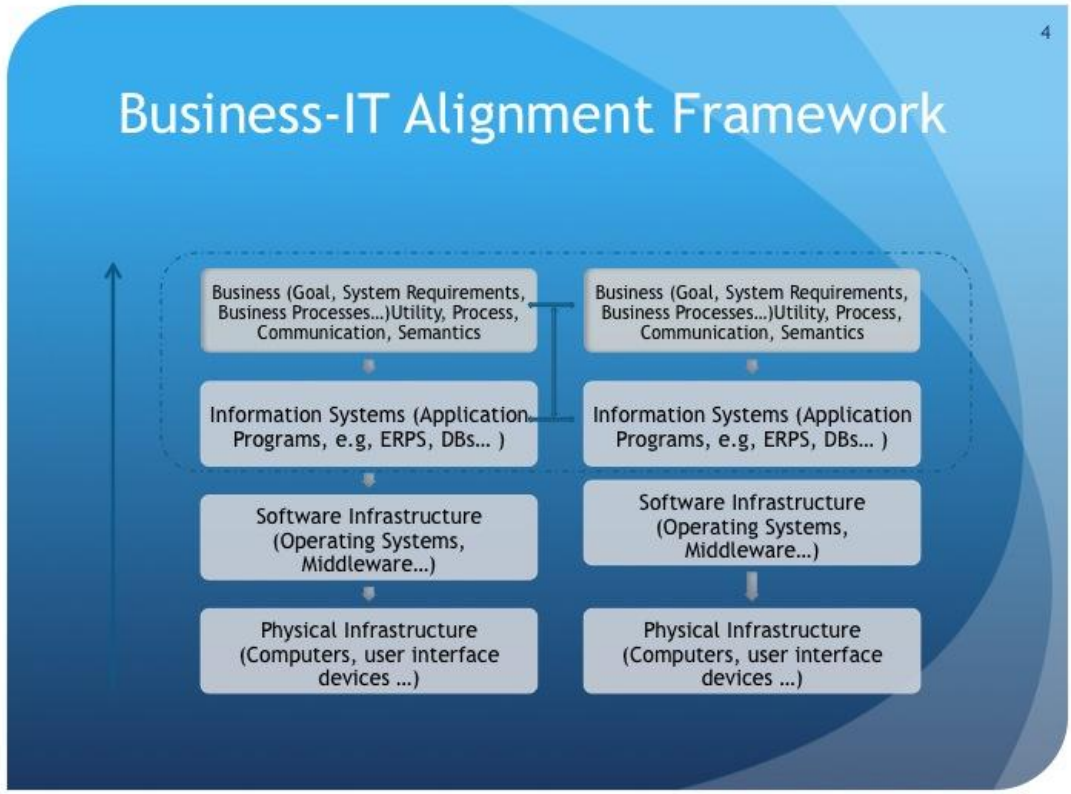
Appendices

Appendix A: Presentation about ICoNOs MM






3
Business-IT Alignment: Definition
Allocation of IT budgets such that business functions are supported in an optimal way
outcome
"the continuous process, …, of consciously and coherently interrelating all components of the business – IT relationship in order to contribute to the organisation's performance over time"
process
From : Maes et al..2000, and SIREN 2006


4
Business-IT Alignment Framework
Business (Goal, System Requirements, Business Processes…)Utility, Process, Communication, Semantics
Information Systems (Application Programs, e.g, ERPS, DBs…)
Software Infrastructure (Operating Systems, Middleware…)
Physical Infrastructure (Computers, user interface devices …)
Business (Goal, System Requirements, Business Processes…)Utility, Process, Communication, Semantics
Information Systems (Application Programs, e.g, ERPS, DBs…)
Software Infrastructure (Operating Systems, Middleware…)
Physical Infrastructure (Computers, user interface devices …)

5

"Mix & Match" Network

Collaborative Network Organizations (CNO)

- Profit and Loss Organizations/ Organization
- Accomplish Task
- Common Goal
- Serve customers over period of time

[5]

6

Networked Organizations (NO)

Definition of Network Organization:

"A Network Organization is a situation that come up when independent people and groups, linked across boundaries, work together for achieving a common goal."[3]

Difference between NO & CNO

- Profit and Loss dependent
- IT Environment

7

Maturity Model (MM)

- Evolution of specific entity over time
- Allow organization to benchmark itself
- Helps to get a clear idea about the organizations potential
- A life cycle approach to predict the desired outcome
- Helps to Judge the organization progress status

8

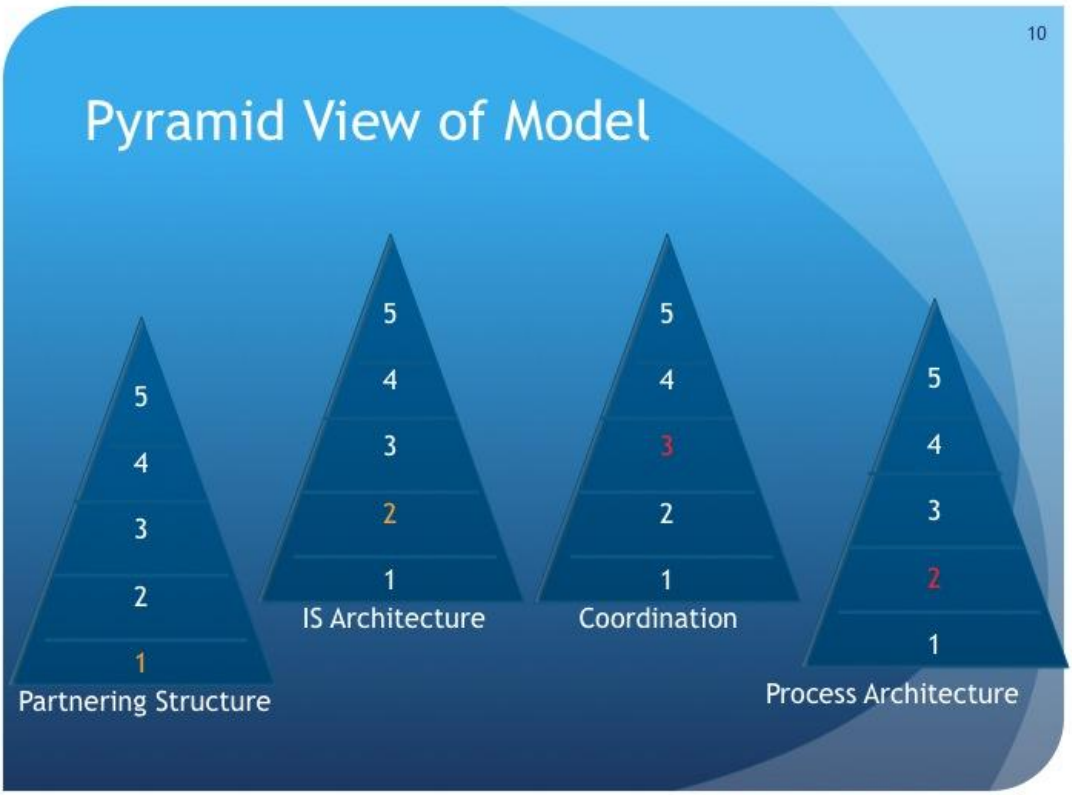
ICoNO Maturity Model

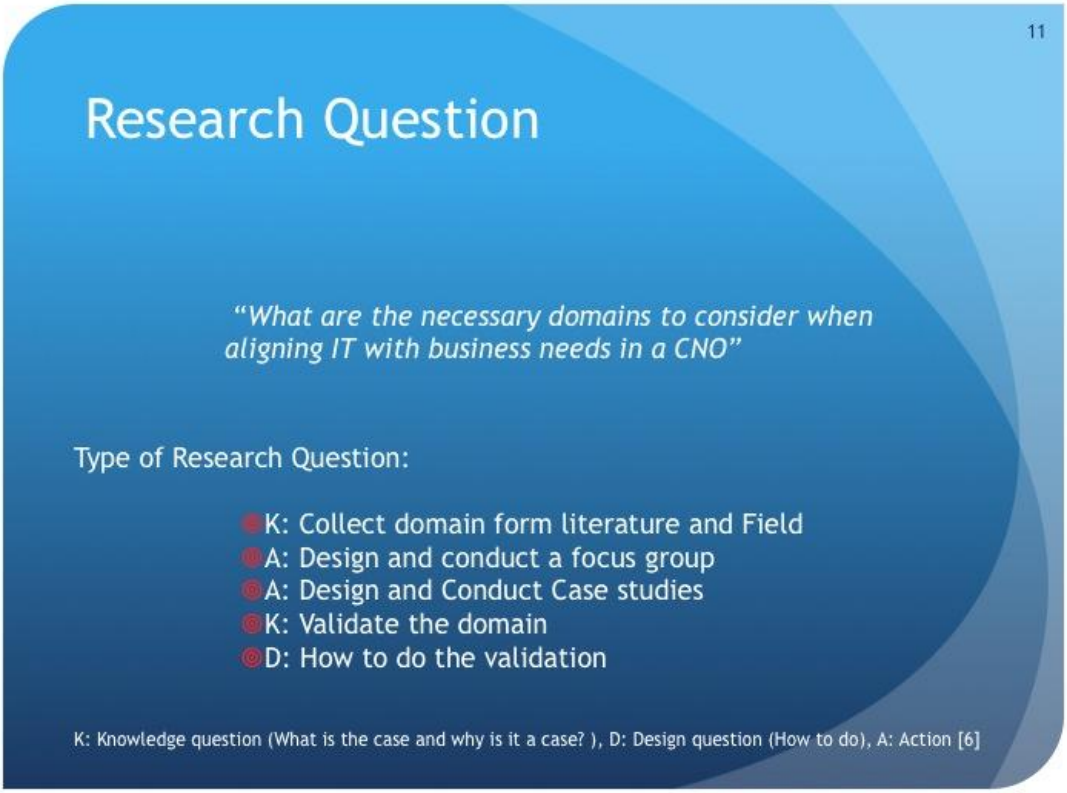
IT-enabled Collaborative Networked Organizations

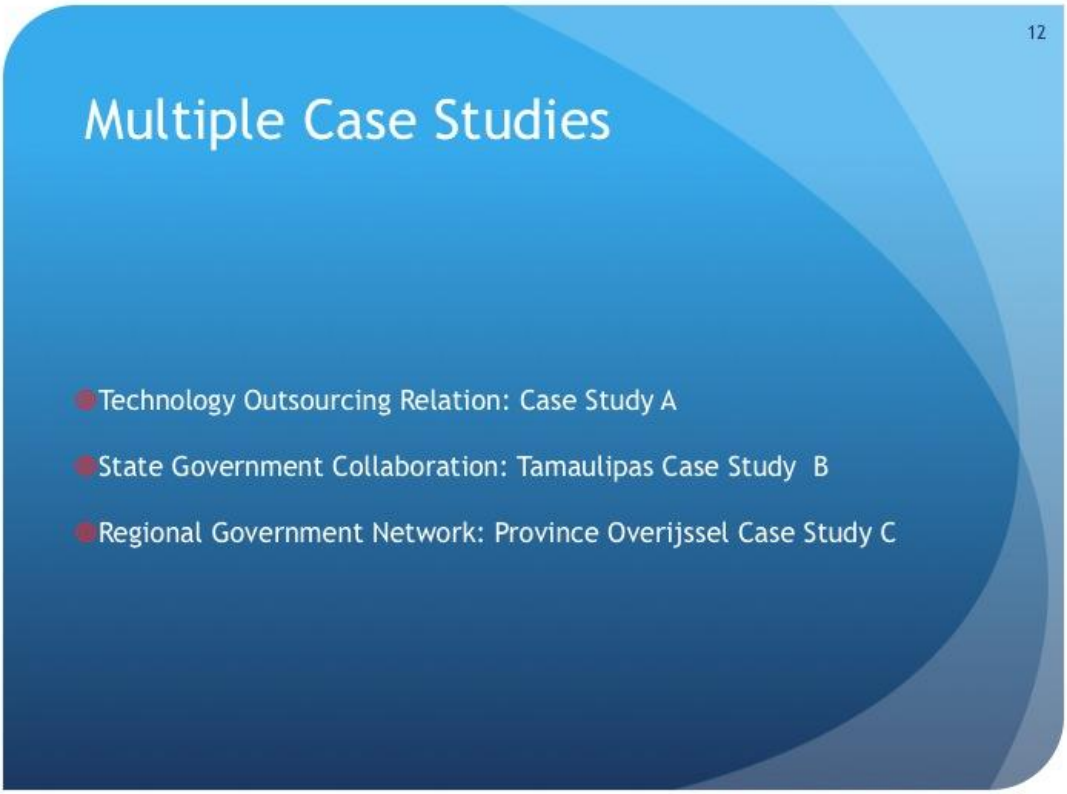
Help CNOs to access the maturity of B-ITa activity to identify lack of efficiency that can have negative impact.

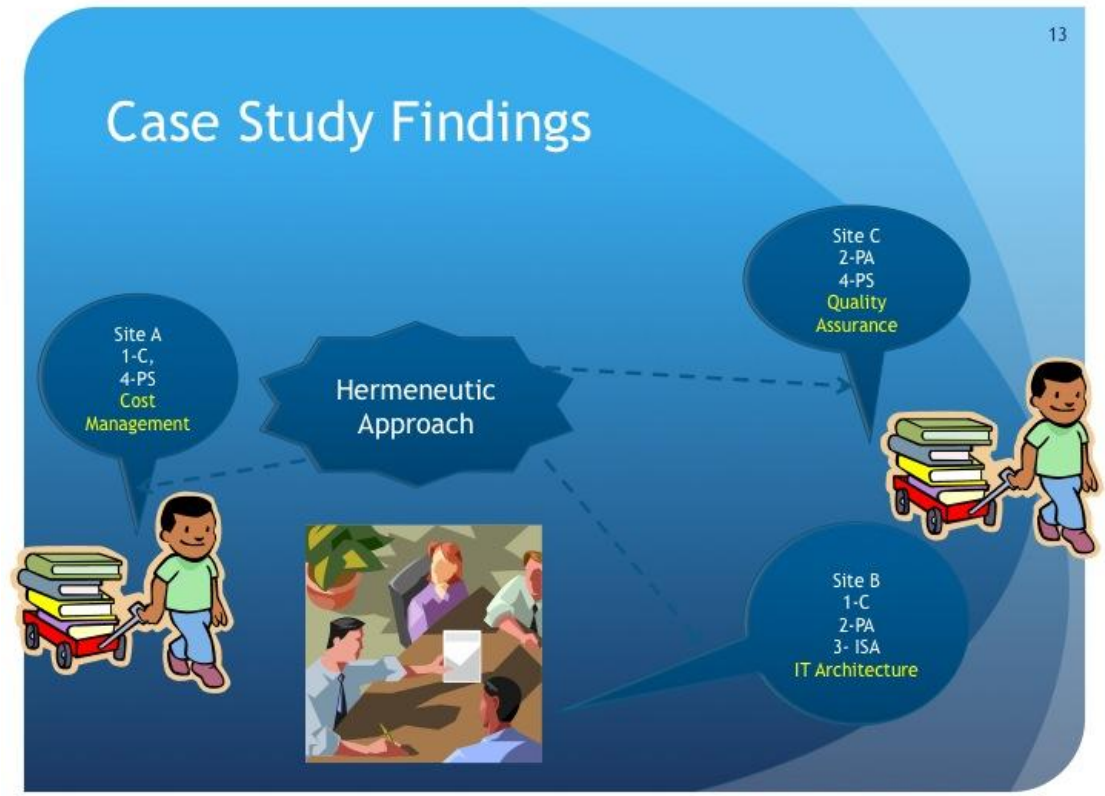
Two dimensional framework
- Domains
- Levels

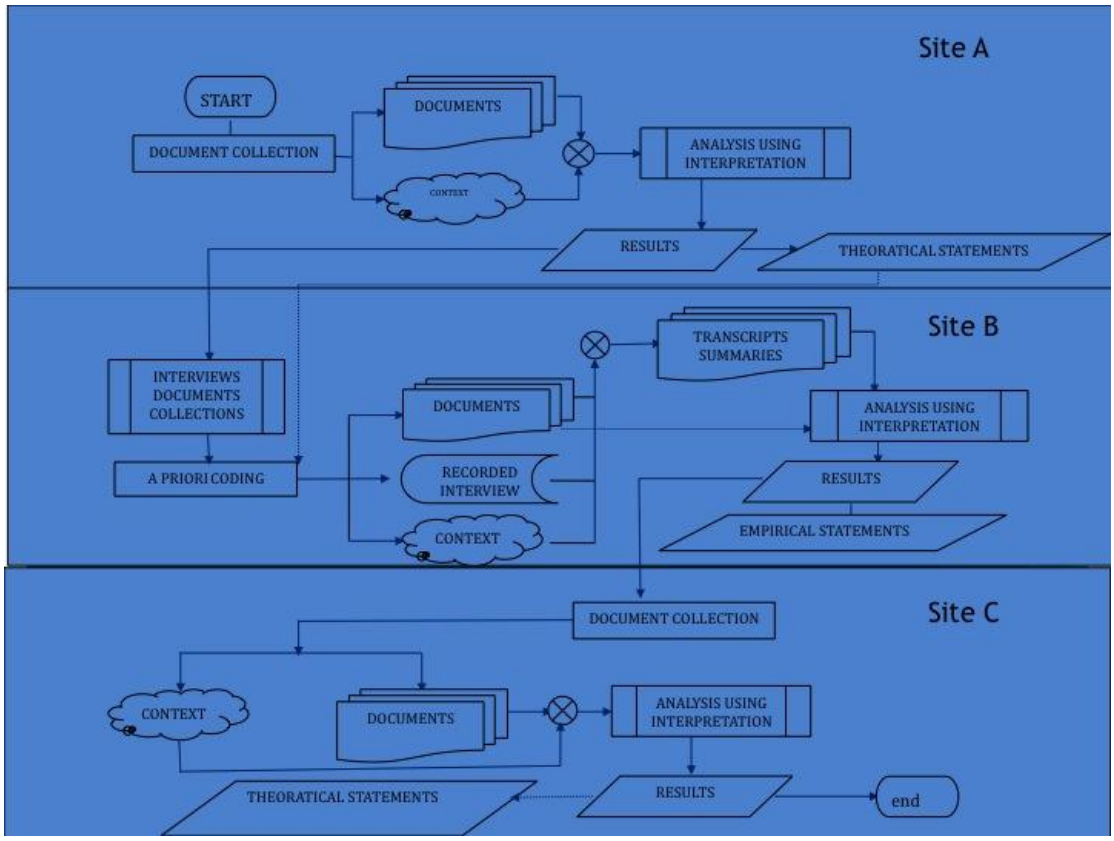

9
ICoNOs MM Maturity Levels
Level 5: Optimized
Level 4: Qualitatively Management
Level 3: Standardized
Level 2: Isolated
Level 1: Incomplete
[4]

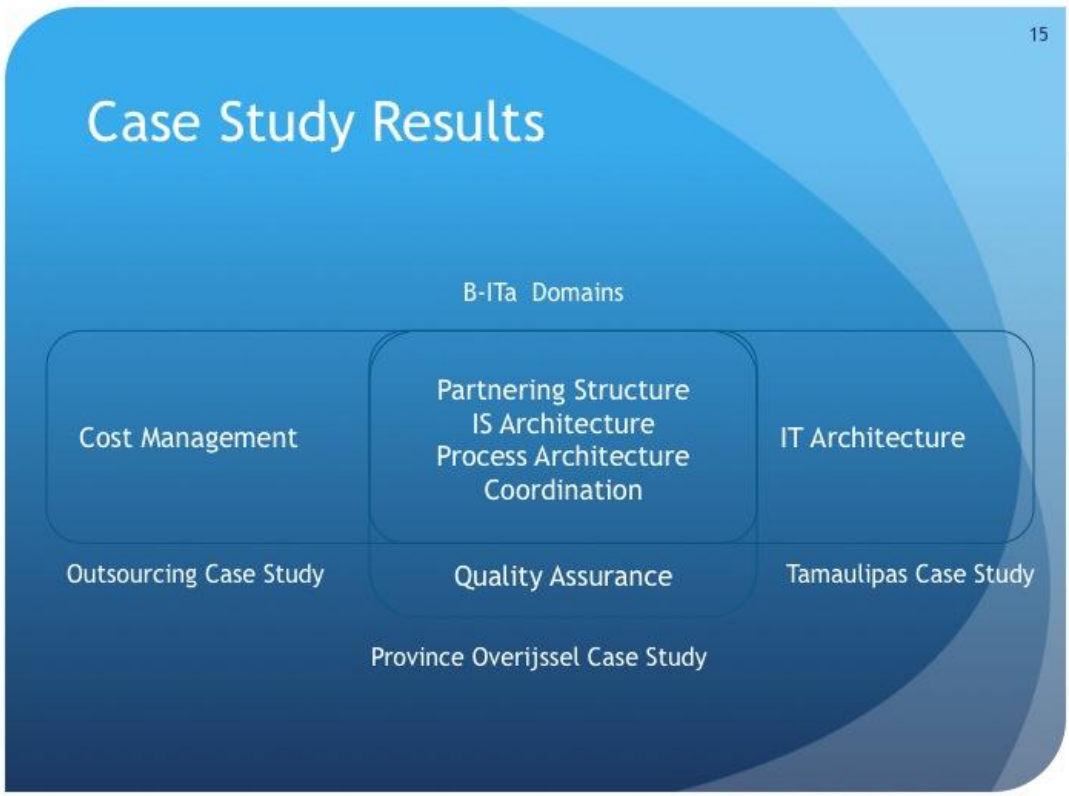

10
Pyramid View of Model
5
4
3
2
1
Partnering Structure
5
4
3
2
1
IS Architecture
5
4
3
2
1
Coordination
5
4
3
2
1
Process Architecture


11
Research Question
"What are the necessary domains to consider when aligning IT with business needs in a CNO"
Type of Research Question:
K: Collect domain form literature and Field
A: Design and conduct a focus group
A: Design and Conduct Case studies
K: Validate the domain
D: How to do the validation
K: Knowledge question (What is the case and why is it a case?), D: Design question (How to do), A: Action [6]


12
Multiple Case Studies
Technology Outsourcing Relation: Case Study A
State Government Collaboration: Tamaulipas Case Study B
Regional Government Network: Province Overijssel Case Study C


13
Case Study Findings
Site A
1-C,
4-PS
Cost
Management
Hermeneutic
Approach
Site C
2-PA
4-PS
Quality
Assurance
Site B
1-C
2-PA
3- ISA
IT Architecture


Site A
START
DOCUMENT COLLECTION
DOCUMENTS
CONTEXT
ANALYSIS USING INTERPRETATION
RESULTS
THEORATICAL STATEMENTS
Site B
INTERVIEWS DOCUMENTS COLLECTIONS
A PRIORI CODING
DOCUMENTS
RECORDED INTERVIEW
CONTEXT
TRANSCRIPTS SUMMARIES
ANALYSIS USING INTERPRETATION
RESULTS
EMPIRICAL STATEMENTS
Site C
DOCUMENT COLLECTION
CONTEXT
DOCUMENTS
ANALYSIS USING INTERPRETATION
THEORATICAL STATEMENTS
RESULTS
end


15
Case Study Results
B-ITa Domains
Cost Management
Partnering Structure
IS Architecture
Process Architecture
Coordination
IT Architecture
Outsourcing Case Study
Quality Assurance
Tamaulipas Case Study
Province Overijssel Case Study


B-ITa Principles
B-ITa Domains e.g Site A: Cost Management
Domains Order e.g Site B: Left partnering structure
B-ITa Approach
B-ITa Strategy
P S D E S I G N
Common Goal Definition
Organizational Structure Design
Value Model Construction
Role&Responsibilities Formalization
Organizational Support Policies
Definition of
IS Architecture
Process Architecture
Coordination Mechanisms
Measurement & Analysis

17

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18

Questions & Discussion

?

Appendix B: Questionnaire used for NADRA

Position your organization in the environmental permits network organization.

- ❖ The central objective of these questions is to see how the participating organizations consider his own position within the network.

    - What are the strategic objectives of CNOs (i.e, expansion of market reach, development of advanced services, familiarization with a new technology, participation in an experiment, etc.)?
    - What are the competencies, specific assets and resources of your organization that work within the network?
    - How important is the environmental permits for your organization
    - Perception of environmental permits by your network organization.

Partnering Structure

- ❖ Characteristics of the environmental permits network.

    - Are the common objective (s) specified?
    - Does anyone know the environmental permits network organization (actors, small or major players, authority, etc.)?
    - Is there a draft environmental permits the network to which complete system (i.e, actors, relationships, input, output, etc.) to describe?

- ❖ Roles and responsibilities

    - Are there service level agreements set out the deliverables, quality and the work of each participating organization?
    - Was the definition of collaboration necessary for effective work structure?
    - What roles and actors are needed? Who takes care of what?
    - How are the organizational resources (people, materials, and information) distributed within the network environmental permits?
    - Is there share risk and rewards policy, which is established for mutual benefit?

IS Architecture

- ❖ Interfaces between organizations.
    - Is there a description of the current situation of the systems? If so, how is that developed?

- What are the necessary technology standards and principles in the IS field?
- How do you decide about the systems information needs? (Gap analysis)
- How are the interfaces of IS preferably achieved?
- Do the support for existing IS interfaces exist? If not, how is it handle?
- Is there a management and IS interfaces exist? If not, will it develop in future and how?

Process Architecture

❖ Interfaces between organizations.

- Is the current situation of the processes described? If so, how that developed?
- What information flows and processes needed to ambient authorization to deliver? Does anyone with a role in information flows and processes? If not, how is it organized?
- How are the processes between the organizations identified?
- Is there an evaluation / selection / design or processes needed to achieve the desired situation to support?
- How do you as cooperating organizations ensure that processes are up-to-date?
- Is there a place portfolio management process? If not, will it develop in future? If yes then how?

Coordination

❖ Characteristics of the environmental permits network.

- What is the degree of standardization of output and enforcement between the participating organizations?
- Is the work checked by specific individuals and who is responsible giving instructions and control activities?
- Interfaces between organizations.
- What are the communication processes (ie, personal, cooperation groups, workflow systems, communities)?
- Are the formal / informal communication channels important for CNOs?