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The BFIT Electronic Business Analysis Methodology^{*}

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Abstract

The recent abundance of notorious dotcom failures leads to an acute need for realistic evaluation procedures for the performance of e-business initiatives. This

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paper proposes a structured approach for e-business analysis. The methodology contains three interrelated parts: a structured set of aspects, a set of analysis objectives, and a guiding plan for analysis. The set of aspects is grouped around the BFIT acronym, which stands for Business model, Finances and Information & Technology. These aspects are further decomposed, resulting in an aspect (reasoning) tree. The analysis objectives are related to parts of these reasoning trees. The analysis process follows a step-wise plan, which uses the proposed BFIT tree structure. A Web-based analysis tool was designed to support the BFIT analysis methodology.

Keywords: *e-business, business model, reasoning tree, community, methodology.*

1. Introduction

In the last decade, new technology has been and still is under continuous development to support market transactions and new electronic forms of business collaboration. As a result, many electronic marketplaces in various business and industry areas emerged in recent years. Unfortunately, many of them also failed to deliver profits. It becomes clear that the combination of an order-matching platform, value-added services, and a platform for information exchange and collaboration between partners is certainly not sufficient for all dotcoms to survive. According to Varma (2001), the examination of more than 100 internet companies lead to four of the most important causes for “e-collapse”: a flawed business model, forgetting the customer, overspending on marketing and customer acquisition, and bad management. Therefore, many companies are more reluctant to start or even to join new initiatives.

The complexity of the many interrelated factors that influence the viability of an e-business initiative makes the weighting of these factors very difficult. The difficulty resides mostly in the fact that there are typical features of the e-business environment (like instability, unpredictability), and new behaviour elements in the attitude of the actors involved in this kind of business, that escape the rules and models of the traditional methodologies of evaluation and analysis (e.g. Activity Based Costing, Economic Value Added, Balanced Scorecard, Net Present Value, Customer Lifetime Value etc.). The lack of adequate measuring and control instruments is definitely an important cause of wrong decisions. All the above mentioned facts led lately to an acute need for the elaboration of good evaluation systems including both metrics and methodologies explicitly suited for electronic business. There exist already several attempts to build such systems both in the scientific literature and as commercial software solutions (IMT Strategies (2001), Finneran (2000), Morrel (1997), Remenyi, Money, and Price (2001), Grembergen, and Bruggen (1997), Grembergen, and Saull (2001), Six Sigma <http://www.isixsigma.com>). After an investigation of several business and e-business evaluation systems (see Table 1), we drew a number of conclusions, which

motivated us to define a systematic and structured approach for electronic business analysis. We resume below some of them:

1. Important frameworks start with the definition of a set of **analysis aspects** (e.g. the four “perspectives” of the Balanced ScoreCard - BSC method). As a general remark, these aspects are either related to the department structure of the organisation (e.g. each letter from COPAFIJTH match one of the main departments of a standard enterprise – see Bruin et al. 2000), or to some main types of activities performed inside the organisation (e.g. business processes, learning, knowledge and information management etc.). In some cases, these aspects are further refined in a number of subtopics. The aspects are used as criteria to make classifications of the qualitative and quantitative evaluation instruments, and of a large range of metrics.
2. The types of questions and objectives companies have concerning e-business analysis may be very different. A company, that intends to design and plan a business-to-business project, has different problems to solve than a company that runs an e-marketplace and wants to improve the relationships with its customers. Therefore, some authors emphasise the kind of problems for which their method is fitted. The analysis situations are clustered following typical **objectives**, which trigger them. For instance, the Six Sigma system makes a distinction between two types of objectives: the need for improvement of a current situation and the intention of planning/designing of a new business idea. The BSC method is linked to objectives like management, planning and design of strategies, evaluation.
3. A number of frameworks also refer to the process of performing the analysis itself by indicating a **methodology**. This is the “recipe” for the application of the method, from the definition of the problem/objectives, to the provision of results and solutions. The methodology is usually a step plan, possibly, allowing iterations of some of the steps.
4. All these frameworks make use of a number of mathematical and statistical **instruments** and models (optimisation methods, metrics, means, expectations, process control, critical path methods, simulations, indicators etc.). Their complexity and the level of sophistication vary a lot from one method to another.

Method	Features	Drawbacks
The Balanced Scorecard (BCS) (see Kaplan, and Norton 1996)	<p>Aspects: Four perspectives - financial, customer, internal business processes, learning and growth</p> <p>Methodology: Stepwise plan (see Appendix in Kaplan, and Norton (1996))</p> <p>Instruments: Metrics</p> <p>Objectives: Improvement programs, management, measuring performance</p>	<p>Conceived for business evaluation.</p> <p>The four perspectives are limiting since they are seen as a comprehensive classification for all the considered measures.</p> <p>Ignores aspects like community.</p>
IT-BSC (see Grembergen, and Bruggen 1997)	<p>Aspects: Four IT-BSC perspectives - corporate contribution, user orientation, operational excellence, future orientation</p> <p>Instruments: metrics</p> <p>Objectives: Improvement programs, measuring performance</p>	<p>Has a limited scope:measuring of IT performance in companies.</p> <p>Validation within a small number of companies for the IT department.</p>
Economic Value Added (EVA) (see Stewart 1994)	<p>Aspects: financial</p> <p>Instruments: financial metrics and indicators</p> <p>Objectives: Improvement programs, management, measuring financial performance</p>	<p>EVA is only a financial management measurement system, and ignores all the non financial aspects and metrics.</p> <p>Requires a lot of experience, and equilibrium of the system. Therefore is less fitted for immature and unstable environments like e-business.</p>
Digital Value Added (Stern Stewart & Co., Razorfish Inc. 2001)	<p>Aspects: are called "services": benchmarking current digital initiatives; developing digital metrics, milestones, and valuations; breaking down the barriers to execution; strengthening IT governance processes</p> <p>Instruments: financial and performance metrics</p> <p>Objectives: maximizing shareholder value, planning, prioritizing, and assessing digital initiatives, efficiency, organizational or process changes</p>	<p>The focus is only on financial issues, ignoring important aspects like customer behavior or community.</p>
COPAFIJTH (Bruin et al. 2000, BizzDesign 2000)	<p>Aspects: commerce, organization, personnel, administration, finances, information, legal aspects, technology, and housing</p> <p>Methodology: step plan: define, choose means, model, analyse, and evaluate</p> <p>Instruments: Models, checklists, simulations, quantitative methods (statistics, completion time, critical paths etc.), and metrics</p> <p>Objectives: seize new opportunities, improving service level, efficiency, effectiveness, knowledge management, measuring performance</p>	<p>Developed for analysis and business process redesign of "bricks and mortar" companies.</p> <p>The aspects are less suited for electronic business.</p> <p>Ignores aspects like community, ICT impact and support.</p>
Six Sigma (Harry 1997 http://www.isixsigma.com)	<p>Aspects: customer centric</p> <p>Methodology: roadmaps + "measure, analyse, improve and control"</p> <p>Instruments: Measures, metrics, statistical, analytical, and optimization sophisticated tools (Pareto analysis, cause-effect diagrams, matrix analysis, statistical process control, Taguchi method). Instruments are structured and linked through roadmaps</p> <p>Objectives: Improvement programs, measuring performance, decision making</p>	<p>It is rather directed to quality control, and monitoring in manufacturing processes, than to improvement strategies.</p> <p>Requires a lot of experience, training, commitment of the whole organization, and equilibrium of the system. Therefore is less fitted for immature and unstable environments like e-business.</p>

Table 1: Analysis Methods

In Table 1, we summarise our findings regarding a number of evaluation systems in relation with the previous remarks. We have to stress that the list below is far from being exhaustive. However, the reader may find interesting supplementary information on commercial solutions on metrics, problem management, and decision support tools at <http://www.concentricmc.com/toolsreport/report.html>.

Our goal in performing this brief survey was to provide the background for our research. This survey also revealed that most of these methods have certain strengths and limitations as well. The strengths reside in features like broadness (BSC, COPAFIJTH), statistical and mathematical support (EVA, SixSigma), or sophistication (SixSigma). The limitations are in principal derived from the original purposes of the investigated frameworks (e.g. applicability limited to physical organisations or to a specific business domain). The e-business analysis framework we propose in this paper tries to overcome such constraints, in at least two ways. First, the framework was developed in the context of e-business, and therefore it takes into account the particularities of this business area. Second, it strives to be comprehensive, by considering various business domains and analysis situations. The framework is built around three main interrelated components: a structured set of analysis **aspects**, a number of classes of analysis problems - called main analysis **objectives** (e.g. effectiveness improvement, relationship enhancement, knowledge management improvement, etc.), and a step-wise **methodology**.

The structured set of aspects is the result of collecting and ordering aspects found in literature (see for example Kaplan and Norton (1996), Bruin et al. (2000), Österle, Fleisch and Alt (2000) and on reference models (Iacob & Smit, 2001). It is organised as trees around three root elements: the **B**usiness model, **F**inances, and **I**nformation & **T**echnology (**BFIT**, to be pronounced as “be fit”). The arguments for selecting these elements are explained in Section 3.1.

Within the BFIT structure we also indicate the **instruments** (such as questionnaires, checklists, models, etc.) used to analyse these subaspects. The structuring of aspects and objectives alone is not enough, because the set of aspects might be too large to handle. A selection process of reducing the number of relevant aspects and sub problems and the process of obtaining the results of analysis has to be undertaken. This is where an *analysis methodology* may guide the analyst in a structured (step by step) way to the fulfilment of this process of gathering analysis results.

This paper is organised around the previously mentioned components of the BFIT framework (see Figure 1).

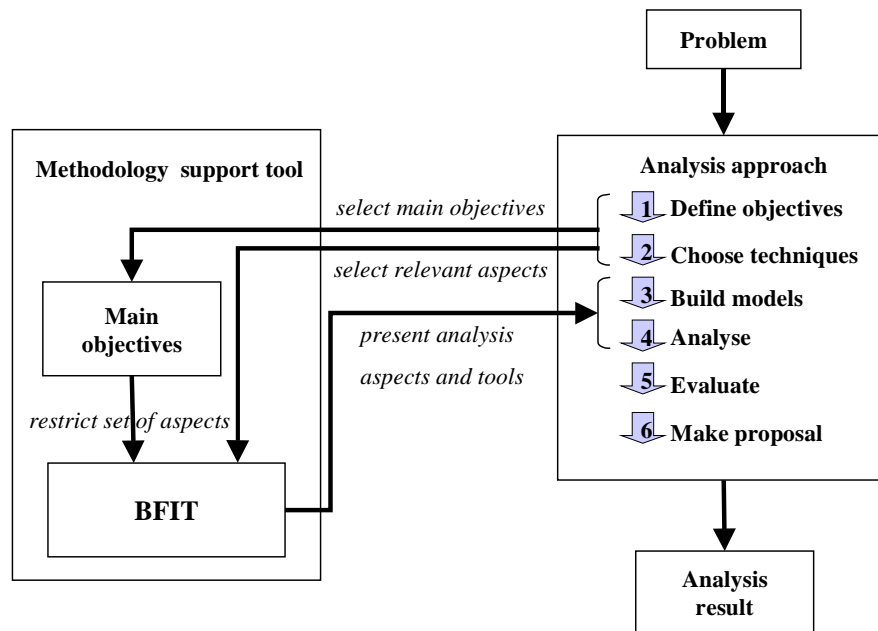


Figure 1: The BFIT Analysis Methodology

An analysis project is triggered by the awareness of a problem. One of the first steps is the definition of the objectives. In Section 2, we cluster such objectives into a number of classes, called main analysis objectives. The selection of the main analysis objectives restricts the set of BFIT aspects to be considered. Still, this set of aspects may be too large and a further reduction of aspects and related analysis tools is needed. The ideas behind the BFIT structure, and the practical use of it is the subject of Section 3. The analysis approach, which guides the analyst from the initial problem to the analysis results (via the BFIT) structure, is described in Section 5. In Section 6, we describe a Web-based analysis tool, which supports the BFIT analysis methodology. Finally, in Section 7 we give some conclusions and indications for future work.

2. Main Objectives for Analysis

The way an e-business initiative is evaluated can vary a lot, depending on the perspective one takes (e. g. seller, buyer or intermediary perspective), and on the goal one has. For instance, from the seller's point of view one can evaluate the relation with customers, and the possibility of establishing relations with other potential customers. From the buyer's perspective the information about suppliers, about the costs of co-ordination in case of outsourcing, and about products and

prices in the market can be essential in decision making. From the intermediary's point of view (e.g. the market operator or the "trusted third party") an issue of major importance is the ability to provide a secured and trusted business environment. Another important matter for the owner of the business is a realistic and correct valuation of the profitability, and effectiveness.

Another argument, which should be taken into account, is that in an every day situation the actors interested in triggering such an analysis are motivated by some very specific problems. They will show, from the very beginning, the reasons why they are requiring it, and what they expect from it. Thus, they will present to the analyst a set of questions, which usually refers to **evaluation** of a current situation, or to some intended **improvement** of a particular business situation. Since it is completely unpractical to define for each problem a methodology, our idea is to cluster the whole set of practical analysis problems. We are doing this by establishing a correspondence between these problems and a number of standardised analysis objectives. In this way, the analyst phrases his problems in terms of one or more general analysis objectives. In fact, this operation can be seen as the inclusion of a certain problem in one (or possibly more) class(es), each defined by a general objective.

In

Table 2, we propose a list of general objectives that cover a large range of operational analysis requirements.

Analysis objective	Description
Start-up evaluation	Design & planning of an e-business project/business model
Functional evaluation	Characterisation & positioning of a web company, possibly including a performance and financial status report
Effectiveness improvement	Identification and improvement of critical processes for the fulfilment of the business objectives.
Efficiency improvement	Improvement of the resource usage, such that the business objectives will be reached with the minimal possible cost.
Exploiting new opportunities	Analysis and improvement of the market behaviour from the point of view of new opportunities (being in the right place at the right moment) and new threats, innovation.
Relationship enhancement	Improvement and analysis of reputation, branding, integrity, certification, relationship with users/customers, underlying interorganizational network flexibility (modularity, use of open standards, switching easily)
Knowledge management improvement	Identification and analysis of available, and required knowledge assets (such as knowledge about market, product, users, technology, and competitors), and knowledge asset related processes (such as developing, preserving, using, sharing and protecting knowledge), and the subsequent planning and control of actions to develop both the assets and the processes in order to fulfil business objectives.

Table 2: Analysis Objectives

3. BFIT: Structured View on e-Business

3.1 What is BFIT

Below we describe the path we followed when defining the BFIT framework. The ideas behind BFIT are certainly not revolutionary. In fact, at a closer examination one can recognise in BFIT elements from two existing business analysis methodologies, COPAFIJTH and BSC, which inspired us. However, the novelty of BFIT resides in the way these elements were redefined, refined, and organised to cover the circle of problems surrounding the e-business environment.

COPAFIJTH stands for Commerce, Organisation, Personnel, Administrative organisation, Finance, Information, Legal aspects, Technology and Housing. The idea of the COPAFIJTH methodology was that consequences of changes should be assessed in the perspective of all nine aspects represented by this acronym (see Bruin et al. 2000). Thus, COPAFIJTH was primarily developed for business process (re)design: optimising and changing internal business processes. For e-business, the approach must be different. It might appear that this statement is too strong, since an e-business process still is a business process, and consequently the simplest way to analyse it would be to use the very same techniques as the ones indicated by the COPAFIJTH methodology (see BizzDesign (2000)). This argument partly stands if one thinks for instance at the evaluation of the financial results of a dotcom. It can be done using classic techniques, and financial metrics and indicators. The situation changes drastically, if one tries to explain the financial results and to find the causes leading to them, using the other elements of COPAFIJTH. This happens for a simple reason: the different nature and the new features of e-business induce a change in the nature and the relevance of these elements. For instance, housing or personnel are less important in e-business. Instead, information and technology together are the means through which a business model becomes e-business, and therefore their importance for analysis is definitely higher. In our view, the classical concept of enterprise organisation is transforming into a very complex network structure, fluid and flexible, resembling to (and therefore called) a community. Also, in e-business an important part of the legal aspects are partly embedded in the capabilities of the technological platforms (e.g. trust & security services, electronic contracting tools, international trade services etc.).

Another important analytical approach is the balanced scorecard, with four perspectives: financial, internal business processes, customer, and learning and growth. The main difference between the two approaches is that the balance scorecard is focusing mainly on the strategic objectives and measures of a business organisation, while COPAFIJTH is developed around the structure of activities/departments of an organisational business unit. Still, there are many common points. For instance, the financial and the business process issues in both approaches have a special emphasis. The information, communication and

technology issues, although considered, occupy a secondary place. That is understandable, for at least two reasons. First, historically, both methods appeared before the explosive growth of the Internet, and therefore, before the development of various new forms of e-business, and second they are both designed for business units, and not for networks of business units. When discussing such networks, Fleisch and Österle (2000) proposed a three-level process-oriented framework for business networking: a strategy level, a process level and an information system level. Since their framework is not meant to be an evaluation framework it does not refer at all to financial issues. Instead, it reveals the importance of networking in business co-ordination.

Based on observations concerning the COPAFIJTH analysis (Iacob, Boekhoudt and Fielt (2002), Bruin, et al. (2000)) and the BSC analysis (Kaplan and Norton 1996), we consider the following elements to be central: the **B**usiness model, **F**inances, and **I**nformation & **T**echnology (BFIT).

The Business Model. We use the definition of Timmers (1998) for the concept of business model. It consists of:

- An architecture for the product, service and information flows, including a description of the various business actors and their roles; and
- A description of the potential benefits for the various business actors; and
- A description of the sources of revenues.

A business model analysis assumes the description and refinement of all these aspects. We group them into two main subjects: *the business blueprint*, and *the community*.

The business blueprint refers to a number of key issues like focus and positioning, transaction and pricing models, and revenue model. The community subject gathers the problems concerning the actors playing a role in the community surrounding a functional web company. It concerns partners, ownership, actual and targeted customers (buyers, sellers, end users) community building strategy, geographical covering, competitors, collaboration aspects, and advertising model.

Finance. In many cases, one can judge accurate enough the healthiness of a business initiative by analysing its financial history. It is an obvious matter that malfunctioning will, very probably, influence the financial figures. The means to accomplish such a financial valuation are rather classical, and are based on a number of well known financial instruments like: costs vs. revenues, ROI analysis, calculation of financial metrics, volume of sales, market analysis, stocks quotes. The financial results are likely to indicate a needed change. However, these are susceptible for manipulation and misinterpretation, and therefore, the truthfulness of the financial figures must be checked through indirect evidence and other non-financial indicators. This is in fact the most important idea promoted by the BSC, which we adopted for BFIT. Apart, from financial measures BSC proposes a multidimensional scorecard with three non-financial perspectives (see Kaplan and

Norton (1996)). Other shortcomings are that most of the existing financial metrics concentrate on accounting measures and have serious limitations in the context of the Internet. To remedy this, Stern Stewart and Razorfish Inc. propose a “digital” version of the EVA system (DVA), by identifying metrics, milestones and value drivers appropriate for digital initiatives. According to Stern Stewart & Co., Razorfish Inc. (2001), this “allows management to adjust strategy quickly in response to market fluctuations”.

Information & Technology. Although it has a strategic position in e-business, IT alone is not a strategy. It should be perceived only as an enabler of the business model. It is true that costly IT investments can create more attractive opportunities, but these opportunities do not become reality unless the business goals are realistic. Therefore, IT should support these goals and not the other way around. The problems addressed by this component must be examined from the perspective of how their solutions might contribute to the fulfilment of business strategy. Such problems refer to the choice of a technological commerce platform, to the adoption of standards, to security, to application-service provision, to a good differentiation of value added services, or to collaboration with customers.

It is an obvious matter that the BFIT elements are important. However, there are two questions still unanswered: First, *why B, F, and IT?* We have already explained the necessity of considering the financial and IT aspects. The rest of the answer concerns the business model component and its relationship with the COPAFIJTH letters, and the BSC perspectives. As we see it, the business model in BFIT covers partially most of the topics addressed by the letters C, O, P, A, J and H. However the correspondence between the business model component and these letters is not one-to-one, because the importance and the meaning of some of these letters have changed, and because legal and housing (to be rephrased in hosting) are issues shared with the IT aspect of BFIT. With respect to BSC, we see a clear correspondence between the business model and two perspectives: the internal business process perspective (embedded in the business blueprint) and the customer perspective (covered by the community component). Second, *are B, F, IT sufficient?* To answer we paraphrase Kaplan and Norton (1996): they should be considered a template not a strait jacket. No mathematical theorem exists to prove that they are necessary and sufficient. A validation across several e-business projects is required before their completeness can be assessed. One can judge how sufficient these elements are only after establishing if the range of problems that can be covered using these elements (see Section 3.2) is sufficiently large. Even though, the refined structures we are proposing in the next section are open for future developments.

3.2 The BFIT Reasoning Trees

The three elements of BFIT themselves do not provide yet an operational approach to e-business analysis. In order to add operational value to these key elements, we

associate them to the concept of reasoning tree. A reasoning tree (see Bruin et al. (2000)) is a directed tree in which each node represents an analysis element, and each edge describes a “decomposition” relationship of the parent node into derived children nodes. The idea behind decomposition is, to split a difficult parent aspect (problem) into smaller and easy to capture children aspects (problems) and to aggregate the results of the parts for the solution (or understanding) of the whole. In fact, this decomposition relationship should not be interpreted too strictly. The meaning of such a relationship is that the child node is a component aspect of the parent, or can be significant for the analysis of the parent.

The first step is to define such a reasoning tree for each root element in BFIT. In this way, we not only refine the BFIT elements by building collections of important analysis areas (located in the nodes of the tree), but also we show how they are related. The interdependencies between these elements are essential for the discovery of all the elements causing a certain malfunctioning, and further on for the evaluation of the nature and range of the improvements that must be accomplished in order to solve the initial problem. The idea behind the BFIT collection of reasoning trees is to provide a structured collection of general analysis topics. In order to increase the practical value of these trees we associate some of the nodes with sets of analysis methods, that we consider adequate for that node. We divide the analysis methods into two categories: model-based analysis methods and non-model-based analysis methods. Model-based analysis methods can relate to techniques based on Petri Nets, but also to other existing modelling methods. The non-model based analysis methods relate to techniques such as questionnaires, checklists, best practices, interviews, brainstorming sessions, financial, statistical, and risk analysis etc.

So far, we presented the BFIT methodology as a generic tool of e-business analysis, without putting any emphasis on particular business models for which it would be applicable. This is generally true. However, the needs of the project, which supported our research, imposed an orientation of the research toward electronic marketplaces. Hence, the BFIT reasoning trees were designed primarily for this business model. This is not necessarily a disadvantage. Since we are working with a tree structure, it is very well possible to add to BFIT new nodes/aspects, to make it suitable also for other types of business models.

The complete BFIT structure for e-marketplaces is depicted in **Figure 2** (for more detailed information see Iacob, Boekhoudt and Fielt (2002)).

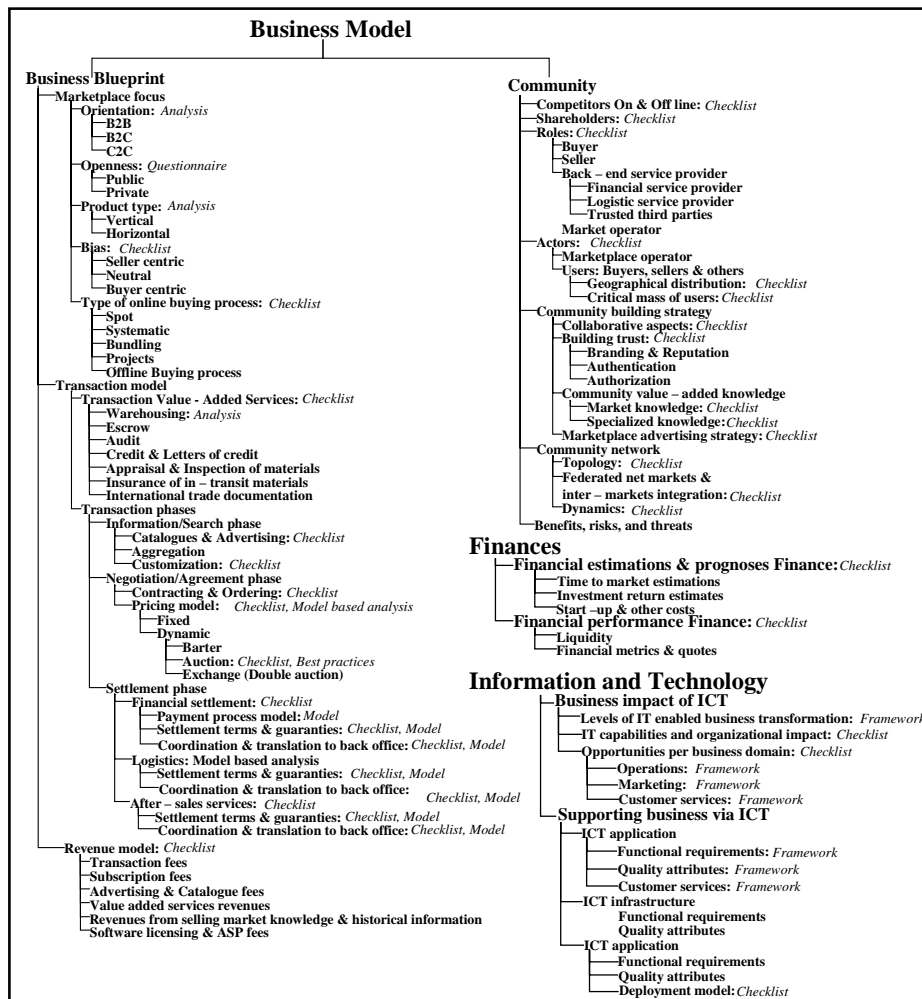


Figure 2: The BFIT structure

4. Relation of BFIT to the General Objectives

So far, we have done two things. On one hand, we defined a structured way to look at e-business through the BFIT reasoning trees, and on the other hand, we defined a number of main types of analysis objectives.

It is obvious that although BFIT has the advantage of a clear structure, its broad character makes it hardly usable in a concrete analysis case. That happens mainly because BFIT covers a large range of topics, most of them irrelevant in a particular situation. The question is then, how to select from the whole structure only those

aspects that are worth to be analysed. The solution we propose combines the BFIT structure with the operational character of the general objectives. It sees BFIT as a collection of structured information and it uses from BFIT only the parts (sub-trees) related to a particular objective. This is carried out, by recommending a limited set of BFIT nodes suited for each general objective. Therefore, even if the problems presented to the analyst are very specific and phrased differently, it is important that they are translated in terms of general analysis objectives.

Let us assume that the analyst sees a given analysis problem **P** as falling under the requirements of the general objective **O**. Then, the first step in building a reasoning tree for **P** is to “import” from BFIT the subtrees rooted in the recommended nodes for the objective **O**. Once the subtrees are selected, they can be united under one root, namely the objective **O**. Thus, a single tree, fitting the whole class of problems categorised as targeting the objective **O**, has been built. As an example, the reader can see in **Figure 4** a screen shot of the recommended reasoning tree for the *effectiveness improvement* objective.

The next phase is the transformation of this tree into one tailored for **P**. This process should be in accordance with the original setting of problem **P** and its limiting conditions. It consists in navigating inside the reasoning tree, from one node to another, and in assessing the relevance of each node. Once a node is considered to be irrelevant, the whole branch rooted in that node will be eliminated. The completion of this elimination process is resulting into a collection of narrowing paths from the general analysis objective (root) to all the leaves that are worth to be analysed in the light of objective **O**, mapped into the particular settings of problem **P**.

We cannot end the presentation of the BFIT framework without adding some comments. First, there is a risk that the objective reasoning trees we recommend might be sometimes too large for a concrete problem. They are, however, meant to offer guidance for the use of the BFIT structure by making a first selection of relevant aspects. Of course, it might also happen that, for some reason, these trees are considered by the analyst as being not appropriate in a certain analysis situation. One motivation for such a conclusion the analyst might find in the fact that he is not able to match his problem with one of the main analysis objectives we are proposing. Then he can define his own analysis objective and he can build for it the right reasoning tree by simply choosing from the BFIT collection of trees the ones he considers relevant. Of course, the selection is subjective and depends on the experience of the analyst.

5. The BFIT Analysis Methodology

Many authors have asserted lately that analysis and performance measuring is essential, for any e-business, when considering new commercial opportunities, or changes in the existing business model. In fact, there is evidence that most of the

dotcom failures were caused by disregarding these techniques as a prerequisite for important managerial decisions, otherwise acknowledged as common practice in “brick and mortar” companies. Typical examples of such decisions refer to new alliances/partners, investments, adoption of new technologies, or changes in the transaction process. The results of analysis, should point out the weaknesses and the strengths of several alternative scenarios (if possible), and should accurately stress the costs, risks, profits, and other benefits on long and short term for any decision. In this section we propose an analysis approach which guides the analyst from a clear formulation of the analysis objectives (Section 2) to the final result of the analysis project (which often will be a final report with conclusions and recommendations). An impression of the step guiding-plan is given in Figure 3. Each step has been associated with a set of input artefacts (the outputs of the previous or earlier steps in the analysis process), a set of means (that support the analysis step) and a list of roles that are involved in the execution of this step. By proposing this six-step plan, we do not exclude the possibility of reiterating some (or even all) steps in this plan if necessary.

In the sequel, we will give a separate description of each step in the plan.

Step 1: define objectives

Most analysis projects start with a rather vague notion of the objective of analysis. Therefore, the first step that is needed is a clarification of ambition and scope. This should be done in order to: understand and elaborate the general problem, define the objective, and specify the actors, roles, processes, flows (money, goods and information) involved in the analysis. The first step requires some activities that deal with the positioning and narrowing of the scope of the analysis project. These preparatory activities include:

1. *determine the general goals of the analysis*
2. *determine critical success factors of the e-business*
3. *determine indications of sub-optimal functioning*
4. *determine constraints and preconditions*
5. *evaluate the feasibility of the analysis*

At this point the actual analysis process starts. The analysis may be guided by a project plan, which contains elements of the previous preparatory activities, a time schedule, a set of predefined deliverables, a communication and control structure, a budget and a resourcing plan.

6. *refine the improvement objectives:* The general analysis goals that were identified in activity 1 have to be refined in order to be concrete enough for further analysis. For the refinement of the general objectives (Section 4) we propose for each objective a selection of relevant BFIT aspects. Of course, if the analyst considers other aspects relevant, he should include them in his reasoning tree as well. The choice is facilitated by the use of the BFIT analysis tool that was developed (see Section 6 for a discussion of this tool). The tool

assists the analyst in performing a systematic and documented selection of appropriate analysis aspects and related techniques.

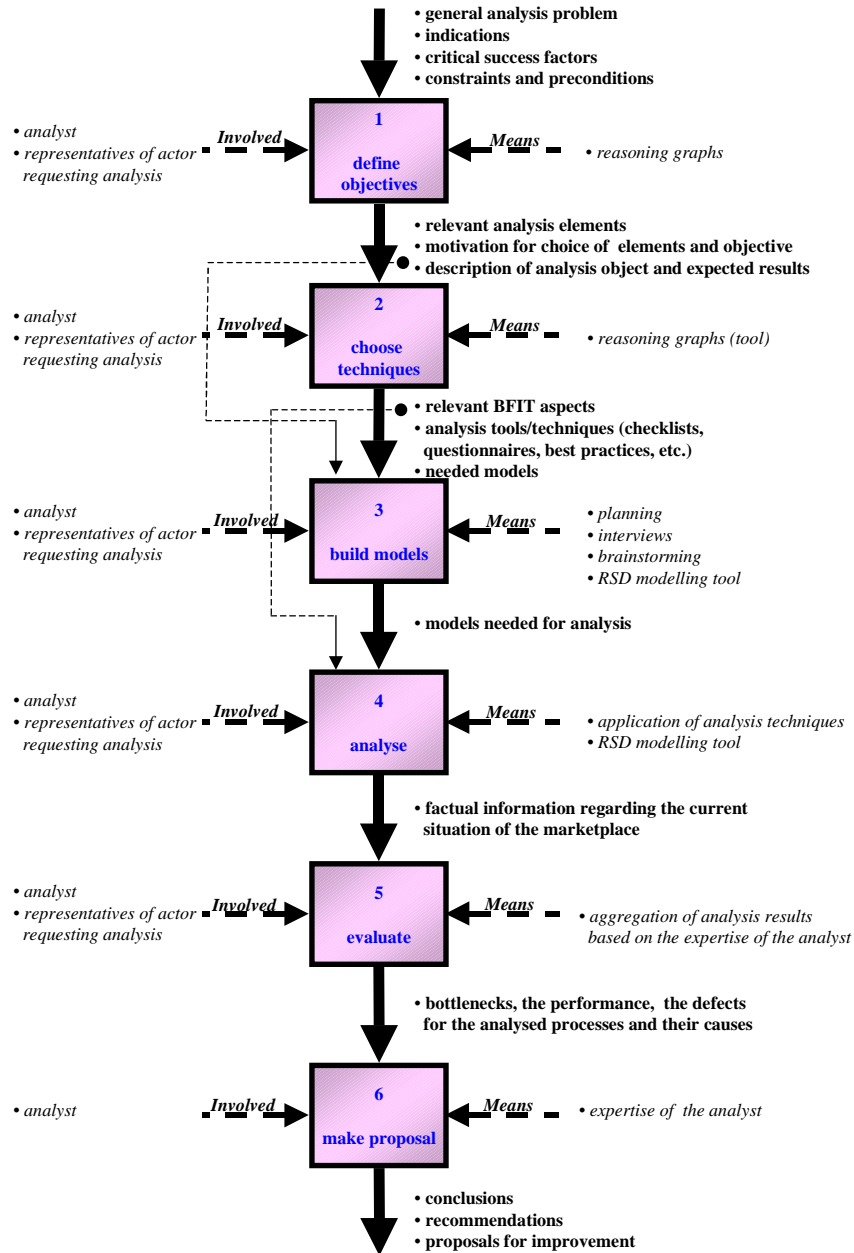


Figure 3: Step Guiding Plan of BFIT Methodology

7. *describe the analysis object and expected analysis results:* The analysis object is that part of the real world that will be subjected to the BFIT analysis. The following questions should be answered:

- a) What type of e-business is subject of analysis? This question relates to the analysis of the business blueprint.
- b) Which functions or services and which business processes are analysed?
- c) What flows of goods, money and information (interior and exterior) are analysed?
- d) Which involved actors and roles are subject to analysis?

Finally, this step should result in a clear statement of the *expected results of the analysis* in order to guide the analysis towards a final deliverable.

Step 2: choose analysis techniques

In this step, concrete methods of analysis are identified. Each of the elements of Step 1 must lead the analyst to appropriate analysis methods, by getting deeper inside the reasoning tree. In nodes, the appropriate analysis methods associated to the followed path should be found. We distinguish two types of analysis: model-based methods and non-model-based methods. Examples of model-based analysis methods are completion time analysis, throughput analysis, cost analysis, resource utilisation analysis, quantitative simulation, model checking, and process simulation. The non-model based methods refer to other tools such as interviews, brainstorming sessions, best practices, checklists, questionnaires, and other quantitative or qualitative analysis techniques. It is important that choices are documented and argued, in order to allow reconstruction or re-use of the analysis process.

Step 3: build models

The models that were identified for model-based analysis in the previous step now have to be built. Our choice was to use RSD Studio, which is a graphical modelling tool for business-to-business modelling (developed in the Giga Transaction Services project). Modelling is labour intensive and requires different types of means, such as workshops, interviews and any other documentation (e.g. reference models) to ensure that the result reflects reality at the right level of abstraction.

Step 4: analyse

In this step, the analyst will apply the model-based and non-model-based methods identified in Step 2. This step results in factual information regarding the current situation of the e-business initiative.

Step 5: evaluate

In this step, the facts found from the analysis (Step 4) are related to the objectives of analysis (Step 1). This step should highlight the bottlenecks, causes of problems and

the performance of the analysed processes. In co-operation with the stakeholders, the acceptability of the results is assessed and priorities will be assigned.

Step 6: make proposals

In this step a final document and (or) a presentation have to be prepared that assemble the results of the analysis and give the conclusions and recommendations. The analysis project is concluded by the acceptance of the deliverables by the stakeholders.

6. BFIT Analysis Tool Support

In this section, we will briefly describe a software tool, which supports the BFIT framework. Our intention was to create a Web-enabled tool that can be accessed from within a Web-browser.

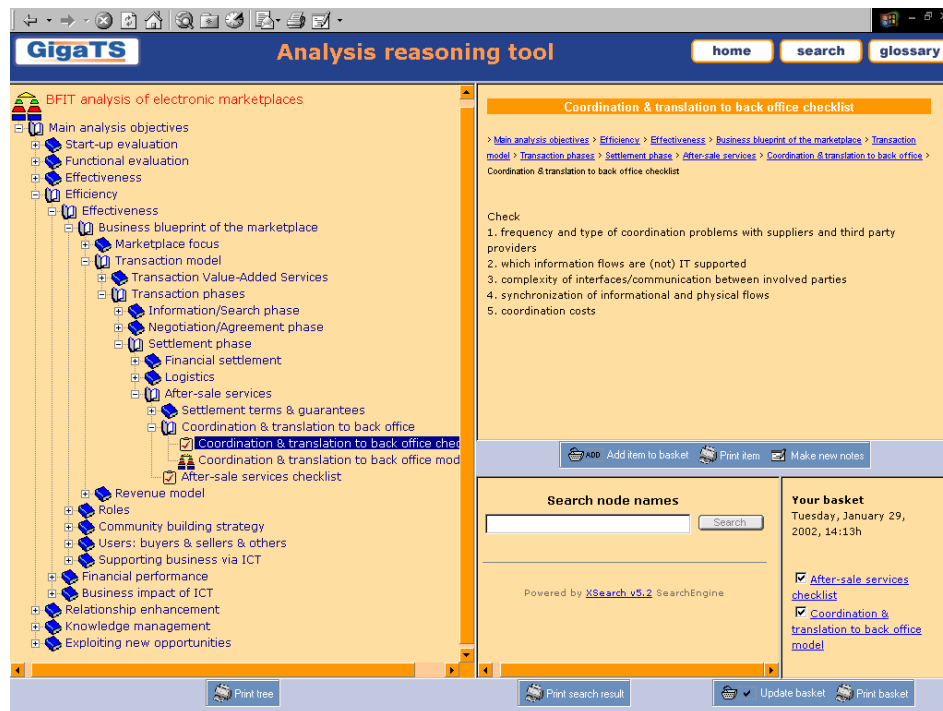


Figure 4: Web-based BFIT Analysis Tool

The tool enables the analyst to build a reasoning tree for the analysis he is performing; which aspects are relevant for the current analysis and why they are relevant? The tool does not automatically generate the next step, but gives the analyst options that he might consider; he has to weigh the options and to make the

decisions. Also, it systematically guides the analyst to the analysis tools he needs. The interface of the tool is almost self-explanatory (see **Figure 4**). The left panel depicts the tree structure and is used for navigation. Mechanisms like colouring should help the user to keep track during navigation. By clicking on a node, the description of this node will be given on the right. This description may be an explanation of the node or it may contain an analysis tool, e.g. a checklist. Those items that are found interesting for later use can be collected in a “basket”. This basket contains links to the nodes and their descriptions. The basket can be updated and the results will be saved for a next session.

The tool works with Microsoft Internet Explorer and is publicly accessible via http://portal.demo.telin.nl/em_analysis/.

Further functional extensions of the tool are under development.

7. Conclusions

The methodology we are proposing provides a structured view of the characteristics and components of electronic business. Our intention to design a structured approach for analysis was not restricted to the topics we covered by the means of the BFIT reasoning tree. We also attempted to define some structure in the way of performing the analysis process itself.

One of our concerns was to check the validity and usefulness of our method. To this purpose, we performed a set of interviews with experienced consultants who participated in e-business projects. Below we will comment on the conclusions drawn from these interviews. The first type of conclusions mostly characterises the BFIT approach, as our interviewees have perceived it. The second group of conclusions resumes their suggestions for further improvements of the analysis methodology. We will include these ideas in our plans to continue the research in this topic. Finally, we will give our opinion on future developments of this work.

Characteristics of the BFIT approach:

- The BFIT structure appeared to be comparable with the Balanced Scorecard. One remark was that BFIT misses the “customer view”. Indeed, in our approach the customer related aspects are not presented as a separate “view”. They are considered as a part of the business model, and moreover they are integrated with the overall circle of problems surrounding an e-business community. In fact, as Bontis et al. (1999) noted, one of the weaknesses of the BSC is that it resumes all the consideration to the external environment to customers, by ignoring relationships with other actors like alliance partners, community, final consumers etc.
- The BFIT aspects reveal the three roles (types of professionals) involved in an e-business analysis (IT, financial analysts and business specialists).

- BFIT might help companies and smaller consultancy firms to develop or evaluate business models.
- BFIT gives an appropriate way of solving problems: splitting difficult problem in smaller pieces and aggregating results.

Suggestions for future work:

- Make more extensive use of the standard business model ingredients (market analysis, customer analysis, value chain, operations (resources), finance).
- Make the whole approach more dynamic and customisable (knowledge management system), for instance by indicating particular business models, typical problems associated to these models, and ways to analyse and solve them.
- Add indications of the required time/resources for performing a particular analysis.

Our intention is to keep BFIT as an open structure. When defining BFIT, we focused especially on electronic marketplaces. Still, we believe that it can be placed in a larger context, namely the context of general networked enterprises (see Steen et al.2000, Boertien et al. (2000)). Of course, in this case, the BFIT collection of trees must be extended with new specific elements concerning other forms of electronic business collaboration, such as: characteristics of networks of organisations (see Nohria and Eccles (1992)), co-ordination and co-operation issues (Bakos and Brynjolfsson (1997), Klüber (1998)), centrality and control (Jägers et al. (1998)) etc.

Finally, the tool support, presented in this paper, can be the nucleus of a complex analysis instrument. In order to achieve this status we will implement new features and some of the most practical analysis methods and indicators. Moreover, the BFIT tool and methodology is currently tested and validated within the iMPact project, which aims to offer knowledge, means and guidance for the Dutch small and medium enterprises, in making informed decisions regarding the suitability of conducting business via electronic market places. The project is part of a broader initiative of the Dutch Ministry of Economic Affairs - “Nederland gaat digitaal” (The Netherlands go digital), targeting a large number of branch organisations and around 700000 SMEs.

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