European
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# Balanced IT Scorecard Description Version 1.0

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# EXECUTIVE SUMMARY

Based on the belief that *"nobody invests in software process improvement solely for the sake of improving"*, ESI has integrated the SPICE (ISO 15504) reference model for Software Process Improvement into the Balanced Scorecard Management model first published by Kaplan and Norton in the Harvard Business Press (Jan – Feb 1992). The merger of these two *"world class"* standards has given birth to the "ESI Balanced IT Scorecard – A Framework for Action". This framework is presented in the form of a generic model, a methodology for adapting the model to the specific needs of a software unit and a set of tools to support the construction of the unit's specific balanced scorecard management tool.

This document presents the components of ESI's Balanced IT Scorecard, their intended usage, who are the potential users and organisations for which this instrument is designed for and the set of services ESI offers for supporting its application.

The development of a Balanced IT Scorecard and its application in a Software Producing Business Unit (SPBU) provides the following benefits:

- used by managers when translating the SPBU's business goals and strategy into a set of interrelated indicators for managing the performance of the operational unit
- supports the identification of where there is need for investment in software process improvement in order to address the achievement of the strategic goals
- supports monitoring of the technical software process improvement and the return on these investments in business terms
- used as an instrument to communicate the strategy throughout the management structure of the organisation. This will facilitate both an enhanced initiation of Software Process Improvement and create a more stable environment for project management.

When considering the application of the Balanced IT Scorecard in an organisation, managers should ask themselves the following questions:

- What is the value of software development to your organisation?
- How do software processes impact on the customer and finance business goals?
- Are your software processes aligned with your long-term business objectives?
- Can you identify what improvements are needed and where they are needed?
- Have you identified quantifiable indicators for your core software processes and linked them to business indicators?

Difficulty in answering these questions may be an indicator that you need to balance measurements for tactical feedback and control of short-term operations with measurements for demonstrating the impact that software process improvement has on long-term strategic business objectives.

# 1. THE USERS

## 1.1 Who should use it?

The Balanced IT Scorecard is intended to be used by Software Producing Business Unit (SPBU) managers when translating business strategy and goals into a set of interrelated indicators for managing the performance of the business unit.

The process of designing the Balanced IT Scorecard (BITS) provides insight on where there is need for investment in software process improvement in order to address the achievement of the strategic goals.

The BITS is an instrument to communicate the strategy throughout the management structure of the organisation. This will facilitate both an enhanced initiation of Software Process Improvement and create a more stable environment for project management.

BITS supports monitoring the performance of the software process improvement programme and the impact of the improvement programme in business terms.

## 1.2 What does the target organisation look like?

The Balanced IT Scorecard is specifically designed for Software Producing Business Units. A Software Producing Business Unit (SPBU) is defined as an independent software producing organisation, a unit thereof, or a division or department in a software "user" organisation like a bank, insurance company, manufacturing company or a trading company, which manages and reports on its financial performance, covers the marketing functions, produces software and manages the infrastructure to support the adequate functioning of the business unit.

The Process Perspective of the Balanced IT Scorecard is limited to Software related Processes. For the definition of scope and coverage we adhere to the definition provided by SPICE (ISO 15504).

The application of the technology will support the identification of the SPBU's core software processes and the quantitative understanding of the performance of these core processes. In addition the organisation must have an understanding of the targeted customer segments as well as of the most critical success factors in these segments.

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# 2. THE COMPONENTS

The ESI Balanced IT Scorecard is made up of the following components:

- The ESI Balanced IT Scorecard Generic Model
- The Method

Additional support material has been developed to support third parties implementing the technology in their customers' sites

## 2.1 ESI Balanced IT Scorecard Generic Model

### 2.1.1 What is it?

ESI has adapted the Business Balanced Scorecard, first published by Kaplan and Norton in the Harvard Business Press (Jan – Feb 1992), to suit the quantitative management of Software Producing Business Units (SBPU). The Business Balanced Scorecard looks at the performance of a strategic business unit from four different perspectives (financial, customer, internal processes and learning & growth).

The Generic Model defines for each of these perspectives a set of generic goals, related drivers and significant indicators which meet the special requirements for monitoring the SPBU's performance.

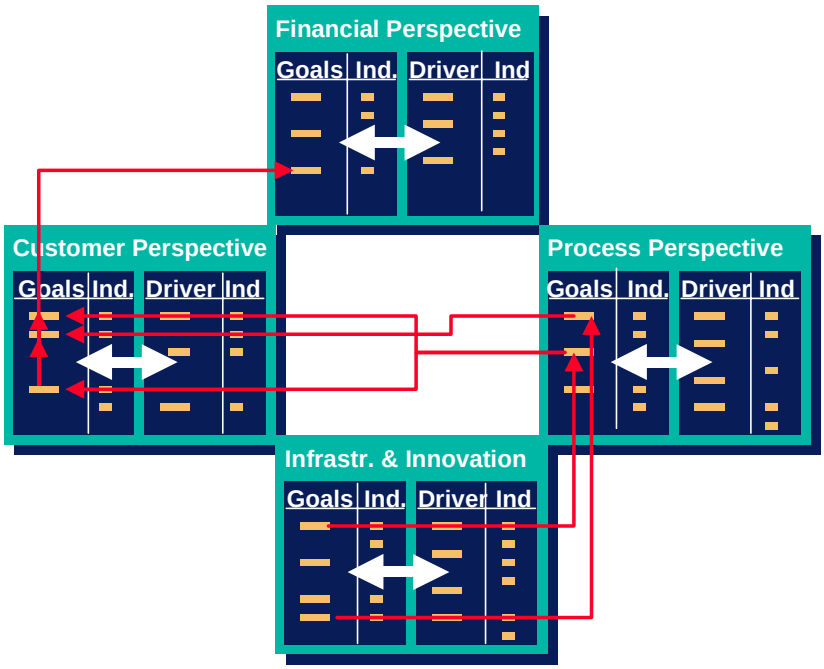


Figure 1 – ESI Balanced IT Scorecard

### 2.1.2 How should it be used?

The underlying assumption is that the set of generic goals for each perspective, as well as the related (lag-) indicators, meets the needs of most SPBUs. This means that SPBU managers should be able to map their specific SPBU goals to the generic set of goals. The initial set of drivers as well as the related (lead-) indicators provide a starting point for identifying the potential positive factors supporting the achievement of these goals and how to measure this influence.

When identifying the SPBU strategy and goals this generic model will serve as a roadmap supporting the definition of strategy and goals. The indicators serve as checkpoints on the way to achieve these goals. The initial set of drivers is used to facilitate the decision process on which factors are supposed to contribute to the success of the strategy.

The Generic Model is adapted to the specific needs of the organisation. This process of using the Generic Model and of adapting it is described and supported by the Method.

### 2.1.3 How does it fit/compare to other approaches?

**European Foundation for Quality Management (EFQM)**

The EFQM model assesses an organisation's progress along the path to "excellence" based on 9 criteria: 5 on the enablers side: "Leadership", "Policy and Strategy", "People Management", "Resources" and "Processes", as well as 4 on the results side "Customer Satisfaction", "People Satisfaction", "Impact on Society" and "Business Results". The results indicate what the company has achieved and is achieving; the enablers indicate how those results are being achieved.

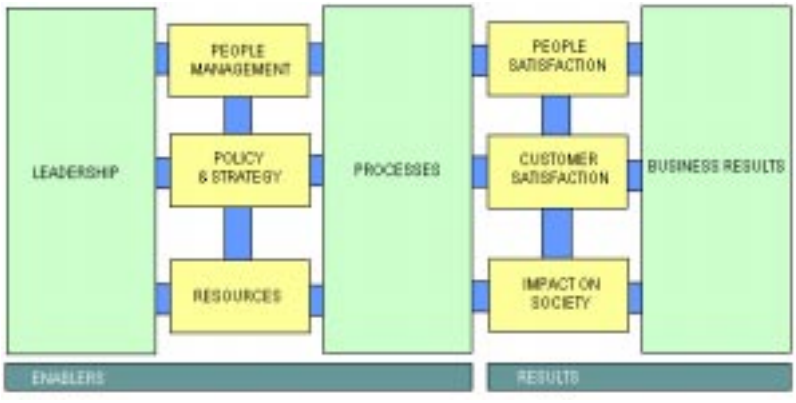


*Figure 2 – EFQM Model*

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### Malcom Baldrige

The Baldrige Award or Baldrige Management Model is based on performance excellence criteria. Organisations use the criteria to assess the condition of their current management system, identify strengths and areas for improvement, and plan an organisation-wide course of action. As the model below shows, the criteria cover every aspect of running a business.

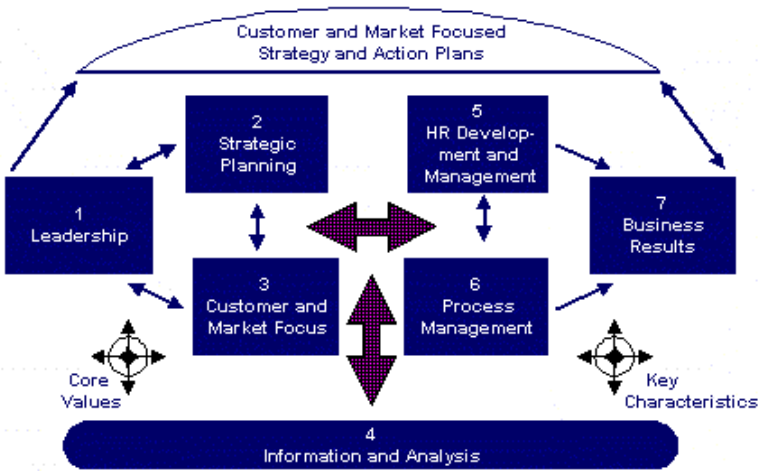


*Figure 3 – Baldrige Management Model*

In addition to the EFQM model the Baldrige Management Model provides a set of core values and concepts. These values and concepts are the foundation for integrating key business requirements within a results-oriented framework. The core values and concepts are: Customer Driven Quality, Leadership, Continuous Improvement and Learning, Employee Participation and Development, Fast Response, Design Quality and Prevention, Long-Range View of the Future, Management by Fact, Partnership Development, Company Responsibility and Citizenship, Results Focus.

In both models the achievement of excellence is related to the principles of TQM. When applying for the EFQM/Baldrige award or participating in benchmarking, the TQM principles represented by the models are used as the reference framework towards measuring your company or comparing it to your competition.

The various criteria in the EFQM and Baldrige models do not sufficiently provide a consistent approach to cover the potential business goals of a SPBU. These criteria instead serve as a indicators of where to look for further improvement, assuming that there is a cause-effect chain between the enablers and results components of these models. But these relationships are not explicit enough to provide a means for monitoring the return on investment of the software process improvement.

The Balanced IT Scorecard, in principle, does not make any use of a reference framework[1]. It focuses on the organisations own strategy, the specific critical success factors and the goals to be achieved. It provides guidance to break down this strategy from the output side (financial and customer performance) to the enablers (internal software processes and the capability to learn and grow).

Nevertheless the EFQM model does provide a consistent set of business goals whose achievement could be enhanced through the use of a Balanced Scorecard approach. Future work at ESI will focus on establishing this link between EFQM and BITS.

## 2.2 Method

### 2.2.1 What is it?

The method describes how to apply the ESI Balanced IT Scorecard Generic Model for constructing the SPBU scorecard.

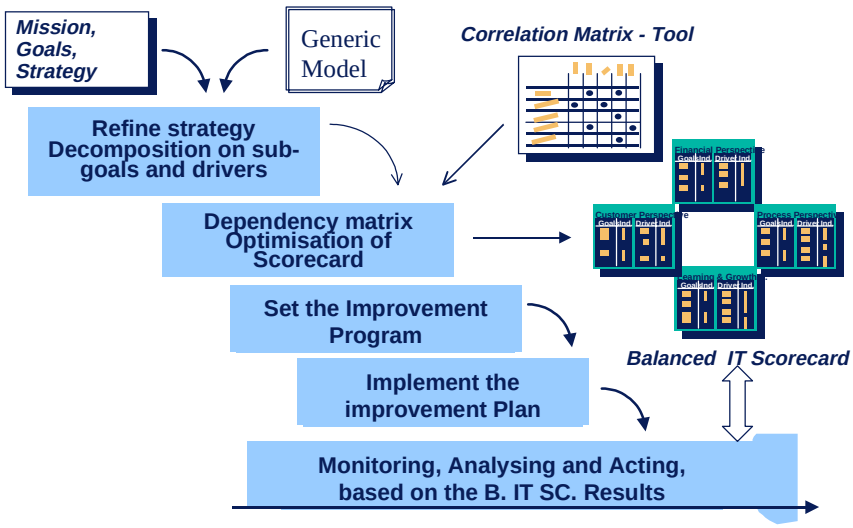


*Figure 4 - ESI Balanced IT Scorecard Method*

### 2.2.2 How should it be used?

The method starts by describing several introductory steps that an organisation willing to monitor its business performance should have followed before this method can be successfully applied. These steps relate to the fulfilment of set of requirements based on the definition of the SPBU's strategy. Once the strategy is completely defined the method guides the development of the SPBU's specific scorecard, using the Generic Model as a starting

[1] The Process Perspective is linked to the principles of the emerging standard (ISO 15504) on software process capability.

point, by following a set of defined steps. Support material in the form of checklists as well as techniques for performing each of the steps are also part of the method.

While refining the SPBU's primary business goals the need for improving critical software process will become evident by performing a gap analysis between the actual situation and expected business results.

As a result of applying the method the set of critical goals for each of the perspectives are identified, factors are agreed as part of the unit's strategy and associated indicators are selected to monitor the overall business performance.

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# 3. SUPPORT MATERIAL

## 3.1 Correlation Tool

During the process of identifying all goals derived from the main business goals and strategy one goal-tree structure for each of the business goals is derived. This structure presents all goals influencing the main business goals' achievement.

The different goal-trees are then analysed and a single optimised dependency matrix is constructed. This analysis is made easier by using the Correlation Tool developed by ESI for identifying the relationships between goals as well as between goals and drivers. The main objectives of this analysis are:

- To visualise and weight the influences of the goals with respect to the business goals
- To optimise the number of goals to be monitored,
- To identify conflicting goals that may require finding a compromise among them.
- To optimise the set of drivers to be followed and monitored by selecting those drivers that can support the largest number of required goals.

Additionally, the analysis results in identifying the following set of relationships among goals:

a) Required goals: In many cases in order to reach one goal a set of additional goals must also be met. Once identified, these goals are included in the scorecard.

b) Conflicting goals: It may not be wise to approach two goals simultaneously (i.e. to reduce cycle time and to improve effectiveness) due to the negative impact of one on the other. These goals must be prioritised in the improvement programme and activities directed at achieving them can be controlled with the scorecard.

c) Side-effect goals: Activities aimed at the achievement of one goal may have a positive impact on the achievement of other goals. These goals can be included in the scorecard if they are of interest to the SPBU.

d) Future goals. By identifying anticipated improvements in performance the SPBU manager may also identify *"goals of opportunity"*. These are new goals that the manager has the *opportunity* to set for the future as a direct consequence of having improved performance while striving to achieve another goal.

The correlation tool can also be used when first building the SPBU Scorecard because it helps to identify the influences among goals and the appropriateness of the different drivers.

## 3.2 Management Briefing

The management briefing is a presentation that is used to introduce organisation managers to ESI's Balanced IT Scorecard technology with either of the following objectives:

- Establish/Identify the need within the organisation to take a more balanced approach to performance measurement and link Software Process Improvement with the organisation's business objectives.
- Introduce the technology to an organisation's software process improvement team.

The briefing takes the audience through the following stages:

- Establishing the need for a balanced measurement system
- Background on and introduction to Kaplan and Norton's Balanced Scorecard and its perspectives and components
- Balanced Scorecard implementation cycle
- Who uses it and why with an expansion on one case study
- The need for a similar approach for SPBUs
- Introduction to ESI's Balanced IT Scorecard, its objectives and components
- Example of applying the technology in a SPBU
- Benefits of using the technology

## 3.3 Case Studies

### 3.3.1 What is it?

The Case Studies are a set of documents (printed and/or html) which describe the application of the technology. Mainly they describe the context where the technology is applied, and they summarise main findings and lessons learnt. Confidentiality issues are previously agreed with the organisation.

### 3.3.2 What does it consist of?

A Case Study consists of:

- a description of the environment the technology was applied,
- a definition of the way the fulfilment of this criteria will be measured,
- a detailed analysis of cost, benefits and risks, and
- lessons learnt

### 3.3.3 How should it be used?

The Case Studies are intended to give practical examples of the successful application of this approach. They serve for creating awareness as well as first reference supporting leveraging this method through transition partners. These case studies will be made available both in printed form and distributed through ESI's Experience Repository.

### 3.3.4 How does it fit/compare to other approaches?

There exist case studies on the usage of the Balanced Scorecard as defined by Kaplan and Norton. The Harvard School of Business publishes these case studies, but so far there are no case studies known which address the application of this approach for SPBUs and in specific for the Software Process.

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# 4. TECHNOLOGY ADAPTATION SERVICES

During 1997 the Software Process Improvement Measurement product line at ESI developed the ESI's Balanced IT Scorecard technology with valuable input from members and other external organisations[2]. In 1998 we are entering the adaptation phase of the technology life cycle. The adaptation phase aims to introduce organisations to the benefits of this technology and enable them to evaluate its use in a well-defined and structured adoption process.

Three are the types of services ESI offers:

- Technology Introduction & 1st Phase Diagnosis
- Balanced IT Scorecard Construction
- Balanced IT Scorecard Introduction

The development and utilisation of a Balanced IT Scorecard is appropriate at software units meeting the following requirements:

- Software unit is managed as a Business Unit
- Mission, business goals and strategy are well defined
- SPBU has an understanding of the market segment and customers' domain
- SPBU is aware of its core software processes
- Management commitment – at all decision-making levels of the SPBU

[2] The Generic Model was validated in two working sessions with IT companies of the Basque Country.

## 4.1 Technology Introduction and 1st Phase Diagnosis

Purpose:

- ✓ To brief managers at the company's site on the ESI's Balanced IT Scorecard as a strategic management tool.
- ✓ Initiate data collection process to understand the SPBU's business context as a preparation for the development of the Balanced IT Scorecard.

Requirements:

- ✓ Attendance to the meeting of the SPBU's manager, sponsor, quality and marketing managers.
- ✓ Data collection interviews on each of the perspectives.

Task duration: 8 hours

Phases:

| Sections | Attendants | Approx. duration |
|---|---|---|
| BITS briefing presentation and discussion | Sponsor, SPBU manager, quality & marketing managers | 1 hour |
| DC: Mission, business goals and strategy | SPBU manager, sponsor | 1 hour |
| DC: Customer & market characteristics | Marketing manager | 1 hour |
| DC: Value creation software processes | SPBU manager, quality manager, project leaders | 1 hour |
| DC: Infrastructure & Innovation | SPBU manager, quality & personnel managers | 1 hour |
| Scorecard team meeting | | 2 hours |
| Main findings presentation & discussion | Sponsor, SPBU manager, quality & marketing managers | 1 hour |

DC: Data collection

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Outcomes:

- ✓ Attendants to meeting gain understanding of the potentials and benefits of the technology.
- ✓ Main characteristics of the SPBU's context are understood to allow the elaboration of the working plan for the construction of the Balanced IT Scorecard.
- ✓ An initial presentation of the organisation strategy in a Balanced Scorecard form.
- ✓ Working plan for the construction of the Balanced Scorecard (within two weeks of service conclusion)

## 4.2 Balanced IT Scorecard Construction

Purpose:

- ✓ Development of the SPBU's Balanced IT Scorecard. Analyse the Software Producing Business Unit's:
  - mission, business objectives and strategy,
  - customer and market segments,
  - value creation software processes

  in order to define the minimum set of indicators to monitor the performance of the SPBU.
- ✓ Establish common understanding of organisation strategy at all levels. This provides the vital foundation of commitment necessary to implement improvement.

Requirements:

- ✓ Availability of required personnel as specified in plan.

Task duration: Two calendar months (two 1-week visits to the company followed by report preparation).

Estimated effort required from organisation: 19 person/days.

Outcomes:

- ✓ Presentation of the organisation's tailored Balanced IT Scorecard.
- ✓ Detailed report on the components of the SPBU's Balanced IT Scorecard.

Benefits

- ✓ Company presented with a powerful tool with which it can quantitatively link and manage organisational objectives with those of the SBPU.
- ✓ SPBU can now quantitatively identify areas/processes requiring software process improvement and can communicate the need to the sponsor.

Phases:

| Phase | Team composition | Approved by | # of 2 hours sessions | Approx. effort (hours) |
|---|---|---|---|---|
| 1.- Preparation phase | Sponsor, SPBU manager | | 1 | 4 |
| 2.- Understanding of the business' goals and strategy | Sponsor, SPBU manager, Quality & Marketing manager | | 3 | 24 |
| 3.- Decomposition of goals into subgoals, and selecting drivers | Teams of 3 people, including the business goal's related personnel and representative project leaders | Sponsor, SPBU manager, Quality and Marketing Managers | 6<br><br>approval session | 36<br><br>8 |
| 4.- Defining indicators for each goal and driver | Sponsor, SPBU manager, quality & marketing managers and project leaders | All the working team | 8 | 48 |
| 5.- Verification and approval of the scorecard | All scorecard' users: Sponsor, SPBU manager, Quality & Marketing managers and project leaders | | 2 | 36 |
| Total | | | | 156<br><br>(19pdays) |

Between phases 3 & 4, the scorecard architect and team will work on the optimisation of the items to be included in the final Balanced IT Scorecard.

## 4.3 Balanced IT Scorecard Implementation

Once the scorecard has been constructed and the final report has identified the opportunities for improvement the organisation will now be in a better position to consider the investment in a Software Process Improvement programme.

This activity to implement the BITS is aimed at supporting the organisation in the initiation and implementation of its improvement and measurement programme. Once the improvement and measurement programme is underway the use of the defined metrics will feed the BITS and the organisation will be able to monitor its business strategy.

Purpose:

- ✓ Support the company in the definition and introduction of the software process improvement and measurement plan
- ✓ Launch of the Improvement and measurement programmes
- ✓ Periodical monitoring of the improvement/measurement programmes

Duration: Although dependent on the organisation's needs, services will generally be scheduled for one-year duration.

Outcomes: To be defined and agreed within each situation.

Benefits:

- ✓ Company presented with the means for quantitatively managing each phase of the Software Process Improvement cycle to include:
    - Taking a snapshot of the organisation's current situation
    - Identifying opportunities for improvement
    - Prioritising improvements based on the organisation's business objectives
    - Controlling improvement initiatives

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