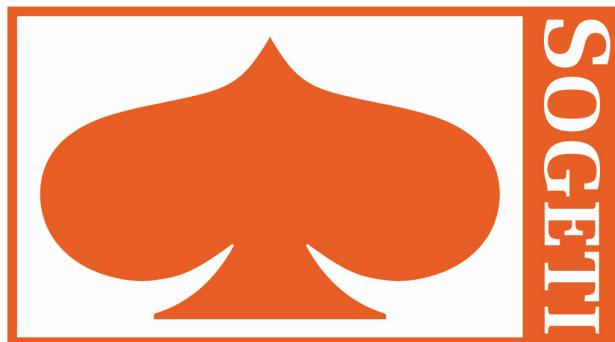


TMAP NEXT

BDTM for clients

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T M A P

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4 BDTM for clients

The importance of the contribution of IT to business is constantly growing and organisations continue to increase their expenditure on IT. Some take the initiative of improving the justification of the IT contribution to the business goals. Others are forced to do so by new regulations (especially regarding IT Governance). The decision making process in relation to the investment of resources in particular can be significantly improved. One success factor is an optimal relationship and coherence between the various control processes. In short, professional IT management is required if the IT organisation is to make a maximum contribution to realising the business goals.

Clearly such professional management is also necessary for test management! After all, test costs amount to 30-50% of the total costs of a project. In maintenance projects, they may even represent 80% of the total project costs! And in addition to these costs, companies must also take account of the costs of possible failure of software. Although a lot of research has been done on the financial consequences of failing software, many organisations still underestimate the risks and consequences of software defects (cf. section 1.2 ‘TMap evolves in step’). As such, it is extremely important to devote explicit attention to Test Governance within the scope of IT Governance.

In addition to providing a detailed description of IT and Test Governance, this chapter also explains how Business Driven Test Management contributes to Test Governance (cf. Figure 4.1 ‘Governance Relations’).

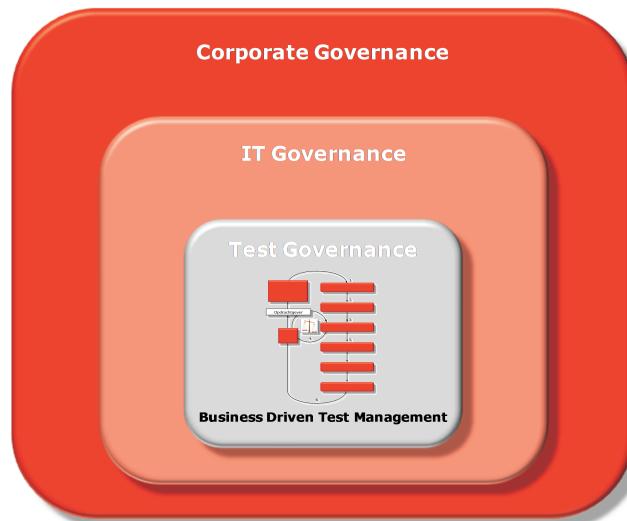


Figure 4.1: Governance Relations.

In more detail**Economic impact of software defects**

According to the American National Institute for Standards and Technology (NIST), software defects have cost the North American economy 59.5 billion dollars in 2002 - which amounts to 0.6% of the Gross Domestic Product [NIST, 2002].

The cost of repairing software defects

Similar statistics from the American National Research Council show that the American business community spent 175 billion dollars on repairing damage caused by software defects in 2001 [McGraw, 2003].

The client in control

Testing can take a long time, particularly in the eyes of an impatient marketing manager who wants to launch his product on the market as quickly as possible or a government manager who needs to get a system up and running before a mandatory deadline. Every client has to consider the lead time and cost of testing for a project. Clearly these aspects have a direct impact on project costs and, as a result, an indirect impact on the financial benefits of the project.

When testing, one needs to find a balance between intense testing (reduces potential damage and creates trust) and light testing (lower costs and shorter lead times). IT Governance is about manageable IT allowing transparency and justification of IT expenditure in relation to the benefits. Together, the combination of manageability and justification of testing is called Test Governance.

IT Governance

Companies quoted on the stock exchange in several countries have to deal with regulations with respect to Corporate Governance. Examples are the Dutch Code for Corporate Governance of the Tabaksblat Committee, the Basel II Act, the American Sarbanes-Oxley Act 2002 (SOX), the Statement and Auditing Standards 70 (SAS 70), and the Clinger Cohen Act for US Government IT projects. Among other things, these laws define requirements relating to the control of business processes to secure the reliability of the company's justification. A company's management must be able to demonstrate that it controls the business processes, for instance by means of a SAS 70 statement or an ISO/IEC 27001:2005 certificate.

The concept of Corporate Governance is being increasingly extended to private companies and not-for-profit organisations. Deploying IT applications is an important link in the operational management and the realisation of business objectives of such entities. As such, managing the provi-

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sion of information is an integral part of managing a company. This makes IT Governance a significant element of Corporate Governance. There are various common definitions of IT Governance, but the following definition is often used in actual practice:

Definition

The primary goals of Information Technology Governance are:

- Assuring that the investments in IT generate business value
- Mitigate the risks that are associated with IT

The IT Governance Institute uses the following definition, that in addition to the what also describes the how:

Definition

IT-Governance is the responsibility of the board of directors and executive management. It is an integral part of Enterprise Governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives.

Controlling the business processes is determined by the following factors:

- The quality of the information systems
- The management of IT change processes
- The management of the IT infrastructure
- The management of IT risks.

Process models like ITIL, Prince2 and CMM(i) have been developed to control and optimise the organisation of IT operations and processes.

IT Governance is a part of Corporate Governance, with the basis provided by:

- 1) A clear vision of the deployment of information technology in an organisation
- 2) Adequate management and control of IT efforts
- 3) Justification of the contribution made by IT
- 4) Monitoring compliance with the agreements made.

The control of IT Governance is translated, preferably in the form of a business case, into the four BDTM aspects: result, risk, time and cost.

In more detail

IT Governance models

Organisations give substance to IT Governance using a range of models: for example Gartner's IT Governance demand/supply model; the model of the Committee of Sponsoring Organizations of the Treadway Commission (COSO); or that developed by ISACA and the IT Governance Institute (COBIT).

Some models clearly define the relative positions of IT Governance and IT Management. Governance is about ‘the rules of the game’, establishing a framework that guides operations, policy-definition and control. IT Management focuses on the decision making, execution and justification of IT operations within the IT organisation.

Test Governance

This book has adopted the following definition of Test Governance:

Definition

Test Governance is the client's justified investment in testing to gain insight into risks and desired results within a certain timeframe.

The activity of testing has a double role in Governance:

1. During test activities, assessments are made to establish whether certain IT controls are being incorporated into an IT system or business process (e.g. validations, authorisations, security, etc). In this verification process, the requirements that have been defined on the basis of regulations, compliance requirements or other legal provisions are ‘translated’ into the test strategy and test scripts. The test process then determines whether the controls have been implemented. A structured test approach must be used to give substance to this role, such as that described in TMap NEXT [Koomen, 2006].
2. The test activities are also checked for their correct and full elaboration and execution.

Registration and traceability play an important part in this respect. For instance, the interrelationships between all of the products in a test process must be recorded. This means what requirements and wishes served as a basis for which test strategy and acceptance criteria. What logical and physical test cases were derived from them, what findings resulted, and which test goals were achieved as a result. All these elements also lead to progress reports, decisions and other project-related documentation, the contents of which can be traced. The link with requirements and test goals ensures the far-reaching traceability of information and the decisions made on the basis of that information.

Example

Test Governance in a Master Test Plan

The following text is taken from a Master Test Plan for a SOX-compliant programme.

The programme complies with the SOX requirements. With regard to testing, this means that:

- The test approach to be followed is clear.

This is achieved by means of formal acceptance of the master test plan and the plans for system, integration and acceptance testing as well as pilots derived from it.

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- The executed tests are traceable.
This is achieved through configuration, version and release management together with test case and defect administration.
- The test-based decisions are traceable.
This is achieved through formal acceptance of the test reports for the system, integration and acceptance tests executed and the pilots, and the release advice established on the basis thereof.

One practical method to develop Test Governance is by incorporating it into an organisations test policy.

Definition

The test policy describes how an organisation deals with the people, resources and methods involved with the test process in the various situations.

The test policy applies to all types of systems, infrastructures and development methods and is in line with policy measures like IT Governance and quality management initiatives. The test policy is elaborated at the strategic, tactical and operational levels. At the strategic level, the impact of the corporate policy is determined in relation to testing for the entire organisation. This is the strategic test policy, which must be enforced and actively supported from this level. At the tactical level, the test policy is translated to the policy at the level of business units, departments, product groups, programmes or projects (depending on the structure of the organisation). This also covers the resources and budgets deployed to guarantee the unconditional implementation of the test policy. Consistent pursuance of the test policy results in a uniform test approach at the operational level.

Test Governance and Business Driven Test Management

The key to testing is that an organisation executes test cases that are derived from a test basis such as requirements, designs or other sources that describe what the test object must comply with.

But what kind of tests are these? To ensure that the testing activities serve a meaningful purpose, they must be set up to test those characteristics and parts of a test object that the client believes to represent a risk if they did not function adequately in production later on. This means that a range of considerations on how to test have already been made before the tests are even executed. The organisation will therefore have already given serious thought to the parts of the test object that must be tested (or not), how they must be tested, and the test coverage.

So what determines these considerations? Why not test all parts of the test object as thoroughly as possible? Indeed, if an organisation possessed unlimited resources, it might be decided to test everything as thoroughly as possible. In actual fact, however, organisations never have the resour-

ces, whether money, time, manpower, etc. to test everything intensively. This means that choices must be made as to what is tested and how intensively. Such choices depend on the risks that an organisation believes it will incur, how much time and money are available, and the result the organisation wishes to achieve. Often, they are laid down in a business case. The fact that these choices are based on risk, result, time and cost is called 'business driven' and, in addition to representing the basis of IT Governance, also serves as a basis for the Business Driven Test Management (BDTM) method for Test Governance (cf. Figure 4.2 'Test Governance').

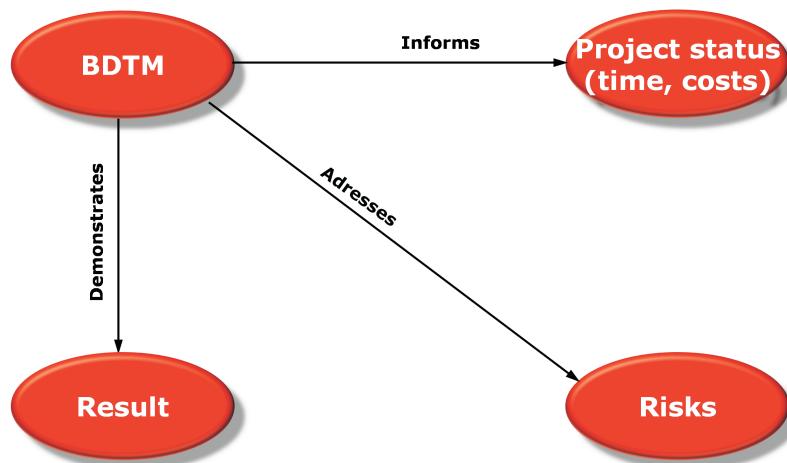


Figure 4.2: Test Governance.

In more detail

The business case as a determinant

Increasingly, IT projects must be considered from a purely business perspective. IT Governance controls projects on the basis of four aspects: result, risk, time and cost. For instance, it might be a more attractive for an organisation to invest in a high-risk project that potentially yields significant results (e.g. being the first to launch a specific product on the market), rather than in a project that represents very little risk but the benefits of which barely outweigh the costs.

Normally, a business case constitutes the foundation of an IT project. There are various definitions of the concept of a business case. For instance the business case definition for projects according to PRINCE2 [PRINCE 2, 2002].

Definition

The business case provides the justification for the project and answers the questions: *why* do we do this project, *what* investments are needed, and *what* does the client wish to achieve with the result?

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The business case is verified at predefined times during the project to ensure that the eventual results remain valid for the client.

TMap supports this justification of IT and translates it into the activity of testing. TMap adheres to the principle that a project approach based on a business case complies with the following characteristics:

- The approach focuses on achieving a predefined result
- The total project to achieve this result is realised within the available (lead) time
- The project to achieve this result is realised at costs that are in balance with the benefits the organisation wishes to achieve
- The risks during commissioning are known and are as limited as possible, all within the framework set by the characteristics above.

The four IT Governance aspects described above are incorporated into these characteristics.

To ensure the successful execution of a project, it is important for the test process to be aligned with the business case. The relationship between the business case and the test process is created via the Business Driven Test Management approach. In other words, the BDTM approach 'translates' the business case characteristics to Test Governance within the constraints imposed by IT Governance.

Characteristics of the Business Driven Test Management approach

Often, test strategies, plans and reports fail to appeal to the client. The reason is that testers still tend to reason from the perspective of IT. The test process has an inward focus and has been rife with test and IT jargon, making it difficult to communicate with non-IT clients such as users, regardless of the need to do so.

Thanks to the Business Driven Test Management approach¹, TMap pays explicit attention to communication by speaking the 'language' of the client. When formulating the assignment and writing the various reports, for instance, the 'language' of the client himself is used instead of the IT or test jargon. BDTM's starting point is that the selected test approach should enable the client to manage the test process based on the BDTM aspects of risk, result, time and cost. As a result, testing becomes more business like. The information that is necessary to achieve this is delivered by the test process, concretising Test Governance (cf. Figure 4.2 'Test Governance'). The characteristics in this context are:

■ **Result**

At various points during the testing programme, the client is involved in

1 We should note that Business Driven Test Management is not an entirely pure term. The word 'business' suggests that this approach is intended to be used exclusively with the user departments, while testers often have to deal only with the IT departments. However, this book uses the general term BDTM.

making choices relating to the required result. The advantage is that the test process continues to match the wishes and requirements - and therefore the expectations - of the organisation as closely as possible. Moreover, BDTM provides handholds to visualise the consequences of future and past choices explicitly.

■ Risk

The total test effort is related to the risks for the organisation of the system to be tested. As a result, the deployment of manpower, resources and budget focuses on those parts of the system that are most important to the organisation. TMap contains the test strategy and budget resources to divide the test effort between the system parts, thus allowing the organisation to gain insight into the extent to which risks are covered or not.

■ Time

The schedule of the test process is related to the possible requirements relating to the end date of the test project and the formulated test strategy. Changes in (and particularly a reduction of) the available time for testing are translated into consequences for the schedule, the result to be achieved, and the risks covered. As a result, the organisation has, at all times, an adequate picture of the lead time and the relationship with the test strategy.

■ Cost

The budget for the test process is related to an imposed budget, if any, and the formulated test strategy. If changes are made that have an impact on the required intensity of testing for the various system parts or systems, this is translated immediately to an amended budget. As a result, the organisation has at all times an adequate picture of the required budget and the relationship with the test strategy.

In summary, we can say that BDTM aims to achieve a balance between the investment in money and time on the one hand, and the result to be achieved and the risks covered on the other (cf. Figure 4.3 ‘BDTM Balance’).

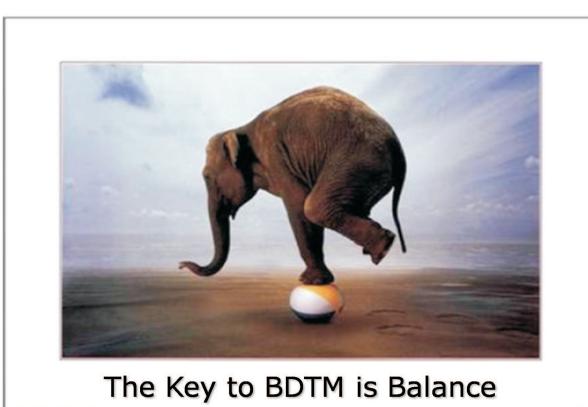


Figure 4.3: BDTM balance.

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The steps in the Business Driven Test Management approach

To understand the BDTM approach, it is important to keep an eye on the final objective, which is to provide a quality assessment of and risk advice for the IT system. Since it is impossible to test everything, a correct assessment can only be realised by dividing the test effort, in terms of time and money, as adequately as possible over parts and characteristics of the system to be tested. The steps of BDTM aim to achieve this (cf. Figure 4.4 ‘BDTM steps’). An outline of the steps is provided in this section. Chapter 5 ‘BDTM for Test Managers’ contains a detailed description of the six steps in sections 5.1 through 5.6.

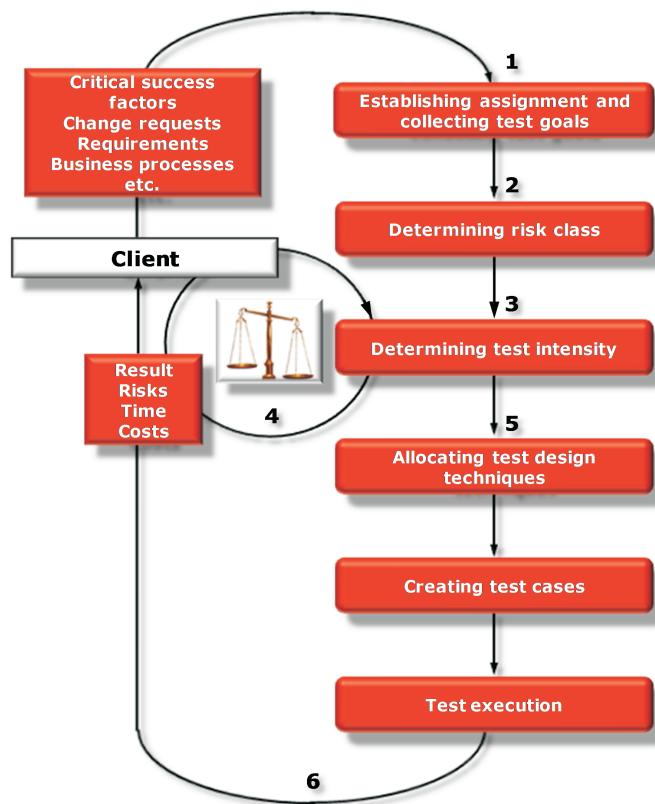


Figure 4.4: BDTM steps.

BDTM's objective

BDTM aims to set up and manage a test process in close collaboration with the client, seeking a balance between the aspects of result, risk, time and cost (Step 4).

Process

After formulating the assignment and gathering the test goals (1), the steps - Determining the risk class¹ (2), ‘Determining the test intensity’ (3), and ‘Allocating test techniques (5) - are used to compile the work packages for the tester. The test cases are created and the result of the specification and execution of the test cases is reported (6) by applying the chosen test design techniques.

Test strategy

The interrelationship between test goals, risks, object parts and characteristics is established in consultation with the client and other stakeholders (cf. 5.1.2 ‘Collecting test goals’). This is done step by step, creating tables that become increasingly detailed until a strategy emerges for each test level. The test design table translates the strategy into work packages for the tester.

Test cases that are specified by applying the test design techniques are related to the strategy. The test execution report allows the stakeholders to understand the quality of the test object and the status of the project in terms of the BDTM aspects of result, risk, time and cost. A ‘dashboard’ is a graphic method of presenting a compact overview of this data:

Aspect	Current status	Previous status	Comments
Result	⊗	☺	...
Risk	☺	☺	...
Time	☺	⊗	...
Cost	☺	☺	...

Tip

Derivation rules must be agreed upon to determine what status a BDTM is assigned. Examples of possible rules for the BDTM aspect of cost are:

- ☺ The cost will remain within the agreed budget.
- ☺ The cost will exceed the agreed budget by a maximum of 10%.
- ⊗ The cost will exceed the agreed budget by more than 10%.

(For examples of the other BDTM aspects, please refer to section 5.6).

- 1 A production risk analysis (PRA) is done to determine the risk class. The PRA’s purpose is to allow the various stakeholders and the test manager to realise a joint picture of the more and less risky parts/characteristics of the system. The PRA focuses on the product risks – what is the risk to the organisation if the product is not of the expected quality.

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Business Driven Test Management control

Organisations rarely, if ever, possess unlimited means to test ‘everything’. This means that they have to make choices, which occurs in the first step of BDTM when the client formulates the assignment, taking account of the four BDTM aspects.

If the resources are unlimited, the aspects of result and risk are at their optimum levels with an unlimited amount of time and cost. Clearly, there is also a minimum level at which the result is so limited that the risk incurred is so high as to be unacceptable.

However, clients rarely make unlimited resources available - so choices have to be made. The client agrees to a certain result to be achieved with the associated level of risks that remain uncovered. The required time and cost follow from there. The boundary between the agreed result and the minimum threshold represents the tolerance limits for the result.

A lot of things can happen during the execution of a project, with certain consequences for the original BDTM related choices (cf. Example below). The test manager’s task is to explain to the client what these consequences are.

Example

Just before the planned test execution starts (with a lead time of four weeks), it appears that the software will be delivered two weeks late. The client wants to keep to the scheduled end date and is unwilling to incur additional costs to hire extra testers, among other things.

The test manager explains to the client that, if there is less time but the cost remains the same, the risk will increase and the result will be reduced. This will result in deviations from the level that was originally agreed upon and brings the result closer to the lower limit.

The test manager then asks the client to determine where the extra risk should be incurred, or which system parts are to be tested less intensively. The test manager offers assistance by examining, together with the client and any other stakeholders, the originally assigned test intensity for each combination of object part and characteristic and recording the changes made.

Emphasising one or more BDTM aspects means that multiple BDTM scenarios - and elaborations - are possible. With an eye on Test Governance, it is important to record the initial agreements as well as any adjustments. After all, these can (and must) serve to justify the initial division of risk and result on the one hand and cost and time on the other, and how and why the process deviated from the initial division.

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Chapter 5 ‘BDTM for Test Managers’ provides a more detailed description of the BDTM steps. Examples are used to explain the consequences of choices made in favour of one or more BDTM aspects in these steps.