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The implementation of the Business Rule Approach

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Management Summary

A large portion of the information systems comprehend *business rules*. These business rules determine the behavior of information systems. Business rule specifications are very prone to change as a result of changing business.

As organizations add more applications to their landscapes the system landscapes tend to be more and more complex. Business rule implementations are spread throughout the landscape; controlling and adapting these business rules gets more difficult whereby potentially invoking errors.

The Business Rule Approach will *externalize* the business rules from the information systems (take it out), *centralize* these rules (store in a central repository), *standardize* these rules (express in such a way all stakeholders can understand), and *structure* (express relations between) these business rules. The business persons can take ownership of the rules, and change them if desirable.

Implementation of the Business Rule Approach can be done in many ways, but the most economical is to use a Business Rule Management System. Service-oriented Business Rules Management Systems (BRMS) present themselves to the functional business applications as a service to make decisions. If a business application needs to make a decision, it supplies the BRMS with relevant information and requests a decision. The BRMS executes the applicable rules and returns the result to the business application. The business application can then continue. It should be noted that although changing the business rules should be as easy as possible, it should also be well-controlled, well-governed, highly performing, and highly available. All application embedded controls could depend on it.

Implementing the Business Rule Approach is a major change in the organization’s business and IT functions. This requires considerable investments to be made. These investments should only be made if the project provides sufficient benefits to the organization. We identified the following benefits:

- Narrower communication gap between requirements, analysis, and design.
- Clearer auditability.
- Possible to change rules faster.
- Change is no longer disruptive.
- Change is no longer costly.
- Business rules are documented and accessible through a repository.
- Greater consistency across the enterprise.
- Little need to freeze requirements because rules can be changed easily.
- Faster development of business systems.
- Systems are delivered for less cost.

For the development of the working method, we assume a *revitalization* or a *re-empowerment* project: The working method addresses a project aimed to implement the Business Rule Approach in an organization keeping the existing primary business processes and infrastructure in place.
As a starting point we use Deloitte’s proprietary working method *Enterprise Value Delivery* (EVD). EVD is a structured and comprehensive working method to execute IT-enabled Business Transformations aimed to deliver maximum value to the business. EVD contains a number of tasks that have to be performed during the various phases of the project. The tasks are categorized under various disciplines and are worked on by certain roles on the project. Every task has a work product (deliverable) that is of value to the business, and/or is a prerequisite for one or more other tasks.

Literature review shows that an additional sub-discipline (*Business Rules Management*) is required to manage the business rule aspects of the project, as this is not included in EVD. Furthermore, two project roles need to be added on top of EVD: the Business Rules Analyst and the Business Rules Management Team Lead.

These two project roles should carry out 11 unique Business Rule related tasks:

- Define Business Rule Standards.
- Define Rule Discovery Roadmap.
- Document Rule Management Policy.
- Develop Rule Management Processes.
- Develop High-Level Ruleset.
- Develop Term/Fact Model.
- Define Rule Test Approach.
- Develop Detailed Rules.
- Develop Object Model.
- Develop Rule Test Cases.
- Conduct Rule Test.

The standard EVD tasks *Design To-Be Sub-processes (L3)* and *Software Development Scope* need to be adapted to capture the decisions in the functional business applications and to integrate the Business Rules Management System in the functional business applications, respectively.
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1. **Introduction**

“A business rule is a rule of a business, company, or corporation. It is a rule that defines or constrains some aspect of business (…)” (Wikipedia, 2014). A large portion of the information systems have *business rules* implemented. These business rules determine the behavior of information systems:

1. What price do we quote for a car insurance policy to a female of 40 years driving a Volkswagen Passat with third party coverage?
2. How much assistance is someone entitled to with the disabilities ‘cannot stoop’, ‘can stand up badly’, ‘cannot move right arm’, and ‘cannot walk without aid’?
3. Can Joe place a purchase order for office equipment of 40 euro?
4. Is 1000 AD a valid postal code in The Netherlands?

We often see these examples in practice. Example 1 when searching and taking out an insurance policy (either online or offline), Example 2 at the ‘Digitaal Wmo-loket’ from the municipality of The Hague, example 3 in a common purchasing application (or ERP system). The 4th example is common when correct addressing is required.

These business rules require further specification, such as the table with valid postal codes, the exact computation rule for the insurance fee, or some threshold value. These business rules, including specification, are normally processed and maintained in the applications’ source code.

Business rules are very prone to change as the result of changing business; (Steinke & Nickolette, 2003); business rules are considered to be the most volatile part of software applications (Wan-Kadir & Loucopoulos, 2004). As a result, when the business changes, the business has to write new software requirements, the developer has to find the old business rule specification in the source code and replace this by (his interpretation of) the new business rule specification. Then both the developer and the business have to test whether the change was implemented correctly. In case of misinterpretations of the requirements, additional communication between business and IT regarding the required software behavior might be necessary.

As organizations add more applications to their landscapes, the system landscapes tend to be more and more complex (more systems, more dependencies, and more interfaces). Business rule implementations are spread throughout the landscape; controlling and adapting these business rules gets more difficult whereby potentially invoking errors. Furthermore, if business rules are applied in more than 1 system, changes of the business rule should also be specified, implemented, and tested for more than 1 system.

The Business Rule Approach should provide sufficient benefits to the organization to cover the costs, such that it adds value to the organization. Business value is further defined in Chapter 3.

1.1 **Reason**

A possible solution to the challenge mentioned above is to externalize the business rules from the information systems (take it out), centralize these rules (store in a central repository), standardize
these rules (express in such a way all stakeholders can understand), and structure these business rules (express relations between them). Ross (2003b) calls this the Business Rule Approach.

In this situation, the business rules do not reside in the source code, but reside in the Business Rule Management System (BRMS). The functional business application calls a business rule from the BRMS, whereby passing relevant information. The Rules Engine executes the business rule with the information provided, and passes the result back to the business application. Business rules in the BRMS can be used by more than one functional application. Although this is not mentioned explicitly by the authors, we consider implementing the Business Rule Approach should imply a serious change to the governance mechanisms: the business people are empowered, but should also be controlled. This reduces the role of IT.

We consider the implementation of the Business Rule Approach a special case of an IT-enabled Business Transformation. An IT-enabled Business Transformation is a significant change to an organization, enabled by IT products. Right now, no value-driven working method for implementing the Business Rule Approach is known. To make sure the project adds value to the organization, more tasks are to be executed other than just the technical implementation; some are related to business adoption, others are related to measuring and tracking business value. If only a technical implementation is performed, the business might never adopt the new processes, or the project might be carried out without adding value to the organization (not every organization has a positive business case for the Business Rule Approach). The term ‘adding value’ is further specified in Chapter 3.

This research investigated how the Business Rule Approach should be implemented in an organization in order to add value to the organization.

1.2. Research Question

Based on the challenge mentioned above, the research question for this research was:

What is an appropriate working method to implement the Business Rule Approach in such a way it adds value to an organization?

Secondary questions:

- What is the Business Rule Approach?
- How can organizations realize added value by implementing the Business Rule Approach?
- What is a general working method for IT-enabled Business Transformations, and how should it be adapted to be suitable for implementation of the Business Rule Approach in an organization?

1.3. Research Approach

This research was conducted in three steps:

The first step in this research was to determine how the Business Rule Approach works, and what components are required to implement the Business Rule Approach. We did this based on literature review.
The second step was to determine how value can be added to organizations by implementing the Business Rule Approach. We considered value from two different perspectives. We determined this also based on literature. Based on this literature review, we identified specific elements that needed to be incorporated into the working method.

Implementing the Business Rule Approach in an organization is an IT-enabled Business Transformation. As our goal is to add value to the organization by implementing the Business Rule Approach, a technical solution is not sufficient; the solution should be embedded in the organization. Furthermore, we need our starting point focusing on business value. We selected Deloitte’s Enterprise Value Delivery to use as a starting point, as this working method satisfies these needs. We combined two ‘flavors’ of EVD, both specifically designed for the applicable software vendor: EVD for SAP 3.7 and EVD for Oracle 3.7. We then removed unnecessary components from it, and added – based on literature review – Business Rule Approach-specific components to this general working method. This made it our working method for the implementation of the Business Rule Approach. This was the third step. The research model for this research is depicted in Figure 1.

Figure 1: Research model

1.4. Summary
A large portion of the information systems comprehend business rules. These business rules determine the behavior of information systems. Business rule specifications are very prone to change as a result of changing business.

As organizations add more applications to their landscapes the system landscapes tend to be more and more complex. Business rule implementations are spread throughout the landscape; controlling and adapting these business rules gets more difficult whereby potentially invoking errors.

A possible solution to this challenge is externalizing the business rules from the information systems (take it out), centralizing these rules (store in a central repository), standardize these rules (express in such a way all stakeholders can understand), and structure (express relations between) these business rules. This is called the Business Rule Approach.

Right now, no value-driven working method for implementing the Business Rule Approach is known. This might result in failed Business Rules journeys because essential parts are skipped, or in projects not adding value to the organization. This research investigates how the Business Rule Approach should be implemented in an organization in order to add value to the organization.
2. The Business Rule Approach

In this chapter, we elaborate on what business rules are exactly, and how the Business Rule Approach works.

Before we go into detail on what the Business Rule Approach means to us, we need to determine what Business Rules are. For the term ‘business rule’, a number of definitions are being used:

- From the business point of view, it’s a directive intended to influence or guide behavior. Business rules are literally the encoded knowledge of your business practices. From an IT point of view, a business rule is an atomic piece of reusable business logic. (Ross R. G., 2003a).
- (...) a statement that aims to influence or guide behavior and information in the organization. (Steinke & Nickolette, 2003).
- (...) “compact statements” about an aspect of a business, expressed in simple, unambiguous language that all interested parties can understand. (Meservy, Zhang, Lee, & Dhaliwal, 2012).
- From the business (...) perspective, it pertains to any of the constraints that apply to the behavior of people in the enterprise, from restrictions on smoking to procedures for filling out a purchase order. From the information system (...) perspective, it pertains to the facts which are recorded as data and constraints on changes to the values of those facts. That is, the concern is what data may or may not be recorded in the information system. (The Business Rules Group, 2000).

Some of these authors consider the business rules being something that is either true or false; a record can or cannot be recorded; the postal code is either valid or invalid. We employ a somewhat broader definition in order to maximize business benefits; we adopt Ross’ definition:

From the business point of view, it’s a directive intended to influence or guide behavior. Business rules are literally the encoded knowledge of your business practices. From an IT point of view, a business rule is an atomic piece of reusable business logic. (Ross R. G., 2003a)

We emphasize the result of a business rule does not necessarily have to be ‘true’ or ‘false’; it could very well be a tax code or a quote price.

2.1 Explanation of the Business Rule Approach

From the definitions above, we determine business rules guide behavior of the organization, but at the same time recognize a significant part of the behavior of the organization is automated by information technology (IT). This means also decision making is performed by IT applications.

Ross (2003b, p. 77) distinguishes three functional categories of business rules:

- Rejecter: The rejecter prevents any event from happening if the event would violate the rule. Rules of this type address data quality.
- Producers: The producer uses relevant data (both ‘old’ data and data created during the event) to produce a result. Producers are therefore functions to enhance productivity.
• Projectors: The projector establishes, next to the foreseen event, another result.

An example of a rejecter-type business rule is a written rule that prohibits storing an invalid postal code. This rule can be enforced automatically, it can be enforced by a manual check, or it might not be enforced at all. Obviously, the latter option is not really effective. Another example is a business rule regarding the acceptance or denial of a loan application.

An example of a producer-type business rule is a rule calculating the insurance fee for a given coverage, taking into account a number of parameters.

An example of a projector-type business rule is a rule that triggers another process, such as issuing an invoice after posting ‘goods issue’.

According to Von Halle (2002), a Business Rule Approach is “(...) a methodology – and possibly special technology – by which you capture, challenge, publish, automate, and change rules from a strategic business perspective”.

The Business Rule Approach will externalize the business rules from the information systems (take it out), centralize these rules (store in a central repository), standardize these rules (express in such a way all stakeholders can understand), and structure (express relations between) these business rules. The business persons can take ownership of the rules, and change them if desirable.

According to Graham (2007), implementing the Business Rule Approach “(...) can be done in many ways, but the most economical is to use a Business Rule Management System”.

A Business Rules Management System has the following responsibilities (Graham, 2007, p. 8):

• Storing and maintaining a repository of business rules that represents the policies and procedures of an enterprise.
• Keeping these rules (the business logic) separate from the ‘plumbing’ needed to implement modern distributed computer systems.
• Integrating with enterprise applications, so that the rules can be used for all business decision making, using ordinary business data.
• Forming rules in independent but chainable rule sets and performing inferences within and over such rule sets.
• Allowing business analysts and even users to create, understand, and maintain the rules and policies of the business with the minimum of learning required.
• Automating and facilitating business processes.
• Creating intelligent applications that interact with users through natural, understandable and logical dialogues.

In essence, implementation of the Business Rule Approach means part of the business logic is taken out of the business applications and accommodated in a Business Rule Management System (BRMS).

Von Halle (2002, p. 17) distinguishes two types of Business Rule Management Systems: data-change-oriented rules products versus service-oriented rules products. BRMS’s of the first category reside between the applications and the database, and constrain the (combinations of) values that can be stored in the database. Although this can work when developing an application in-house, it is
impossible to use this kind of BRMS in a landscape with ERP systems and/or other commercial software. The service-oriented rules products on the other side present themselves to the business applications as a service to make decisions. For the remainder of this work, we assume the Business Rule Approach is implemented using a service-oriented BRMS.

If a business application needs to make a decision, it supplies the BRMS with relevant information and requests a decision. The BRMS executes the applicable rules and returns the result to the business application. The business application can then continue. Figure 2 shows how rules are used and changed. It should be noted that although changing the business rules should be as easy as possible, it should also be well-controlled. All application embedded controls depend on it.

![Figure 2: Rule usage and rule change in an environment with BRMS](image)
Ross (2003b, p. 8) defined the following Basic Principles for the Business Rule Approach:

- Rules should be written and made explicit.
- Rules should be expressed in plain language.
- Rules should exist independent of procedures and workflows.
- Rules should build on facts, and facts should build on concepts as represented by terms.
- Rules should guide or influence behavior in desired ways.
- Rules should be motivated by identifiable and important business factors.
- Rules should be accessible to authorized parties.
- Rules should be single-sourced.
- Rules should be specified directly by those people who have relevant knowledge.
- Rules should be managed.

In short: The Business Rule Approach means “Separating the know from the flow” (Burlton, 2001).

2.2 Illustration of the Business Rule Approach

In this section, we consider the traditional IT situation of a business, and illustrate how this situation would differ after implementation of the Business Rule Approach.

2.2.1 The traditional situation

Many organizations have multiple business applications to support their business processes. The scope of these applications might vary with regard to functional, organizational, and geographical scope. Although these business applications might be connected (and work together) through interfaces, every single application behaves the way that particular application was programmed to behave.

In this situation, every application has its own business rules specifications embedded. A single business rule (from a business perspective) might be embedded in various business applications (IT perspective). If the business decides to change the rule (business perspective) the implementation of the rule specification in every single application must be changed (IT perspective). This would imply the business has to write new software requirements, the developer has to find the old business rule specifications in the source code and replace this by (his interpretation of) the new business rule specifications. Then both the developer and the business have to test whether the change was implemented correctly. In case of misinterpretations of the requirements, additional communication between business and IT regarding the required software behavior might be necessary, as well as rework and retesting. Obviously, these activities need to be done for every application that has this business rule implemented. Generally, it is impossible to have these changes become effective at exactly the same time. This might result in inconsistent data. Figure 3 illustrates this situation in a very simple multi-application landscape.
2.2.2 The situation after implementing the Business Rule Approach

As mentioned above, the Business Rule Approach requires the rules to be externalized from the business applications and centralized in a BRMS. After implementation of the BRMS, the organization still has the same business applications to support its business processes. However, these applications do not have the business rules embedded in the application logic; the business rules reside in a BRMS. Every time a decision is required, the business application requests a decision from the BRMS whereby supplying relevant information.

If the business decides to change a rule (business perspective) the business can do so by adapting the rule in the BRMS (IT perspective). The change can take effect at any desired moment (for example January 1\textsuperscript{st} of the next year), not only at the time of rolling out a new release of the business application. Furthermore, the change takes effect at all business applications at the same time; this adds to data consistency. Figure 4 illustrates this situation in a very simple multi-application landscape.
2.3 Summary

The definition of Business Rules we employ is the following:

*From the business point of view, it’s a directive intended to influence or guide behavior. Business rules are literally the encoded knowledge of your business practices. From an IT point of view, a business rule is an atomic piece of reusable business logic.*

Three types of Business Rules are identified: Rejecters prevent an event from happening if the event would violate the rule. Producers use relevant data to produce a result, whereas projectors establish, next to the foreseen event, another result.

The Business Rule Approach will *externalize* the business rules from the information systems (take it out), *centralize* these rules (store in a central repository), *standardize* these rules (express in such a way all stakeholders can understand), and *structure* (express relations between) these business rules. The business persons can take ownership of the rules, and change them if desirable.

Implementation of the Business Rule Approach can be done in many ways, but the most economical is to use a Business Rule Management System. A Business Rules Management System has the following responsibilities:

- Storing and maintaining a repository of business rules that represents the policies and procedures of an enterprise.
- Keeping these rules (the business logic) separate from the ‘plumbing’ needed to implement modern distributed computer systems.
- Integrating with enterprise applications, so that the rules can be used for all business decision making, using ordinary business data.
- Forming rules in independent but chainable rule sets and performing inferences within and over such rule sets.
- Allowing business analysts and even users to create, understand, and maintain the rules and policies of the business with the minimum of learning required.
• Automating and facilitating business processes.
• Creating intelligent applications that interact with users through natural, understandable and logical dialogues.

Service-oriented rules products present themselves to the business applications as a service to make decisions. If a business application needs to make a decision, it supplies the BRMS with relevant information and requests a decision. The BRMS executes the applicable rules and returns the result to the business application. The business application can then continue. It should be noted that although changing the business rules should be as easy as possible, it should also be well-controlled. All application embedded controls depend on it.
3. **Realizing added value from the Business Rule Approach**


1. How much something is worth (example: increase in value).
2. Being useful/important (example: of great value to something).
3. Beliefs (example: moral values).
4. Mathematics (example: let y have the value 33).

Although the latter two are not exactly what we are looking for, the first two are related to our idea of value. A project can be of value in an economic sense (1), or as being useful to the business (2). In our view, ‘sufficient usefulness’ results in economic value. From an economic point of view, we consider the economic evaluation of an investment: the Economic Value Added (EVA) (Drury, 2004). Although other methods such as Return on Investment and Return on Equity exist, EVA measures the value created from investments (Thompson, 2003). From a usefulness perspective, we look at the various benefits and how these result in economic value. For this, we use Deloitte’s Enterprise Value Map (Deloitte Consulting LLP, 2013c).

Both perspectives have a different, but largely overlapping, view on how value can be added to organizations. Both take shareholder value as the ultimate goal (Drury, 2004; Deloitte Consulting LLP, 2013c).

In this chapter, we discuss the benefits organizations can expect from implementing the Business Rule Approach, and how these benefits result in added value to the organization.

3.1. **Added value and benefits**

Implementing the Business Rule Approach is a major change to the organization’s business and IT functions. This requires considerable investments to be made. The measure ‘Economic Value Added’ is calculated by subtracting cost of capital from profit (and, potentially, various corrections) (Drury, 2004). In capital investment projects, this means the ‘profit’ (monetary benefits – costs) should exceed the cost of invested capital. In other words, organizations should only implement the Business Rule Approach if it provides sufficient benefits to recover all costs, including cost of capital. Only then, the project will add value to the organization. When discussing the Business Rule Approach, we relate this to the terms benefits, and cost of invested capital. The project costs (depreciation of the invested capital) are not considered here, but are directly related with the project budget.

Deloitte’s Enterprise Value Map (Deloitte Consulting LLP, 2013c) identifies four improvement areas that can contribute to an organization’s value: *Revenue Growth, Operating Margin, Asset Efficiency, and Expectations*. Revenue growth focuses on increasing sales volume and average price, while the Operating Margin area focuses on the cost side. The improvement area Asset Efficiency focuses on improving the return on investment of assets (Fixed assets, Inventory, Payables and Receivables). The area Expectations targets the stakeholder’s perception of the organization, such as management and governance effectiveness and the organization’s capabilities. When discussing the Business Rule
Approach, we relate this to the terms revenue growth, operating margin, asset efficiency, and expectations.

As the introduction tells us, implementing the Business Rule Approach should bring sufficient benefits to the organization. Benefits are realized by resolving organizations’ challenges.

Problems the Business Rule Approach addresses are (Ross R. G., 2003b, p. xxi):

- **Ad hoc rules.**
  - If the organization does not have a structured way for defining their business rules, business workers often make up their rules as they go along. This could lead to confusion, contradiction, and operational inefficiency.

- **Miscommunications.**
  - Concepts might vary from one part of the organization to another. Two persons can have a different perception on the meaning of the word ‘profit’.

- **Inaccessible rules.**
  - Business rules are often buried in application source code. This is not the place to go to for business persons trying to understand ‘the rules of the game’.

- **Massive differentiation.**
  - Business today need to massively differentiate between business parties, and at the same time conduct each business transaction faster, more accurately, and at lower costs.

- **The need to keep up to speed.**
  - Changes of the business need to be implemented almost instantaneously.

- **Knowledge walking out the door.**
  - To a large extent, the business rules (and in particular the considerations behind them) are not documented, but are available in employees’ heads. Employees leaving the company are a risk for the organization.

Based on our analysis of the benefits of the Business Rule Approach as identified during our literature reviews (see Section 3.2), we realize we should divide the various benefits into three categories:

2. IT benefits.
3. Risk and Control benefits.

Some benefits fall into more than one category.

### 3.1.1 Business Benefits

In general, business benefits result from the Business Rule Approach because the business people are able to work more effectively and/or more efficiently. These typically are situations where – without Business Rule Approach – the business applications are not sufficiently flexible to support a process, and manual work needs to be done or inconsistent or outdated information is being used. Implementation of the Business Rule Approach could result in both cost reductions and/or increased revenue on the business side.
These benefits are all monetary; they have financial impact (although they might be very hard or impossible to measure or predict). From an Enterprise Value Map perspective, we consider the efficiency increase an Operating Margin improvement if the Business Rule Approach makes the process more efficient; if the Business Rule Approach increases (for example) the asset utilization, we categorize this improvement under Asset Efficiency. From an Economic Value Added perspective, having sufficient of these benefits results in added value.

3.1.2. IT Benefits
IT benefits from the Business Rule Approach can be found in the area of cost reduction on the IT side. After the implementation of the Business Rule Approach, we expect fewer resources are required to provide the same level of service.

This is also a monetary benefit. From an Enterprise Value Map perspective, this cost reduction realizes a higher Operating Margin. As these are also monetary benefits, having sufficient IT benefits might also make this project worthwhile according the Economic Value Added measure.

3.1.3. Risk and Control benefits
Benefits with regard to Risk and Control are realized when implementing the Business Rule Approach results in reduced (impact and/or likelihood of) inherent risks or if controls are more effective. This could result in a reduction of risk for the organization.

Based on the nature of risk and control benefits, we do not envision major direct monetary benefits. However, a reduction of risk in the organization still is beneficial to the organization. From an Enterprise Value Map perspective, this benefit targets the Expectations improvement area. Stakeholders such as shareholders and customers can better form their expectation. From an Economic Value Added perspective, we find the added value on the cost of capital side: A reduction of uncertainty reduces the return capital providers demand for making capital available (Luenberger, 1998). This reduces the costs of capital. Obviously, this reduced cost of capital does not only apply to the investment project, but to all money invested.

3.2. Benefits from the Business Rule Approach
In our literature review, we identified many different benefits from the Business Rule Approach. Because various sources, to a large extent, identified similar benefits, we brought this down to 10 unique benefits. These benefits are mentioned in the first column in Table 1. We interpreted these benefits, our interpretations are mentioned in the second column. Column 3 links this interpretation to one or more of the categories identified earlier: Business benefits, IT benefits, and Risk and Control benefits.

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Explanation</th>
<th>Benefit category</th>
</tr>
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<tbody>
<tr>
<td>A business rule approach narrows the communication gap between requirements, analysis, and design. (von Halle, 2002, p. 12)</td>
<td>Because the Business Rule Approach involves business people in implementing rule changes, it closes the requirements gap between Business and IT. In the traditional approach, much information is lost in the translation of up-front</td>
<td>Business Benefit: As the Business Rule Approach enables the business to change the business rules, no translation to IT concepts is required, so no gap exists.</td>
</tr>
<tr>
<td>Benefit</td>
<td>Explanation</td>
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<tr>
<td>Benefit requirements to the actual application. (Ross R. G., 2003b; Graham, 2007; von Halle, 2002)</td>
<td><strong>Risk and Control benefit:</strong> As no translation from business to IT is required, this translation cannot go wrong. This reduces the risk of erroneous changes to the applications.</td>
<td></td>
</tr>
<tr>
<td>Clearer auditability (Graham, 2007, p. 13)</td>
<td>A large portion of the business rules exist in order to reduce risk. These controls are to be audited. In the business rule approach, many controls reside in the same place, and are more easily visible and auditable.</td>
<td><strong>Risk and Control benefit:</strong> As many business controls reside in the same location and are managed, they are easily auditable. Auditors can check how, when, and by whom these controls were changed, and who approved the change. It must be noted the integration points with the application need periodic review, too.</td>
</tr>
<tr>
<td>The business rule approach makes it possible to change rules faster (Ross R. G., 2003b, p. 186).</td>
<td>The traditional approach generally has a comprehensive set of procedures for allowing change to application systems, involving various decision makers in business and IT. In the Business Rule Approach, the IT involvement can be eliminated. The changes the business makes to business rules can take effect at any desired moment, throughout the application landscape.</td>
<td><strong>Business benefits:</strong> As the rules are not set in stone but can be easily changed, this allows the business to have more activities covered by business rules in the application. This enables the business to work more effective (taking business opportunities that weren’t worthwhile initially) and efficient (automating more work). Time to change is a burden to extend process automation.</td>
</tr>
<tr>
<td>Benefit</td>
<td>Explanation</td>
<td>Benefit category</td>
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<td>----------------------------------------------</td>
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</tr>
<tr>
<td>Change is no longer disruptive</td>
<td>In many (but not all) cases, a change to the business logic in applications results in planned outages of the application. In the Business Rule Approach, changing a rule leaves the applications untouched and therefore undisrupted.</td>
<td>Business benefits: Disruptions in IT services are also disruptive for the business. In some cases, the impact of this disruption can be minimized by performing the changes during the weekend and/or in evening hours. Taking away the disruptions allows the business to have more activities covered by business rules in the application. This enables the business to work more effective (taking business opportunities that weren’t worthwhile initially) and efficient (automating more work). Disruptions to change are a burden to extend automation.</td>
</tr>
</tbody>
</table>

**IT benefits:**
As mentioned above, the impact of disruptions can sometimes be reduced by performing the changes in a particular time frame. This has disruptive impact on the private life of employees performing the change. The Business Rule Approach takes away the disruptions, so no effort from IT required to minimize the disruptions for the business.
<table>
<thead>
<tr>
<th>Benefit</th>
<th>Explanation</th>
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<tbody>
<tr>
<td>Change is no longer costly (von Halle, 2002, p. 12)</td>
<td>The traditional approach generally has a comprehensive set of procedures for allowing change to application systems, involving various decision makers in business and IT. In the Business Rule Approach, the IT involvement can be eliminated.</td>
<td>IT benefits: As the number of changes IT performs is radically reduced, the IT department can reduce staffing, resulting in cost reductions. Business benefits: As the cost of changing business rules are reduced, this allows the business to have more activities covered by business rules in the application. This enables the business to work more effective (taking business opportunities that weren’t worthwhile initially) and efficient (automating more work). Costs to change is a burden to extend process automation.</td>
</tr>
<tr>
<td>Business rules are documented and accessible through a repository (von Halle, 2002, p. 12)</td>
<td>Business rules are documented and accessible through a repository, and no longer hidden in code. When business rules are in an accessible repository, they serve as a mentor to people operating in a collaborative work environment. Business people know where to find the rules.</td>
<td>Business benefits: After implementing the Business Rule Approach, the organization has a comprehensive view on the ‘rules of the game’, documented with the decision to implement this rule, together with the reasoning behind it. This provides the opportunity to consider changing the rules, rather than accepting them as a given.</td>
</tr>
<tr>
<td>Greater consistency across the enterprise (Graham, 2007, p. 13)</td>
<td>A business rule approach enables rule enforcement across technology environments (von Halle, 2002, p. 12). In other words, changing one rule affects all applications; all business applications implement the change exactly at the same time frame. In traditional approaches,</td>
<td>Risk and Control benefit: If rules are applied consistently by the various business applications, the resulting data is also consistent. If applied well, there is only one version of the truth.</td>
</tr>
<tr>
<td>Benefit</td>
<td>Explanation</td>
<td>Benefit category</td>
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<tr>
<td>it is sometimes impossible to make changes to multiple systems at the same time.</td>
<td>BUSINESS BENEFITS: As the cost of changing business rules are reduced, this allows the business to have more activities covered by business rules in the application. This enables the business to work more effective (taking business opportunities that weren’t worthwhile initially) and efficient (automating more work). Costs to change is a burden to extend automation.</td>
<td></td>
</tr>
<tr>
<td>Little need to freeze requirements because rules can be changed easily (von Halle, 2002, p. 12)</td>
<td>BUSINESS BENEFITS: When business applications are implemented according to traditional approaches, the business requirements (including the business rules) should be identified upfront, and detailed out during the design phase. After that moment, the rules cannot be changed anymore without slowing down the implementation efforts. In the business rule approach, only a high-level description of the rules is needed upfront; detailing it out can be done even after technical go-live.</td>
<td></td>
</tr>
<tr>
<td>Faster development of business systems (Graham, 2007, p. 13; von Halle, 2002, p. 12)</td>
<td>BUSINESS BENEFITS: As we have seen above, when implementing business applications, the business rule approach allows us to postpone part of the design work to the ‘build’ phase; this smoothenes out the business involvement.</td>
<td></td>
</tr>
</tbody>
</table>
Furthermore, as less work needs to be done on the business rules (no functional specifications, technical specifications, communication, and misinterpretation), the design phase can be compacted.

**IT benefits:**
A significant part of implementation costs depend on the duration of the project (for example: costs for project management). Reducing the duration of a project reduces the costs of the project.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Systems are delivered for less cost (von Halle, 2002, p. 12)</td>
<td>As we have seen above, the business rule approach enables us to deliver business applications with less effort (work and rework reduction) and a shorter duration (reduction of ‘fixed’ costs’).</td>
<td>IT benefit: Reduced IT costs.</td>
</tr>
</tbody>
</table>

Table 1: Benefits from the Business Rule Approach

### 3.3. Summary
Implementing the Business Rule Approach is a major change in the organization’s business and IT functions. This requires considerable investments to be made.

In capital investment projects, this means the ‘profit’ (monetary benefits – costs) should exceed the cost of invested capital. In other words, organizations should only implement the Business Rule Approach if it provides sufficient benefits to recover all costs, including cost of capital. According to the Economic Value Added measure, only then the project will add value to the organization.

Deloitte’s Enterprise Value Map identifies four improvement areas that can contribute to an organization’s value: *Revenue Growth*, *Operating Margin*, *Asset Efficiency*, and *Expectations*. Improvements in any of these areas result in increased shareholder value.

Based on our analysis of Business Rule Approach benefits we realize we should divide the various benefits from the Business Rule Approach into three categories: Business benefits (BB), IT benefits (ITB), and Risk and Control benefits (RCB). These categories typically contribute to one of the factors of Economic Value Added, and the improvement areas of Deloitte’s Enterprise Value Map (2013c).
We identified the following benefits with the respective categories:

- A business rule approach narrows the communication gap between requirements, analysis, and design (BB & RCB).
- Clearer auditability (RCB).
- The business rule approach makes it possible to change rules faster (BB).
- Change is no longer disruptive (BB & ITB).
- Change is no longer costly (ITB & BB).
- Business rules are documented and accessible through a repository (BB).
- Greater consistency across the enterprise (RCB & BB).
- Little need to freeze requirements because rules can be changed easily (BB).
- Faster development of business systems (BB & ITB).
- Systems are delivered for less cost (ITB).
4. Implementing the Business Rule Approach

Ross (2003b, p. 11) identifies five categories of Business Rule Approach projects:

- **Reengineering:** The project is intended to reengineer business processes, and also replaces or changes the business applications.
- **Revitalization:** No change of business process. This project category applies if changing policies from internal and external sources are painful to implement, and the business rule approach is implemented with the current business processes and infrastructure.
- **Redeployment:** No change of business processes. However, a change in the IT landscape. The business rule approach can support migration from business logic from the ‘old’ system to the new one.
- **Recapture:** If the business rules are buried (badly documented) in software code, and/or spread over various stakeholders. The goal is to redocument the rules. Obviously, if this is the goal of a business rule project, we recommend not to implement a Business Rules Management System.
- **Re-empowerment:** In a fast-changing world with highly individualized customer relations, the ‘rules of engagement’ change quickly. The Business Rule Approach empowers the business user to adapt to the new ‘rules of engagement’.

For the development of the working method, we assume a *revitalization* or a *re-empowerment* project: The working method addresses a project aimed to implement the Business Rule Approach in an organization keeping the current primary business processes and infrastructure in place.

In order to develop a working method for implementing the Business Rule Approach, we first disentangle an existing working method for IT-enabled Business Transformations (Deloitte’s Enterprise Value Delivery). We will use this as a starting point, remove unnecessary components, and make Business Rule Approach-specific additions and changes to this working method.

4.1 General working method for IT-enabled Business Transformations

With the implementation of the Business Rule Approach, we intend to add value to the organization. In order to add value to an organization; a technical solution is insufficient. The solution should be embedded in the organization, so business change should be addressed. Furthermore, as we are value-focused, we need a value-focused starting point. This means the business case for the project should be prepared and continuously monitored.

To this end, we selected Enterprise Value Delivery (EVD) as our starting point. EVD is a working method that combines all these elements. It is Deloitte’s proprietary structured and comprehensive working method to execute IT-enabled Business Transformations. It is aimed to deliver maximum value to the business.

EVD contains a number of tasks that have to be performed during the various phases of the project (Deloitte Consulting LLP, 2013a; Deloitte Consulting LLP, 2013b). The tasks are categorized under various disciplines and are worked on by certain roles on the project. Every task has a work product (deliverable) that is of value to the business, and/or is a prerequisite for one or more other tasks. In order to work efficiently and effectively, the method contains deliverable templates and samples.
Various EVD variants exist to account for various ‘types’ of business transformations (various technologies or approaches). Among them are EVD for Agile, EVD for Electronic Health Records, EVD for System Integration, EVD for Oracle (which can be used for the complete family, including Siebel, EBS, J.D. Edwards, and PeopleSoft), EVD for SAP, and EVD for Salesforce.com. Each method takes into account a specific approach and terminology as used in that particular field; the phases in SAP’s ASAP methodology (SAP AG, 2014) serve as an example.

In this section, we determine which phases, disciplines, tasks, deliverables, and roles are generally used in IT-enabled Business Transformations. To this end, we determine the similarities between EVD for SAP (v3.7) (Deloitte Consulting LLP, 2013a), and EVD for Oracle (v3.7) (Deloitte Consulting LLP, 2013b). For the analysis of similarities between EVD for SAP (v3.7) and EVD for Oracle (v3.7), see Appendix A. Figure 5 shows how the various disciplines and phases in EVD are related.

Enterprise Value Delivery is a value-oriented working method, aimed at maximizing the benefits for the organization. Preparing, maintaining, and continuously verifying the business case throughout the project lifecycle are the means for maximizing value delivered. This could also include adjusting the project scope by increasing or decreasing scope for value adding or non-value adding scope items, respectively.

![Figure 5: Deloitte’s working method for IT-enabled Business Transformations](image)

However, although EVD is commonly associated with a change of the primary business processes, this is not necessarily the case for implementation of the Business Rule Approach. For that reason, from the similarities between EVD for SAP (v3.7) and EVD for Oracle (v3.7), we took out 76 tasks relevant for projects changing primary business processes, but less relevant in the implementation of the Business Rule Approach.

### 4.1.1 Phases

Project phases split the project into smaller time frames, thereby providing a ‘handle’ for planning. In general, the next phase is started once the current phase is finished.
The phases in the general working method for IT-enabled Business Transformations are the following:

1. **Vision.**
   - The purpose of the *Vision* phase is to develop the business case, and to define the goals, benefits, approach, timeline, and key milestones for the project.

2. **Plan.**
   - The purpose of the *Plan* phase is to define the scope of the project and plan the rest of the project. Furthermore, in this phase the project organization is defined, and project procedures are agreed upon.

3. **Design.**
   - The purpose of the *Design* phase is to design to-be business processes, design the configuration of the supporting IT platform, and design the developments required (if any). If a prototype is included in the scope of the project, the prototype is conducted in this phase.

4. **Build.**
   - The purpose of the *Build* phase is to build and test the IT platform according to the specifications documented in the previous phase.

5. **Deliver.**
   - The purpose of the *Deliver* phase is to prepare for and execute system and business cutover.

6. **Operate.**
   - The purpose of the *Operate* phase is to transition to and support actual business operations.

Every task is associated with at least one phase. If a task is associated with more than one phase, the task is performed more than once. Exceptions to this rule are the *phase independent* tasks. These tasks are performed throughout the project, regardless of the currently phase.

In a ‘big bang’ IT-enabled Business Transformation, all phases are executed exactly once. However, if the organization chooses to build the IT platform in multiple steps (releases), the steps *Design* and *Build* are repeated for every release. Furthermore, if an organization decides to have multiple roll-outs, the phases *Deliver* and *Operate* occur more than once.

### 4.1.2 Disciplines

Project disciplines split the projects into high-level groups of related tasks (disciplines). Sub-disciplines are a lower-level grouping of related tasks. This grouping is done across project phases, although not every (sub-)discipline has associated tasks in every phase.

The general working method for IT-enabled Business Transformations comprehends the following (sub-)disciplines:

- Project Management.
- Quality Management.
- Process and Application.
- Development.
- Information Management.
 Deployment.
Technology.
Organizational Change Management.
Value.
Tax.

For a complete overview of all disciplines with associated sub-disciplines, see Appendix A. Because a number of tasks are not relevant for Business Rule Approach implementations (see Section 4.1.3), the disciplines Tax and Information Management are not relevant for the implementation of the Business Rule Approach, and will not be included in the working method for Business Rule Approach implementations.

Every task is associated with one sub-discipline. If a task is performed in more than one phase (see above), the discipline of the task is the same for every occurrence.

4.1.3 Tasks and deliverables
The general working method for IT-enabled Business Transformations comprehends 338 unique tasks. Every task is associated with a (sub)-discipline. 19 tasks are phase independent, the other 319 tasks are assigned to one or more phases.

After taking out the 76 tasks not relevant for the implementing the Business Rule Approach, the input from EVD for the implementation of the Business Rule Approach is 262 unique tasks.

The distribution of tasks accross phases is shown in Figure 6. The distribution of tasks over disciplines is shown in Figure 7. As a task can occur in more than one phase, the total number of tasks in Figure 6 is more than 262: 283.

![Figure 6: Number of tasks per phase](image-url)
Every task has a resulting work product: deliverable. Although most deliverables are (reflected in) documents, it is also possible to have other categories of deliverables, such as systems. Deliverables of preceding tasks are inputs to successive tasks.

A complete list of all tasks and deliverables is shown in Table 5 in Appendix A.

### 4.1.4 Roles

The general working method for IT-enabled Business Transformations contains 59 different roles. 52 of these roles are considered part of the project team; these are assigned to any of the disciplines. 7 roles are fulfilled by resources involved because of their ‘day job’ in the business and their position in the organization; these roles are not assigned to a discipline but are mentioned under ‘General’. For an overview of the roles and their ‘intuitive’ association to the disciplines, see Appendix A.

The relations between the roles and the disciplines are not given by EVD; it is a high-level grouping based on our interpretation of the role and the tasks assigned to this role. Every role in the project team is assigned at least one task. Furthermore, many roles are involved in other tasks as secondary responsible. Roles can be responsible for tasks within and outside their discipline.

Because tax is not considered important in the implementation of Business Rule Approach (the tasks have been taken out in 4.1.3), the Tax Specialist role will not be included in the working method for Business Rule Approach implementations. Furthermore, as we took out all Information Management tasks (mostly Business Intelligence), the Information Management roles will not be included.
4.2 Business Rule Approach implementation aspects

Von Halle (2002) published a working method for the implementation of the Business Rule Approach. This working method takes common system development approaches as a starting point, and adds Business Rules specific components to it. This assumes the development of a home-built application. This is a rather technical approach, not to be considered a Business Transformation, and not taking into account Business Value. Von Halle’s working method (2002, p. 52) assumes the working method is not part of a Business Process Reengineering (BPR) project, but claims to provide the starting point to incorporate it into a BPR project working method.

We combine the general working method for IT-enabled business transformations with the Business Rule-specific parts of Von Halle’s working method (2002).

When combining both working methods, we make the following assumptions:

- The Business Rule Approach implementation is performed as a standalone initiative, not as part of a system development initiative. This defines the scope of the working method. It is possible to combine this initiative with an ERP implementation or other type of project, but then additional tasks need to be taken into scope.
- Although it is not necessarily the case, we assume implementing the Business Rule Approach implies the use of a commercial Business Rule Management System. This is what Von Halle (2002, p. 20) considers most mature, and according to Graham (2007), implementing the Business Rule Approach “…(…) can be done in many ways, but the most economical is to use a Business Rule Management System”. Alternatives are building a BRMS from scratch separately, or implementing the Business Rule Approach without using a BRMS. The latter type of project would not realize the full potential of business benefits (von Halle, 2002).
- As mentioned in Chapter 2, a service-oriented BRMS will be used, in contrast to a data-change-oriented BRMS. A data-change-oriented BRMS does not work in landscapes with ERP and other commercial software.
- We assume the selection of a Business Rules Management System has already been done. If this is not the case, a pre-study needs to be performed before using this working method. This pre-study is not in scope for this working method.
- The items in Von Halle’s working method (2002, p. 62) particularly relevant for the Business Rule Approach (and for that reason marked with an asterisk) need to be translated to the general working method for IT-enabled business transformation to turn it into a working method for the Business Rule Approach transformation. We assume the items not marked with an asterisk are already covered in the general working method.

Exceptions:

- Not shown in the overview are steps related to the actual implementation of the BRMS (von Halle, 2002, p. 474), and the steps related to Rule Management (von Halle, 2002, p. 491). We consider these important, and include these steps in our working method.
- The items marked with an asterisk include also items related to data model design. From an application development perspective, this is logical. However, our aim is to implement the Business Rule Approach without the development of a new application. For this reason, we will not elaborate on the data model implications of this working method.
4.2.1 Phases
Von Halle’s working method (2002) distinguishes six phases:

- **Scoping.**
  - Scoping is the process for capturing high-level business requirements and defining the boundaries of the project.
- **Planning.**
  - Planning is creating a project plan based on the information obtained during the Scoping phase.
- **Discovery.**
  - The Discovery phase has two parts: discovering initial business requirements and discovering rules and data.
- **Analysis.**
  - In the Analysis phase, the team structures the artefacts found in the Discovery phase.
- **Design.**
  - In the Design phase, the information system is designed.
- **Delivery.**
  - In the Delivery phase, the information system is brought forth, users are trained, and the system is tested.

The phases Scoping and Planning together are in the general working method for IT-enabled business transformations (EVD) comparable to the phase ‘Plan’. Discovery of initial business requirements is also part of this phase, because it is a prerequisite for estimating the effort required for the next phases, and planning this effort. Discovering rules and data is considered part of Design, as are Von Halle’s Analysis and Design phases (2002). Von Halle’s Delivery phase (2002) contains the phase in which the solution is built and delivered; in the general working method comparable to the the phases ‘Build’ and ‘Deliver’. As Von Halle’s working method (2002) is not intended for executing a business transformation (although it provides the starting point for it), our phases ‘Vision’ (which regards preparing a business case) and ‘Operate’ (which regards keeping the users and the system working) are not in scope of this working method. Table 2 shows this in tabular form.

<table>
<thead>
<tr>
<th>General working method</th>
<th>Von Halle’s working method (2002)</th>
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<tbody>
<tr>
<td>Vision</td>
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<tr>
<td>Plan</td>
<td>Scoping</td>
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<tr>
<td></td>
<td>Planning</td>
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<tr>
<td></td>
<td>Discovery – Initial business requirements</td>
</tr>
<tr>
<td>Design</td>
<td>Discovery – Rules and data</td>
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<td></td>
<td>Analysis</td>
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<td></td>
<td>Design</td>
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<tr>
<td>Build</td>
<td>Deliver</td>
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<tr>
<td>Deliver</td>
<td></td>
</tr>
<tr>
<td>Operate</td>
<td></td>
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</tbody>
</table>

Table 2: Mapping General working method with Von Halle’s working method (2002)
4.2.2 Disciplines
Von Halle’s working method (2002) identifies 3 tracks (disciplines) for the traditional working method for system development projects: Technology, Process, and Data. For the implementation of a Business Rule Approach, she claims a 4th track is required: the Rule track.

- Technology track.
  - The technology track includes the tasks for the selection, customization, and support of the technology in order to leverage the Business Rule Approach.
    - In the general working method for IT-enabled business transformation, the activities in this discipline are covered by the Technology discipline.
- Process track.
  - The process track focuses on understanding the business processes, and the interaction between the actors, the application, and other systems.
    - In the general working method for IT-enabled business transformation, the activities in this discipline are covered by the discipline Process and Application, in particular the sub-discipline Business Process Management.
- Data track.
  - The data track is responsible for producing the data models and (if applicable) the database.
    - In the general working method for IT-enabled business transformation, the activities in this discipline are covered by the Information Management discipline.
- Rule track.
  - The rule track focuses on the capture, analysis, automation, and change of business rules.
    - In the general working method for IT-enabled business transformation, this new discipline is not covered. Because the rules should be very close to the business, and are very much related to business processes, we will position this new discipline as a sub-discipline under the Process and Application discipline. We call it Business Rules Management.

4.2.3 Roles
Von Halle (2002, p. 72) identifies four new roles in Business Rule Approach implementation projects:

- Rule Analyst.
  - Responsible for capturing rules from business conversations, documents, or program code.
- Rule Designer.
  - Responsible for determining where rules are to be enforced within the application architecture.
- Rule Implementer.
  - Accountable for coding the executable rules, although application developers or database administrators may play a role here.
- Rule Integrator or Rule Manager.
  - Analyzes rules across business events and across applications to ensure high-quality rules for the organization.
We consider the skills required for the first three roles (Rule Analyst, Rule Designer, and Rule Implementer) very similar: Resources need both comprehensive business knowledge and sufficient technical knowledge. We include these responsibilities in one role: *Business Rule Analyst*.

The Rule Integrator or Rule Manager plays a more high-level role in the project. We consider this role the lead for the Rules work stream: *Business Rules Management Team Lead*, to be consistent with other lead roles in EVD (Deloitte Consulting LLP, 2013b).

### 4.2.4 Tasks and deliverables

Von Halle’s working method (2002, p. 62) splits up the project effort into steps. Generally, one or more of these steps result in a deliverable. It focusses on the parts of a project that are unique for the Business Rule Approach, and raises the abstraction level for more generic parts (“Design the rest of the system” and “Put it all together”) (von Halle, 2002, p. 427). Von Halle marked the steps particularly related to the Business Rule Approach with an asterisk.

The general working method for IT-enabled Business Transformations typically has one task for every deliverable (although exceptions exists, for example if a deliverable is sharpened in a later phase). In order to enter the part that is relevant for the Business Rule Approach into the general working method, we map the marked steps to existing tasks in the general working method, or we shape new tasks to contain the steps. For newly ‘invented’ tasks, we also ‘invented’ new deliverables (in some cases we based the naming on literature). Based on the phase in Von Halle’s working method (2002, p. 62), we map the task to the equivalent phase in the general working method. This is done in Section 4.2.1. An overview of all steps in Von Halle’s working method (2002, p. 62) and how they map in our working method for the implementation of the Business Rule Approach is described in Appendix B.

Below, we explain the tasks specific to an implementation of the Business Rule Approach, and the tasks from the general working method touched by the steps mentioned in Von Halle’s working method (2002). Tasks in the general working, but not mentioned in Von Halle’s working method (2002) are not considered in detail here, but will still be part of the working method for the implementation of the Business Rule Approach. Tasks unique to Business Rule Approach implementations are marked as such. Tasks are in chronological order. The item numbers refer to the steps mentioned in Appendix B.

*Develop Project Charter – Exists in EVD, no change required*

Deliverable: Project Charter

The project charter documents the vision, goals, and expected benefits of the project, as well as the project approach, end-product scope, project schedule, constraints and dependencies, and other important information. It identifies important stakeholders and authorizes the project to proceed (Deloitte Consulting LLP, 2013b). The business context is documented in the project charter (item 1).

Phase: Plan

Discipline / Sub-discipline: Project Management / Plan

Role: Project Manager
**Develop Work Plan** – *Exists in EVD, no change required*

Deliverable: Work Plan

The Work Plan contains the schedule for the coming phase. In this work plan, tasks with estimated effort are scheduled, and resources are assigned. It is the basis for progress reporting. It does not only consider time for project personnel, but also includes business involvement (item 6).

Phase: Plan, Design, Build, Deliver, Operate

Discipline / Sub-discipline: Project Management / Plan

Role: Project Manager

**Define Business Rule Standards** – *Unique for Business Rule Approach*

Deliverable: Business Rule Standards

In order to deliver a business rule system with a coherent set of business rules and consistent documentation, a set of business rule standards must be defined. More specifically, rule classifications, naming conventions, rule templates, and required meta data need to be decided upon (von Halle, 2002, p. 182). This covers item 5.

Phase: Plan

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rules Management Team Lead

**Design To-Be Sub-processes (L3)** – *Exists in EVD, adapted for Business Rule Approach*

Deliverable: To-Be Sub-process Design

As compared to a system development project, a business transformation aims to optimize business processes. This means not only the use cases for a particular application should be taken into account, the complete business processes in scope should be considered. Sub processes represent the relationship between all manual and system tasks undertaken by a person to meet the business output (Enterprise Value Delivery for Oracle 3.7, 2013b; Deloitte Consulting LLP, 2013a). The sub processes also document the decisions made in the business processes. This is where the decisions are identified (item 2).

As the (sub-)processes are designed integrally (together with the decisions), there is no need to refine the process based on rule family dependencies or data activities (item 20). They are already discovered at the moment the decision is identified. This in not necessarily the case in a pure system development effort.

Phase: Design


Role: Application Functional Analyst
**Define Rule Discovery Roadmap – Unique for Business Rule Approach**

Deliverable: Rule Discovery Roadmap


People as a rule source can be knowledge workers who know the rules, or decision makers who can define the rules. Policy documents, contracts, and work instructions are examples of documents as a rule source. If rules are to be found in application code and database triggers and stored procedures, the rule source is software code.

The rule discovery roadmap is the mapping of the decisions identified in the processes against the rule sources (item 4). For every decision, it mentions the rule sources to consult. Furthermore, it identifies the means of rule discovery. Examples are interviews and workshops if the rule sources are people, document analysis if the rule sources are documents, or software code inspection or *rule mining* if the rules have to be sourced from application code.

We recommend to perform this step in close cooperation with a business representative with strong business knowledge in this domain.

The Rule Discovery Roadmap is the starting point for preparing the High-Level Rule set.

**Phase: Design**

**Discipline / Sub-discipline:** Process and Application / Business Rules Management

**Role:** Business Rules Management Team Lead

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**Document Rule Management Policy – Unique for Business Rule Approach**

Deliverable: Rule Management Policy

The project to implement the Business Rule Approach will, at a certain point in time, come to an end. The starting point for embedding the Business Rule Approach in the target organization is the Rule Management Policy. The Rule Management Policy determines how the rules will be managed, which safeguards for unauthorized changes will be implemented, and the new roles and responsibilities in the organization.

The Rule Management Policy should cover at least the following subjects:

- **Scope (item 50):** During the Plan phase we defined the scope of the project. We defined for which process groups, which organizational entities, and which applications we are going to implement the Business Rule Approach. This could be the whole organization, or just a part. Business Rules might have jurisdiction over many political, geographical, and project boundaries (von Halle, 2002, p. 498). For Rule Management, we have to define a similar scope. It is very well possible the scope is exactly the same as the project scope, but the organization might have changed already.

- **Rule-related deliverables (item 51):** During this project, we develop a number of deliverables. Examples are the To-Be Sub-process Design, High-Level Rule set, Detailed...
Rules, and the Term/Fact Model. We recommend to maintain these deliverables during ‘business as usual’ to have complete documentation. Standards related the maintenance of these deliverables should be documented in the Rule Management Policy.

- Roles in the organization (items 52, 53, 55): As the Implementation of the Business Rule Approach puts the business in the driver seat, it has significant impact on the organization. Von Halle identifies 3 rule-related new roles (2002, p. 502):
  - Rules Repository Administrator: The Repository Administrator is responsible for ensuring a high-quality rule set. This means rules are not duplicated, overlapping, and/or inconsistent. The Rule Repository Administrator performs a QA role.
  - Rule Steward: The rule steward is accountable (and potentially also responsible) for management of rules on behalf of the owner (the organization). In general the complete scope of the business rules would be divided over more than one role steward; each rule steward is accountable for a specific business area.
  - Rule Analyst: The rule analyst can be considered a consultant for the rule steward. The rule analyst assists the rule steward in rule management, and performs ‘hands-on’ rule-related activities on the rule steward’s behalf.

As Von Halle indicates, a steward is someone taking accountability for managing something that belongs to someone else (2002, p. 505). We think it is also important to establish ownership. For that reason, we also add another role:

  - Rule Owner: The rule owner is the person deciding on the contents of the rules. The rule owner could be the Director of Purchasing. The rule owner mandates the rule steward (this could be his controller or a purchasing manager) for managing the rules on his behalf. The rule owner initiates the addition of rules, rule changes, or rule retirement.

- New entities in the organization:
  - The Rule Function (items 50 and 53): This department functions as a competence center for the management of rules. The Rule Analysts and Rule Repository Administrator work for this function. The Rule Function is responsible for maintaining the complete set of rules (cross-business and cross-function). This department should be sponsored by the business’ senior management.
  - The Rule Council (item 56): The Rule Council is a board meeting for the purpose of resolving rule-related conflicts. Conflicts could, for example, arise over jurisdiction of a rule or definition of a rule. The Council meets only if a conflict requires resolution. A rule council should be comprised of high-level business personnel who are empowered to resolve the conflict, but also have the organization’s benefits at heart over personal domain issues. A starting point are the Rule Stewards (von Halle, 2002, p. 506).

Phase: Design

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rules Management Team Lead
Develop Rule Management Processes – Unique for Business Rule Approach

Deliverable: Rule Management Processes

Although the Rule Management Policy describes the scope, actors, and responsibilities in rule management. However, it does not prescribe the processes for rule management. This is covered in the deliverable Rule Management Processes.

The Rule Management Processes cover the processes related to the addition, modification, and retirement of business rules (item 64). The objective of these processes is to keep the rule set consistent and in line with the business objectives. The Rule Management Processes should mitigate the risk of unauthorized changes.

Although Von Halle (2002, p. 514) does not cover this, we find it important to document at least the following subjects:

- Change Initiation: A change to a rule should be initiated by the rule owner. This can be explicit or implicit. If the change originates from somewhere else in the organization, the rule owner’s approval is required, and the rule owner is considered the principal.
- Change execution: In simple cases (such as the change of a variable from €25 to €40) the rule steward might make the change himself. In more complex cases, the rule steward delegates making the required change to one or more rule analyst(s).
- Testing: Rule Testing is performed by simulation. The tester provides the input parameters for the decision (simulated input), after which the BRMS executes the rules, and provides the decision (simulated output). As we are often testing automated controls, it is important to test the rule with various scenarios and perform both positive and negative tests. To prevent unauthorized changes, the testing effort is a combined effort by the rule steward and rule analyst; both roles should sign off on the test results.
- Quality Assurance: The Rule Repository Administrator checks whether the change fits in the bigger picture, and whether the documentation is updated (if required).
- Sign-off and activation: Once the change has been performed, tested, and reviewed, the rule owner signs off on the change. The Rule Repository Administrator activates the changed as per the desired implementation date.
- Rule impact analysis (item 65): Business rules can depend on other business rules. A change to one rule can therefore impact the result of other business rules. In a consistent and coherent set of rules, this will not give unexpected results. However, Von Halle (2002, p. 523) suggests to do an impact analysis on the intended rule change, and verify whether the change impact is as expected. The Business Rules Management System should provide this functionality.
- Authorization: In order to prevent unauthorized changes, we recommend to strictly segregate duties between the rule steward and the rule analyst on one side (business content, can change the rules) versus the rule repository administrator (cannot change the rules, only activate them).

Although the safeguards mentioned above might appear very overwhelming and not very flexible, it is worth mentioning a small change (for example, changing a threshold value from €25 to €40) can
be executed and activated very quickly. This effect is even stronger if the rule is used by more than one business application.

Phase: Design

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rules Management Team Lead

**Develop High-Level Rule set – Unique for Business Rule Approach**

Deliverable: High-Level Rule set

The High-Level Rule set is a high-level overview of all decisions identified in the To-Be Sub-process Design. It determines how these decisions are treated. Based on the Rule Discovery Roadmap, the rule sources are consulted to establish whether the decision can be captured in a set of business rules (item 7 and 8), and the decision should be connected to the business objectives (item 9). Furthermore, the factors driving the decision are identified and documented in the High-Level Rule set. Based on, among other factors, the nature of the decision, the factors driving the decisions, complexity, and expected change frequency, an assessment should be made whether the decision is suitable for facilitation through the BRMS (items 22, 32, 38, and 39). Rules can cover more than one scenario. If a rule is added to the high-level rule set, take some time to think whether this rule is relevant for other situations. Document where this rule should be anchored in the business applications.

We recommend to complete this task in an iterative manner. The High-Level Rule set is a key scoping deliverable, as it determines which rules will be captured in the Business Rules Management System. It is the starting point for various other tasks, such as the development of the Detailed Rules.

Phase: Design

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rule Analyst

**Develop Term/Fact Model – Unique for Business Rule Approach**

Deliverable: Fact Model

Business rules should be formulated in the business language (not IT language), as the business is the owner and maintainer of the business rules. In order to prevent miscommunication or drifting interpretation of the terms, it is advisable to explicitly define a business definition of each term used in the business rules (item 10). Furthermore, create a synonym list for the terms, but use the standard term consistently in the business rules (von Halle, 2002, p. 197).

An examples of a term and a definition are:

- **Customer:** a person or a legal entity who/which placed an order during the past 24 months.

A fact is a complete statement connecting terms (via verbs or prepositions) into sensible, business-relevant observations (von Halle, 2002, p. 202).
An example of a fact is:

- Customer places order.

Although the fact model can serve as a communication medium for the terms and their definitions, we consider this an optional part of the deliverable (item 11). Von Halle’s method assumes an application development project where the fact model forms the basis of the data models. As we are not developing a new application and data model, the added value of the fact model is limited to communication medium only. In any case, we recommend to establish the terms and definitions, as these are required for an end-state with consistent rules.

Ross (2003b) considers the Term/Fact model the skeleton (bones and ligaments) which are moved by the processes (muscles) and controlled by the rules (nerves).

Phase: Design

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rule Analyst

**Define Rule Test Approach – Unique for Business Rule Approach**

Deliverable: Rule Test Approach

In the Build phase, the project will develop the Detailed Rules, and these rules will be entered into the Business Rules Management System. As the quality of the implementation in the BRMS drives the downstream business applications, it is important to test the implementation of all rules to rule out the possibility of unexpected behavior (item 12).

The approach of this Rule Test should be documented in the Rule Test Approach. Examples of subjects covered in the Rule Test Approach:

- Actors (who will conduct the test?).
- Timing (when will the testing be conducted?).
- Test method (how will the testing be conducted?).
- Scope (which rules will be tested, and what aspects of the rules will be tested?).

Most commercial Business Rules Management Systems have the possibility to test (yet inactivated) rules by simulation. The tester provides the input parameters for the decision (simulated input), after which the BRMS executes the rules, and provides the decision (simulated output).

As we are often testing automated controls, it is crucial to test all rules thoroughly. By thoroughly we mean both positive tests and negative tests in various scenarios.

In order to put the business in the driver seat early in the process, and make sure all (business) stakeholders get used to their new responsibility, we recommend to make the Rule Test Approach very similar to the Rule Management Processes. The rule testing effort during the Build phase of the project will be similar to the future ‘business as usual’, but controlled by the project.

Phase: Design
Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rules Management Team Lead

**Document To-Be Application Landscape** – *Exists in EVD, no change required*
Deliverable: To-Be Application Landscape

In the Plan phase, the As-Is Application Landscape was documented in Graphical form. The As-Is Application Landscape is a brief description of the existing landscape, functionality, inputs and outputs, application performance, company boundary applications, and external entities integrated in the current state solution (Deloitte Consulting LLP, 2013b).

During the Design phase, this document should be updated to represent the situation after implementation of the Business Rules Management System (item 28, 41).

Phase: Design

Discipline / Sub-discipline: Development / Application Architecture

Role: Application Development Team Lead

**Develop Software Development Scope** – *Exists in EVD, adapted for Business Rule Approach*
Deliverable: Software Development Scope

The Software Development Scope is an inventory of all development objects. In a Business Rule Approach implementation project, the scope covers two areas:

- Adaptation of business applications to embed the rule service in the process flow (item 32). The High-Level Rule set comprehends the list of rules, and the anchoring points of these rules in the business applications. These anchoring points comprehend the main part of the Software Development Scope.
- Creation of reports in the Business Rule Management System. In order to be able to do proper rule management, a number of rule reports might be required. If the Rule Management Policy and Rule Management Processes require specific information not yet provided by the BRMS, these reports should be added to the Software Development Scope.

The Software Development Scope is a major scoping deliverable for the software developers. It is the starting point for the functional specifications, technical specifications, etc.

Phase: Design

Discipline / Sub-discipline: Development / Application Development

Role: Application Development Team Lead

**Develop End-User Training Curriculum** – *Exists in EVD, no change required*
Deliverable: End-User Training Curriculum

The Rule Management Processes and Rule Management Policy should be embedded in the business organization (item 66). This should be done by providing end-user training to the individuals involved.
The End-User Training Curriculum contains the detailed training curriculum with course details, such as course objectives, delivery vehicle, course length, and pre-requisites. It guides the structure and the development of the end-user training program (Deloitte Consulting LLP, 2013b).

Courses regarding the Rule Management Processes and Rule Management Policy should be documented in the Curriculum, together with more technical courses regarding the Business Rule Management System.

Phase: Design

Discipline / Sub-discipline: Organizational Change Management / End-User Training

Role: Training Lead

**Build System – Exists in EVD, no change required**

Deliverable: Built System (Business Rules Management System)

The objective of this task is to assemble and integrate the physical and logical infrastructure required to support the system. Often this includes the creation of additional environments to support the development, configuration, and testing of the system (Deloitte Consulting LLP, 2013b) (item 62).

The output of this task is an operational but ‘empty’ (no rules implemented yet) Business Rules Management System.

Phase: Build

Discipline / Sub-discipline: Technology / Infrastructure

Role: Technical Infrastructure Team Lead

**Develop Detailed Rules – Unique for Business Rule Approach**

Deliverable: Detailed Rules

The Design phase delivers the High-Level Rule set. In the Build phase, the rules supported by the Business Rules Management System will be further detailed out and implemented in the BRMS.

This task should be performed by the Business Rule Analyst, while following the Rule Discovery Roadmap, and adhering to the Business Rule Standards documented during the Plan phase. This step is performed in the Build phase to level business involvement over the project timeline, and to be able to implement and document the rules right into the Business Rules Management System.

Phase: Build

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rule Analyst
**Develop Object Model – Unique for Business Rule Approach**

Deliverable: Object Model

In the Design phase, a Term/Fact Model is developed to define and link terms. Depending on the software product used, these terms and facts need to be entered into the Business Rules Management System in the form of an object model.

We recommend to perform this task in parallel to the development of the detailed rules.

Phase: Build

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rule Analyst

**Develop Rule Test Cases – Unique for Business Rule Approach**

Deliverable: Rule Test Cases

Rule Test Cases are the predefined scenarios a business rule should pass in order to be accepted. Business Rules Management Systems usually have to possibility to test the rules by simulation. Various scenarios should be covered for every business rule (item 12), both positive and negative.

Example: If a rejecter-type business rule is implemented to prevent recording an invalid postal code, the test should at least comprehend the scenario of a valid postal code (to check whether it will result in an ‘OK’; this is called a positive test) and an invalid postal code (to check whether it will indeed return a ‘not OK’; this is called a negative test).

Phase: Build

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rule Analyst

**Conduct Rule Test – Unique for Business Rule Approach**

Deliverable: Rule Test Results

Business Rules Management Systems usually have the possibility to test rules by simulation. The tester provides the input parameters for the decision (simulated input), after which the BRMS executes the rules, and provides the decision (simulated output).

Conducting the Rule Test is nothing more than executing the test scenarios for the rules, according to the Rule Test Approach (item 48). Results should be documented in the Rule Test Results. Defects should be resolved before the rules are activated.

Phase: Build

Discipline / Sub-discipline: Process and Application / Business Rules Management

Role: Business Rule Analyst
Perform Role-to-Position Mapping – Exists in EVD, no change required
Deliverable: Role-to-Position Mapping Results

Goal of the Role-to-Position Mapping is to assign the job roles Rule Analyst, Rule Steward, Rule Repository Administrator, and Rule Owner to new or existing positions in the organization (item 52). Based on the result, the persons on these positions will be invited for the relevant end-user courses.

Phase: Build

Discipline / Sub-discipline: Organizational Change Management / Organizational Alignment

Role: Change Specialist

4.3 Implementation of the Business Rule Approach
In 4.1 we described phases, tasks, disciplines, deliverables, and roles for the general working method for IT-enabled Business Transformations. In 4.2 we identified 2 additional roles, an additional sub-discipline, and 11 new tasks and deliverables required in Business Rule Approach implementations on top of the ones from the general working method.

No change was made to the structure of the phases.

Figure 8 shows how the phases and the disciplines integrate.

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Figure 8: Working method for implementation of the Business Rule Approach

4.3.1 Disciplines
After adding the Business Rule Management discipline, the working method contains the following (sub-)disciplines:

- Project Management
  The Project Management discipline facilitates effective project planning and management.
  - Plan.
  - Manage.
  - Close.
Quality Management

The Quality Management discipline ensures the quality of the project by assessing deliverables and project processes against organizational standards.
- Quality Planning.
- Quality Assurance.
- Quality Support.

Process and Application

The Process and Application discipline addresses the business processes and the way these processes are supported by the IT platform.
- Business Process Management.
- Package Configuration.
- Business Process Controls.
- Business Rules Management.

Information Management

The Information Management discipline concerns the value, usefulness, accessibility, and security of an organization’s data and information assets.
- Information Strategy and Architecture.
- Data Protection and Privacy.
- Master Data Management.
- Information Quality.
- Reporting and Analytics.
- Metadata Management.

Development

The Development discipline regards designing, building, and testing custom development objects.
- Application Architecture.
- Application Development.
- User Experience.
- Development Controls.

Deployment

The Deployment discipline considers the transition to the new IT platform.
- System Deployment.
- Business Deployment.
- Support Preparation and Stabilization.
- Readiness Testing.

Technology

The Technology discipline addresses the technological aspects of the Business Transformation.
- Infrastructure.
- Application Security.
- Identity and Access Management.
- Technology Controls.

Organizational Change Management

The Organizational Change Management discipline regards the adoption and sustainability of the project.
- Change Preparation.
- Organizational Alignment.
- Communications.
- Capability Transfer.
- End-User Training.

Value

*The Value discipline is responsible for identifying and tracking benefits (to be) realized by the project.*

- Value and Business Case Management.

Every task is associated with one sub-discipline. If a task is performed in more than one phase (see above), the discipline of the task is the same for every occurrence.

### 4.3.2 Tasks and deliverables

After adding the 11 tasks specifically required for the implementation of the Business Rule Approach, our working method contains 273 unique tasks.

The distribution of tasks across phases is shown in Figure 9. The distribution of tasks over disciplines is shown in Figure 10. As a task can occur in more than one phase, the total number of tasks in Figure 9 is more than 273: 294.

![Number of tasks per phase](image)

*Figure 9: Number of tasks per phase*
For a complete list of all tasks and deliverables, see Table 9 in Appendix C.

### 4.3.3 Roles

After adding the two Business Rule-related roles, the working method for implementing the Business Rule Approach contains the following roles:

- **General – not assigned to discipline:**
  - Key Stakeholder.
  - Project Sponsor.
  - Site Coordinator.
  - Subject Matter Expert.
  - Information Steward.
  - Super User.
  - Change Agent.

- **Project Management:**
  - Project Manager.
  - Project Office Support.
  - Project Planner.
  - Lead Client Service Partner.

- **Quality Management:**
  - Quality Manager.
  - Configuration Manager.
  - Assessor.
- Method Coach.
- Project Adviser.

**Process and Application:**
- Business Process Analyst.
- Process Team Lead.
- Controls Specialist.
- Security and Controls Team Lead.
- Application Functional Analyst.
- Business Process Owner.
- **Business Rules Analyst.**
- **Business Rules Management Team Lead.**

**Information Management:**
- BI Functional Resource.
- Data Modeler.
- Information Architect.
- Information Quality Specialist.
- Data Analyst.
- Database Administrator.
- BI Report Developer.
- Information Governance Specialist.
- Content Management Specialist.
- Data Quality Lead.

**Development:**
- Application Development Team Lead.
- User Experience Team Lead.
- Middleware Developer.
- Legacy Analyst.
- Application Developer.
- Portal Developer.
- Legacy Developer.
- User Interface Specialist.
- Application Designer.
- Data Integration Developer.

**Deployment:**
- Integration Manager.
- Service Delivery Analyst.
- Service Delivery Manager.

**Technology:**
- Technical Infrastructure Team Lead.
- Security Specialist.
- Technical Test Analyst.
- Technical Infrastructure Analyst.
- Client IT Stakeholder.

**Organizational Change Management:**
- Organizational Change Management (OCM) Team Lead.
Roles can be responsible for tasks within and outside their discipline.

### 4.4 Summary

For the development of the working method we assume a *revitalization* or a *re-empowerment* project: The working method addresses a project aimed to implement the Business Rule Approach in an organization keeping the current primary business processes and infrastructure in place.

As a starting point we use Deloitte’s proprietary working method *Enterprise Value Delivery* (EVD). EVD is a structured and comprehensive working method to execute IT-enabled Business Transformations aimed to deliver maximum value to the business. EVD contains a number of tasks that have to be performed during the various phases of the project. The tasks are categorized under various disciplines and are worked on by certain roles on the project. Every task has a work product (deliverable) that is of value to the business, and/or is a prerequisite for one or more other tasks.

Literature review shows an additional sub-discipline (*Business Rules Management*) is required to manage the business rules aspects of the project, as this is not included in EVD. Furthermore, two project roles need to be added on top of EVD: the Business Rules Analyst and the Business Rules Management Team Lead.

These two project roles should carry out 11 unique Business Rule related tasks:

- **Define Business Rule Standards:**
  - To specify for example rule classifications, naming conventions, rule templates, and required meta data, etc.

- **Define Rule Discovery Roadmap:**
  - A rule discovery roadmap is a description of the journey we will take searching for rules.

- **Document Rule Management Policy:**
  - The Rule Management Policy determines how the rules will be managed, which safeguards for unauthorized changes will be implemented, and the new roles and responsibilities in the organization.

- **Develop Rule Management Processes:**
  - The Rule Management Processes cover the processes related to the addition, modification, and retirement of business rules. The objective of these processes is to keep the rule set consistent and in line with the business objectives.

- **Develop High-Level Ruleset:**
  - The High-Level Rule set is a high-level overview of all decisions identified in the To-Be Sub-process Design.
Develop Term/Fact Model:
- The fact model defines all business terms used in the business rules to ensure consistent usage and thereby consistent business rules.

Define Rule Test Approach:
- As the quality of the implemented business rules drives the quality of the decisions made for the functional business applications, the business rules should be tested. The Test Approach determines how this test is carried out.

Develop Detailed Rules:
- The Detailed Rules are specified in the Business Rules Management System. This specification is performed by business users during the build phase.

Develop Object Model:
- The Object Model is the representation of the Term/Fact Model specified in the BRMS.

Develop Rule Test Cases:
- Rule Test Cases are the predefined scenarios a business rule should pass in order to be accepted.

Conduct Rule Test:
- Conducting the Rule Test is nothing more than executing the test scenarios for the rules, according to the Rule Test Approach.

The standard EVD tasks Design To-Be Sub-processes (L3) and Software Development Scope need to be adapted to capture the decisions in the functional business applications and to integrate the Business Rules Management System in the functional business applications, respectively.
5. Conclusion

The primary question in this research was:

*What is an appropriate working method to implement the Business Rule Approach in such a way it adds value to an organization?*

We answered this question by answering the three secondary questions:

- What is the Business Rule Approach?
- How can organizations realize added value by implementing the Business Rule Approach?
- What is a general working method for IT-enabled Business Transformations, and how should it be adapted to be suitable for implementation of the Business Rule Approach in an organization?

This chapter first answers the secondary research questions before answering the primary research question.

5.1 Secondary research questions

5.1.1 The Business Rule Approach

*What is the Business Rule Approach?*

We define Business Rules from two perspectives: From the business point of view, it's a directive intended to influence or guide behavior. Business rules are literally the encoded knowledge of your business practices. From an IT point of view, a business rule is an atomic piece of reusable business logic.

The Business Rule Approach will externalize the business rules from the information systems (take it out), centralize these rules (store in a central repository), standardize these rules (express in such a way all stakeholders can understand), and structure (express relations between) these business rules. The business persons can take ownership of the rules, and change them if desirable.

The Business Rule Approach typically involves the implementation of a Business Rules Management System. Under our assumption of an existing business application landscape, a service-oriented Business Rules Management System is to be installed. Service-oriented rules products present themselves to the business applications as a service to make decisions. If a business application needs to make a decision, it supplies the BRMS with relevant information and requests a decision. The BRMS executes the applicable rules and returns the result to the business application.

5.1.2 Realizing added value

*How can organizations realize added value by implementing the Business Rule Approach?*

Organizations should only implement the Business Rule Approach if it provides sufficient benefits to recover all costs, including cost of capital. According to the Economic Value Added measure, only then the project will add value to the organization.
Deloitte’s Enterprise Value Map identifies four improvement areas that can contribute to an organization’s value: Revenue Growth, Operating Margin, Asset Efficiency, and Expectations.

Benefits from the Business Rule Approach generally fall into one or more of the following categories: Business benefits, IT benefits, and Risk and Control benefits. These categories typically contribute to one of the factors of Economic Value Added, and the improvement areas of Deloitte’s Enterprise Value Map.

We identified the following benefits:

- A business rule approach narrows the communication gap between requirements, analysis, and design.
- Clearer auditability.
- The business rule approach makes it possible to change rules faster.
- Change is no longer disruptive.
- Change is no longer costly.
- Business rules are documented and accessible through a repository.
- Greater consistency across the enterprise.
- Little need to freeze requirements because the rules can be changed easily. Focus on determining priority of rule change and proper authorizations for doing so.
- Faster development of business systems.
- Systems are delivered for less cost.

5.1.3 Working method

*What is a general working method for IT-enabled Business Transformations, and how should it be adapted to be suitable for implementation of the Business Rule Approach in an organization?*

To determine the general working method for IT-enabled Business Transformations, we use Deloitte’s proprietary working method *Enterprise Value Delivery* (EVD) as a starting point. EVD is a working method to execute IT-enabled Business Transformations aimed to deliver maximum value to the business. EVD contains a number of tasks that have to be performed during the various phases of the project.

With regard to adaption, literature review shows an additional sub-discipline *Business Rules Management* is required to manage the business rules aspects of the project. This sub-discipline has 2 roles: the Business Rules Analyst and the Business Rules Management Team Lead.

These two project roles should carry out 11 unique Business Rule related tasks:

- Define Business Rule Standards.
- Define Rule Discovery Roadmap.
- Document Rule Management Policy.
- Develop Rule Management Processes.
- Develop High-Level Ruleset.
- Develop Term/Fact Model.
- Define Rule Test Approach.
- Develop Detailed Rules.
5.2 Primary research question

What is an appropriate working method to implement the Business Rule Approach in such a way it adds value to an organization?

As the implementation of the Business Rule Approach is an IT-enabled Business Transformation, it shares many characteristics with other IT-enabled Business Transformations. For this reason, our starting point is another working method: Enterprise Value Delivery, Deloitte’s proprietary method for performing IT-enabled Business Transformation.

Enterprise Value Delivery is a value-oriented working method, aimed at maximizing the benefits for the organization. Preparing, maintaining, and continuously verifying the business case throughout the project lifecycle are the means for maximizing value delivered.

In order to define an appropriate working method to implement the Business Rule Approach, we add Business Rule-specific elements to it: The sub-discipline Business Rule Management.

Furthermore, we identified the following deliverables are uniquely required for the implementation of the Business Rule Approach:

- Business Rule Standards:
  - Standards required to end in a situation with a coherent set of business rules and consistent documentation.

- Rule Discovery Roadmap:
  - The roadmap for capturing the business rules from the rule sources.

- Rule Management Policy:
  - Policy prescribing Business Rule Management and Governance.

- Rule Management Processes:
  - Describing the processes to add, change, and retire business rules.

- High-Level Rule set:
  - Capturing the decisions identified in the business processes, and identifying the factors driving the decisions.

- Term/Fact Model:
  - Make sure everyone involved is using the same business language.

- Rule Test Approach:
  - Describes how the rules will be tested.

- Detailed Rules:
  - Describe how the factors in the rules are driving the decisions.

- Object Model:
  - The Term/Fact Model, implemented in the Business Rules Management System.

- Rule Test Cases:
  - To check for every rule whether rule the implementation is aligned with rule design.
Rule Test Results:
  - Are documented during rule test execution.

These Business Rule Approach-specific deliverables are prepared by two new roles in the project: the Business Rule Analyst and the Business Rules Management Team Lead.

The standard EVD tasks *Design To-Be Sub-processes (L3)* and *Software Development Scope* need to be adapted to capture the decisions in the functional business applications and to integrate the Business Rules Management System in the functional business applications, respectively.

In order to implement the Business Rule Approach in an organization whereby realizing business value, the organization should use a value-centered working method for IT-enabled Business Transformations (such as EVD), completed with the tasks and deliverables specifically for the Business Rule Approach. The value-centric method ensures the Business Rule Approach is only implemented if it provides sufficient benefits to the business, and maximizes these benefits.
6. Discussion

In this text, we elaborated extensively on the Business Rule Approach, and the benefits it can bring for organizations. These benefits are indicated by literature, and we agree with them intuitively. However, there’s always a down side.

In this Chapter, we elaborate on this trade-off, and suggest this as an area for further research. Furthermore, we reflect on the process and product of writing this thesis.

6.1 Suggestion for further research

The Business Rule Approach should not be implemented because your intuition tells you it is a good idea. Small organizations normally tend to fit their processes to the (standard) IT products they have, rather than the other way around. In larger organizations, it is worthwhile to adapt IT to accommodate the process, because the processes are executed on a larger scale. Although the Business Rule Approach might cause the ‘gray area’ between small and large organizations to shift a little, in our opinion this phenomenon will not change significantly as a result of the Business Rule Approach. We consider small organizations (unless they have a need for processes and rules changing frequently) not as good candidates for implementing the Business Rule Approach. In most cases, the most efficient course of action is to fit the process to the IT products.

Because large organizations run their processes on a larger scale, adapting IT to fit the process can often be justified by a positive business case. The Business Rule Approach will lower the thresholds, because executing the change is easier and cheaper. However, there are always limits to this effect. Organizations should realize they should not externalize all thinkable automated decisions in their Business Rule Management Systems; for some decisions there is no business case to automate them. In that case, the decision is only made infrequently; it is cheaper to have a human make the decision. For other decisions there is no business case to externalize them, because they change only infrequently. The business case should be made for every decision in your business processes considered for externalizing, although this might be done implicitly.

Although we did not elaborate on this very extensively, we identified the following factors relevant for the choice whether to externalize a certain business rule (Chapter 4):

- Nature of the decision.
- Factors driving the decisions.
- Complexity.
- Expected change frequency.

As a suggestion for further research, we are curious whether this list is complete, and which rules to apply to determine whether a decision should be automated and/or externalized. Rules about rules.
6.2 Reflection and acknowledgement

The goals for this thesis are for the candidate to:

- Acquire proper knowledge and understanding with regard to a certain subject.
- Demonstrate he can apply the acquired knowledge, understanding, and skills; this can be demonstrated by independently:
  - analyzing an IT-audit related problem formulation.
  - finding, analyzing, assessing, and arranging relevant literature.
  - applying general knowledge in specific cases, extracting general knowledge from specific cases.
  - formulating a clear and consistent argument with a vision.

With regard to the product, I managed to meet these goals. During the period writing this thesis, I acquired a comprehensive knowledge and understanding regarding Business Rule Management Systems and the Business Rule approach. I used and extracted this knowledge and understanding to formulated a clear and consistent text regarding this subject, whereby indicating my own opinion and experience as an IT auditor and a consultant.

With regard to the process, I also met these goals, although – due to a mix of happy and unhappy events, and also just being busy – it was quite a journey. I managed to arrive at this point largely independently. I had a number of meetings with my supervisors who provided very good feedback for improvement opportunities, and very good suggestions for resolving ‘key design decisions’.

Although I kept my supervisors up-to-date on the current status most of the time, this was not always the case. There were a small number of periods of ‘radio silence’ related to the events and busy periods mentioned earlier. In order to improve, I should send regular updates to supervisors, also when no progress is made.

I thank my supervisors Abbas Shahim (Vrije Universiteit) and Rob de Maat (Deloitte) for their time, patience, and dedication they put into this journey. I am very grateful for the quality and quantity of their feedback, and, in particular, their swiftness. From my experience with graduation assignments, I can tell there are always review periods that disrupt the process (waiting). Because I submitted parts of the document for review early, and I got feedback very quickly, I did not have an excuse to take a break. Rob and Abbas, thank you for that!
**Bibliography**


Appendix A: Comparing Enterprise Value Delivery methods

In order to compare EVD for SAP 3.7 (Deloitte Consulting LLP, 2013a), and EVD for Oracle 3.7 (Deloitte Consulting LLP, 2013b), we obtained from the method the Work Breakdown Structure (WBS). This WBS lists for every task (among other details) the task identifier, task name, phase, discipline, sub-discipline, output, and roles.

Phases

EVD for SAP and EVD for Oracle have a different phase structure. EVD for SAP’s phases are aligned with SAP’s ASAP methodology. The table below shows an ‘intuitive’ mapping between the phase structures of both working methods.

<table>
<thead>
<tr>
<th>EVD for SAP</th>
<th>EVD for Oracle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Preparation</td>
<td>Vision</td>
</tr>
<tr>
<td></td>
<td>Plan</td>
</tr>
<tr>
<td>Business Blueprint</td>
<td>Design</td>
</tr>
<tr>
<td>Realization – Build</td>
<td>Build</td>
</tr>
<tr>
<td>Realization – Test</td>
<td></td>
</tr>
<tr>
<td>Final Preparation</td>
<td>Deliver</td>
</tr>
<tr>
<td>Go Live and Support</td>
<td>Operate</td>
</tr>
</tbody>
</table>

Furthermore, 19 tasks are Phase Independent. These tasks are to be done throughout the project, such as ‘Manage Issues’, and ‘Manage Budget’. Every task is assigned to one or more phases.

We identified 324 tasks that are both in EVD for SAP and EVD for Oracle and are in both working methods assigned to only one phase. 302 of these tasks (93.2%) are assigned according to the intuitive mapping between the phases.

<table>
<thead>
<tr>
<th>Count of Task External Id</th>
<th>Column Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row Labels</td>
<td>1 Vision 2 Plan 3 Design 4 Build 5 Deliver 6 Operate Phase Independent Grand Total</td>
</tr>
<tr>
<td>1 Project Preparation</td>
<td>5 29</td>
</tr>
<tr>
<td>2 Business Blueprint</td>
<td>9 99 2</td>
</tr>
<tr>
<td>3a Realization - Build</td>
<td>1 4 80</td>
</tr>
<tr>
<td>3b Realization - Test</td>
<td>39 1 1</td>
</tr>
<tr>
<td>4 Final Preparation</td>
<td>1 1 2 21</td>
</tr>
<tr>
<td>5 Go Live &amp; Support</td>
<td>1 10</td>
</tr>
<tr>
<td>Phase Independent</td>
<td>19 19</td>
</tr>
<tr>
<td>Grand Total</td>
<td>5 40 104 123 23 10 19 19 324</td>
</tr>
</tbody>
</table>

Furthermore, 14 tasks are (in any of the two working methods) assigned to more than one phase. In 8 cases, the assignment was according to the intuitive phase mapping.

The above shows the intuitive mapping is largely but not completely correct.
We decided to use the phases provided by EVD for Oracle as ‘general approach’, for the following reasons:

- The phase **Vision** (EVD for Oracle) comprehends tasks that are typically performed before the decision to start the project is made. It makes sense to separate this phase from the **Planning** phase.

- The phase **Realization – Test** (EVD for SAP) indicates all testing is done during that phase. However, careful analysis indicates the phase contains many tasks unrelated to testing, such as ‘Develop Batch Job Schedule’, and ‘Develop To-Be Support Service Delivery Procedures’. Furthermore, many testing tasks are performed in other phases. The tasks ‘Conduct String Test’, ‘Conduct Technical Unit Test’, and ‘Conduct Functional Unit Test’ are (logically) already performed during the phase **Realization – Build**, while the task ‘Conduct User Acceptance Test’ is performed during the phase **Final Preparation**. We consider the split-up between Build and Test unnecessary and confusing.

- The phase structure of EVD for SAP was chosen to reuse terminology used in the field (phases in SAP’s ASAP method). We do not need this for our working method, as we do not consider a particular technology.

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task Name</th>
<th>Phases EVD for SAP</th>
<th>Phases EVD for Oracle</th>
</tr>
</thead>
<tbody>
<tr>
<td>01035</td>
<td>Develop Work Plan</td>
<td>Project Preparation, Business Blueprint, Realization – Build, Realization – Test, Final Preparation, Go Live &amp; Support</td>
<td>Plan, Design, Build, Deliver, Operate</td>
</tr>
<tr>
<td>01038</td>
<td>Complete Deliverables Log</td>
<td>Project Preparation, Business Blueprint, Realization – Build, Realization – Test, Final Preparation, Go Live &amp; Support</td>
<td>Plan, Design, Build, Deliver, Operate</td>
</tr>
<tr>
<td>03100</td>
<td>Perform Phase-end Review</td>
<td>Project Preparation, Business Blueprint, Realization – Build, Realization – Test, Final Preparation, Go Live &amp; Support</td>
<td>Plan, Design, Build, Deliver, Operate</td>
</tr>
<tr>
<td>02786</td>
<td>Maintain Business Case</td>
<td>Business Blueprint, Realization – Build, Realization – Test, Final Preparation</td>
<td>Plan, Design, Build, Deliver</td>
</tr>
<tr>
<td>02718</td>
<td>Prepare Subject Matter Experts</td>
<td>Business Blueprint, Realization – Build</td>
<td>Design, Build</td>
</tr>
<tr>
<td>02729</td>
<td>Develop and Deliver Communications</td>
<td>Business Blueprint</td>
<td>Design, Build, Deliver</td>
</tr>
<tr>
<td>02710</td>
<td>Develop Leadership Action Plans</td>
<td>Realization – Build</td>
<td>Build, Deliver, Operate</td>
</tr>
<tr>
<td>02704</td>
<td>Facilitate Project Team Capability Transfer</td>
<td>Realization – Test, Final Preparation</td>
<td>Build, Deliver</td>
</tr>
<tr>
<td>03090</td>
<td>Build Systems</td>
<td>Business Blueprint, Realization – Build</td>
<td>Build</td>
</tr>
<tr>
<td>01805</td>
<td>Cleanse Legacy Data</td>
<td>Realization – Build, Realization – Test</td>
<td>Build</td>
</tr>
<tr>
<td>02010</td>
<td>Develop Interface and Data Conversion Control Framework</td>
<td>Realization – Build, Realization – Test</td>
<td>Build</td>
</tr>
<tr>
<td>02748</td>
<td>Develop Web-Based Training Courseware</td>
<td>Realization – Build, Realization – Test</td>
<td>Build</td>
</tr>
<tr>
<td>02749</td>
<td>Develop Instructor-Led Training Courseware</td>
<td>Realization – Build, Realization – Test</td>
<td>Build</td>
</tr>
<tr>
<td>02274</td>
<td>Perform Legacy System Decommissioning</td>
<td>Final Preparation, Go Live &amp; Support</td>
<td>Deliver</td>
</tr>
</tbody>
</table>

Table 3: Multi-phase tasks

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task Name</th>
<th>Phase EVD for SAP</th>
<th>Phase EVD for Oracle</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>02395</td>
<td>Develop Post Implementation and Evaluation Report</td>
<td>Go Live &amp; Support</td>
<td>Deliver</td>
<td>Yes</td>
</tr>
<tr>
<td>02778</td>
<td>Establish Benefits Tracking Team</td>
<td>Final Preparation</td>
<td>Plan</td>
<td>SAP: Yes, Oracle: No</td>
</tr>
<tr>
<td>03049</td>
<td>Develop Security, Privacy, and Controls Governance Approach</td>
<td>Final Preparation</td>
<td>Design</td>
<td>SAP: No, Oracle: Yes</td>
</tr>
</tbody>
</table>
Disciplines
The general working method for IT-enabled Business Transformations contains the following (sub)disciplines:

- **Project Management**
  *The Project Management discipline facilitates effective project planning and management.*
  - Plan.
  - Manage.
  - Close.

- **Quality Management**
  *The Quality Management discipline ensures the quality of the project by assessing deliverables and project processes against organizational standards.*
  - Quality Planning.
  - Quality Assurance.
  - Quality Support.

- **Process and Application**
  *The Process and Application discipline addresses the business processes and the way these processes are supported by the IT platform.*
  - Business Process Management.
  - Package Configuration.
  - Business Process Controls.

- **Development**
  *The Development discipline regards designing, building, and testing custom development objects.*
  - Application Architecture.
  - Application Development.
  - User Experience.
  - Development Controls.

- **Information Management**
Information Management addresses the value, usefulness, accessibility, and security of an organization’s data and information assets.

- Information Strategy and Architecture.
- Data Protection and Privacy.
- Master Data Management.
- Information Quality.
- Reporting and Analytics.
- Metadata Management.

 vå

deployment

The Deployment discipline considers the transition to the new IT platform.

- System Deployment.
- Business Deployment.
- Support Preparation and Stabilization.
- Readiness Testing.

Technology

The Technology discipline addresses the technological aspects of the Business Transformation.

- Infrastructure.
- Application Security.
- Identity and Access Management.
- Technology Controls.

Organizational Change Management

The Organizational Change Management discipline regards the adoption and sustainability of the project.

- Change Preparation.
- Organizational Alignment.
- Communications.
- Capability Transfer.
- End-User Training.

Value

The Value discipline is responsible for identifying and tracking benefits (to be) realized by the project.

- Value and Business Case Management.

Tax

The Tax discipline addresses identifying, capturing, and sustaining business value through the fulfillment of the global tax planning strategy and legal requirements.

- Tax.

Because a number of tasks are not relevant for Business Rule Approach implementations (see Section 4.1.3), the disciplines Tax and Information Management are not relevant for the implementation of the Business Rule Approach, and will not be included in the working method for Business Rule Approach implementations.
Tasks

Based on the task identifiers, we checked whether the particular tasks are present in any other of the two working methods under consideration, and whether the task name is the same. In 23 cases, the same task number had a deviating (although very similar) task name. In the EVD methods we checked and confirmed the Purpose, Deliverable, and Roles are exactly the same for these tasks. These tasks simply have a different name to align with terminology in the field. In the case of naming conflicts between EVD for SAP and EVD for Oracle, we will use the name used in EVD for Oracle, as this working method applies to a broader set of (inhomogeneous) technologies (all packages in the Oracle family of products, including Siebel, EBS, J.D. Edwards, and PeopleSoft).

We determined EVD for Oracle and EVD for SAP have 338 tasks in common (tasks can have more than one occurrence in an implementation). EVD for Oracle has 26 unique tasks (Oracle-only); EVD for SAP has 6 tasks. We verified the contents of these tasks; these tasks are truly unique (not just different task name and number). For that reason, the tasks are not considered part of the general working method for IT-enabled Business Transformations. The 338 common tasks are considered part of the general working method for IT-enabled Business Transformations.

We made 4 minor changes to EVD for SAP and EVD for Oracle to make the methods more consistent:

- EVD for SAP: Task ‘Perform Quality Assessment’ moved from phase ‘Business Blueprint’ to ‘Phase Independent’ to be consistent with EVD for Oracle.

We got confirmation by email from Christian Ottesen (Method Coach – Deloitte Global Methods and Tools) on October 22nd, 2013, these changes are valid.

The following tasks are included in both the EVD for SAP and EVD for Oracle working methods. For that reason, they are considered part of the general working method for IT-enabled Business Transformations.

Based on literature review and review of EVD, we determined whether the tasks should be included in a Business Rule Approach project.

<Table 5 removed.>

Table 5: Tasks included in general working method for IT-enabled Business Transformations

The following tasks were unique in either EVD for SAP or EVD for Oracle. For that reason, they are not considered part of the general working method for IT-enabled Business Transformations.
<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task Name</th>
<th>Working Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>01442</td>
<td>Define Business Intelligence Data Modeling Standards and Guiding Principles</td>
<td>EVD for SAP</td>
</tr>
<tr>
<td>01884</td>
<td>Define Integration Exception and Error-Handling Mechanism</td>
<td>EVD for SAP</td>
</tr>
<tr>
<td>03195</td>
<td>Develop Information Governance Policies</td>
<td>EVD for SAP</td>
</tr>
<tr>
<td>01411</td>
<td>Configure Business Intelligence Data Architecture</td>
<td>EVD for SAP</td>
</tr>
<tr>
<td>03149</td>
<td>Perform Support Access Management</td>
<td>EVD for SAP</td>
</tr>
<tr>
<td>01405</td>
<td>Define Strategic Direction and Objectives</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01408</td>
<td>Identify Business Intelligence Issues and Value Opportunities</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01447</td>
<td>Develop Common Data Model Vision</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01417</td>
<td>Review Business Intelligence Applications Landscape</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01575</td>
<td>Define Key Performance Indicators</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03052</td>
<td>Develop As-Is Interface Inventory</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03051</td>
<td>Conduct Application SOA Readiness Assessment</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>02261</td>
<td>Develop Environment Strategy</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01449</td>
<td>Develop Conceptual Data Model</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01437</td>
<td>Define Enterprise Data Values</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01439</td>
<td>Develop Data Sourcing Approach</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03001</td>
<td>Define Semantic Layer Development Standards</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03002</td>
<td>Develop Semantic Layer Technical Design</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>02690</td>
<td>Prepare Strategy for Service-Oriented Architecture</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03053</td>
<td>Develop Enterprise Canonical Models</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03054</td>
<td>Develop Interface Proof of Concept</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01878</td>
<td>Define Software Development Processes</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01883</td>
<td>Develop Software Development Plan</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>02017</td>
<td>Assess As-Is Technical Infrastructure</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>02614</td>
<td>Create Database Objects</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01496</td>
<td>Implement Privacy Roadmap</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>03084</td>
<td>Develop Final Data Cleansing Rules</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01637</td>
<td>Configure Information Management Applications and Tools</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01639</td>
<td>Develop Semantic Layer</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>01640</td>
<td>Create and Load Sample Data Set</td>
<td>EVD for Oracle</td>
</tr>
<tr>
<td>02794</td>
<td>Develop Migration Specifications</td>
<td>EVD for Oracle</td>
</tr>
</tbody>
</table>

Table 6: Tasks not included in general working method for IT-enabled Business Transformation

### Disciplines

EVD for SAP and EVD for Oracle comprehend exactly the same Disciplines. However, once subtle difference exists with regard to sub-disciplines:

<table>
<thead>
<tr>
<th>EVD for Oracle</th>
<th>EVD for SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Management:</strong></td>
<td><strong>Project Management:</strong></td>
</tr>
<tr>
<td>o Plan.</td>
<td>o Plan.</td>
</tr>
<tr>
<td>o Manage.</td>
<td>o Manage.</td>
</tr>
<tr>
<td>o Close.</td>
<td>o Close.</td>
</tr>
<tr>
<td><strong>Quality Management:</strong></td>
<td><strong>Quality Management:</strong></td>
</tr>
<tr>
<td>o Quality Planning.</td>
<td>o Quality Planning.</td>
</tr>
<tr>
<td>o Quality Assurance.</td>
<td>o Quality Assurance.</td>
</tr>
<tr>
<td>o Quality Support.</td>
<td>o Quality Support.</td>
</tr>
<tr>
<td><strong>Process and Application:</strong></td>
<td><strong>Process and Application:</strong></td>
</tr>
<tr>
<td>o Package Configuration.</td>
<td>o Package Configuration.</td>
</tr>
<tr>
<td>o Business Process Controls.</td>
<td>o Business Process Controls.</td>
</tr>
<tr>
<td><strong>Information Management:</strong></td>
<td><strong>Information Management:</strong></td>
</tr>
<tr>
<td>o Information Strategy and Architecture.</td>
<td>o Information Governance</td>
</tr>
<tr>
<td>o Data Protection and Privacy.</td>
<td>o Data Protection and Privacy.</td>
</tr>
<tr>
<td>o Master Data Management.</td>
<td>o Master Data Management.</td>
</tr>
<tr>
<td>o Information Quality.</td>
<td>o Information Quality.</td>
</tr>
<tr>
<td>o Reporting and Analytics.</td>
<td>o Reporting and Analytics.</td>
</tr>
<tr>
<td>o Metadata Management.</td>
<td>o Metadata Management.</td>
</tr>
</tbody>
</table>
We determined the sub-discipline Information Governance has only one task, and this task exists in EVD for SAP only. As this task is considered not to be part of the general working method for IT-enabled Business Transformations, we also consider the sub-discipline Information Governance not part of the general working method for IT-enabled Business Transformations.

We determined for every common task the sub-discipline it is assigned to in EVD for SAP and EVD for Oracle is identical.

**Table 7: (Sub)-discipline analysis**

<table>
<thead>
<tr>
<th>Role Name</th>
<th>Discipline</th>
<th>EVD for SAP</th>
<th>EVD for Oracle</th>
<th>In gen. working method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Analyst</td>
<td>Value</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Project Management</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Quality Manager</td>
<td>Quality Management</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Configuration Manager</td>
<td>Quality Management</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Team Lead</strong></td>
<td></td>
<td><strong>No</strong></td>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
</tr>
<tr>
<td>Business Process Analyst</td>
<td>Process and Application</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Process Team Lead</td>
<td>Process and Application</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Because the roles Team Lead, Assessor, and IM Team Lead were not included in both EVD for SAP and EVD for Oracle, we investigated whether these roles should or should not be included in the general working method for IT-enabled Business Transformations.

- **Team Lead:**
  - This role refers to the specific team leads, such as Process Team Lead, in their capacity of Team Lead. In many tasks they perform secondary roles by providing...
input for tasks. As the Team Leads have been identified individually, we do not need a general ‘Team Lead’ role.

- **Assessor:**
  - This role performs the Quality Assurance task. It was not included in EVD for SAP by mistake. We obtained an email from Deloitte Global Methods and Tools confirming this error. It should be included in the general working method for IT-enabled Business Transformations.

- **IM Team Lead:**
  - The IM Team Lead role is a SAP specific role. For that reason, it is not part of the general working method for performing IT-enabled Business Transformations.

The relations between the roles and the disciplines are not given by EVD; it is a high-level grouping based on our interpretation of the role and the tasks assigned to this role.

The general working method for IT-enabled Business Transformations contains 59 different roles. 52 of these roles are considered part of the project team; these are assigned to any of the disciplines. 7 roles are fulfilled by resources involved because of their ‘day job’ in the business and their position in the organization; these roles are not assigned to a discipline but are mentioned here under ‘General’.

- **General – not assigned to discipline:**
  - Key Stakeholder.
  - Project Sponsor.
  - Site Coordinator.
  - Subject Matter Expert.
  - Information Steward.
  - Super User.
  - Change Agent.

- **Project Management:**
  - Project Manager.
  - Project Office Support.
  - Project Planner.
  - Lead Client Service Partner.

- **Quality Management:**
  - Quality Manager.
  - Configuration Manager.
  - Assessor.
  - Method Coach.
  - Project Adviser.

- **Process and Application:**
  - Business Process Analyst.
  - Process Team Lead.
  - Controls Specialist.
  - Security and Controls Team Lead.
  - Application Functional Analyst.
  - Business Process Owner.
Information Management:
  - BI Functional Resource.
  - Data Modeler.
  - Information Architect.
  - Information Quality Specialist.
  - Data Analyst.
  - Database Administrator.
  - BI Report Developer.
  - Information Governance Specialist.
  - Content Management Specialist.
  - Data Quality Lead.

Development:
  - Application Development Team Lead.
  - User Experience Team Lead.
  - Middleware Developer.
  - Legacy Analyst.
  - Application Developer.
  - Portal Developer.
  - Legacy Developer.
  - User Interface Specialist.
  - Application Designer.
  - Data Integration Developer.

Deployment:
  - Integration Manager.
  - Service Delivery Analyst.
  - Service Delivery Manager.

Technology:
  - Technical Infrastructure Team Lead.
  - Security Specialist.
  - Technical Test Analyst.
  - Technical Infrastructure Analyst.
  - Client IT Stakeholder.

Organizational Change Management:
  - Organizational Change Management (OCM) Team Lead.
  - Change Specialist.
  - Communications Specialist.
  - Organization Design Specialist.
  - Training Lead.
  - Training Developer.
  - Trainer.

Value:
  - Value Analyst.

Tax:
  - Tax Specialist.
The relations between the roles and the disciplines are not given by EVD; it is a high-level grouping based on our interpretation of the role and the tasks assigned to this role. Every role in the project team is assigned at least one task. Furthermore, many roles are involved in other tasks as secondary responsible. Roles can be responsible for tasks within and outside their discipline.

Because Tax is not considered important in the implementation of Business Rule Approach (the tasks have been taken out in 4.1.3), the Tax Specialist role will not be included in the working method for Business Rule Approach implementations. Furthermore, as we took out all Information Management tasks (mostly Business Intelligence), the Information Management roles will not be included.
# Appendix B: Steps for implementing the Business Rule Approach

## Scoping phase

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Investigate full business context</td>
<td>Project Charter</td>
<td>Develop Project Charter</td>
</tr>
</tbody>
</table>

## Planning phase

The planning phase does not comprehend steps particularly important for implementing the Business Rule Approach.

## Discovery phase – Initial Business Requirements

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Identify decisions</td>
<td>To-Be Sub-process Design</td>
<td>Design To-Be Sub-processes (L3)</td>
</tr>
</tbody>
</table>

## Discovery phase – Rules and data

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Identify rule sources</td>
<td>New: Rule Discovery Roadmap</td>
<td>New: Define Rule Discovery Roadmap</td>
</tr>
<tr>
<td>4</td>
<td>Select a rule discovery roadmap</td>
<td>New: Rule Discovery Roadmap</td>
<td>New: Define Rule Discovery Roadmap</td>
</tr>
<tr>
<td>5</td>
<td>Select or confirm rule standards</td>
<td>New: Business Rule Standards</td>
<td>New: Define Business Rule Standards</td>
</tr>
<tr>
<td>6</td>
<td>Plan rule discovery time and commitment</td>
<td>Work plan</td>
<td>Develop Work Plan</td>
</tr>
<tr>
<td>7</td>
<td>Discover rules through the roadmap</td>
<td>New: High-Level Rule set</td>
<td>New: Develop High-Level Rule set</td>
</tr>
<tr>
<td>8</td>
<td>Authenticate the rules</td>
<td>New: High-Level Rule set</td>
<td>New: Develop High-Level Rule set</td>
</tr>
<tr>
<td>9</td>
<td>Give rules business value</td>
<td>New: High-Level Rule set</td>
<td>New: Develop High-Level Rule set</td>
</tr>
<tr>
<td>10</td>
<td>Define terms</td>
<td>New: Term/Fact Model</td>
<td>New: Develop Term/Fact Model</td>
</tr>
<tr>
<td>11</td>
<td>Define facts</td>
<td>New: Term/Fact Model</td>
<td>New: Develop Term/Fact Model</td>
</tr>
<tr>
<td>12</td>
<td>Add concrete scenarios</td>
<td>New: Rule Test Approach</td>
<td>New: Define Rule Test Approach</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New: Rule Test Cases</td>
<td>New: Develop Rule Test Cases</td>
</tr>
</tbody>
</table>
### Analysis phase

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Make each rule atomic</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>14</td>
<td>Understand the underlying rule patterns</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>15</td>
<td>Remove redundant rules</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>16</td>
<td>Resolve overlaps among rules</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>17</td>
<td>Resolve inconsistencies among rules</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>18</td>
<td>Ensure completeness among rules</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>19</td>
<td>Identify dependencies among rules</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>20</td>
<td>Refine the process based on rule family dependencies or data activities</td>
<td>To-Be Sub-process Design</td>
<td>Design To-Be Sub-processes (L3)</td>
</tr>
<tr>
<td>21</td>
<td>Optimize the rules for the business</td>
<td>New: Detailed rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>22</td>
<td>Assign decisions and rules to the rules capability</td>
<td>New: High-Level rule set</td>
<td>New: Develop High-Level Rule set</td>
</tr>
<tr>
<td>23</td>
<td>Confirm the essential process flow</td>
<td>To-Be Sub-process Design</td>
<td>Design To-Be Sub-processes (L3)</td>
</tr>
<tr>
<td>24</td>
<td>Create a simple workflow diagram for the core process flow.</td>
<td>To-Be Sub-process Design</td>
<td>Design To-Be Sub-processes (L3)</td>
</tr>
<tr>
<td>25</td>
<td>Reference business context (again!)</td>
<td>To-Be Sub-process Design</td>
<td>Design To-Be Sub-processes (L3)</td>
</tr>
<tr>
<td>26</td>
<td>Round out all tracks</td>
<td>To-Be Sub-process Design</td>
<td>Design To-Be Sub-processes (L3)</td>
</tr>
<tr>
<td>27</td>
<td>Create a workflow diagram for the rule flow, if necessary</td>
<td>New: Detailed rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
</tbody>
</table>

### Design phase

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Confirm your architecture, but sharpen it with a rules capability</td>
<td>To-Be Application Landscape</td>
<td>Document To-Be Application Landscape</td>
</tr>
<tr>
<td>29</td>
<td>Determine the basic requirements for your rules capability</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>Determine if you will acquire a commercial rules product</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>31</td>
<td>If not, determine if you will develop your own rules capability</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>32</td>
<td>Determine in which tier to enforce rules</td>
<td>• New: High-Level Rule set.</td>
<td>• New: Develop High-Level Rule set.</td>
</tr>
<tr>
<td></td>
<td>• Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>--------------------</td>
<td>---</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>33</td>
<td>Design for rules in a commercial data-oriented rules product.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>34</td>
<td>Design for rules in a homegrown data-oriented rules product.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>35</td>
<td>Design for rules in a commercial service-oriented rules product.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>36</td>
<td>Design for rules in a homegrown service-oriented rules product.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>37</td>
<td>Tune the rules</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>38</td>
<td>Tune the rules by moving rule enforcement to another tier</td>
<td>New: High-Level Rule set</td>
<td>New: Develop High-Level Rule set</td>
</tr>
<tr>
<td>39</td>
<td>Tune the rules by duplicating rule enforcement</td>
<td>New: High-Level Rule set</td>
<td>New: Develop High-Level Rule set</td>
</tr>
<tr>
<td>40</td>
<td>Tune the rules by changing rule templates</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
</tbody>
</table>

Steps 29, 30 and 31 result in decisions. As we have already decided we are going to implement a commercially available service-oriented BRMS (see above under ‘Assumptions’), and which product we are going to implement, these steps are obsolete. Furthermore, steps 33, 34, 35, and 36 are actually conclusions of these decisions.

**Deliver phase**

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Create component model of application showing rule service component</td>
<td>To-Be Application Landscape</td>
<td>Document To-Be Application Landscape</td>
</tr>
<tr>
<td>42</td>
<td>Develop an object model for the rules capability</td>
<td>New: Object Model</td>
<td>New: Develop Object Model</td>
</tr>
<tr>
<td>43</td>
<td>Decide on rule sets and rule hierarchies</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>44</td>
<td>Define the object model to the product</td>
<td>New: Object Model</td>
<td>New: Develop Object Model</td>
</tr>
<tr>
<td>45</td>
<td>Enter rules into the product</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>46</td>
<td>Determine the control of rule evaluation sequence within a rule set</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>47</td>
<td>Determine if some of the rules need to be coded in procedural nonrule code</td>
<td>New: Detailed Rules</td>
<td>New: Develop Detailed Rules</td>
</tr>
<tr>
<td>48</td>
<td>Test the rules</td>
<td>New: Rule Test Results</td>
<td>New: Conduct Rule Test</td>
</tr>
<tr>
<td>49</td>
<td>Admire the finished product</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Step 49 does not contribute to the result, so it is not included in our working method.
## Rule Management

<table>
<thead>
<tr>
<th>#</th>
<th>Step (von Halle, 2002)</th>
<th>Deliverable</th>
<th>Task (general working method)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Identify the scope over which to manage rules</td>
<td>New: Rule Management Policy</td>
<td>New: Document Rule Management Policy</td>
</tr>
<tr>
<td>52</td>
<td>Outline roles, responsibilities, and skills for managing rules</td>
<td>• Role-to-Position Mapping Results.</td>
<td>• Perform Role-to-Position Mapping.</td>
</tr>
<tr>
<td>54</td>
<td>Establish business objectives for rule stewardship</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>57</td>
<td>Establish objectives for the rule repository</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>58</td>
<td>Develop a rule meta model</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>59</td>
<td>Develop rule-related modeling and repository requirements</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>60</td>
<td>Determine if you will build, buy, or extend a repository.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>61</td>
<td>Document the rule repository requirements and selection in a document</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>62</td>
<td>Implement the rule repository</td>
<td>Built System</td>
<td>Build System</td>
</tr>
<tr>
<td>63</td>
<td>Design rule reports</td>
<td>Software Development Scope</td>
<td>Develop Software Development Scope</td>
</tr>
<tr>
<td>66</td>
<td>Implement the rule management processes and procedures</td>
<td>End-User Training Curriculum</td>
<td>Develop End-User Training Curriculum</td>
</tr>
</tbody>
</table>

The decision in step 60 and 61, and the underlying documentation (steps 57, 58, and 59) are the starting point for using this working method; the decisions have already been made (see Assumptions in Section 4.2). Step 54 identifies business objectives for rule stewardship (or rule management, in a broader context). One of the main objectives of this project is to have the business able be to manage business rules and their implementation in IT; we consider redefining
the business objectives (again) for maintenance a useless effort. This could be different if the goal of the project were the development of an application.
Appendix C: Implementation of the Business Rule Approach

Based on the items identified as ‘common’ for IT-enabled Business Transformation, and the activities added to account for the special case of a Business Rule Approach, the working method for the implementation of the Business Rule Approach contains the tasks listed below. Tasks unique for implementing the Business Rule Approach are marked in **bold**.

**Tasks**

< Table 9 removed. >

*Table 9: Tasks in the working method for Business Rule Approach implementation projects*