Implementing a Business Process Management Solution at an Engineering Software Solution Provider

by

RUDA OOSTHUIZEN

27032559

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Executive Summary

The aim of this document is to provide a detailed explanation of the steps completed in the implementation of a pilot model for a Business Process Management System (BPMS). The project will be done for ESTEQ, a group of companies dedicated to driving success through innovation during the entire Product Lifecycle.

A literature study is incorporated to facilitate in the selection of the appropriate methods and techniques for the design of the final solution. The Business Process Management (BPM) methodology, which is aimed at providing companies with the means to improve the performance of their business processes, is motivated; as well as the various methods used to contribute to the final solution.

The process which will form the basis of the model is the company's Customer Acquisition Process. The company aims towards never-ending improvement of this process to ensure that their customers are always satisfied. A BPM methodology will be used to aid the company in reaching this goal.

A complete BPMS will be implemented for the process to enable the company to continually monitor and measure the process' performance, therefore providing a system for continuous improvement.

The steps that will be followed in the implementation of this BPMS include the complete mapping of the Customer Acquisition Process, followed by the compilation of a Balanced Scorecard. The scorecard will be developed to assist the organisation in setting certain goals and measuring their performance relative to these goals. The next step will be to align the process steps with these performance measures which will allow them to be automatically updated as the process is enacted. Thereafter an interactive web portal will be designed and developed that will allow for the continuous monitoring of the process. Finally, historical data collected will be used to analyse the process and to demonstrate how the BPMS can be used to improve performance.

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1. Introduction & Background

The project will be done for ESTEQ, a group of companies dedicated to driving success by assisting companies in empowering innovation through the entire Product Lifecycle. The various business units include: ESTEQ Engineering, ESTEQ PLM (Product Lifecycle Management) and ESTEQ Test & Measurement. They act as resellers of a large variety of engineering software solutions, including NX, Solid Edge, MSC and Teamcentre. The company also provide services such as software implementation, support, maintenance, training and consulting.

The company has recently become a distributor of a BPM and enterprise architecture tool called *QPR (Quality, Processes, Results). QPR* consists of four different modules*; QPR Scorecard*, *QPR ProcessGuide, QPR ProcessAnalyser* and *QPR Portal*.

The main objective of the technology is to implement a BPMS into a company that continually monitors and measures business process performance. In order to do this effectively, the company needs to have insight in the effectiveness of their current business processes and improvement needs to be made where applicable. The company therefore requires their current business processes to be modelled, analysed and improved. This is done using *QPR ProcessGuide* and *QPR ProcessAnalyser*. It is also required that their strategy, in the form of objectives and measures, be clearly communicated. This is done using *QPR Scorecard,* where the processes are aligned with business strategy. Finally, an interactive portal is designed, using *QPR Portal*, which is used for continuous monitoring of performance.

The company has decided to test QPR internally before selling it into their customer base to evaluate and understand the full capabilities of the tool.

2. Problem Statement

To meet the challenges of increased competition, ESTEQ seeks to improve their business processes through shortening cycle times, improving resource allocation, reducing costs associated with business processes and improving service quality. In order to do this effectively, they need to have insight in the effectiveness of their current business processes as well as an excellent understanding of the needs and expectations of their customers. This insight will aid in the identification of potential areas for improvement.

The organisation is currently being managed around functional business units. Each business unit has their own goals and objectives and their main focus is on improving their own internal processes. Improving processes this way may not result in improving overall competitiveness as perceived improvements inside one functional area are actually detrimental to the organisation's performance overall. An example of this would be the logistics department of an organisation that seeks to reduce transportation costs by having less frequent but larger transports. This may result in a decrease in transportation costs, but customer satisfaction will most likely also be decreased due to longer waiting times.

The business processes which touch the organisation's suppliers, outsourcing partners and customers are often cross-functional (figure 1). An organisation's ability to improve those competitive-defining processes requires them to take the same cross-functional and end-to-end focus of the processes. BPM as a discipline provides this.

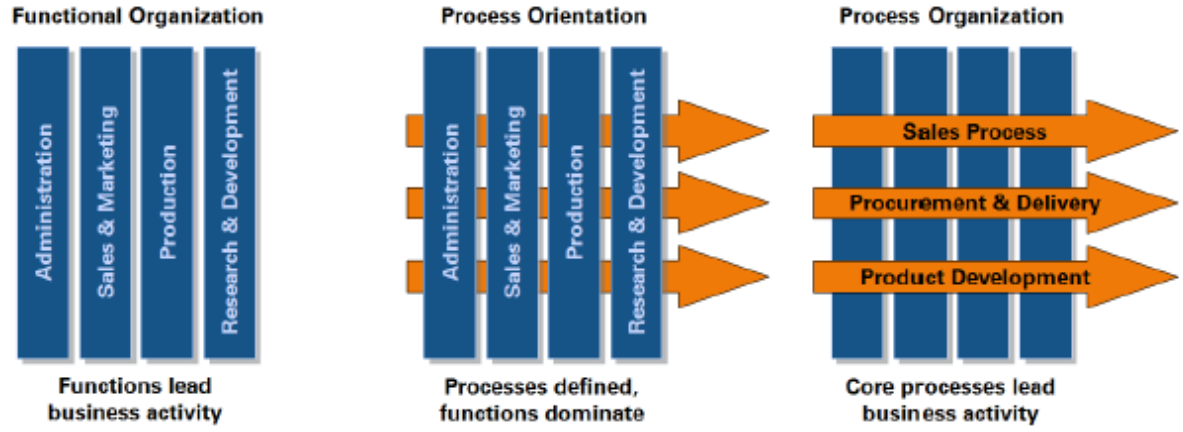

Figure 1: Functional Orientation vs. Process Orientation - Key business processes cross functional boundaries (Iseger, 2009)

An advanced BPMS will ensure that the core processes lead business activity, instead of business functions dominating the processes.

Additionally, the company's strategy has not been condensed into clear objectives and measures, and has not clearly been communicated to all the employees. Their BPM initiative will therefore lack a solid foundation for steering improvement initiatives as well as for identifying the goals of their improvement efforts. A Balanced Scorecard approach will be used to measure and evaluate business operations from four perspectives: finance, customer, internal business process, and learning and growth. These objectives and measures will be communicated to the employees by means of an interactive portal.

Before any improvement can be made, a clear understanding of the company's 'AS-IS' processes is required. Process mapping is imperative to achieve this. All the existing players currently have different ideas on what constitutes best practices and perceives the execution of the process in different ways. Collaborative mapping of the process will create commitment to BPM and will ensure a unified understanding of problem areas in the 'AS-IS' process.

Once the process has been documented, the organisation can start testing process alternatives with the aid of simulation tools. This will assist in the design and development of a new and improved process. The new process then needs to be implemented and communicated to all the players in an unambiguous manner. A good communication tool for this purpose is an intranet or extranet portal. It provides tailored access and a central point for gathering comments, defining, assigning and launching action plans, etc.

The process then needs to be enacted and continually monitored for abnormalities. In order to do this effectively, the system should provide efficient process monitoring tools that report cycle times, idle times, workload, etc. and capture exceptions in order to alert process owners at the appropriate times. Historical insight into process data should also be provided, which can be used to solve process bottlenecks.

To understand the true value of the process, the organisation needs their performance to be measured against set targets that are aligned with their business strategy. This measurement of business performance will then provide the driver for launching a new cycle of process improvement initiatives and serves as a facet for the strategy assessment process.

3. Project Aim

The aim of the project is to build a pilot model for a BPMS in order to demonstrate it can be used to monitor and improve performance. A complete BPMS will be designed and implemented for a single major business process, the Customer Acquisition Process within ESTEQ. An analysis of the process will be completed using historical data in order to demonstrate the purpose of a BPMS and how it can aid in the continuous improvement of business processes.

The final BPMS will aid the organisation in the effective monitoring and measuring of business process performance, resulting in improved operational efficiency and therefore increased customer satisfaction.

4. Project Scope

In this project, a pilot model will be created for the BPMS. Focus is placed on a single major business process, namely the Customer Acquisition Process. This pilot will form a basis for future development where all the remaining processes will be built into the BPMS. The project consists of five steps.

The first step is to model the 'AS-IS' Process. This will give ESTEQ insight in the effectiveness of their current sales processes as well as a thorough understanding of the needs and expectations of their customers.

The second step is to communicate the organisation's business strategy and key performance indicators by means of a Balanced Scorecard. The scorecard will be used to measure and evaluate business operations from four perspectives: finance, customer, internal business process, and learning and growth.

The third step is to align the process steps with the metrics defined in the scorecard. This involves adding performance measurements to certain activities and linking the process to the KPIs (Key Performance Indicators).

The fourth step is to design an Interactive Web Portal that allows for continuous monitoring of process performance. The portal will allow data to be captured into the system and automatically update the performance measures. It will actively control the execution of the process occurrences as defined by the business process model. The process needs to be monitored to observe the status of the process occurrence. State information will be provided by the system which enables users to determine if performance objectives are being met. This data will then be used to analyse and improve the process based on its performance.

The fifth step is to execute process development studies. For the purpose of this project, instead of waiting for the process to be executed and monitored for a certain period of time, historical data will be used to analyse the process. This will demonstrate how the system can be used for continuous process performance improvement. A Workflow is also developed that will aid in the execution of the process.

5. Literature Review

The purpose of this literature review is to provide motivation for the methods and techniques that will be used in the completion of the project. Various concepts are studied to enable the final development of an appropriate method which meets all the organisation's requirements.

5.1. The BPM Methodology

"*Business Process Management is based on the observation that each product that a company provides to the market is the outcome of a number of activities performed. Business processes are the key instrument to organising these activities and to improving the understanding of their interrelationships.*" (Weske, 2007)

A company can only reach their business objectives successfully if their people and resources are effectively collaborated. Business processes play an important role in this. In his book *Business Process Management: Concepts, Languages, Architecture*; Mathias Weske (2007) defines a business process as "a *set of activities that are performed in coordination in an organisational and technical environment. These activities jointly realize a business goal.*" He further explains that each process is performed by a single organisation, but generally interacts with processes performed by other organisations. He then defines BPM as a collection of concepts, methods and techniques that supports the design, administration, configuration, enactment and analysis of in these processes.

In his effort to explain BPM, Zairi (1997) states that "*BPM is concerned with the main aspects of business operations where there is a high leverage and a big proportion of added value. BPM has to be governed by the following rules:*

- *Major activities have to be properly mapped and documented*
- *BPM creates a focus on customers through horizontal linkages between key activities*
- *BPM relies on systems and documented procedures to ensure discipline, consistency and repeatability of quality performance*
- *BPM relies on measurement activity to assess the performance of each individual process, set targets and deliver output levels which can meet corporate objectives*
- *BPM has to based on a continuous approach to optimisation through problem solving and reaping out extra benefits*
- *BPM has to be inspired by best practices to ensure that superior competitiveness is achieved*
- *BPM is an approach for culture change and does not result simply through having good systems and the right structure in place."*

These rules need be taken into account when incorporating a BPMS into an organisation to ensure its effectiveness.

As said by Dr A. van Rensburg (1998), "*The business process management framework ties all elements of an organisation together to ensure a true process-based organisation*". In order to achieve a process-based organisational structure, organisations need to move away from current functional focused management policies towards a more business process focus. Attention should be placed on those processes which deliver the most value to their customer base. The BPM paradigm enables this as organisational processes are placed at the heart of business operations.

There are various benefits to an effective BPMS. Companies are able to optimise their performance by setting goals, monitor their processes against these goals and react fast and effectively to change, therefore enabling them to outpace their competitors.

"In virtually every industry, companies of all sizes have achieved extraordinary improvements in cost, quality, speed, profitability, and other key areas by focusing on, measuring, and redesigning their customer-facing internal processes" Michael Hummer (2007).

5.1.1. Business Process Lifecycle

As seen in figure 2, the lifecycle begins with the *Design & Analysis* phase; in which the business environment is examined in order to identify, review, validate and model the business processes. The core sub phase during this stage is business process modelling. Once the model is designed and verified, the business process needs to be implemented. This is often done with the support of a dedicated software system, which involves a platform being chosen. This includes the model being enhanced with technical information that facilitates the performance of the process. The system must be *Configured* according to the business environment and the processes it should control. This configuration includes employee and software interaction with the system. Once the system configuration is completed, the process is *Enacted*. The BPMS actively controls the execution of the process occurrences as defined by the business process model. The monitoring component of the system observes the status of the process occurrence. State information should be provided by the system to monitor business processes and valuable execution data should be collected in some form of a log file. This log information forms the basis for the *Evaluation* phase in which execution logs are evaluated and business process models are improved accordingly. The aim of this method is to identify the quality of the process models and the adequacy of the execution environment (Weske, 2007).

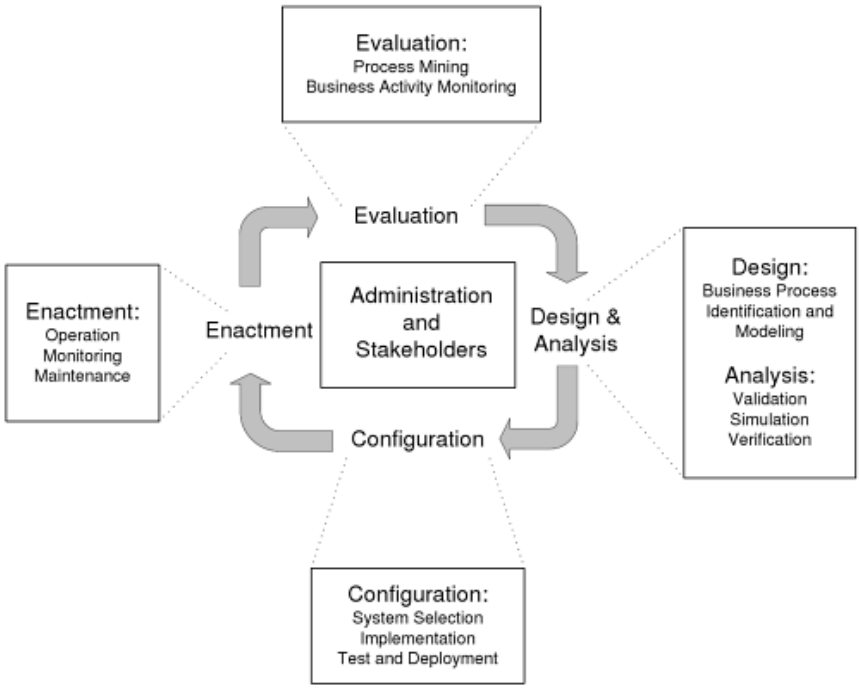

Figure 2: Business Process Lifecycle (Weske, 2007)

Zairi (1997) says that although there are "*numerous examples of methodological approaches*", he suggests Harrington's (1995) approach. Harrington recommends five major phases – organising for quality, understanding the process, streamlining the process, implementation, measurement and controls, and continuous improvement. He continues to propose that BPM is a fundamental role of senior management as they are responsible for the vision, determining strategies, designing processes, reducing barriers and encouraging employees to contribute. It is therefore vital that management play an interactive part in the implementation of such a system.

5.1.2. Aspects of BPM

Armistead, Pritchard and Machin (1999) have identified seven themes associated with BPM. These themes are not discrete as there are obvious interactions and interrelationships, as seen in figure 3.

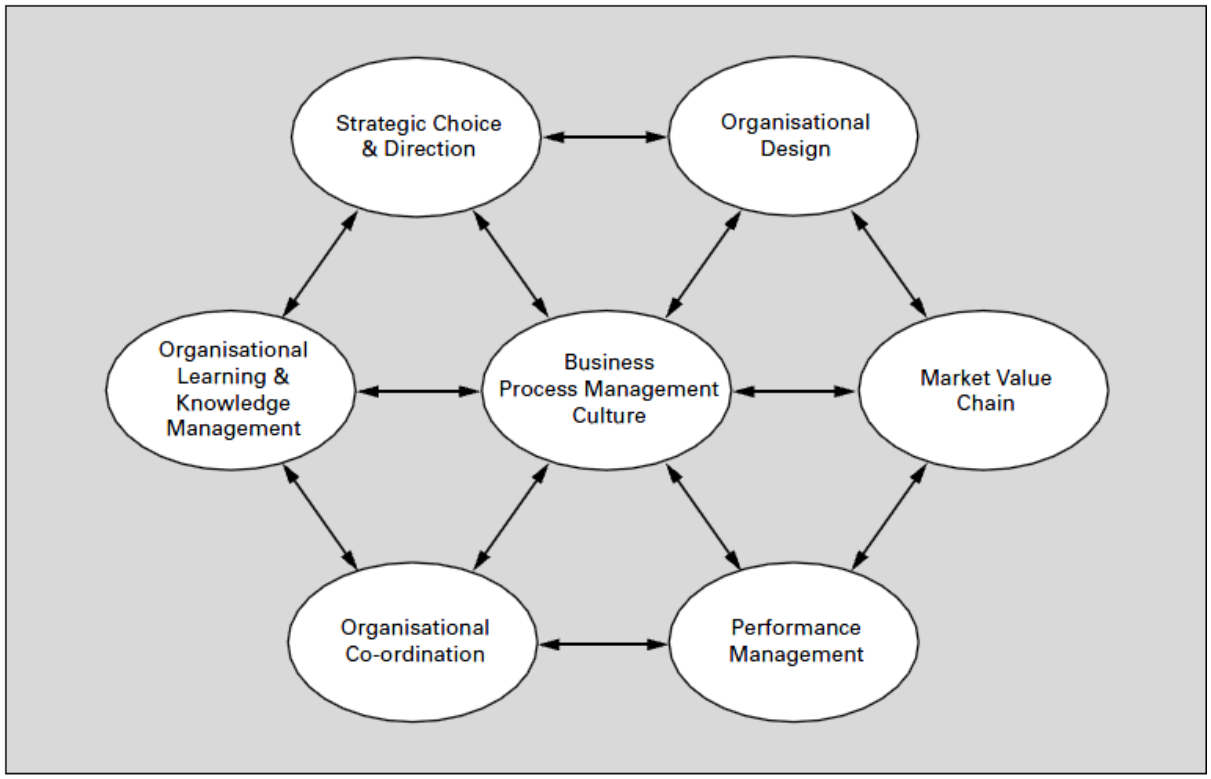

Figure 3: Important themes of BPM (Armistead, Pritchard, & Machin, 1999)

They explain the themes as follows:

Strategic choice and direction: the way in which business strategy is developed and plans are designed within the organisation's goals and targets.

Organisational design: the way in which BPM is incorporated into the design of an organisation which influences the limitations, structure and purpose of the surrounding processes.

Maximising the market value chain: improving business processes leads to innovation and a more satisfied customer base.

Performance management: BPM relies on the management of resources and on a series of measurement systems that allow the setting of targets, monitoring of progress and the initiation of corrective action. Application of the Balanced Score Card approach fulfils this requirement.

Organisational learning and knowledge management: BPM provides a framework for organisational learning and integrates the management of knowledge.

Organisational co-ordination: an organisation's culture shapes the way BPM works and vice versa. A simple example of this would be the implementation of changes to the current business processes which might emerge from a large BPM exercise. This may result in employees resisting the change. An organisation's culture defines how employees will react to change and how susceptible they are to changes in their business environment.

5.2. Performance Management using a Balanced Scorecard

Paul Niven (2002) introduces his book *Balanced Scorecard STEP-BY-STEP: Maximizing Performance and Maintaining results* with the following quote:

"When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind." – William Thompson (Lord Kelvin), 1824-1907

He comments on the quote stating that "*measurement is… more important than ever in today's environment."*

Traditionally, performance measurement systems focused on either the financial or the operational measurements. The problem with this approach is that no single measure can provide a definite performance target or focus attention on the critical areas of the business. Malmi (2001) provides the example of a pilot flying an aircraft and only focusing on the air-speed gauge. The altitude or the fuel might be fine at the moment, but if something goes wrong, and there is no way to identify it, it will be disastrous. Managers need a balanced presentation of both operational and financial measures. During the 1980s Robert Kaplan and David Norton suggested using four sets of parameters to track all the required measures, namely; Finance, Customer, Internal Business Process and Learning and Growth (Kaplan & Norton, 1992). The resultant concept was called the Balanced Scorecard (BSC).

Their BSC was developed to complement "financial measures of past performance with their measures of drivers of future performance." As the name of the concept suggests, it balances the score "between short term and long term objectives, between financial and non-financial measures, between lagging and leading indicators, and between internal and external performance perspectives" (Bhagwat & Sharma, 2007). The scorecard was not a replacement for financial measures, but rather it served as their compliment. The nonfinancial measurements are very important since they predict future financial performance instead of simply reporting what has already happened. (Kaplan & Norton, 1996)

Kaplan and Norton indicated three principles to be adhered to when creating a BSC to avoid having a group of conflicting measures and strategies. Firstly, build in cause-and-effect relationships. If the cause-and-effect relationships are inadequately reflected in the BSC, the vision and strategy of the business will not be communicated properly (Kaplan & Norton, 1996). The notion of cause and effect is the major aspect of BSC that separates it from other performance management systems. A properly designed BSC should indicate your strategy through the measures and objectives which have been chosen. These measures should link together in "*a chain of cause-and-effect relationships from the performance drivers in the Learning and Growth perspective all the way through to improved financial performance reflected in the Financial perspective*" (Niven, 2002).

There should also be sufficient and properly defined performance drivers with a mixture of outcome measures and performance drivers. Performance drivers without outcome measures will fail to indicate whether the operational improvements resulted in improved financial performance. The performance drivers of each individual company will be specific and based on their strategy while the measures can be more generic. Finally, there should be linkage to financial measures (Kaplan & Norton, 1996).It does not help if everything can be measured and compared to the predefined goals if the results cannot be linked or translated into monetary value.

Once the BSC is set-up and functional it should translate the organisation's strategy and vision into a comprehensive set of performance measures which provides the framework for a strategic measurement and management system (Figure 4). The BSC must also emphasize that nonfinancial and financial measures are part of the information system for employees at all levels in the organisation (Kaplan & Norton, 1996). Chan (2003) says that the performance measures should describe the feedback on activities with respect to meeting strategic objectives and customer expectations. The BSC will thus indicate the need for improvement in areas with unsatisfactory performance and possibly improving quality and efficiency.

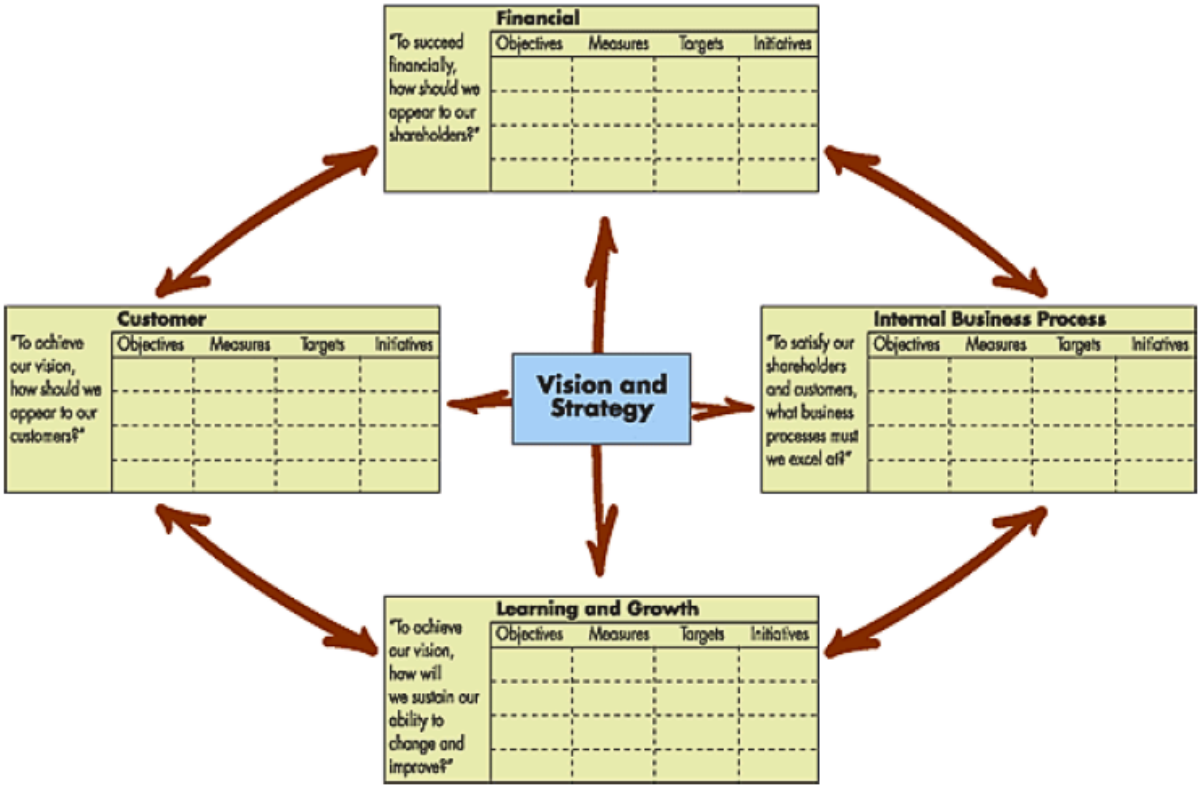

Figure 4: BSC Approach (Kaplan & Norton, 1996)

The BSC will ensure that benefits are realized and sustained through constant monitoring of results and alerting appropriate parties to inadequate performance (Solutions Hosting, Inc., 2006).

5.3. Improving Process Performance

Michael Hammer (2007) has designed a *Process and Enterprise Maturity Model* that enables companies to deliver higher performance over time. Two kinds of characteristics need to be developed: *process enables*, which relate to individual processes, and *enterprise capabilities*, which pertain to entire organisations. The five process enablers Hammer discusses are:

"Design: The comprehensiveness of the specification of how the process is to be executed.

Performers: The people who execute the process, particularly in terms of skills and knowledge

Owner: A senior executive who has responsibility for the process and its results

Infrastructure: Information and management systems that support the process

Metrics: The measures the company uses to track the process's performance"

The four enterprise capabilities which Hammer uses in his Maturity Model are:

"*Leadership: Senior Executives who support the creation of processes*

Culture: The values of customer focus, framework, personal accountability and willingness to change

Expertise: Skills in, and methodology for, process redesign

Governance: Mechanisms for managing complex projects and change initiatives"

Companies can use this framework to evaluate, plan and assess the maturity of their business processes. The complete model can be found in Appendix C.

5.4. Change Management

In an article in the Harvard Business Review, Beer & Nohria (2000), begin with the following phrase.

> *"Here's a brutal fact: 70% of all change initiatives fail. Why? Managers flounder in an alphabet soup of change methods, drowning in conflicting advice. Change efforts exact a heavy toll - human and economic - as companies fail from one change management to another."*

They suggest successful change can only be effective if managers grasp two basic theories of change. Firstly, they need to grasp change which emphasises on economic value, as measures *only* by shareholder returns. This is known as the 'hard' approach to change. Secondly, they need to grasp the 'softer' approach to change which focuses on developing corporate culture and human capability as well as building trust and commitment to the company through communication and teamwork.

The key is not to focus on either one or the other, but to carefully and simultaneously balance these two very different approaches (Beer & Nohria, 2000).

Although the elements of the 'softer' approach to change are critical for success, change projects can't get off the ground unless companies address their 'hard' elements first (Sirkin, Keenan, & Jackson, 2005).

There are four essential hard elements, namely: Duration, Integrity, Commitment and Effort (Sirkin, Keenan, & Jackson, 2005).

'Duration' refers to the time between milestone reviews. A long project reviewed frequently stands a higher chance of success than a short project reviewed infrequently. The reason for this is that if projects are reviewed regularly, problems can be identified faster and corrective actions are initiated quicker.

The element 'Integrity' refers to the project teams' skills. A change project's success is higher for a high-quality, high integrity project team. It is important to recruit people who have problem-solving skills, are result oriented and are logical but endure uncertainties.

The 'Commitment' element refers to the directors and managers dedicated to the project. Employees need to see company leaders supporting the change initiative for them to accept the change. It is also necessary to clearly and consistently communicate why the change is needed and how it will benefit the employees.

'Effort' refers to the extra work employees are required to do to adopt the new processes. If adopting change burdens employees, they will resist. It is therefore essential that the additional efforts required by the employees are minimal. If necessary, nonessential activities should be removed during the change project to ensure a more comfortable transition.

5.5. Development of Method

Figure 5 shows the approach that will be followed and methods that will be used in the implementation of the BPMS. The process is a combination of Weske's Business Process Lifecycle (2007) and Harington's five phases (1995). A few of the themes discussed by Armistead, Pritchard & Machin (1999) are also incorporated. Michael Hammer's Maturity Model (2007) will be used to analyse and improve process performance. A continuous cycle is formed to show how the system strives towards never-ending improvement.

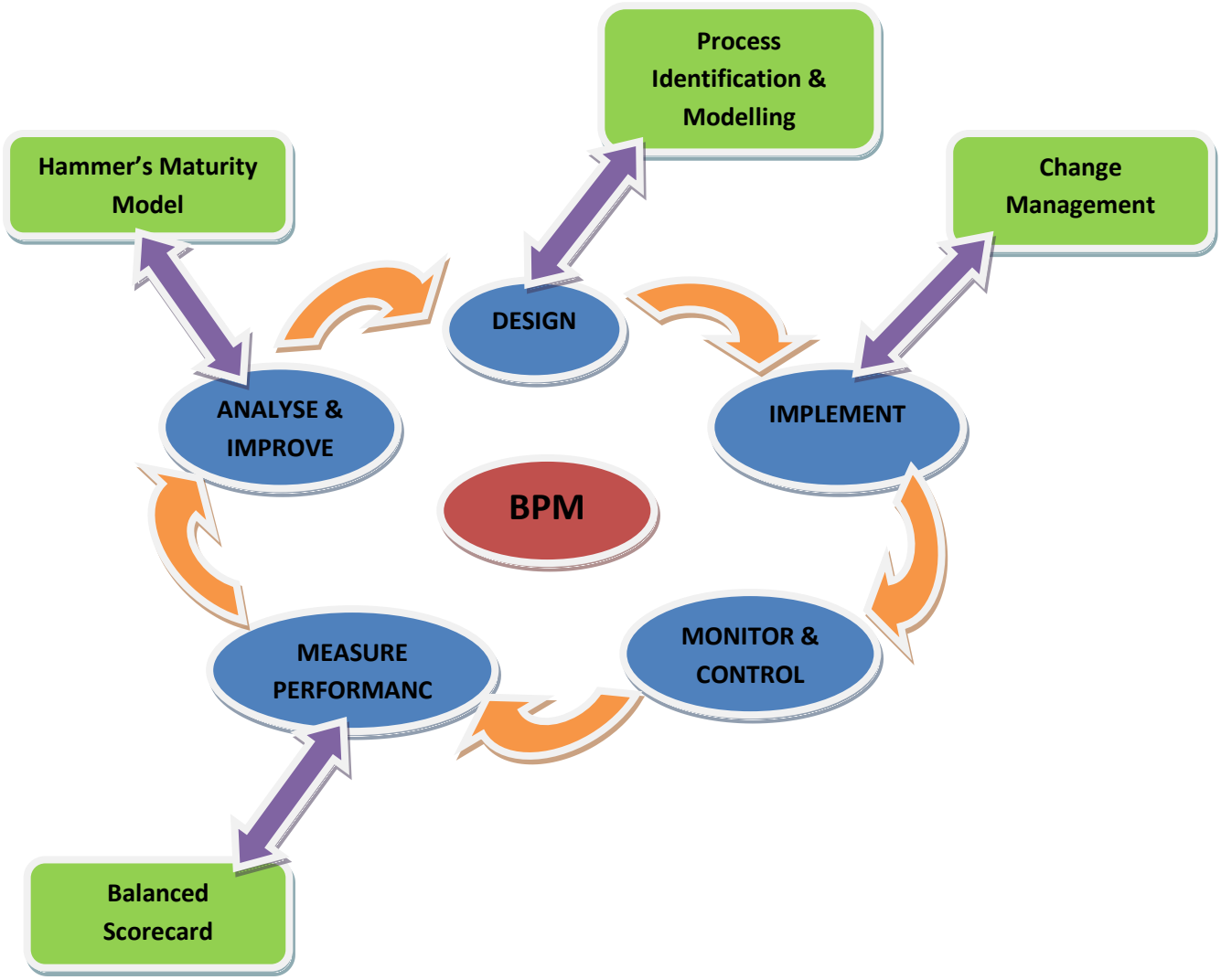

Figure 5: Business Process Management

6. Data Analysis

ESTEQ has recently re-structured their functional business layout. This new structure can be seen in table 1. Rather than individual departments governing their own individual processes, they are structured according to functional business units (BUs) that have the same basic processes. The BUs are divided according to products. Mainstream, for example, is responsible for the distribution and support of Solid Edge, Femap, CAM and Teamcentre software. The aim of this new structure is to ensure that individual solutions are supplied by each BU team who are more specialized in that specific field, instead of having larger teams working with a larger variety of solutions. Each business unit has a BU Manager, a Sales team and a Technical team. The Marketing department functions across all the business units.

	Main Stream	*Digital Product Development*	*Structural Mechanics*	*Plant Design & Simulation*	*Test & Measurement*	*New Business*
Strategic Account Management	**Solid Edge**	**EPM**		**FLOWNex**	**HBM**	**MRO**
Strategic Delivery	**Femap** **CAM Exp**	**NX** **CAD**	**MSC**	**FlowEFD** **Pipestress**	**με** **MSS**	**CPG** **DM** **Plant Simulation**
Training	**TC Exp**	**CAM**		**EDEM**		**Siemens**
Consulting	**Resellers**	**CAE**				**Automation**
Marketing						

Table 1: ESTEQ Structure

The design of the balanced scorecard which is applied to each individual business unit to measure performance can be seen in table 2. The 'Target' and 'Alarm' (minimum threshold) values of each is also shown.

Gross profit values are used to measure financial performance. The alarm values are equal to the expenses, i.e. if they go below the breakeven point. Performance is shown on the dashboards as percentage of target met.

In the past, sales to new accounts and sales to existing customers were measured as one. As part of the implementation of the BPMS, sales to new accounts and sales to existing customers should be measured separately.

The organisation also only required their NPS (Net Promoter Score), a survey to measure customer satisfaction, to be determined once a year at an event for all their customers. They would like to incorporate this into the delivery of every strategic sale, enabling them to measure their customer satisfaction more regularly and accurately.

Perspective	*Strategic Objective*	*Measure*	Main Stream		Digital Product Development		Structural Mechanics	
			Target	Alarm	Target	Alarm	Target	Alarm
Financial Perspective	**Sales (per Q)**	Product (% of Target)	100%	74%	100%	74%	100%	87%
		Maintenance (% of Target)	100%	74%	100%	74%	100%	92%
		Services (% of Target)	100%	74%	100%	74%	100%	90%
Customer Perspective	**New Customer Relationships**	Event Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%
		Leads Qualified quarter(num per Q)	150	50	48	25	24	16
		New opportunities quarter (num per Q)	45	25	21	15	12	8
		Opportunities won qaurter (num per Q)	21	9	14	7	6	4
	Develop Customer Loyalty	Support Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%
		Training Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%
		Delivery Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%
		Customer Retention (%)	95%	80%	95%	80%	95%	80%
Process Perspective	**Sales Performance**	Average Sale Value (R)	R 30 000	R 10 000	R 300 000	R 150 000	R 300 000	R 150 000
		Average Discount from List Price (%)	10%	35%	18%	30%	20%	30%
		Average Sales Cycle (days)	90	150	50	150	120	160
		Days trained per month (num)	80	40	80	40	80	40
	Effective use of Technical Team	Utilization (% time available to sell)	70%	60%	80%	60%	80%	60%
		Realization (% of Utilization sold)	100%	80%	100%	70%	100%	70%
	Support Service Reliability	Turnaround time on Support (hrs)	48	72	48	72	48	72
		Response time on Support (hrs)	4	8	4	8	4	8
	Effective Delivery	In Budget Delivery (% of total sales)	100%	85%	100%	70%	100%	70%
		On Time Delivery (% of total sales)	100%	70%	100%	70%	100%	70%
		Delivery Time (weeks)						
Learning & Growth Perspective	**Empower Sales Force**	Sales Trianing (hrs/month)	4	2	4	2	4	2
		Marketing Training (hrs/month)	4	2	4	2	4	2
		Sales Team Happiness	8	6	8	6	8	6
	Increase Employee Productivity	Technical Training (hrs/month)	16	8	16	8	16	8
		Technical Team Happiness	8	6	8	6	8	6

Table 2: Balanced Scorecard Data (Main Stream, DPD and Structural Mechanics)

Perspective	*Strategic Objective*	*Measure*	Plant Design & Simulation		Test & Measurement		New Business		Strategic Industries	
			Target	Alarm	Target	Alarm	Target	Alarm	Target	Alarm
Financial Perspective	**Sales (per Q)**	Product (% of Target)	100%	83%	100%	94%	100%	70%	100%	70%
		Maintenance (% of Target)	100%	94%	100%	94%	100%	70%	100%	70%
		Services (% of Target)	100%	79%	100%	94%	100%	70%	100%	70%
Customer Perspective	**New Customer Relationships**	Event Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%	40%	20%
		Leads Qualified quarter(num per Q)	20	12	75	50	20	12	6	3
		New opportunities quarter (num per Q)	8	6	38	25	8	6	3	2
		Opportunities won qaurter (num per Q)	4	2	25	17	4	2	2	1
	Develop Customer Loyalty	Support Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%	40%	20%
		Training Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%	40%	20%
		Delivery Satisfaction NPS (%)	40%	20%	40%	20%	40%	20%	40%	20%
		Customer Retention (%)	95%	80%	95%	80%	95%	80%	95%	80%
Process Perspective	**Sales Performance**	Average Sale Value (R)	R 350 000	R 175 000	R 50 000	R 45 000	R 300 000	R 20 000	R 300 000	R 200 000
		Average Discount from List Price (%)	20%	30%	0%	0%	0%	30%	0%	30%
		Average Sales Cycle (days)	120	160	30	60	90	180	180	360
		Days trained per month (num)	80	40	80	40	80	40	80	40
	Effective use of Technical Team	Utilization (% time available to sell)	80%	60%	80%	60%	80%	60%	80%	60%
		Realization (% of Utilization sold)	100%	70%	100%	70%	100%	70%	100%	70%
	Support Service Reliability	Turnaround time on Support (hrs)	48	72	48	72	48	72	48	72
		Response time on Support (hrs)	4	8	4	8	4	8	4	8
	Effective Delivery	In Budget Delivery (% of total sales)	100%	70%	100%	70%	100%	70%	100%	70%
		On Time Delivery (% of total sales)	100%	70%	100%	70%	100%	70%	100%	70%
		Delivery Time (weeks)			6	8				
Learning & Growth Perspective	**Empower Sales Force**	Sales Trianing (hrs/month)	4	2	4	2	4	2	4	2
		Marketing Training (hrs/month)	4	2	4	2	4	2	4	2
		Sales Team Happiness	8	6	8	6	8	6	8	6
	Increase Employee Productivity	Technical Training (hrs/month)	16	8	16	8	16	8	16	8
		Technical Team Happiness	8	6	8	6	8	6	8	6

Table 3: Balanced Scorecard Data (Plant Design & Simulation, Test & Measurement, New Business and Strategic Industries)

7. Development of Conceptual Design

STEP 1: Mapping of Customer Acquisition Process

The first few steps of the Customer Acquisition Process can be seen in figure 6. The Marketing department takes responsibility for identifying possible clients and then completing the '*Gather Information*' process. This process consists of a number of activities including identifying business conditions, products and services, client history, etc. The information gathered will enable them to determine what type of sale will occur.

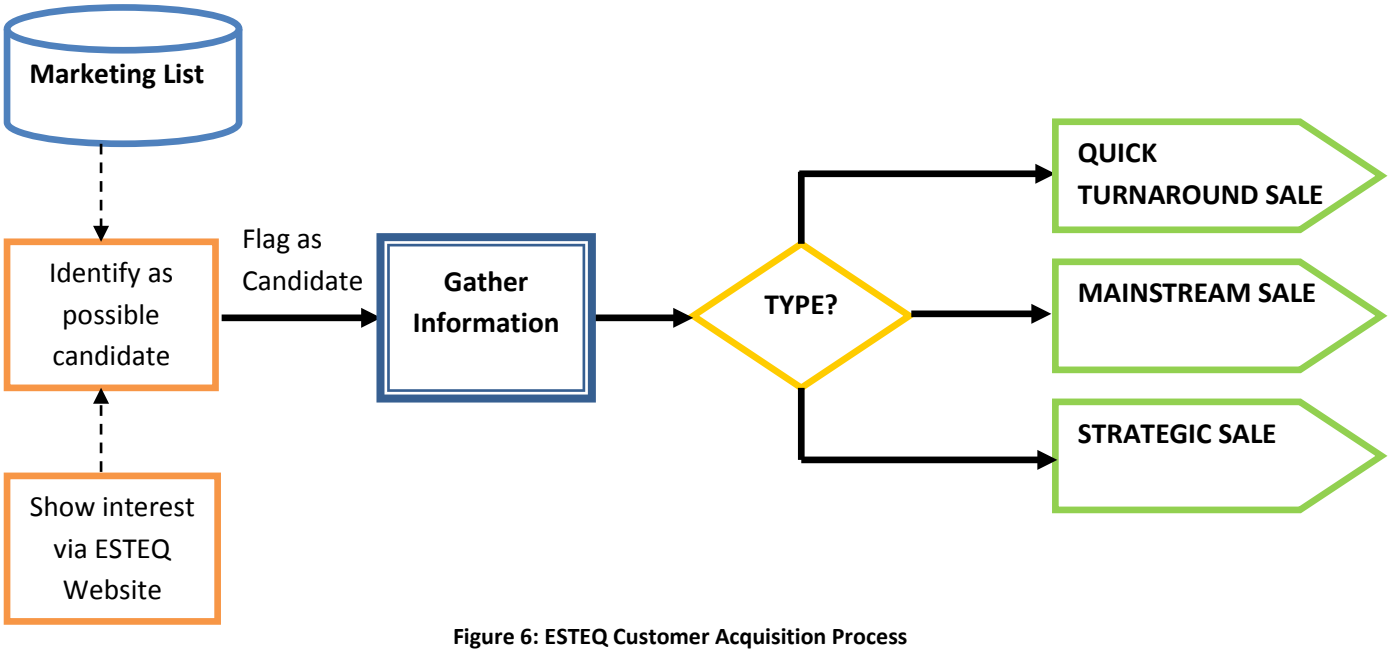

Figure 6: ESTEQ Customer Acquisition Process

There are three different types of sales processes, each defined by the complexity of the sale. The process for the most complex sale, called a *Strategic Sale*, can be seen in figure 7. Each phase of the process is composed of a number of sub-processes which can further be broken down into individual activities. After the *'Deliver'* phase, the process loops back to the '*Discover*' phase. This shows that there exists a continuous, never-ending relationship between the company and their Strategic Clients.

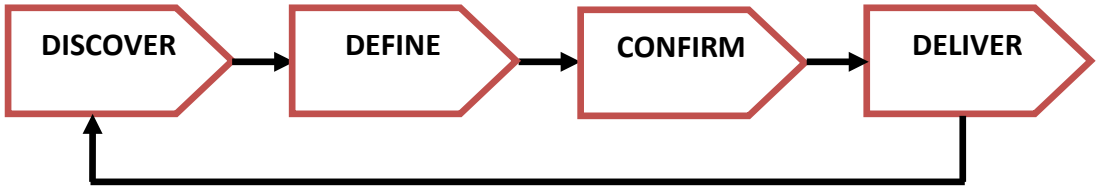

Figure 7: ESTEQ Strategic Sales Process

The other two types of sales are called '*Quick Turnaround*' and '*Mainstream*' sales, the latter being the more complicated type of sale as it consists of more activities and generally takes longer to be

completed. Similar to the Strategic sales process, both processes consists of four phases, namely; '*Discover', 'Define', 'Confirm*' and '*Deliver*'. After the completion of the '*Deliver*' phase, a number of decisions need to be made as to whether or not the relationship should continue. This process can be seen in figure 8. The first decision is whether the client has enough interest in the available solutions to become a Strategic Client. The Strategic Sales Process discussed earlier will then commence. If the client doesn't appear to be interested in additional solutions, a further decision will be made whether or not the client's information should be stored in the marketing list. If there is potential for future sales to the customer, the '*Obtain Customer Permission*' process will follow. This involves the customer receiving an e-mail asking if they would like to receive e-mails about new solutions, upcoming training, events, etc. If the customer denies permission, the relationship will end and the process will be terminated. If the customer gives permission, their contact information will be placed in an information store in the CRM Database.

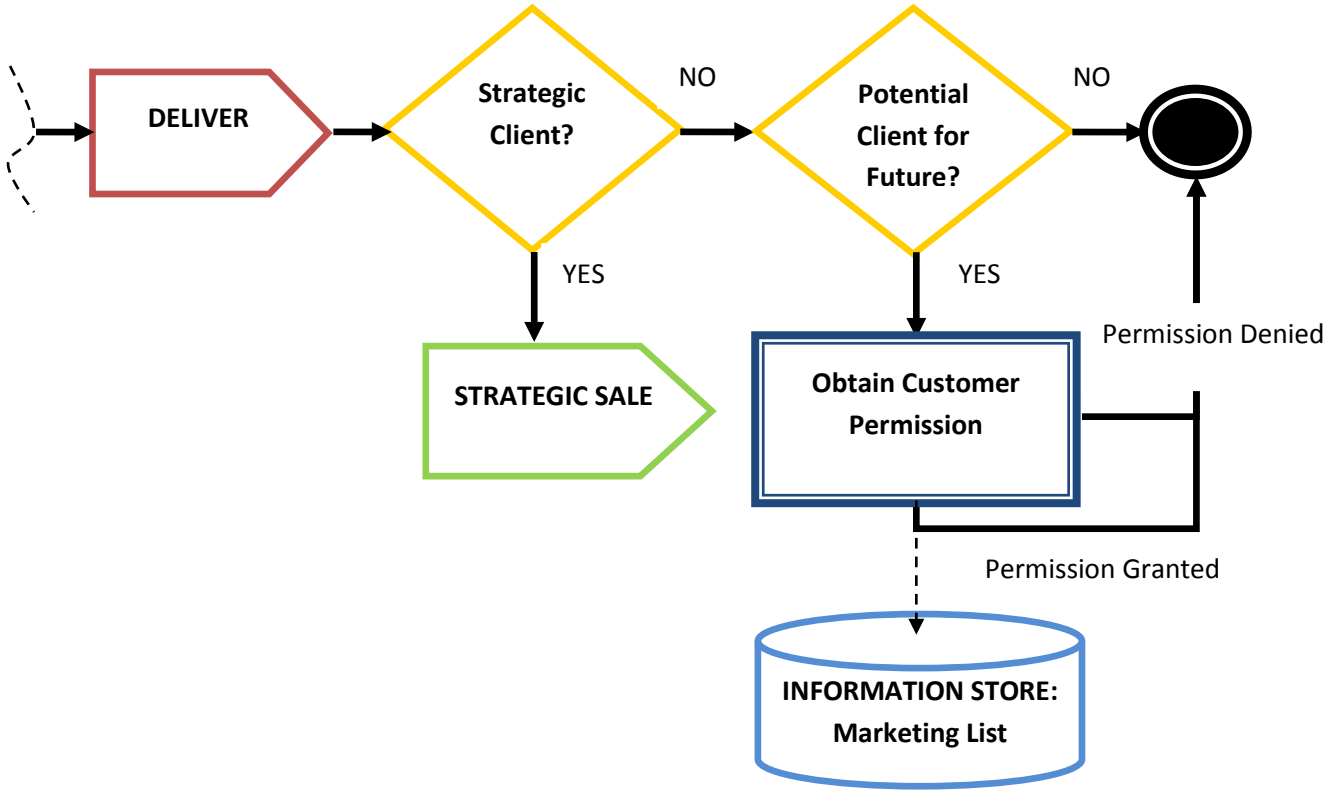

Figure 8: Extract from Mainstream/Quick Turnaround Sales Process

The complete mapping of the Customer Acquisition Process can be seen in Appendix A.

STEP 2: Communicating Strategy by means of a Balanced Scorecard

Individual Scorecards have been built for each business unit in the organisation, each having the same KPIs (Refer to table 2 and 3). The data from each business unit is then 'rolled up' to show ESTEQ's overall performance. The Business Strategy, as related to the KPIs, can be seen in Appendix B.

The Balanced Scorecard design for the '*Digital Product Development*' (DPD) business unit can be seen in figure 9. The layout is the same for each business unit. The average vales of the KPIs are used as the overall measures in the 'ESTEQ Scorecard'. An extract of the 'ESTEQ Scorecard' can be seen in figure 10.

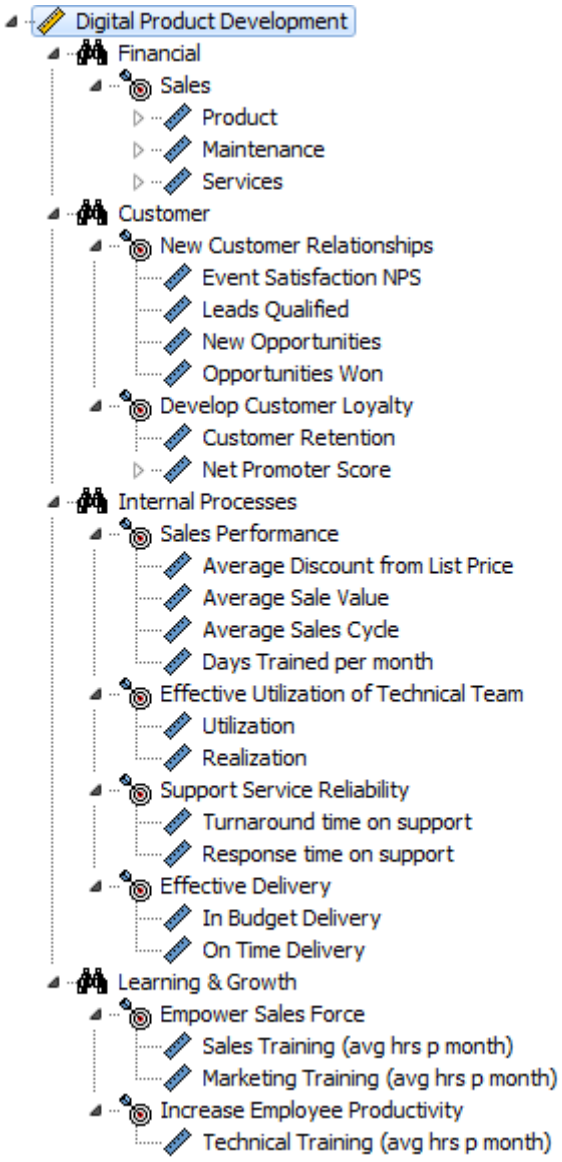

Figure 9: Scorecard for Digital Product Development BU

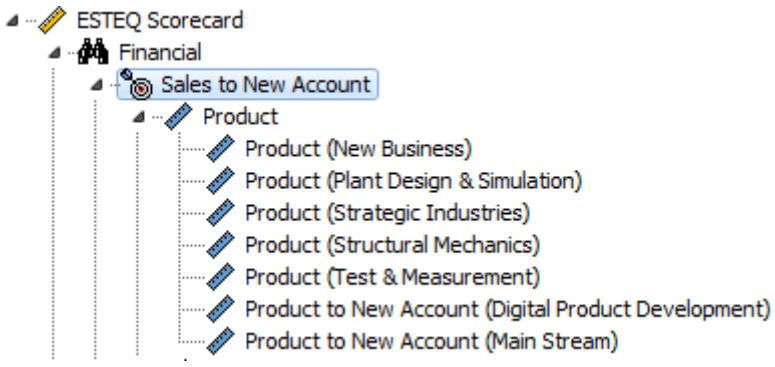

Figure 10: Extract from ESTEQ Scorecard

Historical and some fictitious data, where no data has been recorded, is used to depict performance in the past. This performance is shown via a dashboard. Figure 11 shows an example of this. 'Target' and 'Alarm' values are entered to illustrate when performance was 'Excellent', 'Average' or 'Poor'. In the

example, if 'Actual' product sales are 100% or more of their target gross profit, performance is 'Excellent' or green. If their 'Actual' product sales are less than 74% of their target gross profit, therefore producing sales below their breakeven, performance is 'Poor' or red. The indicator on the left shows the performance of the most resent timeframe, i.e. quarter 3, year 2011. In this quarter their performance was 'Excellent' or Green. The graph gives a visual representation of the business unit's past and present performance and enables users to evaluate and compare performance.

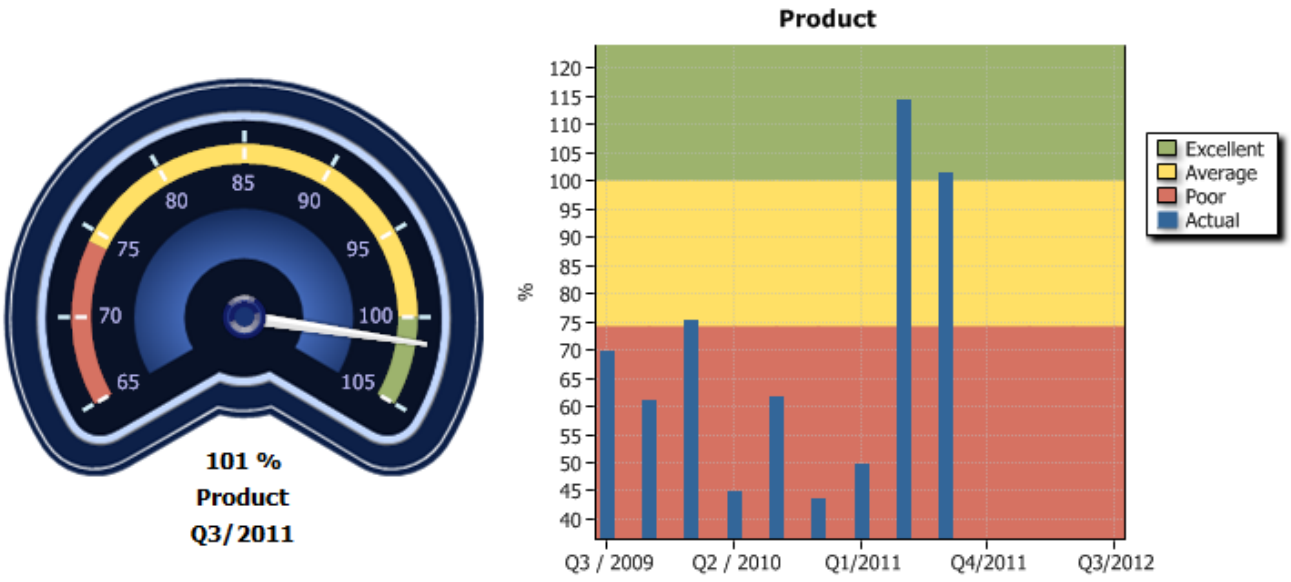

Figure 11: Dashboard Example (DPD Product Sales)

STEP 3: Aligning Process steps with KPIs

The metrics in the balanced scorecard need to be aligned with certain activities in the process so that performance can be continuously monitored. This involves adding the measures to the appropriate steps in the process.

An example of this is aligning the KPI 'Leads Generated' with the activity 'Generate Lead'. Refer to figure 12.

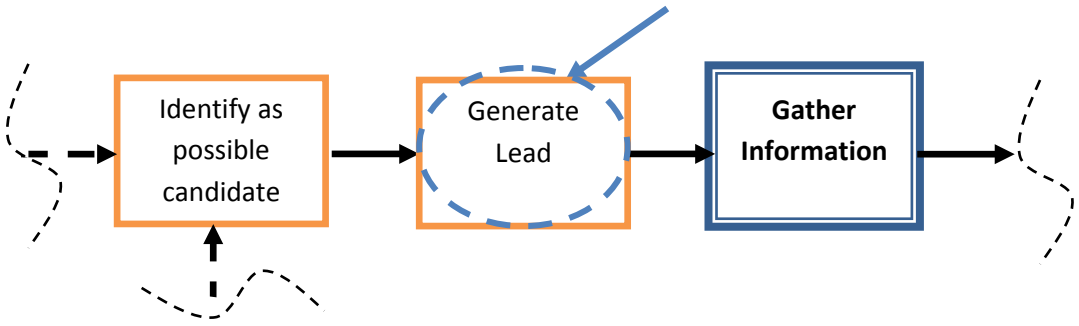

Figure 12: Extract from ESTEQ Customer Acquisition Process

The measure 'Leads Generated' is added to the connector which sums all the candidates indentified in a certain period as the process is enacted. This measure is then automatically recorded in the scorecard for that time frame.

STEP 4: Design of an Interactive Web Portal

The Web Portal will allow for the continuous monitoring and control of process performance. It will enable data to be captured into the system and automatically update the KPIs and dashboards. The execution of the process occurrences will be actively controlled as defined by the business process model.

The portal will also make the dashboards viewable to employees in all levels of the company. This will enable each individual and business unit to evaluate their own performance as compared to overall performance.

Aligning the process steps with the KPIs as described in the previous step will also allow the display of the latest performance 'colour' on the process step in the Portal, as can be seen in figure 13.

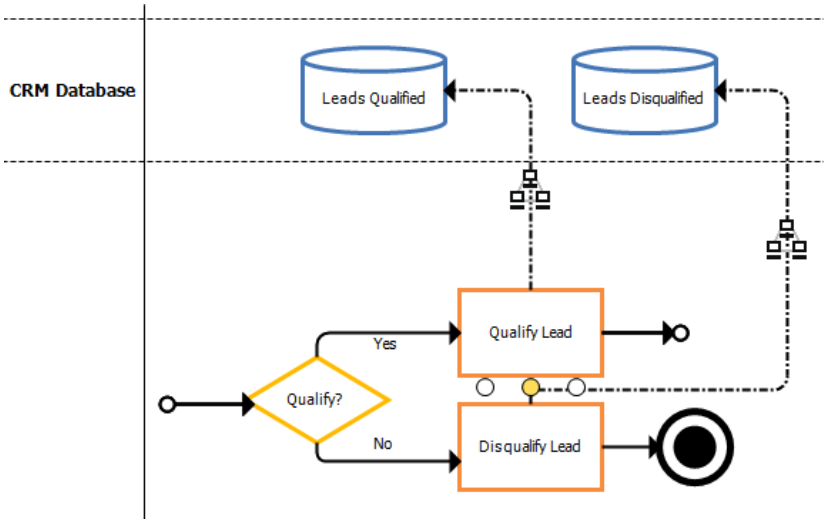

Figure 13: Extract from Customer Acquisition Process, Qualify Lead (DPD)

By clicking on the highlighted circle, the dashboard pertaining to that specific case will be shown. Refer to figure 14.

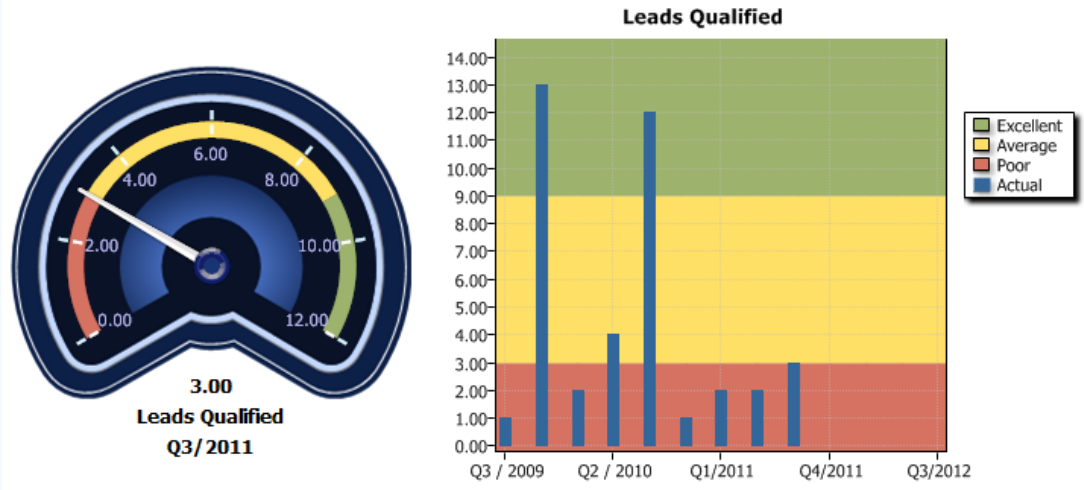

Figure 14: Dashboard, Leads Qualified – DPD

This visual representation of performance can be used to study and analyse areas for improvement. It is obvious, for example, that not enough leads are being qualified by DPD. This BU mainly focuses on strategic sales to existing customers; therefore the number of leads will not necessarily directly affect sales but may have a long term negative effect so it needs to be monitored. When studying the dashboard it seems that the number of leads qualified has been increasing slowly since Q3/2010, suggesting a growing interest. As the products distributed by this BU are relatively new, this may merely be a representation of this.

A better representation will be a measure of 'New Opportunities', which considers both new and existing customers. Refer to figure 15.

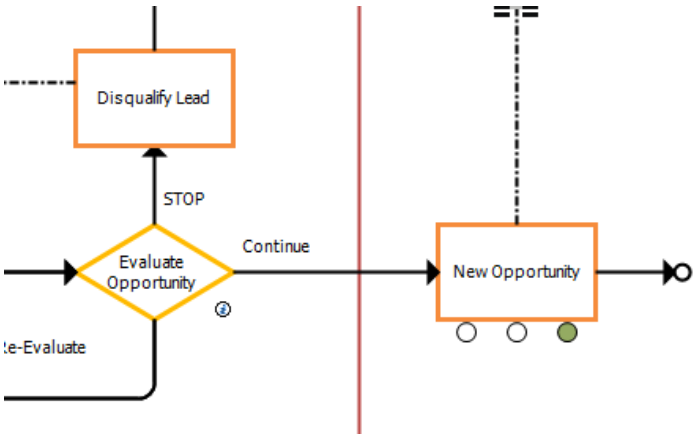

Figure 15: Extract from Customer Acquisition Process, Strategic Sales - Discover (DPD)

In contrast to 'Leads Qualified', performance is now 'green' or excellent. This gives a better representation of reality. Refer to figure 16 to compare present performance to past performance.

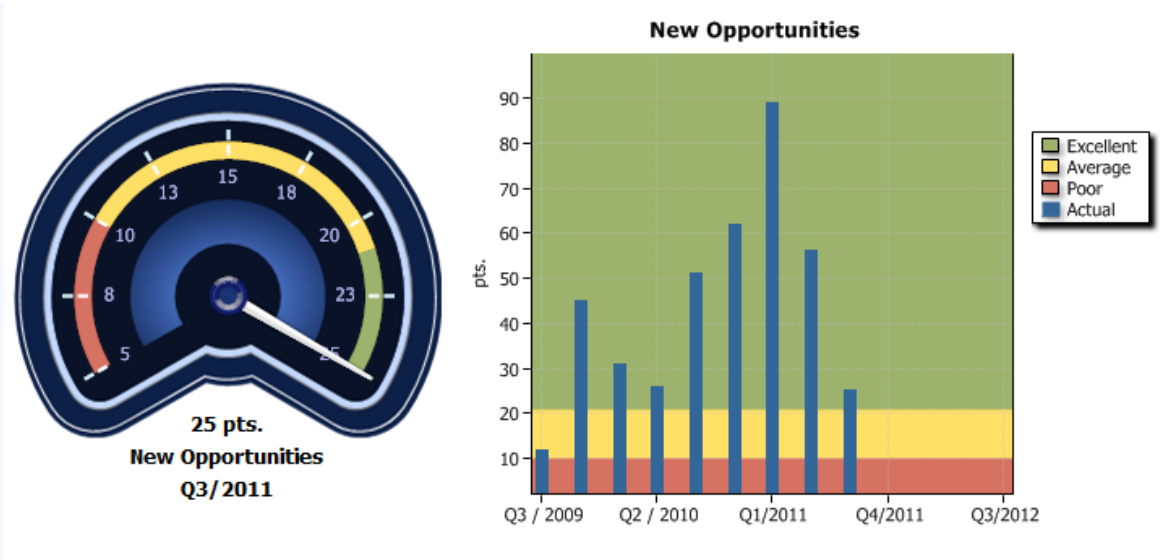

Figure 16: Dashboard, New Opportunities – DPD

The dashboard shows that DPD is currently experiencing a decline in 'New Opportunities'. This may continue to drop if not monitored. When compared to 'Leads Qualified', it may suggest that 'New Opportunities' might now increase again. This cannot be guaranteed though as a wide variety of factors can effect this.

A true depiction of performance is the number of opportunities won and the number of opportunities lost. Refer to figure 17 for an extract of this for DPD.

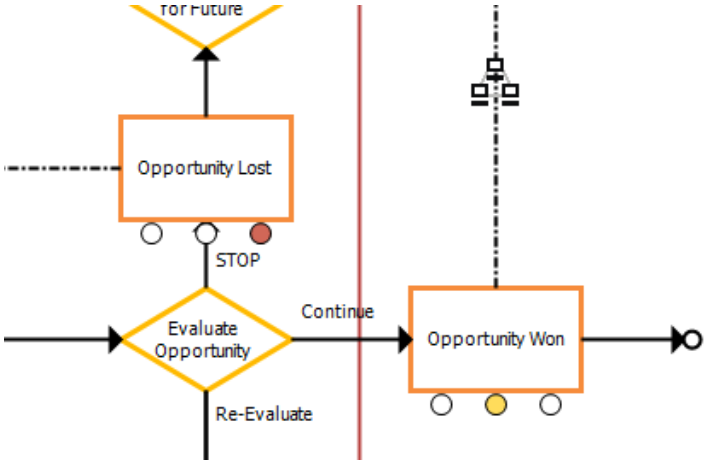

Figure 17: Extract from Customer Acquisition Process, Strategic Sales - Define (DPD)

This clearly shows what happened with all the 'New Opportunities'. Too many of these opportunities have been lost as the activity has been highlighted red. Not enough opportunities have been won either. Refer to figure 18 and 19 to compare present and past performance of these two KPIs.

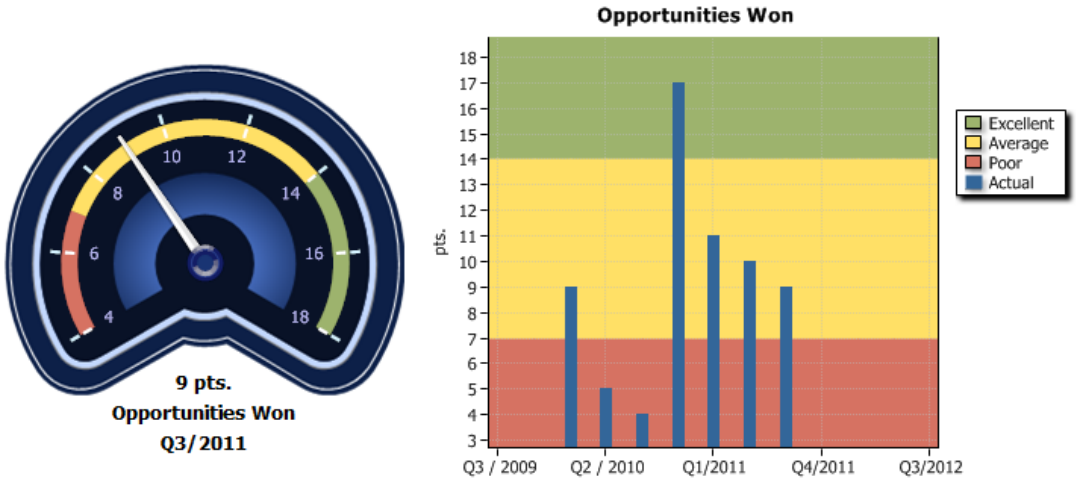

Figure 18: Dashboard, Opportunities Won – DPD

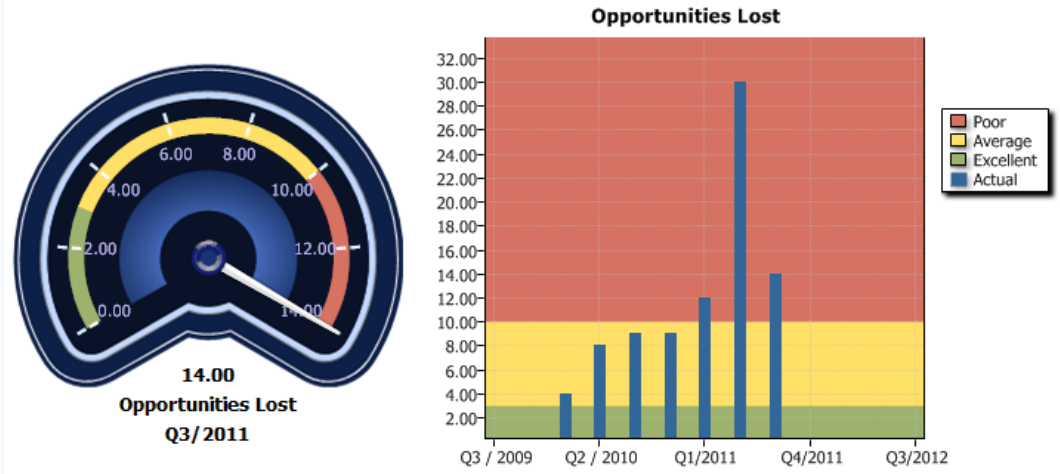

Figure 19: Dashboard, Opportunities Lost – DPD

Although there were enough opportunities won, a large variety of these opportunities have been lost, not only the most recent timeframe but for a considerable period now. This needs to be analysed in detail for a clearer understanding of what should be done to improve this. A question also arises as to why so many opportunities have been lost. It is also clear that the number of opportunities won is decreasing and if it continues to decrease it will soon be in the red. Improvements need to be made before this happens.

STEP 5: Process Development Studies

Historical data collected was used to analyse the process based on past performance. The 'AS-IS' maturity of the process has been analysed according to Hummer's Maturity Model which can be found in Appendix C. Based on this, improvements will be suggested.

According to the model, the areas that need the most attention are Design and Metrics. Both of these areas have a maturity of below P-0 and therefore focus will be placed on these.

The problem area in Design is 'Documentation'. The implementation of the BPMS will solve this problem as the processes design will be properly documented from end-to-end. It will also link the process to the enterprise system and architecture and when operational, it will support the analysis of performance and process management.

The problems in 'Metrics' will be solved by the scorecard and portal designed. The enterprises strategy and goals, as related to customer requirements, is defined and built into performance measurements. Managers will be able to track performance, identify root causes for faulty performance and compare performance to benchmarks and targets. The dashboards will enable the day-to-day management of the process.

After the system has been implemented and allowed to run for a period of time, the maturity of the process will again be analysed and studied to determine if the system has the desired effect and to find areas for further improvement.

Further analysis of the process has been done to determine if there are any problem areas in the process itself. Data was extracted from the CRM database relating to quarter 3, 2011. Only two business units will be considered in this analysis, namely Mainstream and DPD. The raw data as well as various analysis views can be seen in Appendix D.

As seen when studying the dashboards for DPD, too many opportunities have been lost. This is the same for Mainstream (Refer to Figure 20). With further analysis, it is observed that a considerable amount of time goes by before declaring the opportunity as lost (Refer to Figure 21 and 22). This suggests that too much time is spent on opportunities that amount to nothing and should be disqualified earlier on, thus preventing time from being wasted.

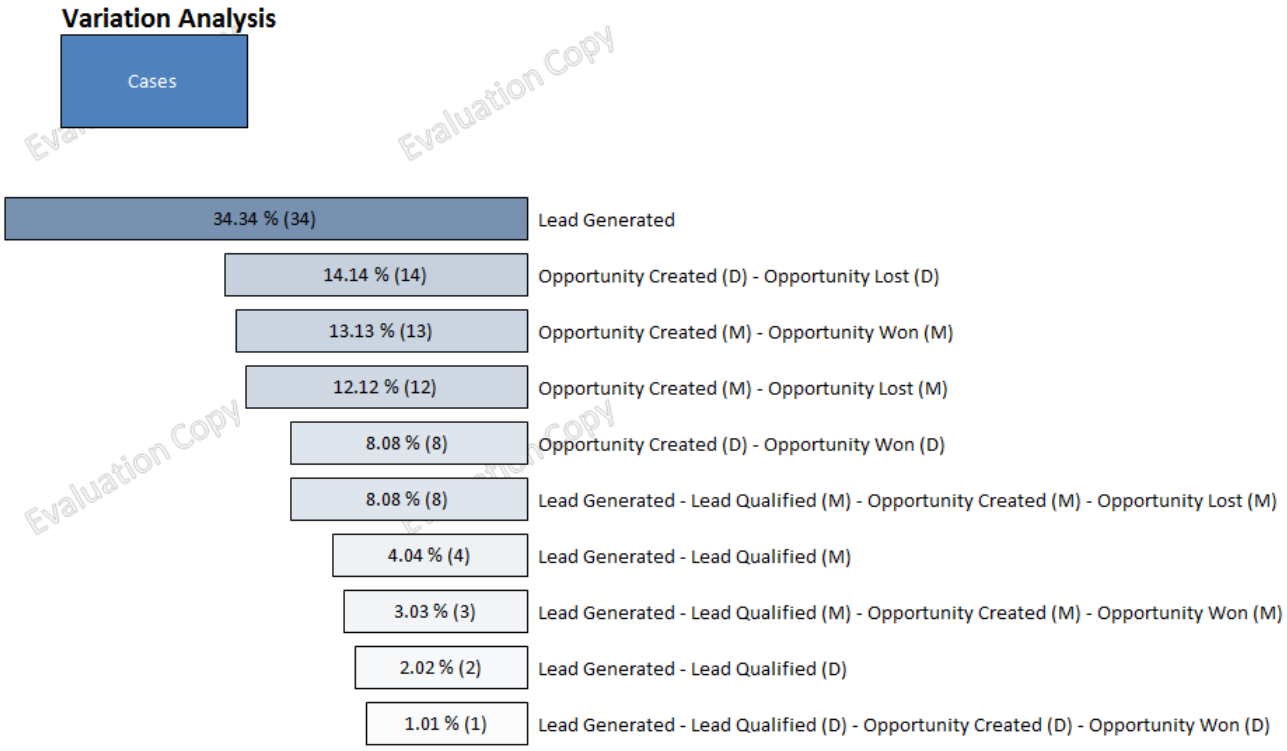

Figure 20: Variation Analysis for Q3/2011 (DPD & Mainstream)

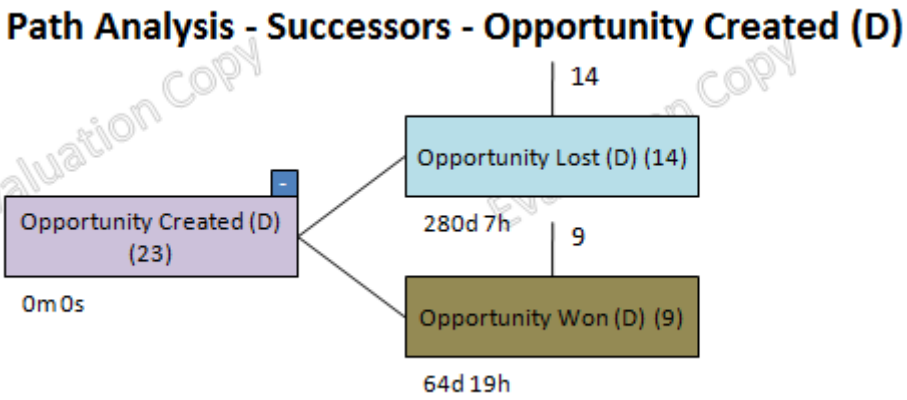

Figure 21: Path Analysis - DPD

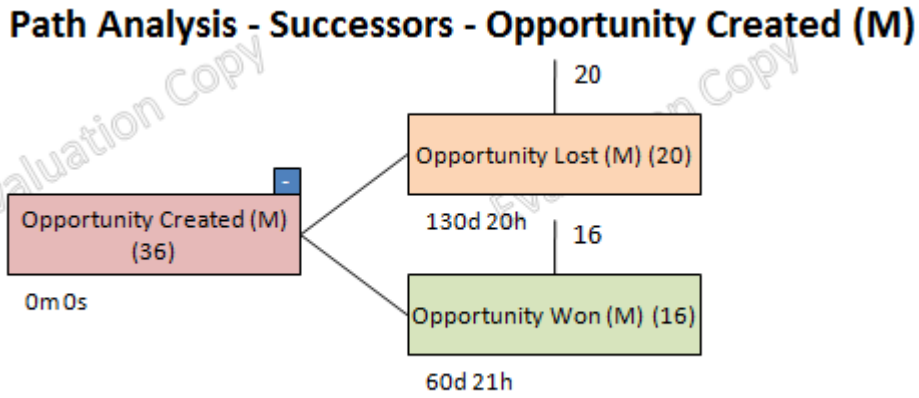

Figure 22: Path Analysis - Mainstream

Additionally, no reasons as to why the opportunities were lost are specified in the database. It would be very helpful to add this to the database for future transactions so that management can analyse what causes most opportunities to be lost, be it loss to competition, loss due to indecisiveness, loss due to no budget or loss due to some other reason not yet known. Only then will they be able to make the necessary improvements to decrease the number of opportunities lost and therefore increase the number of opportunities won.

Whilst doing the analysis, it was realized that there is no record of what happens to the leads generated that don't amount to opportunities. Uncertainty exists as it isn't clear whether the lead is still being processed or whether it is simply lost. It is therefore suggested that an activity be added to the process called 'disqualify lead' which is recorded in the database. This has been added to the process which can be seen in figure 13 and 15, as well as in Appendix A.

A Workflow has also been created in the CRM System which informs actors of the work to be done after certain activities have been performed (Refer to figure 23 & table 4).

When an actor qualifies a certain lead, an e-mail will be sent to him describing which steps should now be executed. A form is attached which must be completed in the 'Discovery' phase of the Customer Acquisition Process. Similarly, when an opportunity is created in the database, the actor receives an e-mail with a form to be completed in the 'Define' phase of the process. This is the same for when the actor declares the opportunity as won.

After an Invoice has been created and sent to the customer, the system automatically sends an e-mail to the customer which provides the customer with a link to go to for the purpose of rating their satisfaction. The system then calculates the customer's NPS and stores it in the database for future analysis (Refer to figure 24).

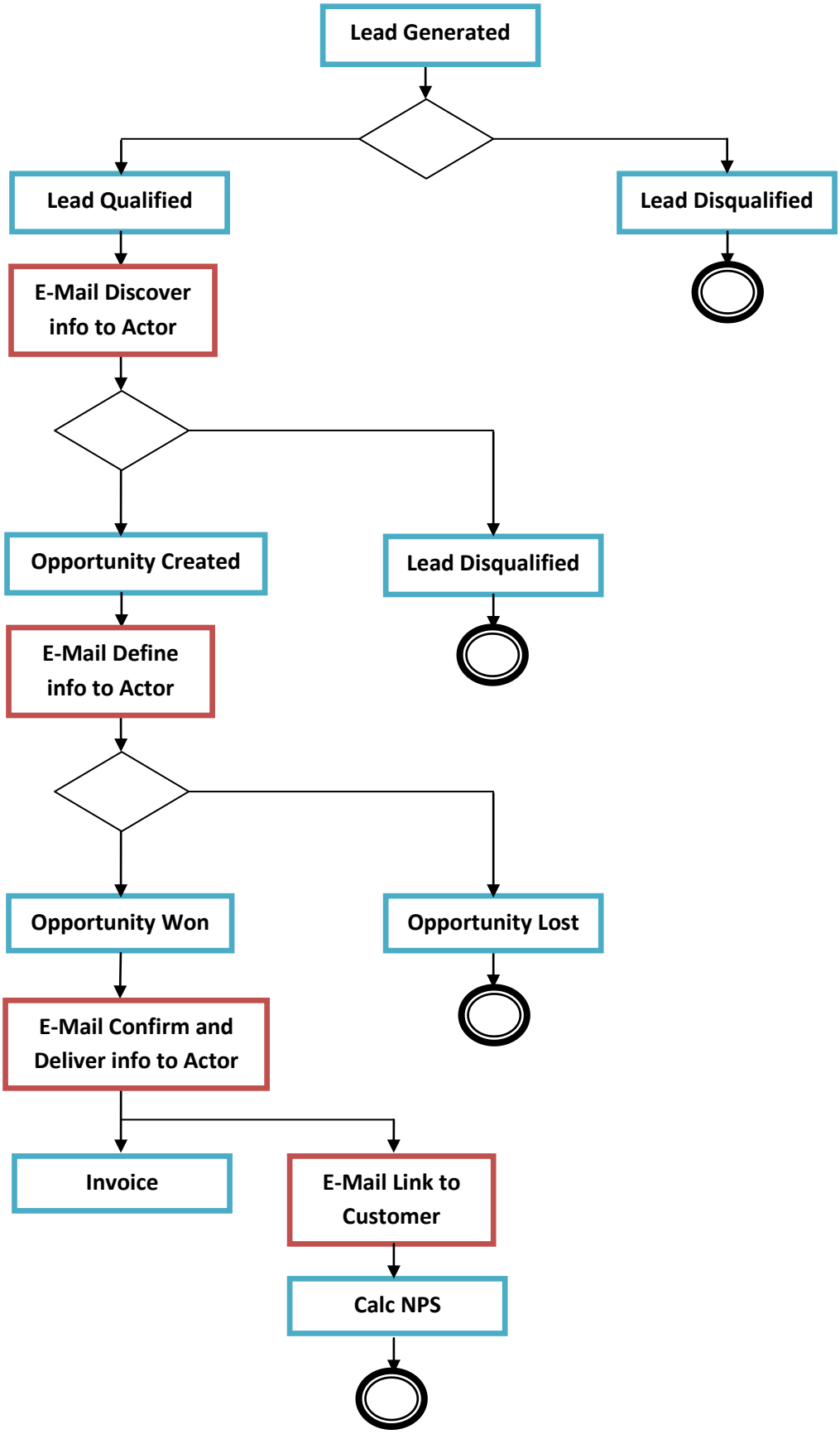

Figure 23: Workflow

Task	Actor(s) Responsible
Lead Generated	Marketing
Lead Qualified	BU Manager
Lead Disqualified	BU Manager
Opportunity Created	BU Manager
Opportunity Won	BU Manager
Opportunity Lost	BU Manager
Invoice	Finance
E-mails	Automatic - CRM Database

Table 4: Workflow Actors

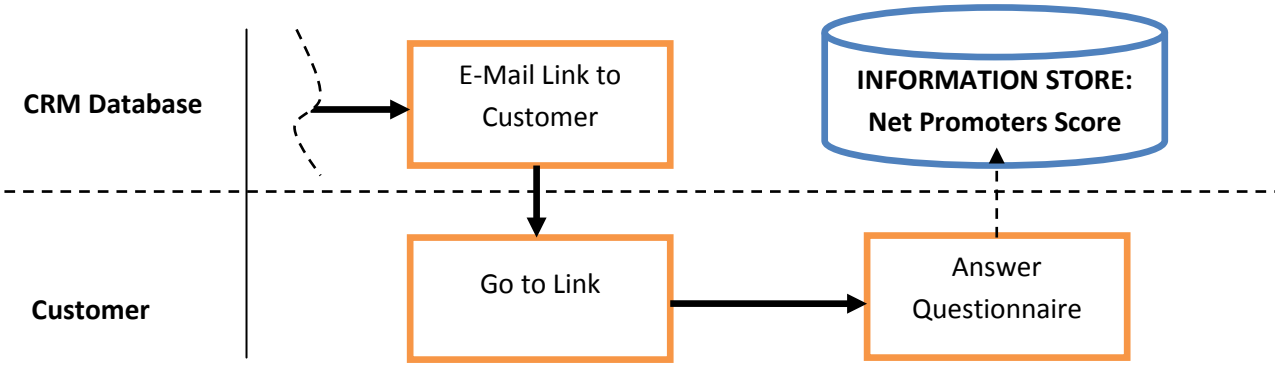

Figure 24: Automatic Calc of NPS after Delivery

8. Problem Solving and Results

From the analysis, it is clear that too many opportunities have been lost in quarter 3, 2011. Also, a considerable amount of time passes before declaring the opportunity as lost. This implies that the clients are either indecisive or have reason to doubt the products. This problem should be addressed by management and the root causes should be determined as too much time is being wasted on opportunities that result to nothing.

There is also an uncertainty as to why so many opportunities have been lost. It is suggested that a measure be added to the database so that management can determine what causes the majority of opportunities to be lost. An example of this can be seen in the pie chart below. If the results from the next quarter depict something like this, it is clear that most opportunities are lost to competitive products. This shows management that they should concentrate on improving their marketing and sales strategy, rather than spending more time on increasing efficiency when the problem lies elsewhere.

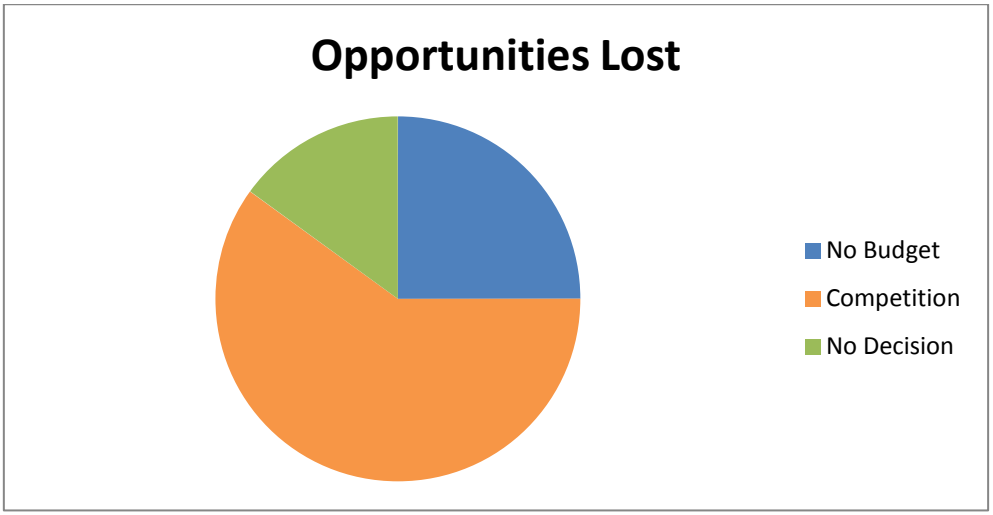

Figure 25: Pie Chart - Opportunities lost

Additionally, uncertainty exists to what happened to some of the leads generated that were never qualified. It is therefore suggested that a measure of 'Leads Disqualified' be added to the system. This will not only give a clearer understanding of what happens with every single lead, but will also show how much time passes before a lead is disqualified. Management will then be able to determine if too much or even not enough time is being spent on leads.

Another problem identified in the analysis was that certain actors do not always qualify their leads before creating an opportunity. It is therefore suggested that it be added to the database that users are not able to create an opportunity for a new customer if the lead has not been qualified. This may result in users simply qualifying a lead directly before creating an opportunity, which will not necessarily depict reality accurately. Management need to find ways to encourage users to use the system appropriately by showing them how it can aid them in their day-to-day work and improve future business.

Actors have also not been following the appropriate steps when completing a sale. The workflow designed in the CRM System will aid users in their work and ensure that the appropriate actions are performed.

Another requirement is that customer satisfaction (NPS) be determined more regularly, ideally after every transaction. It has therefore been added to the system that whenever an invoice is sent to a customer, the customer automatically receives an e-mail directing him to a link where a number of questions are asked that rates his overall satisfaction.

9. Conclusion

The pilot model for the BPMS will provide ESTEQ with the insight they require to improve their Customer Acquisition Process. Process owners will be able to continually monitor their actual performance relative to their set targets and incorporate change initiatives to improve their processes. The model will also provide ESTEQ with the knowledge of the capabilities of BPM they require to further implement the solution into other companies. Additionally, the model will provide a framework for the expansion of the BPMS into all ESTEQ's business processes.

The final BPMS will enable ESTEQ to effectively measure their overall performance by setting goals, monitoring their processes against these goals and finally continuously improve their processes to ensure they reach their goals. This will give them a competitive advantage as they will be able to easily react and adapt to change as they strive to exceed customer expectations.

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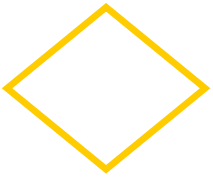
Appendix A: Process Modelling

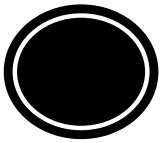
Activity

Core Process

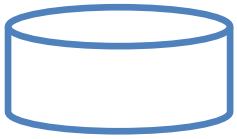


Decision

Sub Process

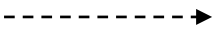


End Process



Information Store

Control Flow

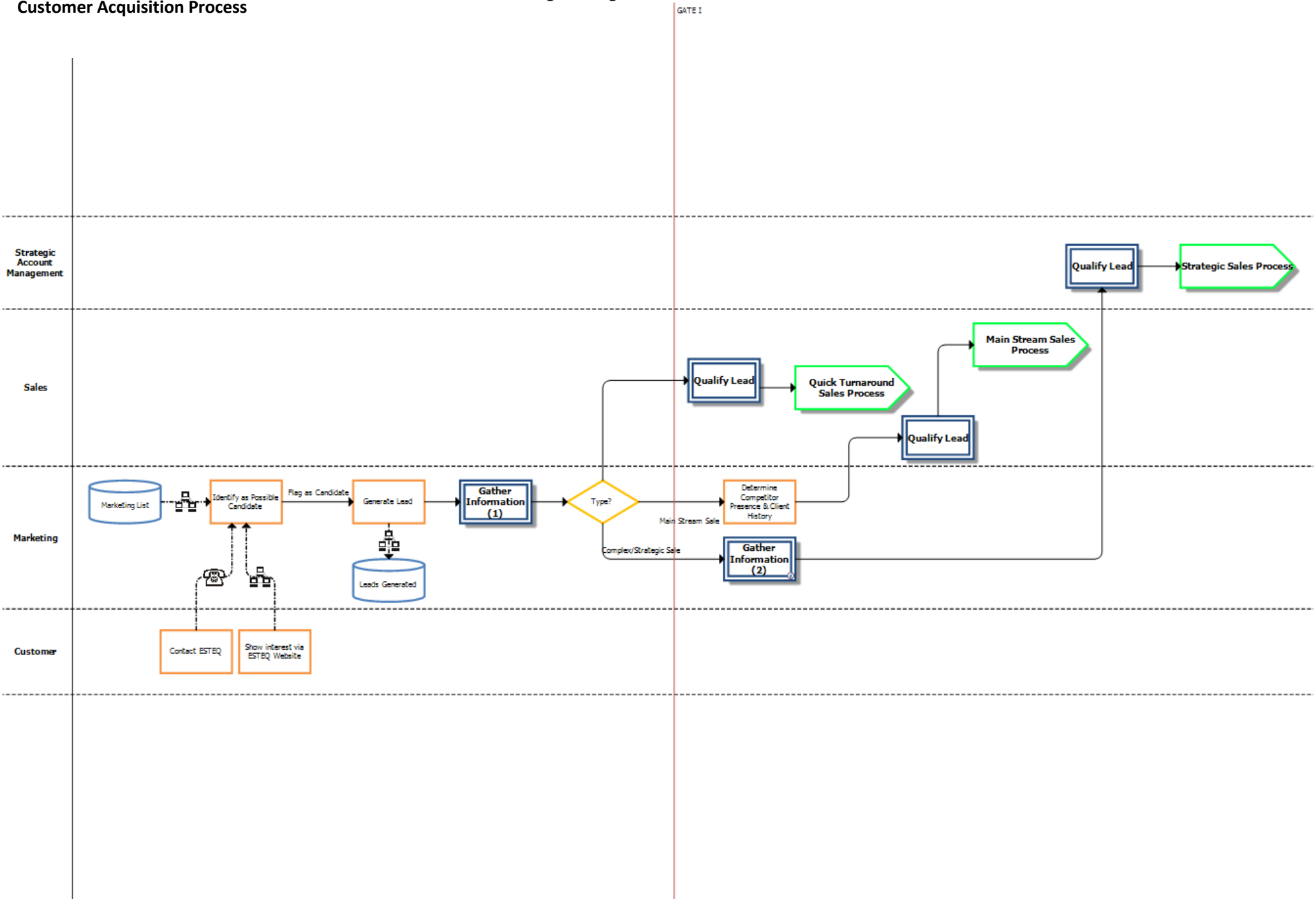


Information Flow

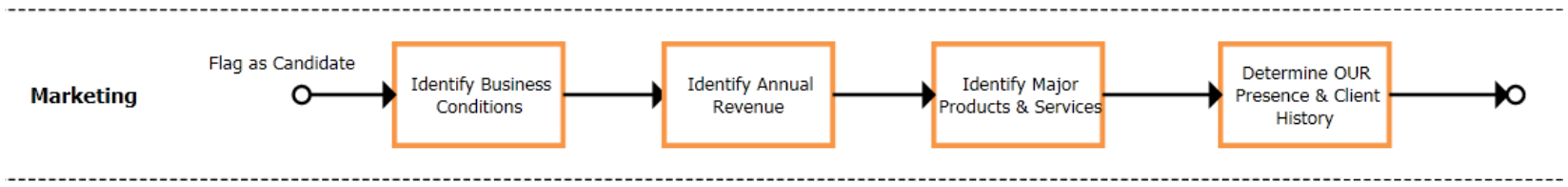
Checkpoint/Gate

Information Item

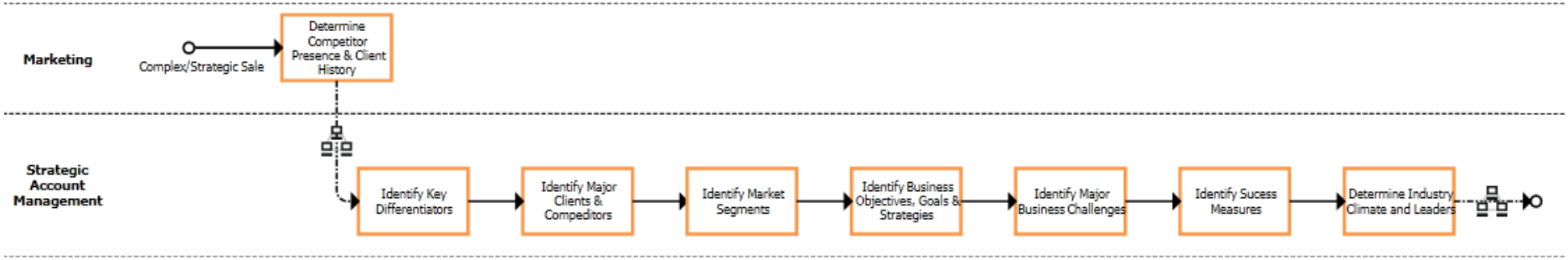
Customer Acquisition Process



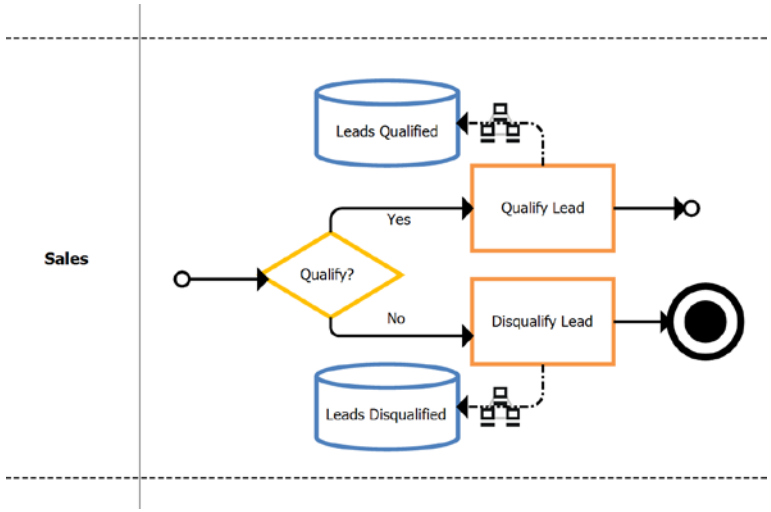
1. Sub Process: Gather Information (1)



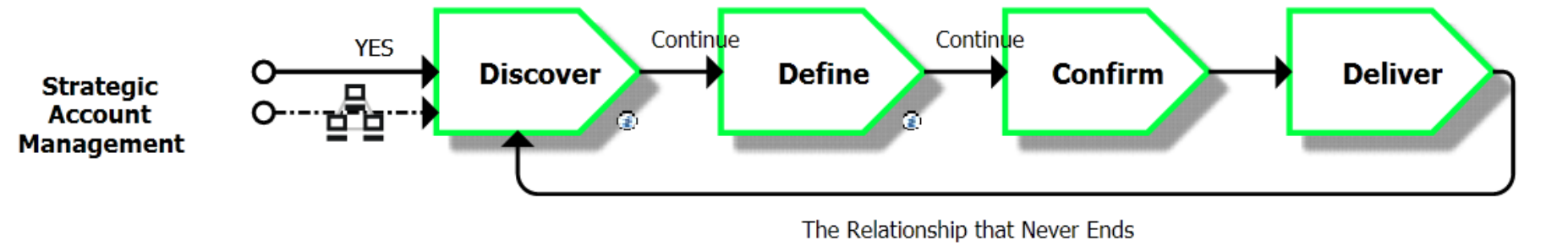
2. Sub Process: Gather Information (2)



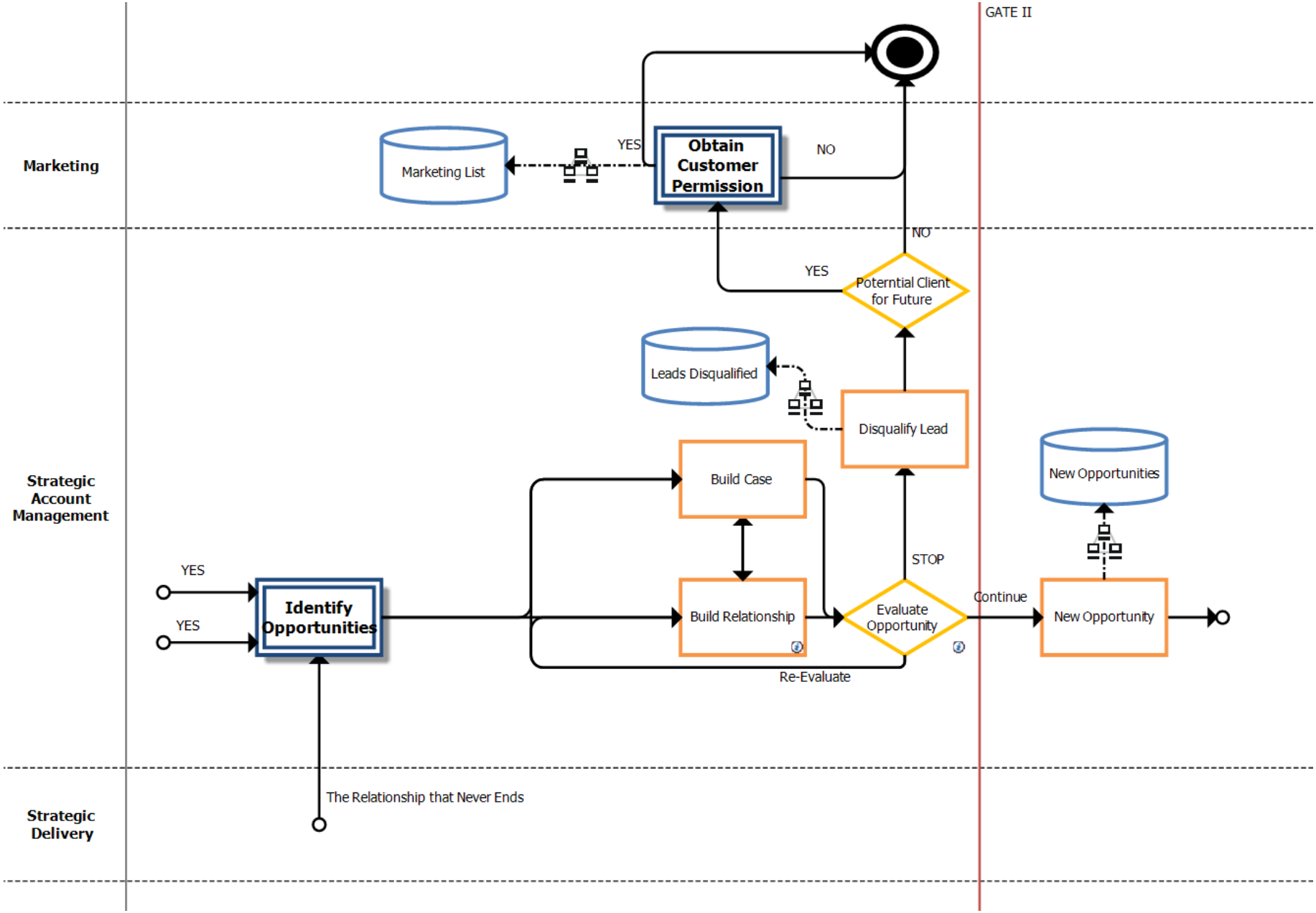
3. Sub Process: Qualify Lead



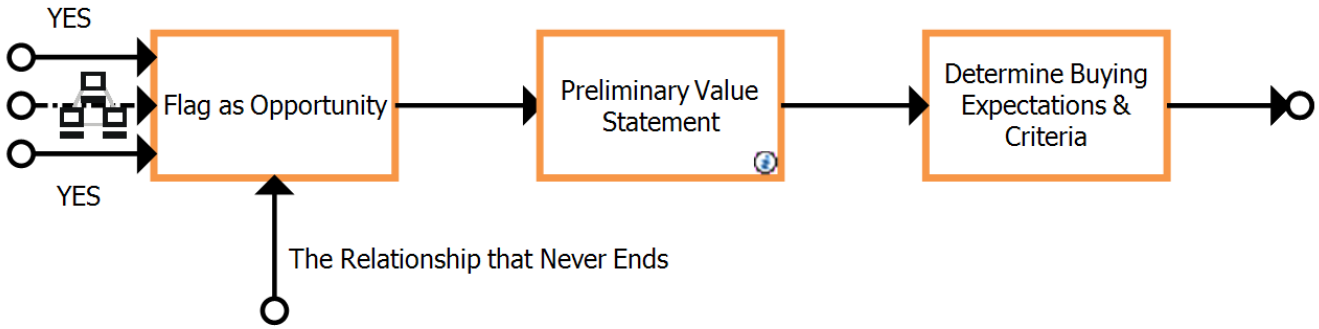
4. STRATEGIC SALES PROCESS



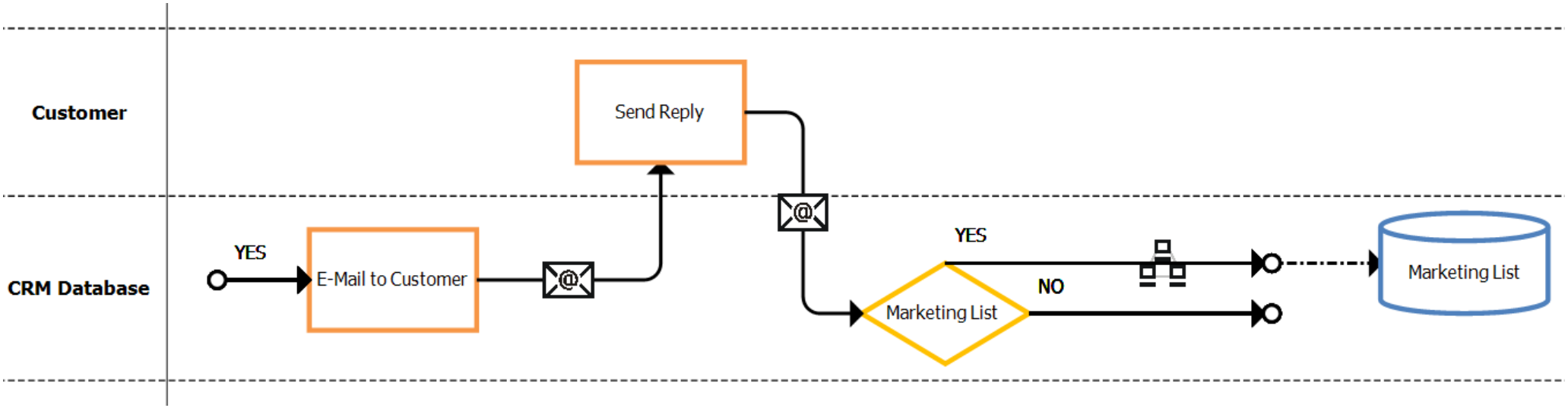
4.1. Discover


GATE II
Marketing
Strategic Account Management
Strategic Delivery
Marketing List
YES
Obtain Customer Permission
NO
NO
YES
Poterntial Client for Future
Leads Disqualified
Disqualify Lead
Build Case
New Opportunities
YES
YES
Identify Opportunities
Build Relationship
STOP
Evaluate Opportunity
Continue
New Opportunity
Re-Evaluate
The Relationship that Never Ends

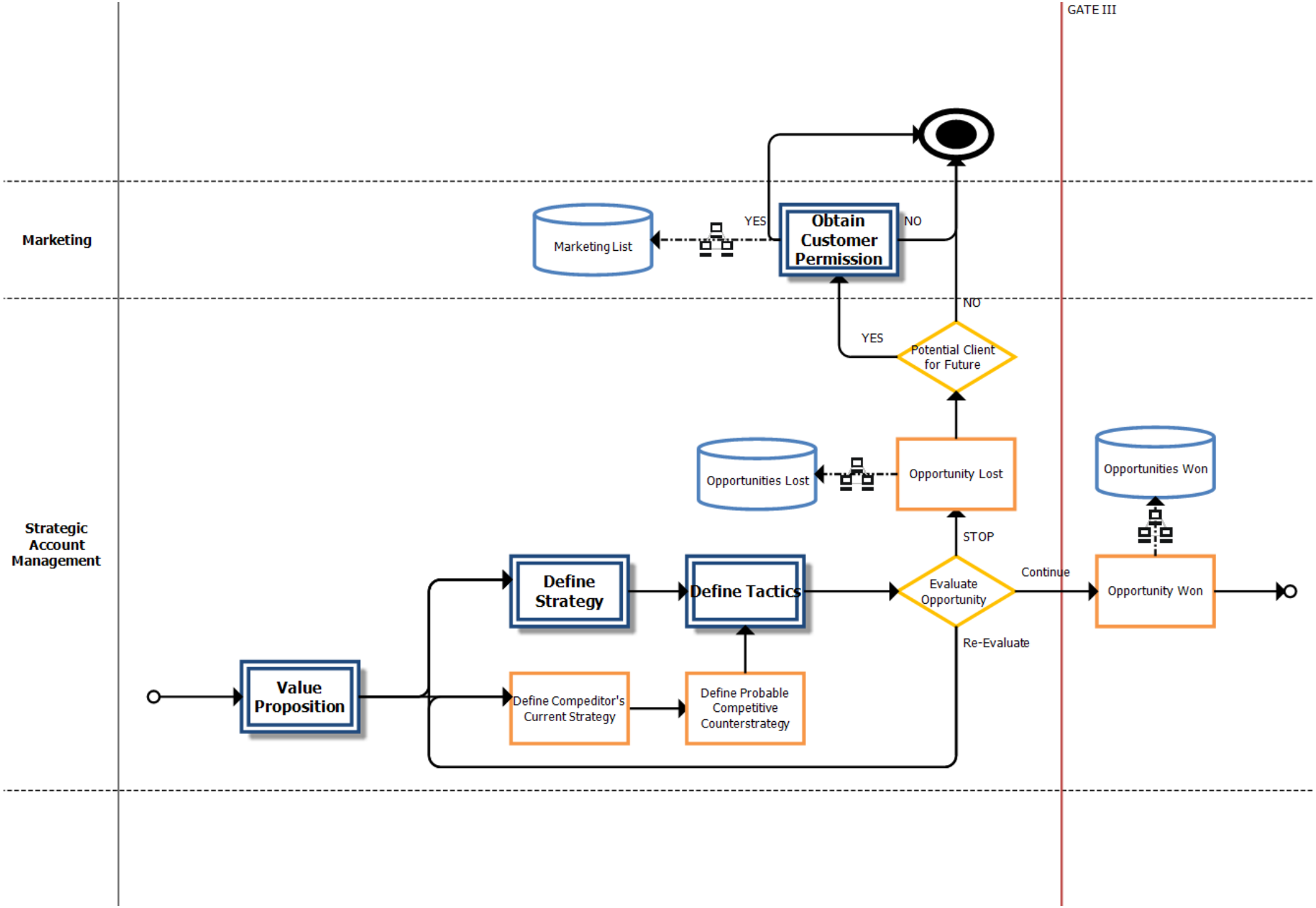
4.1.1. Sub Process: Identify Opportunities



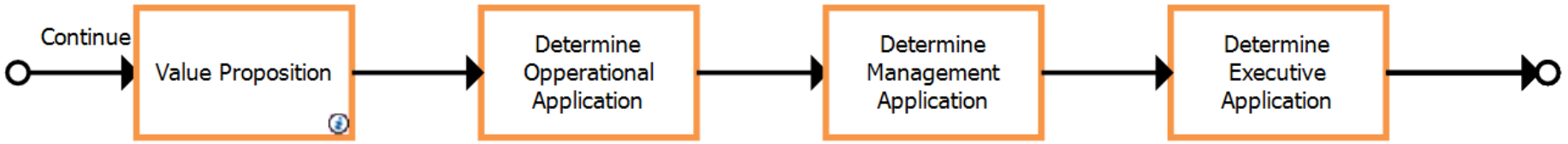
4.1.2. Sub Process: Obtain Customer Permission



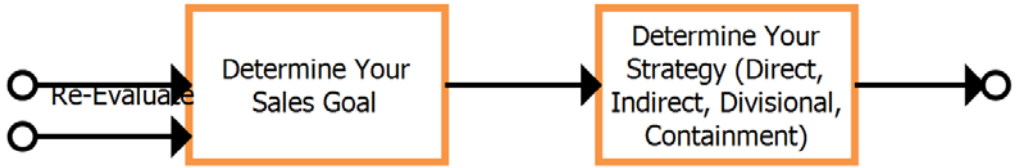
4.2. Define


GATE III
Marketing
Strategic Account Management
Marketing List
YES
Obtain Customer Permission
NO
NO
YES
Potential Client for Future
Opportunities Lost
Opportunity Lost
Opportunities Won
STOP
Define Strategy
Define Tactics
Evaluate Opportunity
Continue
Opportunity Won
Re-Evaluate
Value Proposition
Define Competitor's Current Strategy
Define Probable Competitive Counterstrategy

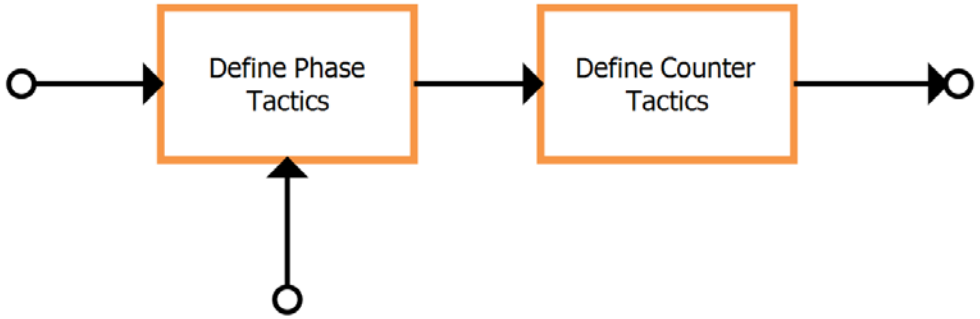
4.2.1. Sub Process: Value Proposition



4.2.2. Sub Process: Define Strategy

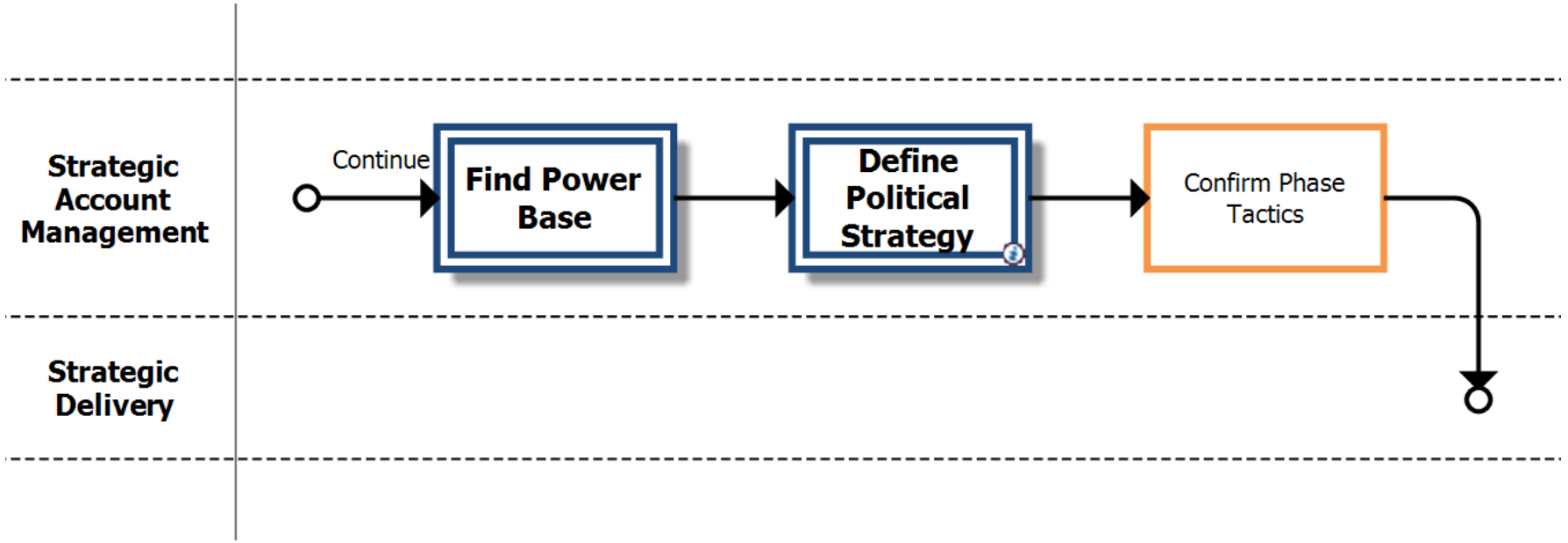


4.2.3. Sub Process: Define Tactics

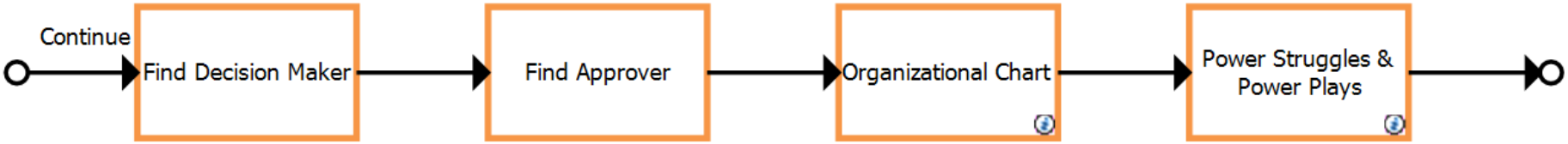


4.2.4. Sub Process: Obtain Customer Permission – Refer to 4.1.2

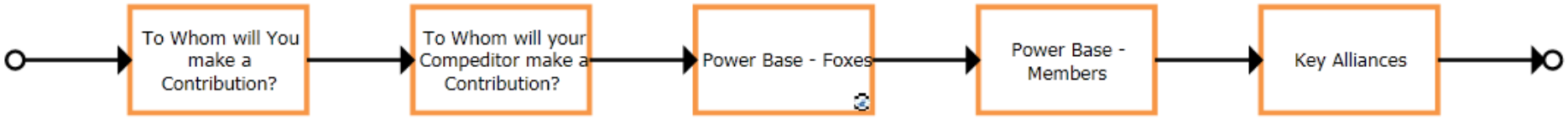
4.3. Confirm



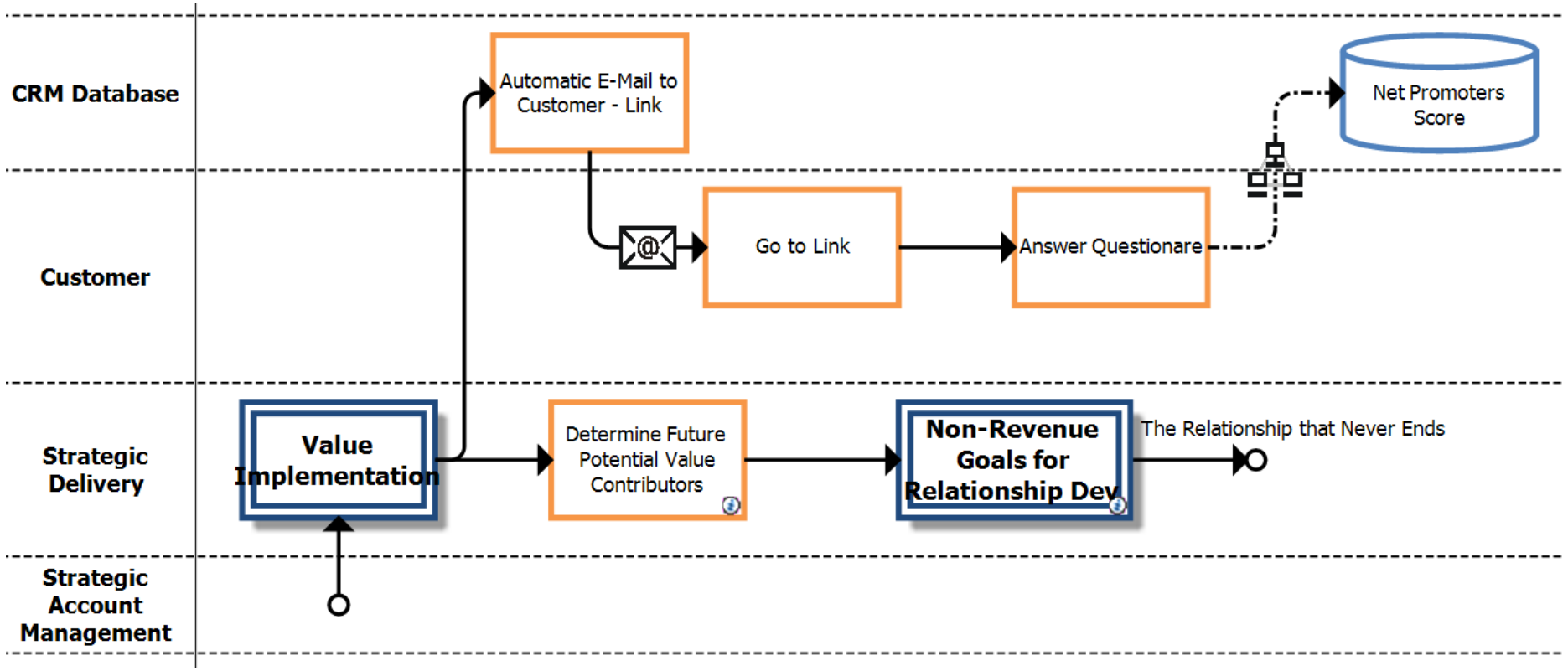
4.3.1. Sub Process: Find Power Base



4.3.2. Sub Process: Define Political Strategy

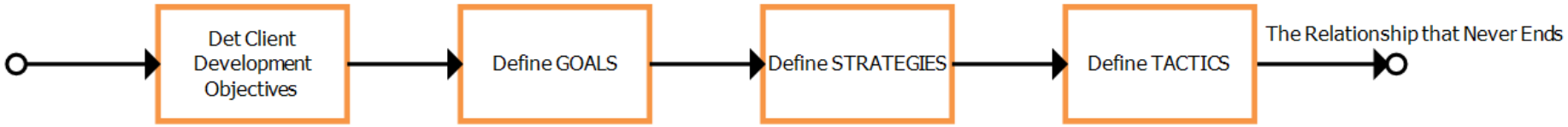


4.4. Deliver

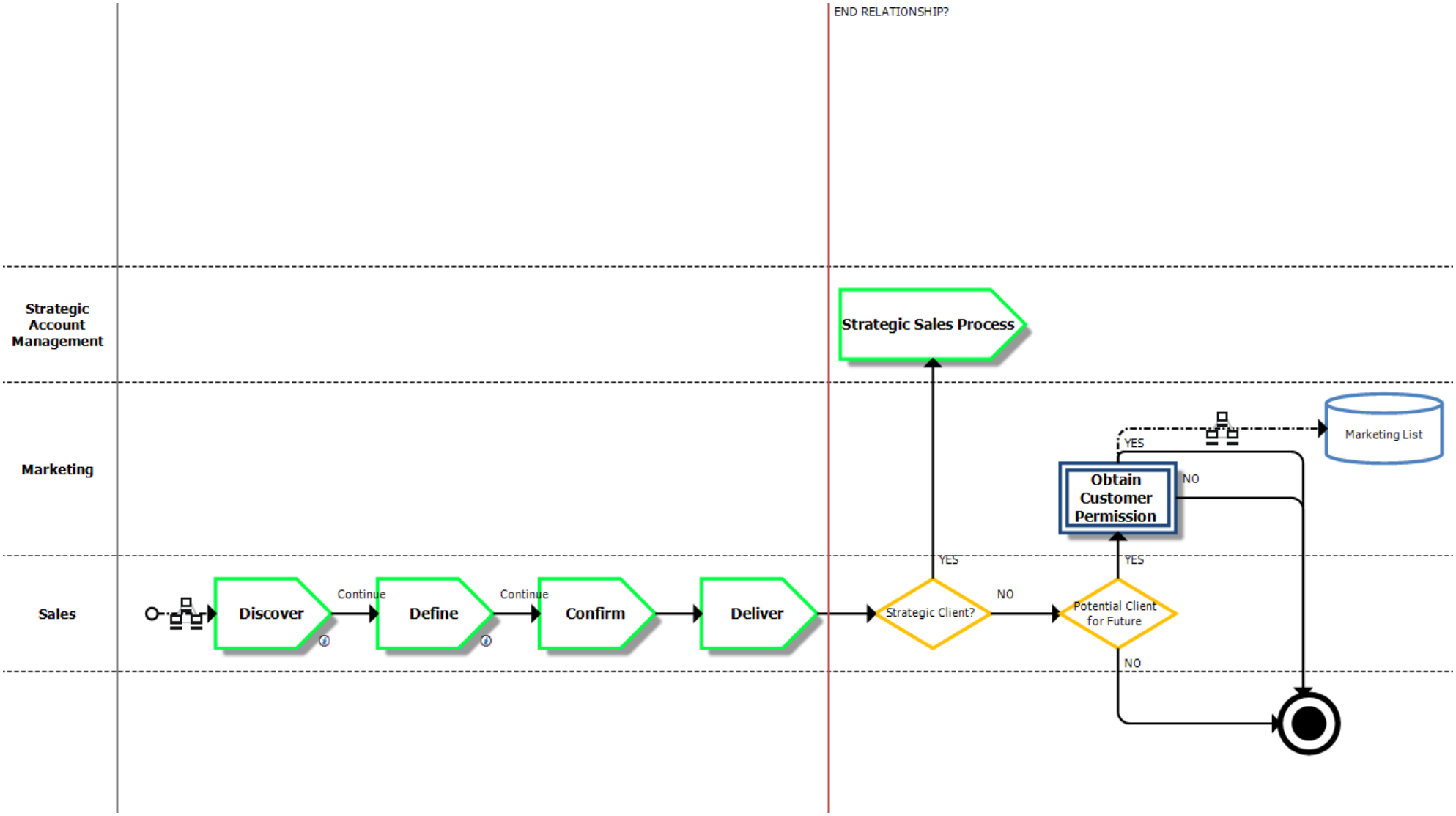


4.4.1. Sub Process: Value Implementation

4.4.2. Sub Process: Non-Revenue Goals for Relationship Dev

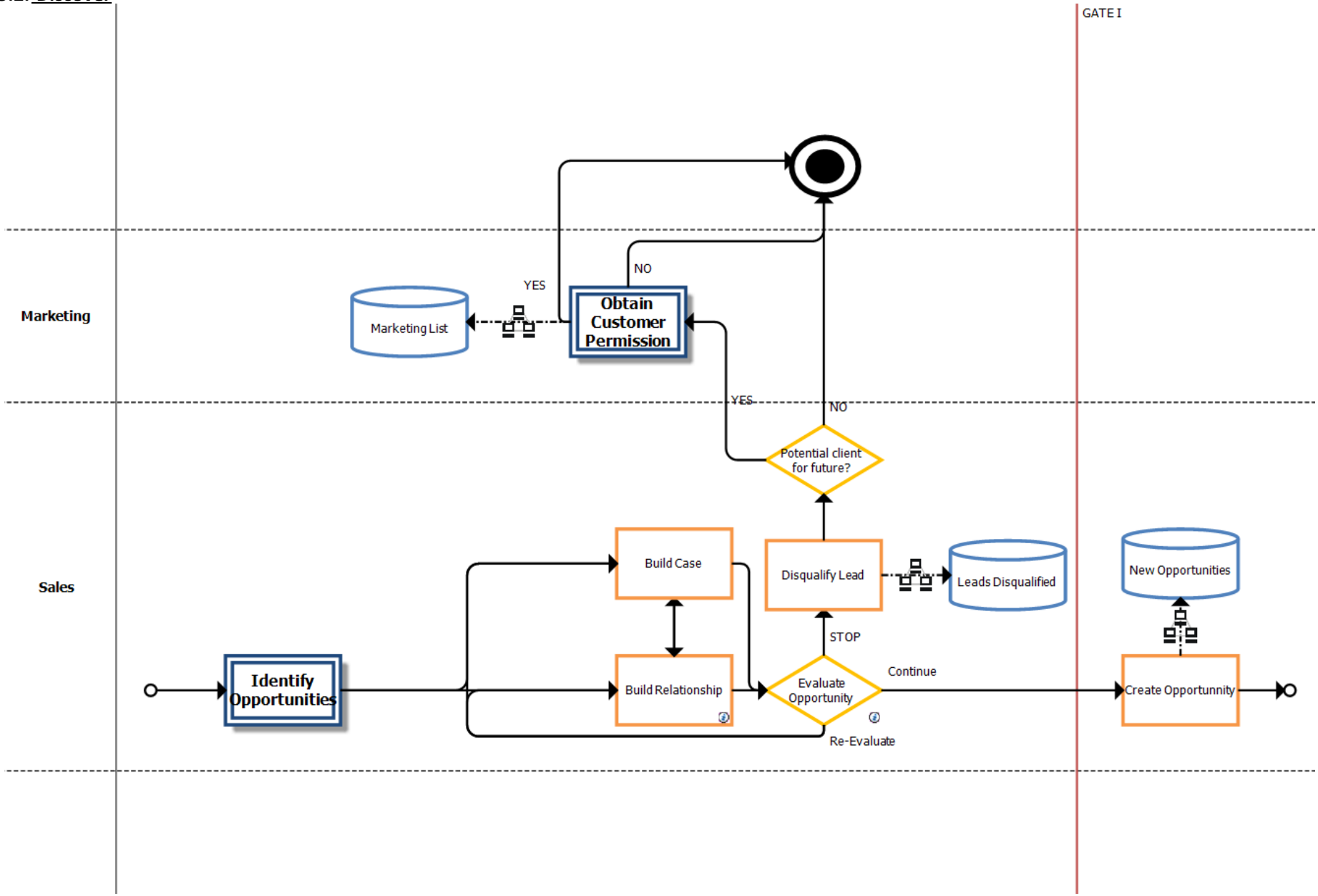


5. MAINSTREAM SALES PROCESS



5.1. Sub Process: Obtain Customer Permission – Refer to Page 4.1.2

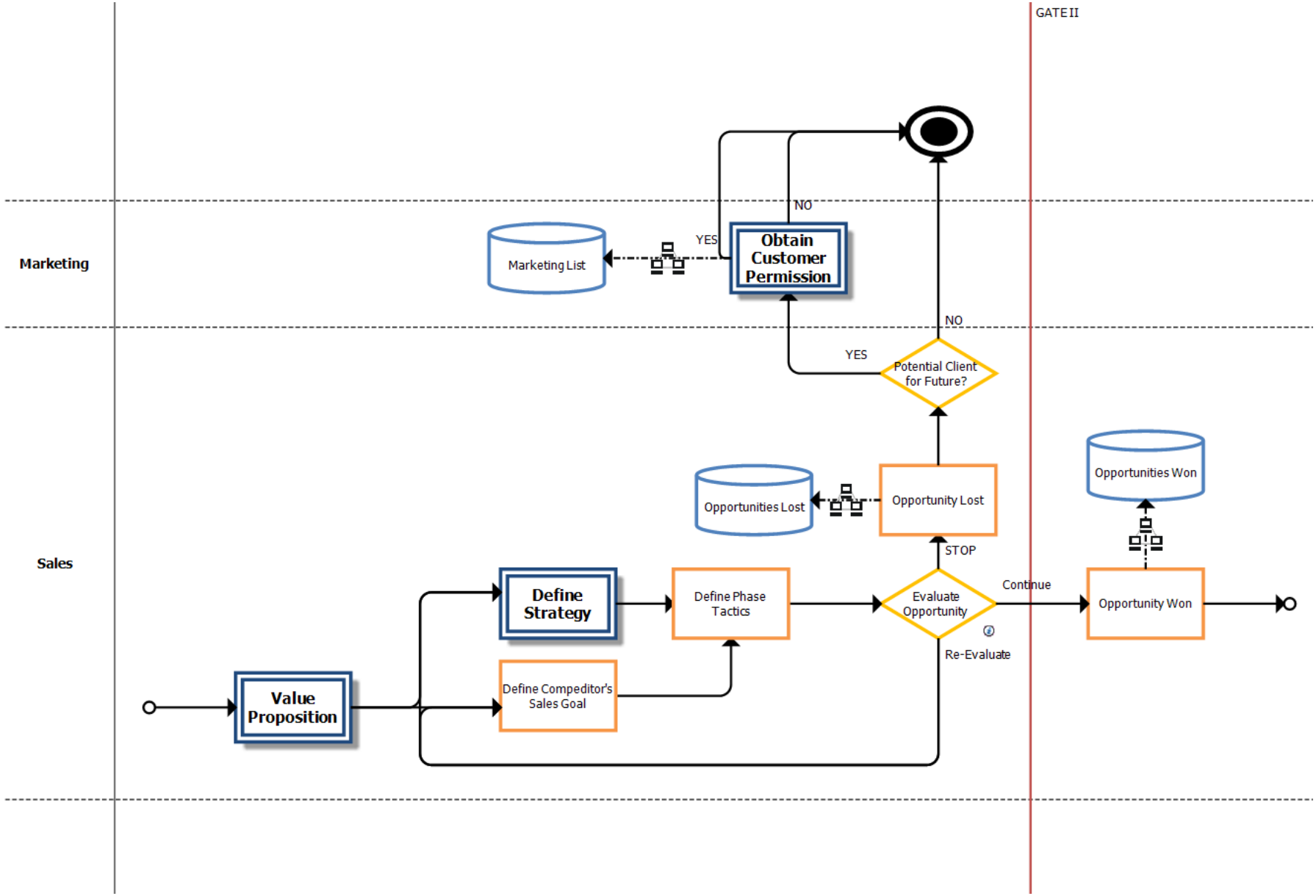
5.2. Discover


GATE I
Marketing
Sales
Marketing List
YES
NO
Obtain Customer Permission
YES
NO
Potential client for future?
Build Case
Disqualify Lead
Leads Disqualified
New Opportunities
Identify Opportunities
Build Relationship
STOP
Evaluate Opportunity
Continue
Re-Evaluate
Create Opportunnity

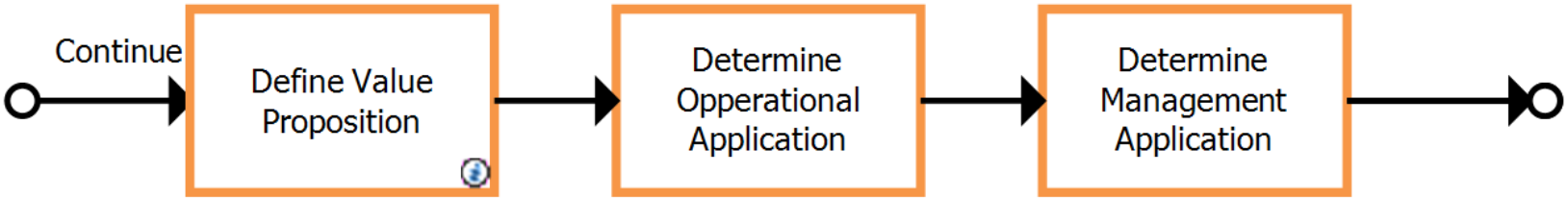
5.2.1. Sub Process: Identify Opportunities

5.2.2. Sub Process: Obtain Customer Permission – Refer to 4.1.2

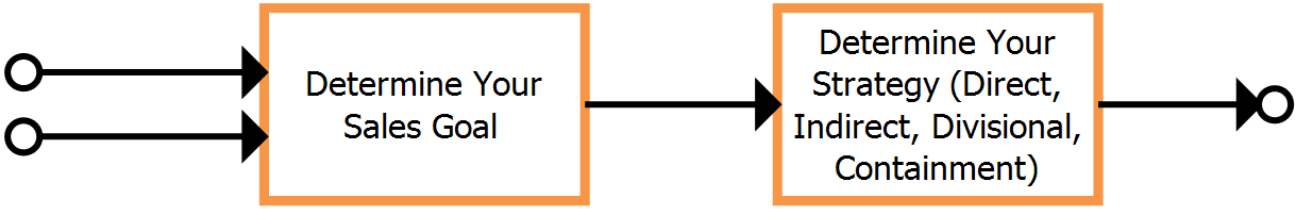
5.3. Define


GATE II
Marketing
Sales
Marketing List
YES
Obtain Customer Permission
NO
NO
YES
Potential Client for Future?
Opportunities Lost
Opportunity Lost
Opportunities Won
STOP
Define Strategy
Define Phase Tactics
Evaluate Opportunity
Continue
Opportunity Won
Re-Evaluate
Value Proposition
Define Competitor's Sales Goal

5.3.1. Sub Process: Value Proposition

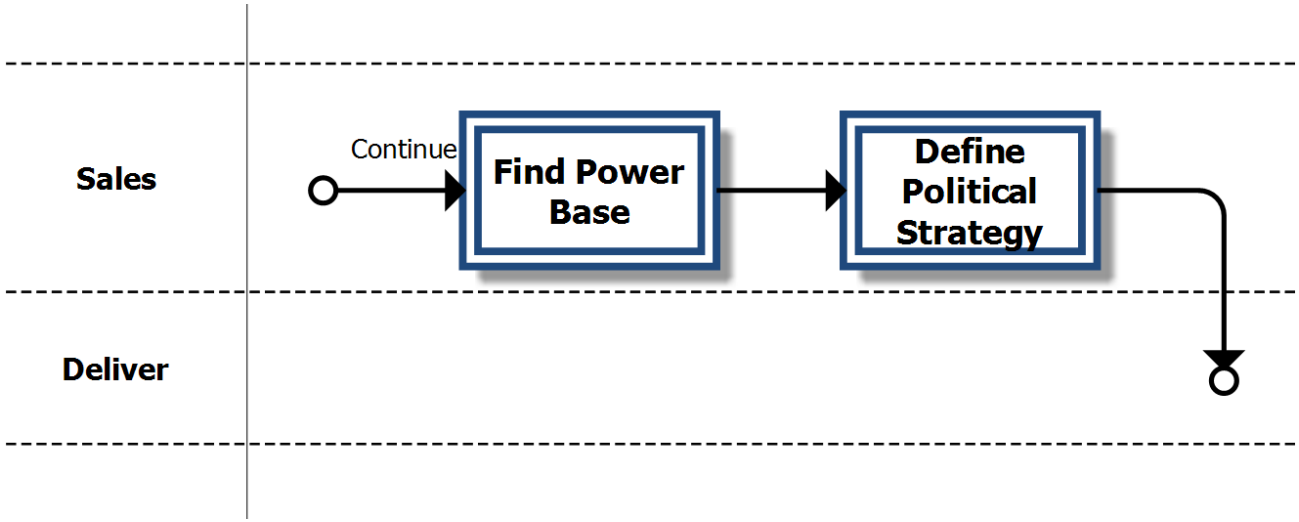


5.3.2. Sub Process: Define Strategy

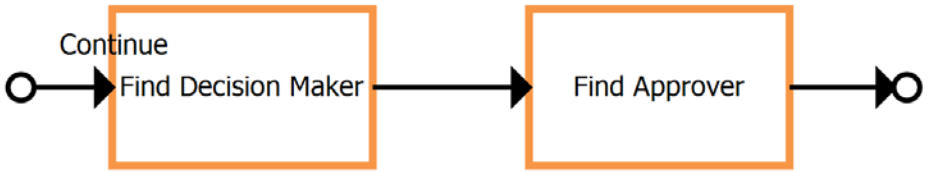


5.3.3. Sub Process: Obtain Customer Permission – Refer to 4.1.2

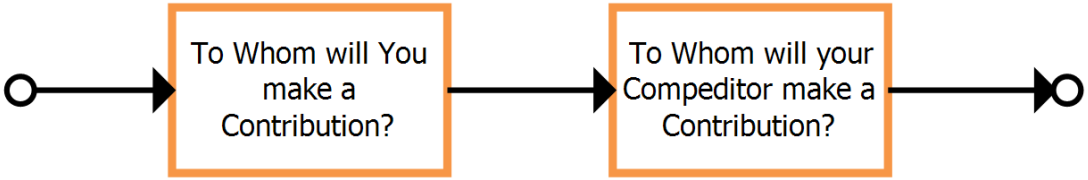
5.4. Confirm



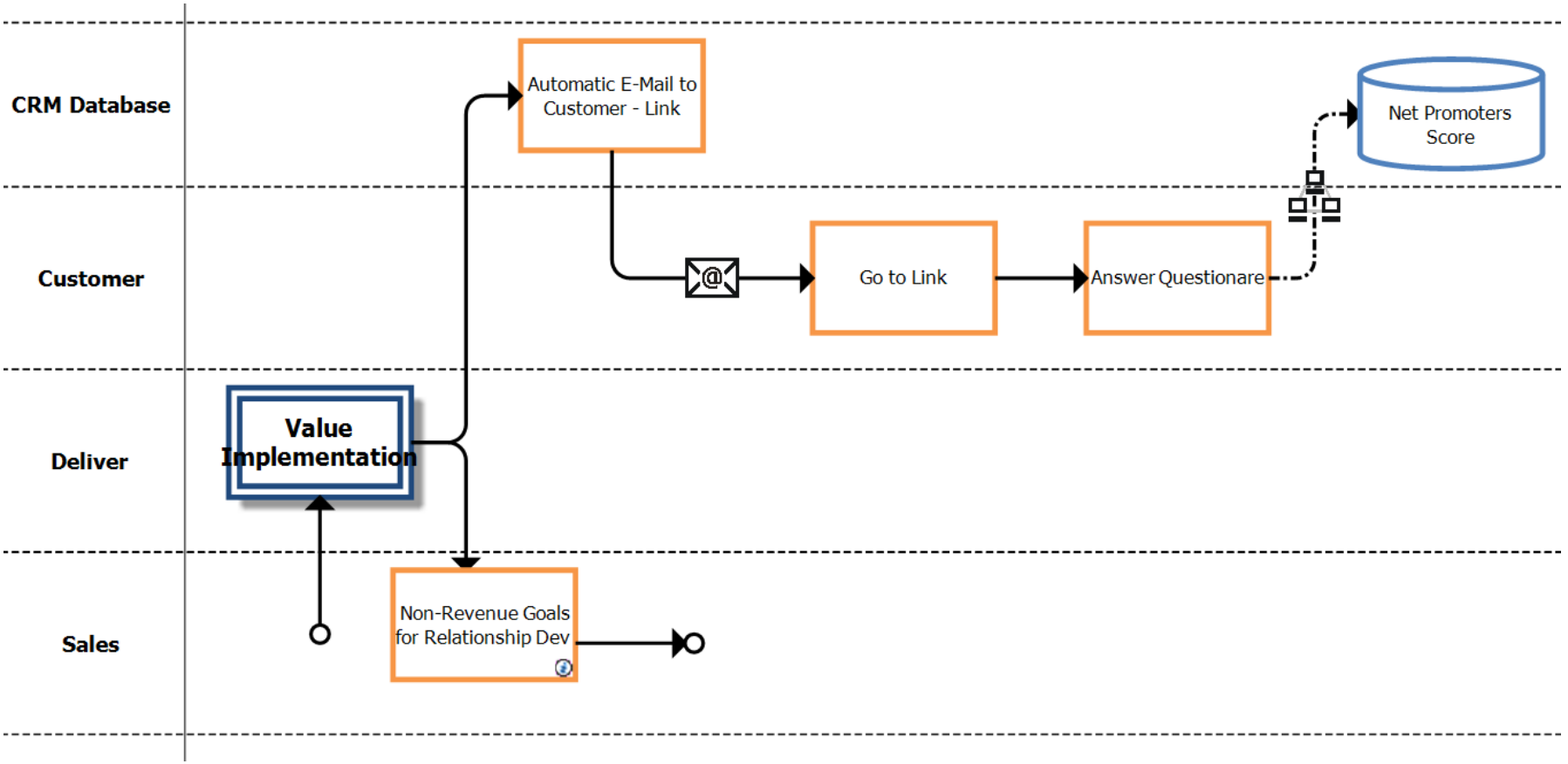
5.4.1. Sub Process: Find Power Base



5.4.2. Sub Process: Define Political Strategy

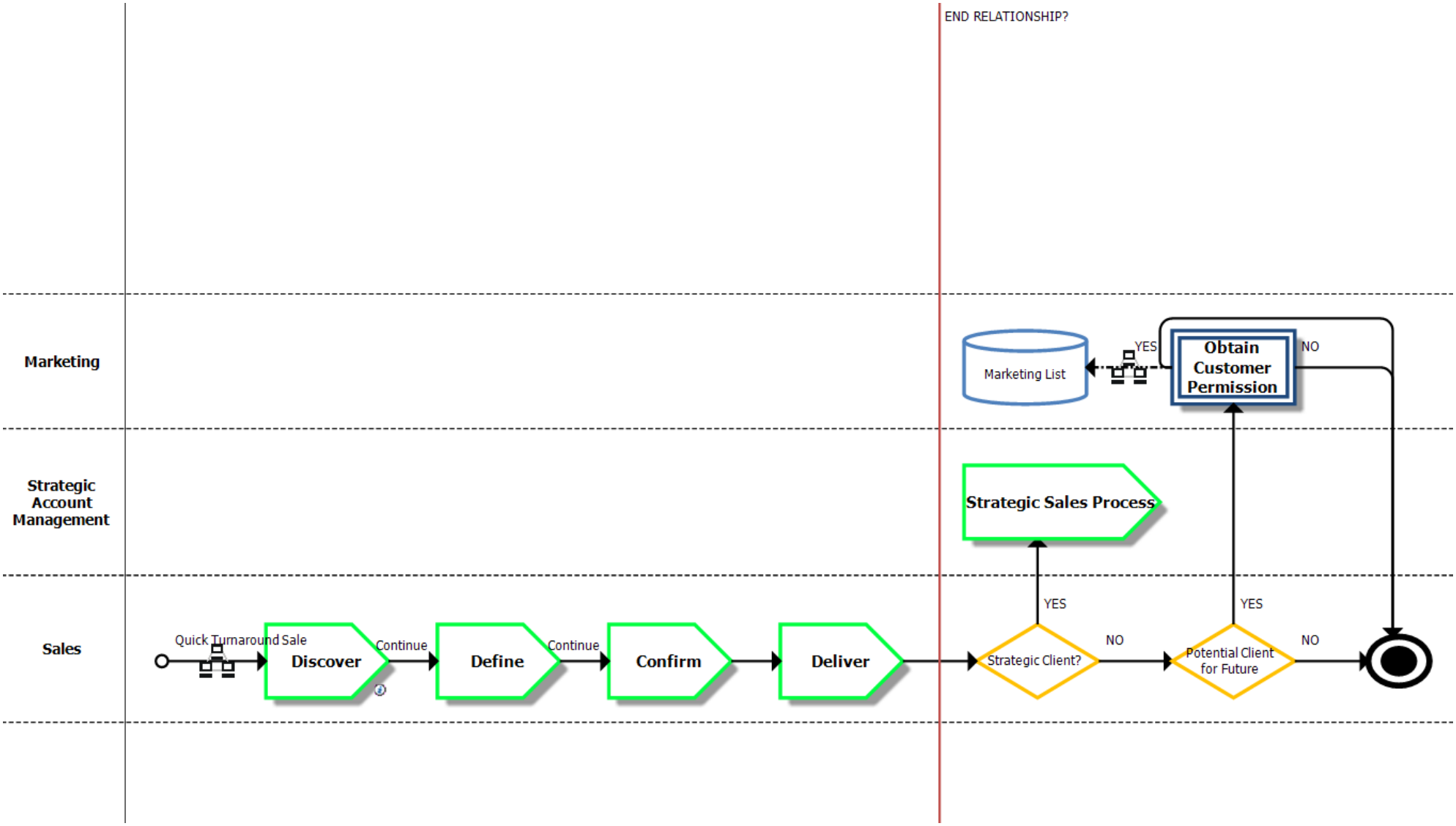


5.5. Deliver



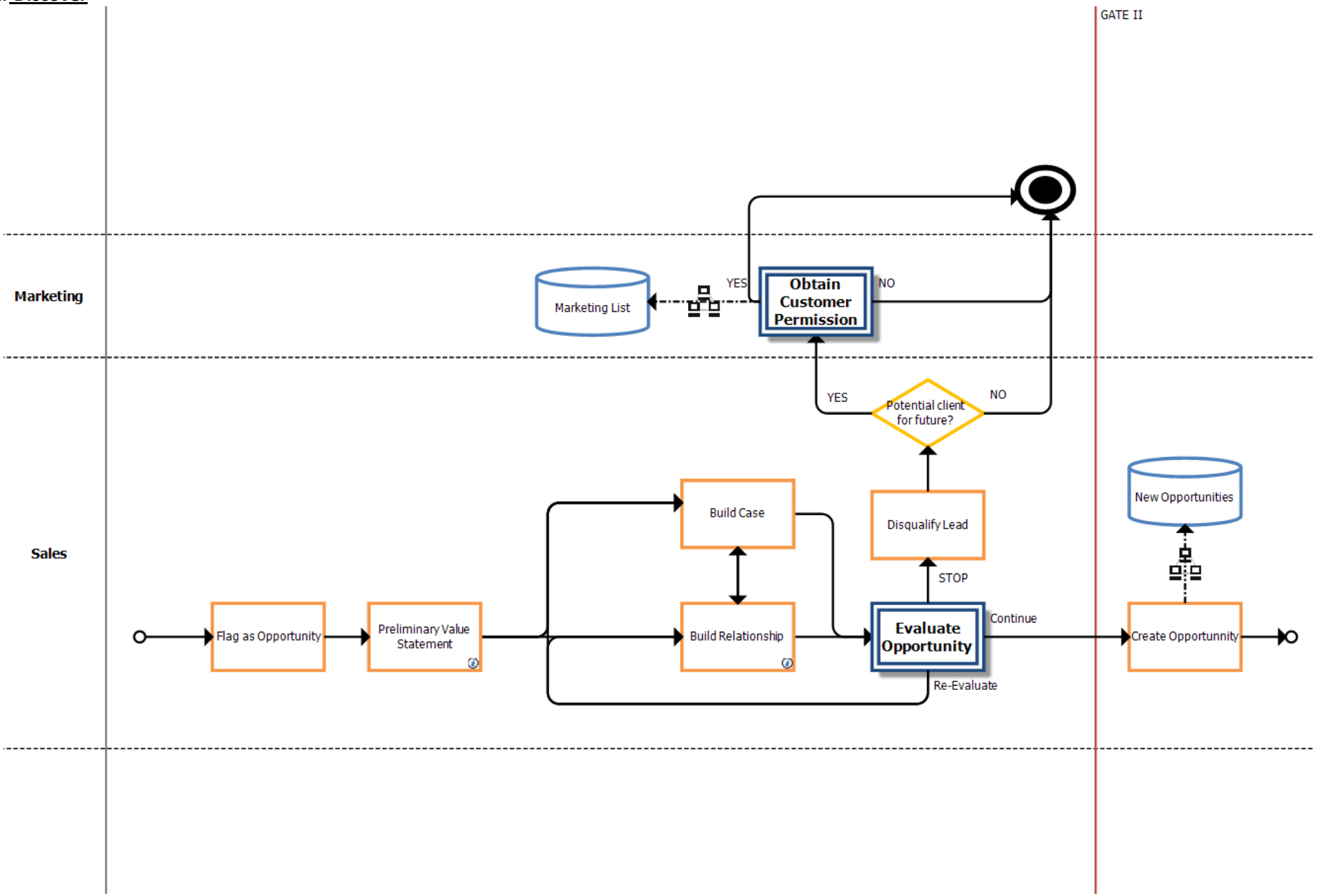
5.5.1. Sub Process: Value Implementation

6. QUICK TURNAROUND SALES PROCESS

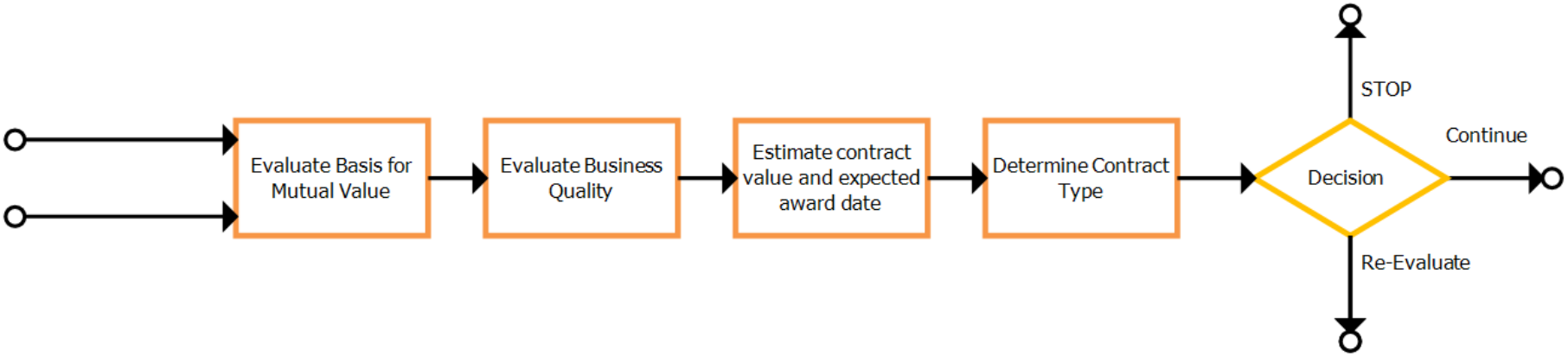


6.1. Sub Process: Obtain Customer Permission – Refer to 4.1.2

6.2. Discover

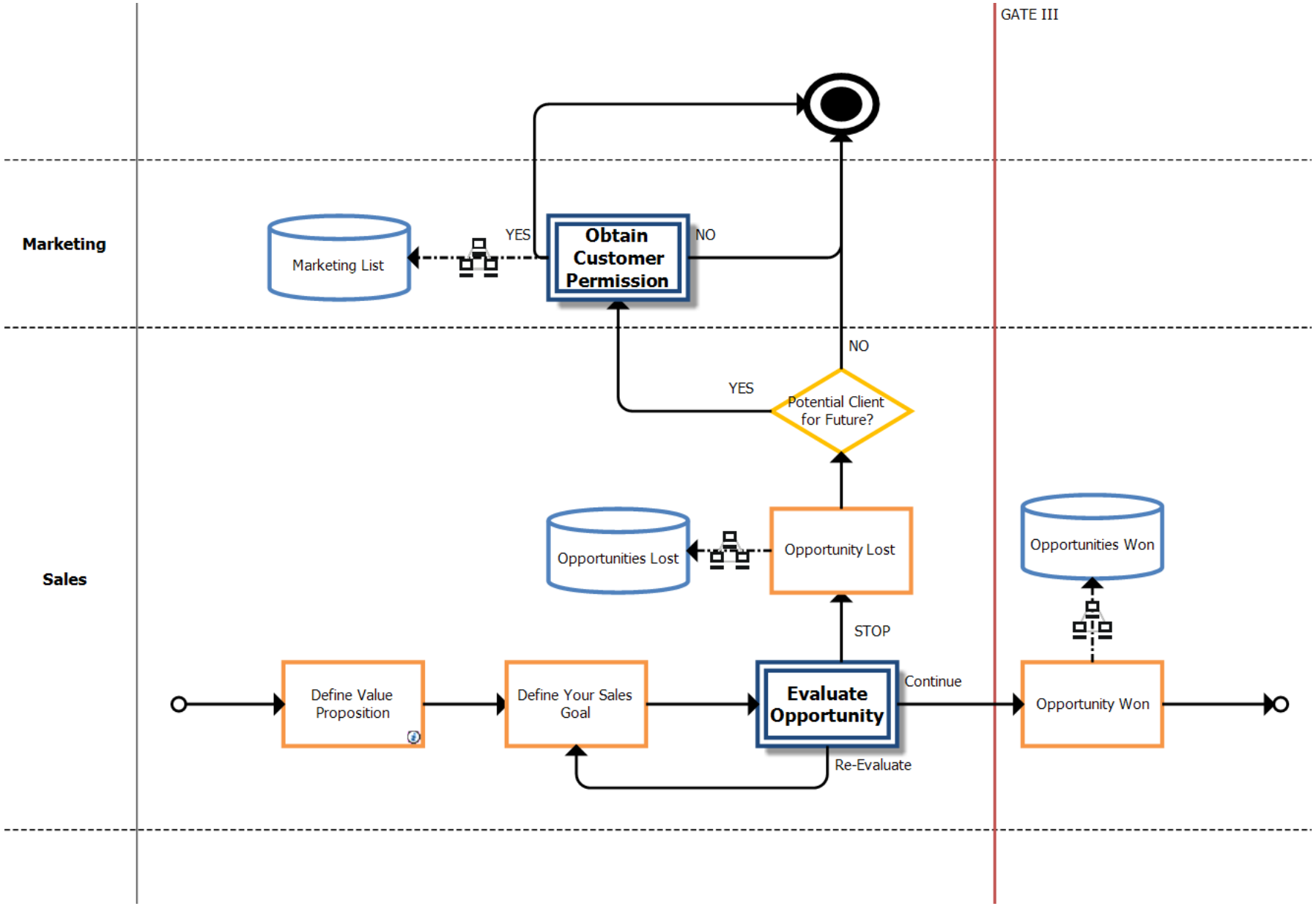

GATE II
Marketing
Sales
Marketing List
YES
Obtain Customer Permission
NO
YES
Potential client for future?
NO
Build Case
Disqualify Lead
New Opportunities
STOP
Flag as Opportunity
Preliminary Value Statement
Build Relationship
Evaluate Opportunity
Continue
Create Opportunnity
Re-Evaluate

6.2.1. Sub Process: Evaluate Opportunity



6.2.2. Sub Process: Obtain Customer Permission – Refer to 4.1.2

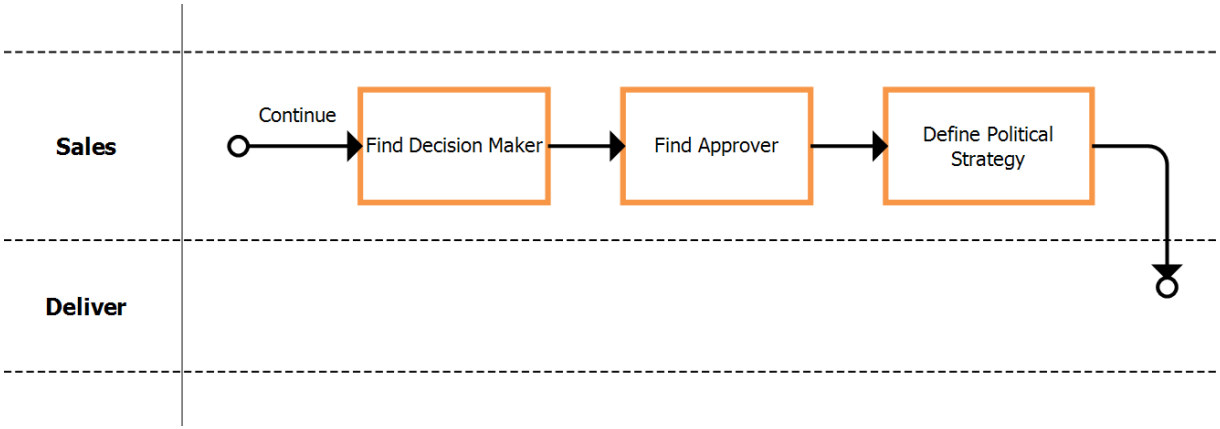
6.3. Define


GATE III
Marketing
Sales
Marketing List
YES
Obtain Customer Permission
NO
NO
YES
Potential Client for Future?
Opportunities Lost
Opportunity Lost
Opportunities Won
STOP
Define Value Proposition
Define Your Sales Goal
Evaluate Opportunity
Continue
Opportunity Won
Re-Evaluate

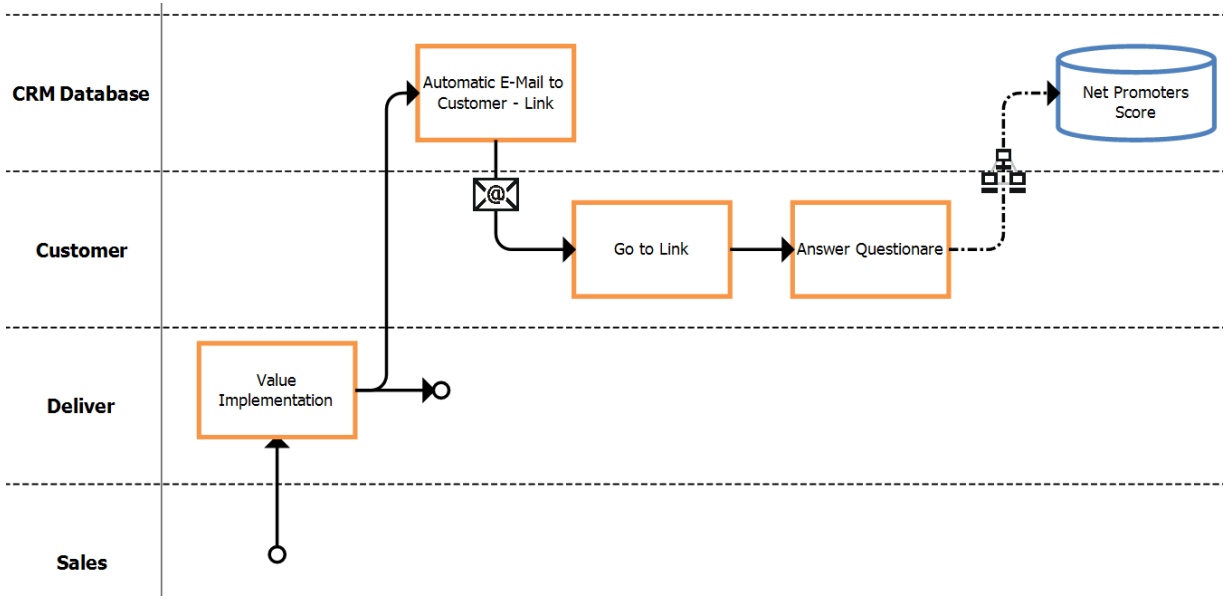
6.3.1. Sub Process: Evaluate Opportunity – Refer 6.2.1

6.3.2. Sub Process: Obtain Customer Permission – Refer to 4.1.2

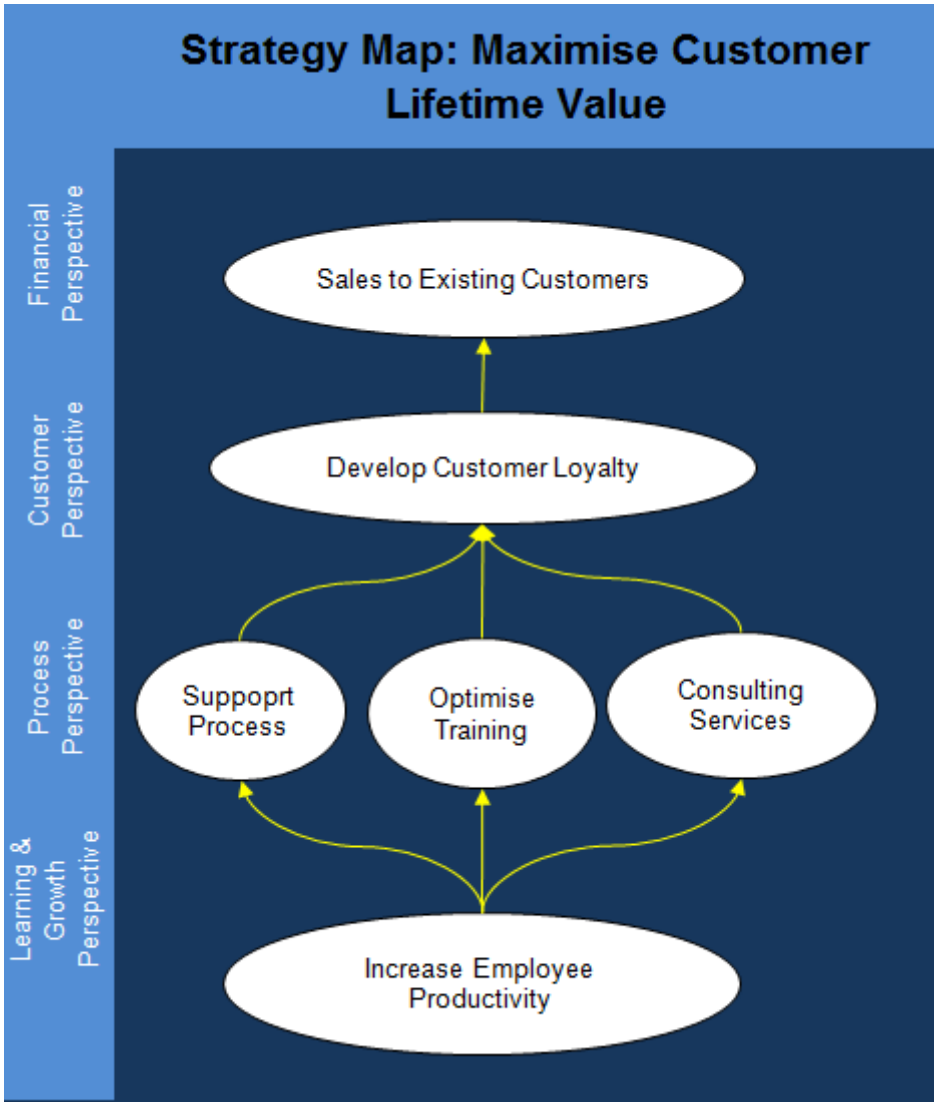
6.4. Confirm

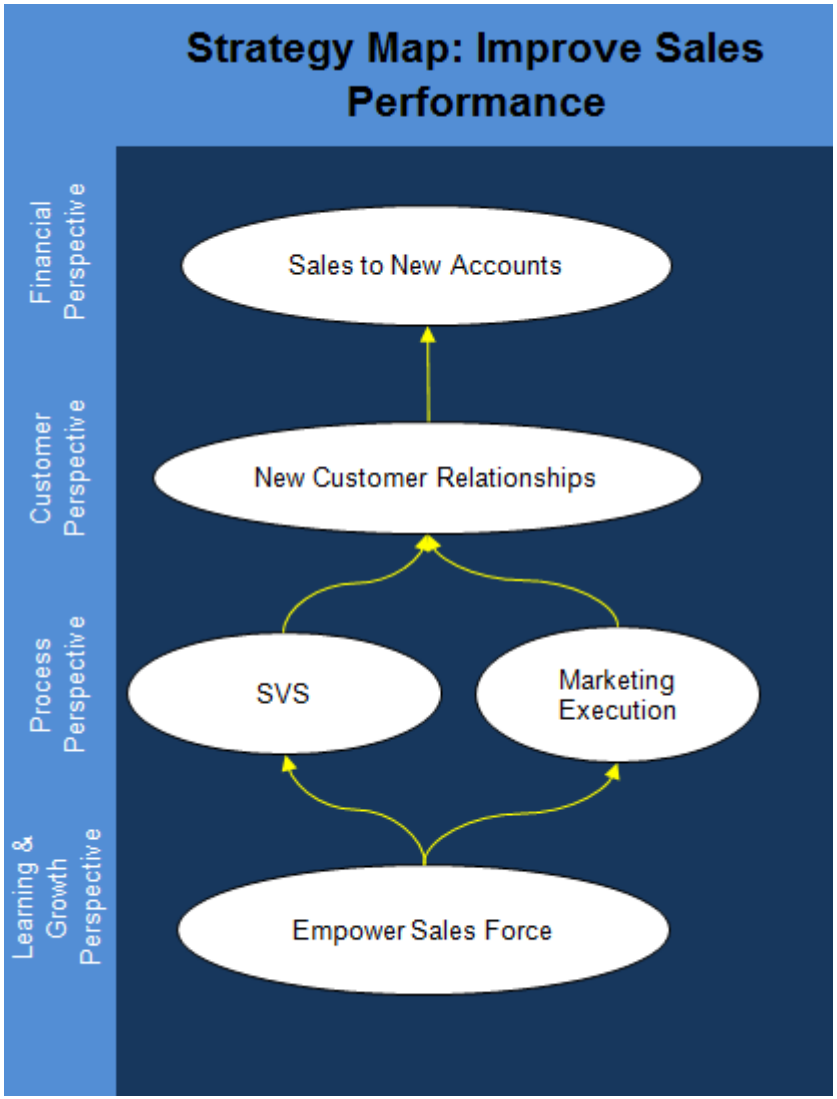


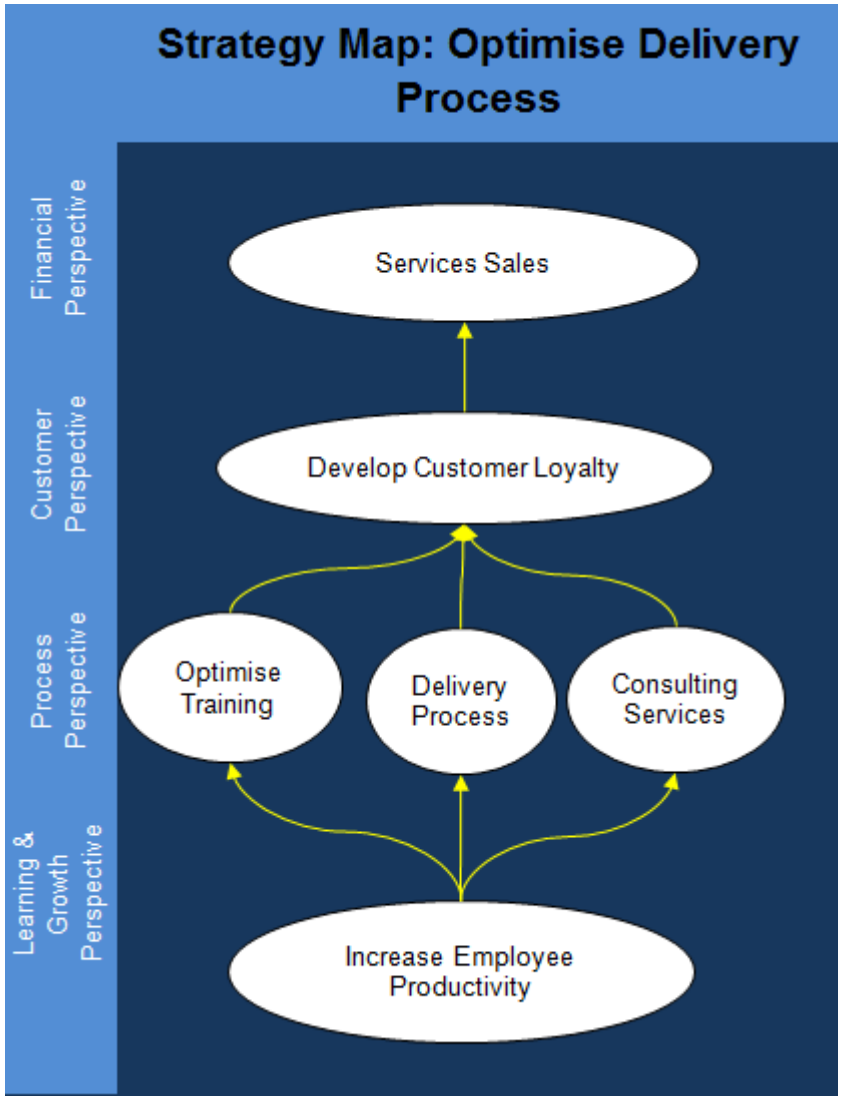
6.5. Deliver



Appendix B: Business Strategy

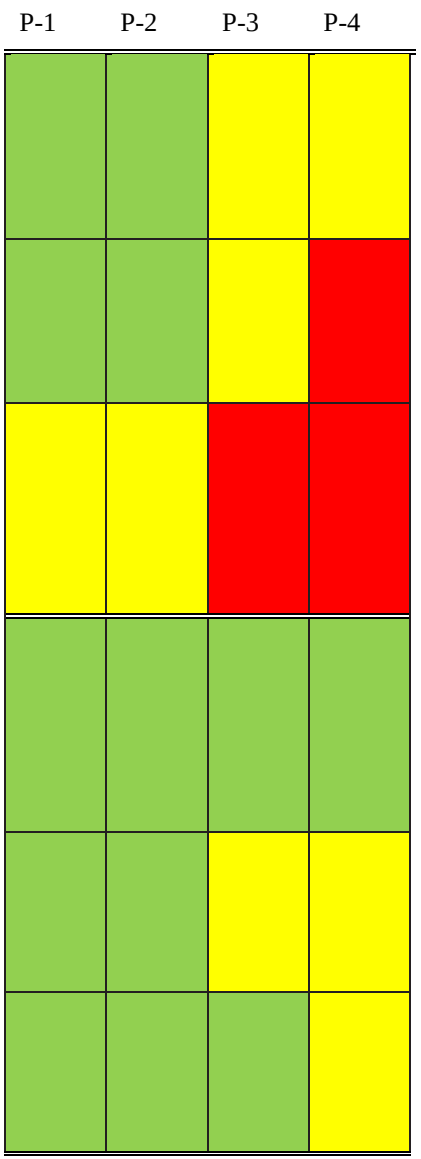



Strategy Map: Improve Sales Performance
Financial Perspective
Customer Perspective
Process Perspective
Learning & Growth Perspective
Sales to New Accounts
New Customer Relationships
SVS
Marketing Execution
Empower Sales Force


Strategy Map: Optimise Delivery Process
Financial Perspective
Customer Perspective
Process Perspective
Learning & Growth Perspective
Services Sales
Develop Customer Loyalty
Optimise Training
Delivery Process
Consulting Services
Increase Employee Productivity

Appendix C: How Mature are your Processes?

		P-1	P-2	P-3	P-4
Design	Purpose	The process has not been designed on an end-to-end basis. Functional managers use the legacy design prima- rily as a context for functional performance improvement.	The process has been redesigned from end to end in order to optimize its performance.	The process has been designed to fit with other enter- prise processes and with the enterprise's IT systems in order to optimize the enterprise's performance.	The process has been designed to fit with customer and supplier processes in order to optimize inter enterprise performance.
	Context	The process's inputs, outputs, suppliers, and customers have been identified.	The needs of the process's customers are known and agreed upon.	The process owner and the owners of the other processes with which the process interfaces have established mutual performance expectations.	The process owner and the owners of customer and supplier processes with which the process interfaces have established mutual performance expectations.
	Documentation	The documentation of the process is primarily functional, but it identifies the interconnections among the organisations involved in executing the process.	There is end-to-end documentation of the process design.	The process documentation describes the process's interfaces with, and expectations of, other processes and links the process to the enterprise's system and data architecture.	An electronic representation of the process design supports its performance and management and allows analysis of environmental changes and process reconfigurations.
Performers	Knowledge	Performers can name the process they execute and identify the key metrics of its performance.	Performers can describe the process's overall flow; how their work affects customers, other employees in the process, and the process's performance; and the required and actual performance levels.	Performers are familiar both with fundamental business concepts and with the drivers of enterprise performance and can describe how their work affects other processes and the enterprise's performance.	Performers are familiar with the enterprise's industry and its trends and can describe how their work affects inter enterprise performance.
	Skills	Performers are skilled in problem solving and process improvement techniques.	Performers are skilled in teamwork and self management.	Performers are skilled at business decision making.	Performers are skilled at change management and change implementation.
	Behaviour	Performers have some allegiance to the process, but owe primary allegiance to their function.	Performers try to follow the process design, perform it correctly, and work in ways that will enable other people who execute the process to do their work effectively.	Performers strive to ensure that the process delivers the results needed to achieve the enterprise's goals.	Performers look for signs that the process should change, and they propose improvements to the process.



Owner	Identity	The process owner is an individual or a group informally charged with improving the process's performance.	Enterprise leadership has created an official process owner role and has filled the position with a senior manager who has clout and credibility.	The process comes first for the owner in terms of time allocation, mind share, and personal goals.	The process owner is a member of the enterprise's seniormost decisionmaking body.	
	Activities	The process owner identifies and documents the process, communicates it to all the performers, and sponsors small-scale change projects.	The process owner articulates the process's performance goals and a vision of its future; sponsors redesign and improvement efforts; plans their implementation; and ensures compliance with the process design.	The process owner works with other process owners to integrate processes to achieve the enterprise's goals.	The process owner develops a rolling strategic plan for the process, participates in enterprise level strategic planning, and collaborates with his or her counterparts working for customers and suppliers to sponsor interenterprise process redesign initiatives.	
	Authority	The process owner lobbies for the process but can only encourage functional managers to make changes.	The process owner can convene a process redesign team and implement the new design and has some control over the technology budget for the process.	The process owner controls the IT systems that support the process and any projects that change the process and has some influence over personnel assignments and evaluations as well as the process's budget.	The process owner controls the process's budget and exerts strong influence over personnel assignments and evaluations.	
Infrastructure	Information Systems	Fragmented legacy IT systems support the process.	An IT system constructed from functional components supports the process.	An integrated IT system, designed with the process in mind and adhering to enterprise standards, supports the process.	An IT system with a modular architecture that adheres to industry standards for interenterprise communication supports the process.	
	Human Resource Systems	Functional managers reward the attainment of functional excellence and the resolution of functional problems in a process context.	The process's design drives role definitions, job descriptions, and competency profiles. Job training is based on process documentation.	Hiring, development, reward, and recognition systems emphasize the process's needs and results and balance them against the enterprise's needs.	Hiring, development, reward, and recognition systems reinforce the importance of intra- and interenterprise collaboration, personal learning, and organizational change.	
Metrics	Definition	The process has some basic cost and quality metrics.	The process has end-to-end process metrics derived from customer requirements.	The process's metrics as well as cross-process metrics have been derived from the enterprise's strategic goals.	The process's metrics have been derived from interenterprise goals.	
	Uses	Managers use the process's metrics to track its performance, identify root causes of faulty performance, and drive functional improvements.	Managers use the process's metrics to compare its performance to benchmarks, best-in-class performance, and customer needs and to set performance targets.	Managers present the metrics to process performers for awareness and motivation. They use dashboards based on the metrics for day-to-day management of the process.	Managers regularly review and refresh the process's metrics and targets and use them in strategic planning.	

Appendix D: Process Analysis

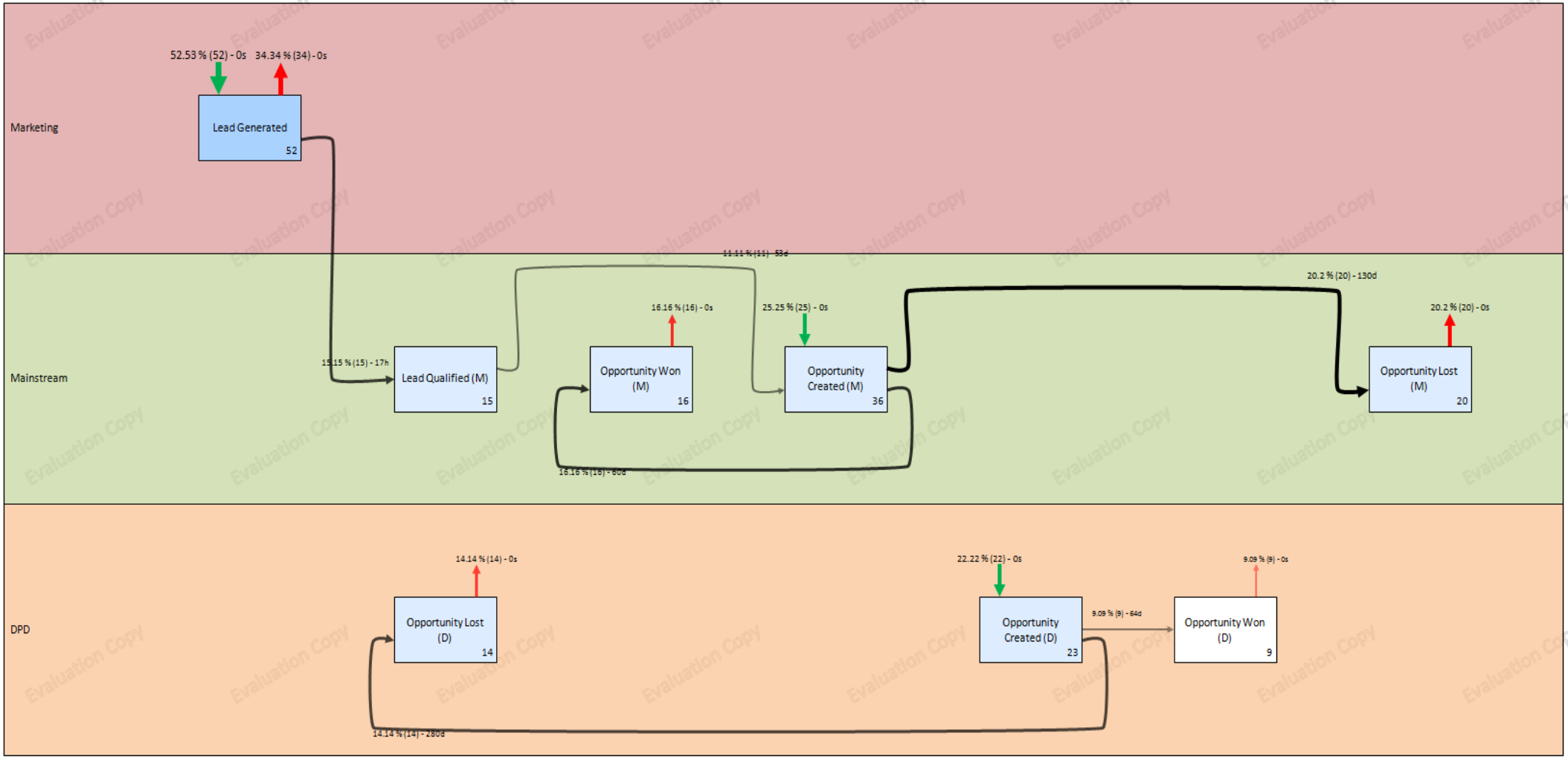
Case-id	Process_step	Organization_unit	Start_time	End_time
1001	Lead Generated	Marketing	2011/04/18 08:30	2011/04/18 08:30
1002	Lead Generated	Marketing	2011/04/29 11:46	2011/04/29 11:46
1003	Lead Generated	Marketing	2011/05/05 14:40	2011/05/05 14:40
1004	Lead Generated	Marketing	2011/05/12 14:05	2011/05/12 14:05
1004	Lead Qualified (M)	Mainstream	2011/05/12 22:00	2011/05/12 22:00
1005	Lead Generated	Marketing	2011/05/25 10:23	2011/05/25 10:23
1005	Lead Qualified (M)	Mainstream	2011/05/25 22:00	2011/05/25 22:00
1006	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1006	Lead Qualified (D)	DPD	2011/06/06 22:00	2011/06/06 22:00
1007	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1008	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1009	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1010	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1011	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1012	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1013	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1014	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1015	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1016	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1017	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1018	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1019	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1020	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1021	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1022	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1023	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1024	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1025	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1026	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1027	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1028	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1029	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1030	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1031	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1032	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1033	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1034	Lead Generated	Marketing	2011/06/06 15:42	2011/06/06 15:42
1035	Lead Generated	Marketing	2011/06/09 11:06	2011/06/09 11:06
1035	Lead Qualified (D)	DPD	2011/06/09 22:00	2011/06/09 22:00
1036	Lead Generated	Marketing	2011/06/13 10:15	2011/06/13 10:15
1036	Lead Qualified (M)	Mainstream	2011/06/13 22:00	2011/06/13 22:00
1037	Lead Generated	Marketing	2011/06/14 08:51	2011/06/14 08:51
1038	Lead Generated	Marketing	2011/06/22 14:39	2011/06/22 14:39
1039	Lead Generated	Marketing	2011/06/29 07:56	2011/06/29 07:56
1039	Lead Qualified (M)	Mainstream	2011/06/29 22:00	2011/06/29 22:00
1040	Lead Generated	Marketing	2011/06/30 08:35	2011/06/30 08:35

Case-id	Process_step	Organization_unit	Start_time	End_time
a	Opportunity Created (M)	Mainstream	2010/12/02 14:46	2010/12/02 14:46
a	Opportunity Won (M)	Mainstream	2011/04/11 06:24	2011/04/11 06:24
aa	Opportunity Created (D)	DPD	2009/10/07 09:48	2009/10/07 09:48
aa	Opportunity Lost (D)	DPD	2011/04/11 07:53	2011/04/11 07:53
ab	Lead Generated	Marketing	2010/01/20 14:13	2010/01/20 14:13
ab	Lead Qualified (M)	Mainstream	2010/01/21 22:00	2010/01/21 22:00
ab	Opportunity Created (M)	Mainstream	2011/02/23 15:05	2011/02/23 15:05
ab	Opportunity Lost (M)	Mainstream	2011/04/01 07:29	2011/04/01 07:29
ac	Opportunity Created (M)	Mainstream	2011/03/02 07:54	2011/03/02 07:54
ac	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
ad	Opportunity Created (M)	Mainstream	2011/03/02 08:11	2011/03/02 08:11
ad	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
ae	Lead Generated	Marketing	2011/03/03 08:00	2011/03/03 08:00
ae	Lead Qualified (M)	Mainstream	2011/03/03 08:08	2011/03/03 08:08
ae	Opportunity Created (M)	Mainstream	2011/03/03 08:23	2011/03/03 08:23
ae	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
af	Lead Generated	Marketing	2011/03/08 07:20	2011/03/08 07:20
af	Lead Qualified (M)	Mainstream	2011/03/08 07:32	2011/03/08 07:32
af	Opportunity Created (M)	Mainstream	2011/03/08 07:37	2011/03/08 07:37
af	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
ag	Opportunity Created (M)	Mainstream	2011/03/23 14:20	2011/03/23 14:20
ag	Opportunity Lost (M)	Mainstream	2011/04/01 07:24	2011/04/01 07:24
ah	Opportunity Created (M)	Mainstream	2011/03/25 14:35	2011/03/25 14:35
ah	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
ai	Opportunity Created (M)	Mainstream	2011/06/23 06:25	2011/06/23 06:25
ai	Opportunity Lost (M)	Mainstream	2011/06/28 22:00	2011/06/28 22:00
b	Opportunity Created (D)	DPD	2010/11/30 08:11	2010/11/30 08:11
b	Opportunity Won (D)	DPD	2011/06/20 22:00	2011/06/20 22:00
bb	Lead Generated	Marketing	2010/06/17 12:22	2010/06/17 12:22
bb	Lead Qualified (M)	Mainstream	2010/06/18 22:00	2010/06/18 22:00
bb	Opportunity Created (M)	Mainstream	2010/12/03 07:50	2010/12/03 07:50
bb	Opportunity Lost (M)	Mainstream	2011/04/01 07:15	2011/04/01 07:15
c	Opportunity Created (M)	Mainstream	2010/12/01 12:38	2010/12/01 12:38
c	Opportunity Won (M)	Mainstream	2011/06/07 22:00	2011/06/07 22:00
cc	Opportunity Created (D)	DPD	2010/06/18 07:10	2010/06/18 07:10
cc	Opportunity Lost (D)	DPD	2011/04/08 08:41	2011/04/08 08:41
d	Opportunity Created (D)	DPD	2011/04/20 13:23	2011/04/20 13:23
d	Opportunity Won (D)	DPD	2011/05/26 08:09	2011/05/26 08:09
dd	Opportunity Created (D)	DPD	2010/09/15 13:03	2010/09/15 13:03
dd	Opportunity Lost (D)	DPD	2011/06/28 22:00	2011/06/28 22:00
e	Opportunity Created (M)	Mainstream	2011/01/19 06:27	2011/01/19 06:27
e	Opportunity Won (M)	Mainstream	2011/04/01 06:49	2011/04/01 06:49
ee	Opportunity Created (M)	Mainstream	2010/09/22 11:00	2010/09/22 11:00
ee	Opportunity Lost (M)	Mainstream	2011/04/11 06:04	2011/04/11 06:04

Case-id	Process_step	Organization_unit	Start_time	End_time
f	Lead Generated	Marketing	2011/01/24 09:52	2011/01/24 09:52
f	Lead Qualified (M)	Mainstream	2011/01/25 22:00	2011/01/25 22:00
f	Opportunity Created (M)	Mainstream	2011/01/28 09:03	2011/01/28 09:03
f	Opportunity Won (M)	Mainstream	2011/05/20 11:34	2011/05/20 11:34
ff	Opportunity Created (M)	Mainstream	2010/10/22 10:26	2010/10/22 10:26
ff	Opportunity Lost (M)	Mainstream	2011/04/01 07:27	2011/04/01 07:27
g	Opportunity Created (D)	DPD	2011/02/08 13:55	2011/02/08 13:55
g	Opportunity Won (D)	DPD	2011/05/05 11:52	2011/05/05 11:52
gg	Opportunity Created (M)	Mainstream	2010/10/25 10:54	2010/10/25 10:54
gg	Opportunity Lost (M)	Mainstream	2011/04/01 07:49	2011/04/01 07:49
h	Lead Generated	Marketing	2011/01/19 07:00	2011/01/19 07:00
h	Lead Qualified (D)	DPD	2011/01/19 22:00	2011/01/19 22:00
h	Opportunity Created (D)	DPD	2011/02/21 15:40	2011/02/21 15:40
h	Opportunity Won (D)	DPD	2011/04/04 08:46	2011/04/04 08:46
hh	Opportunity Created (M)	Mainstream	2010/11/02 14:38	2010/11/02 14:38
hh	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
i	Opportunity Created (M)	Mainstream	2011/02/23 07:38	2011/02/23 07:38
i	Opportunity Won (M)	Mainstream	2011/04/05 09:14	2011/04/05 09:14
ii	Opportunity Created (D)	DPD	2010/11/02 14:53	2010/11/02 14:53
ii	Opportunity Lost (D)	DPD	2011/06/26 22:00	2011/06/26 22:00
j	Opportunity Created (M)	Mainstream	2011/02/23 07:42	2011/02/23 07:42
j	Opportunity Won (M)	Mainstream	2011/04/05 09:15	2011/04/05 09:15
jj	Opportunity Created (D)	DPD	2010/11/03 13:12	2010/11/03 13:12
jj	Opportunity Lost (D)	DPD	2011/04/04 08:52	2011/04/04 08:52
k	Opportunity Created (M)	Mainstream	2011/02/23 07:44	2011/02/23 07:44
k	Opportunity Won (M)	Mainstream	2011/04/05 09:16	2011/04/05 09:16
kk	Lead Generated	Marketing	2010/11/20 16:18	2010/11/20 16:18
kk	Lead Qualified (M)	Mainstream	2010/11/21 22:00	2010/11/21 22:00
kk	Opportunity Created (M)	Mainstream	2010/11/22 08:27	2010/11/22 08:27
kk	Opportunity Lost (M)	Mainstream	2011/04/01 07:28	2011/04/01 07:28
l	Opportunity Created (M)	Mainstream	2011/05/20 10:40	2011/05/20 10:40
l	Opportunity Won (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
ll	Opportunity Created (D)	DPD	2010/08/12 14:37	2010/08/12 14:37
ll	Opportunity Lost (D)	DPD	2011/06/26 22:00	2011/06/26 22:00
m	Opportunity Created (D)	DPD	2011/05/26 08:24	2011/05/26 08:24
m	Opportunity Won (D)	DPD	2011/06/26 22:00	2011/06/26 22:00
mm	Opportunity Created (D)	DPD	2010/08/25 12:45	2010/08/25 12:45
mm	Opportunity Lost (D)	DPD	2011/06/08 22:00	2011/06/08 22:00
n	Opportunity Created (D)	DPD	2011/03/08 05:27	2011/03/08 05:27
n	Opportunity Won (D)	DPD	2011/04/15 15:30	2011/04/15 15:30
nn	Opportunity Created (D)	DPD	2010/08/27 14:52	2010/08/27 14:52
nn	Opportunity Lost (D)	DPD	2011/04/08 08:39	2011/04/08 08:39
o	Opportunity Created (D)	DPD	2011/03/08 15:03	2011/03/08 15:03
o	Opportunity Won (D)	DPD	2011/05/12 08:36	2011/05/12 08:36
oo	Lead Generated	Marketing	2010/08/29 10:41	2010/08/29 10:41
oo	Lead Qualified (M)	Mainstream	2010/08/30 22:00	2010/08/30 22:00
oo	Opportunity Created (M)	Mainstream	2010/08/31 10:46	2010/08/31 10:46
oo	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00

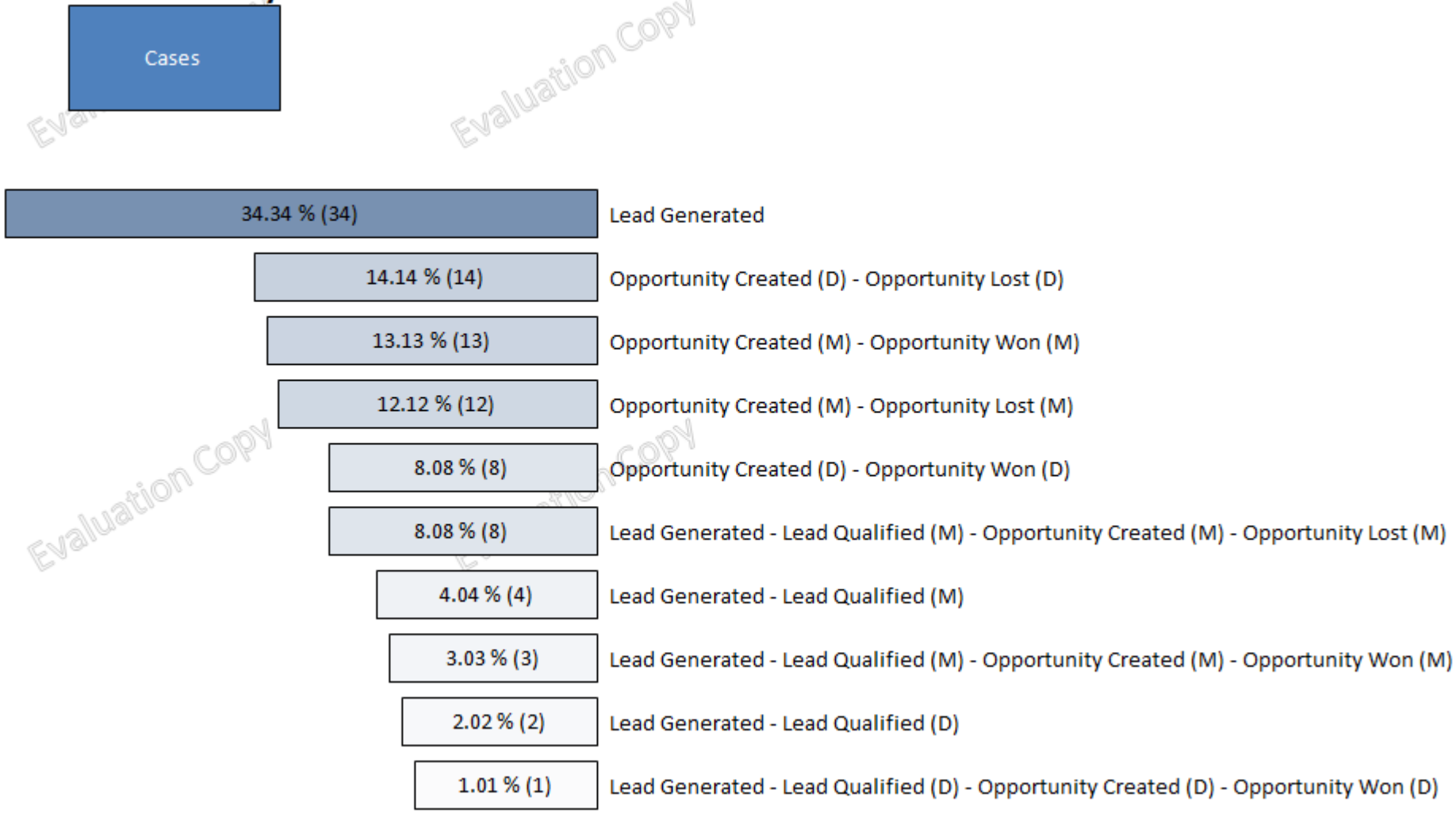
Case-id	Process_step	Organization_unit	Start_time	End_time
p	Lead Generated	Marketing	2011/03/10 08:11	2011/03/10 08:11
p	Lead Qualified (M)	Mainstream	2011/03/10 08:15	2011/03/10 08:15
p	Opportunity Created (M)	Mainstream	2011/03/10 08:27	2011/03/10 08:27
p	Opportunity Won (M)	Mainstream	2011/04/19 13:47	2011/04/19 13:47
pp	Opportunity Created (D)	DPD	2010/09/01 13:12	2010/09/01 13:12
pp	Opportunity Lost (D)	DPD	2011/05/26 08:13	2011/05/26 08:13
q	Opportunity Created (M)	Mainstream	2011/03/10 09:40	2011/03/10 09:40
q	Opportunity Won (M)	Mainstream	2011/06/26 22:00	2011/06/26 22:00
qq	Opportunity Created (D)	DPD	2010/09/01 14:25	2010/09/01 14:25
qq	Opportunity Lost (D)	DPD	2011/06/28 22:00	2011/06/28 22:00
r	Lead Generated	Marketing	2011/03/17 06:48	2011/03/17 06:48
r	Lead Qualified (M)	Mainstream	2011/03/17 06:49	2011/03/17 06:49
r	Opportunity Created (M)	Mainstream	2011/03/17 06:53	2011/03/17 06:53
r	Opportunity Won (M)	Mainstream	2011/04/19 09:45	2011/04/19 09:45
rr	Opportunity Created (D)	DPD	2010/09/02 06:24	2010/09/02 06:24
rr	Opportunity Lost (D)	DPD	2011/05/05 10:10	2011/05/05 10:10
s	Opportunity Created (M)	Mainstream	2011/04/05 09:23	2011/04/05 09:23
s	Opportunity Won (M)	Mainstream	2011/05/16 05:32	2011/05/16 05:32
ss	Lead Generated	Marketing	2010/04/22 11:10	2010/04/22 11:10
ss	Lead Qualified (M)	Mainstream	2010/04/22 22:00	2010/04/22 22:00
ss	Opportunity Created (M)	Mainstream	2010/04/23 11:10	2010/04/23 11:10
ss	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
t	Opportunity Created (M)	Mainstream	2011/04/08 06:47	2011/04/08 06:47
t	Opportunity Won (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
tt	Opportunity Created (D)	DPD	2010/03/11 13:13	2010/03/11 13:13
tt	Opportunity Lost (D)	DPD	2011/05/12 09:19	2011/05/12 09:19
u	Opportunity Created (M)	Mainstream	2011/04/08 07:06	2011/04/08 07:06
u	Opportunity Won (M)	Mainstream	2011/05/16 05:26	2011/05/16 05:26
uu	Opportunity Created (D)	DPD	2010/12/06 07:29	2010/12/06 07:29
uu	Opportunity Lost (D)	DPD	2011/06/08 22:00	2011/06/08 22:00
v	Opportunity Created (D)	DPD	2011/04/08 13:01	2011/04/08 13:01
v	Opportunity Won (D)	DPD	2011/06/06 22:00	2011/06/06 22:00
vv	Opportunity Created (D)	DPD	2011/01/26 09:25	2011/01/26 09:25
vv	Opportunity Lost (D)	DPD	2011/06/26 22:00	2011/06/26 22:00
w	Opportunity Created (D)	DPD	2011/05/31 13:26	2011/05/31 13:26
w	Opportunity Won (D)	DPD	2011/06/23 22:00	2011/06/23 22:00
ww	Lead Generated	Marketing	2011/01/10 08:28	2011/01/10 08:28
ww	Lead Qualified (M)	Mainstream	2011/01/11 22:00	2011/01/11 22:00
ww	Opportunity Created (M)	Mainstream	2011/01/26 15:03	2011/01/26 15:03
ww	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00
x	Opportunity Created (M)	Mainstream	2011/06/14 08:41	2011/06/14 08:41
x	Opportunity Won (M)	Mainstream	2011/06/15 06:41	2011/06/15 06:41
xx	Opportunity Created (M)	Mainstream	2011/01/27 07:24	2011/01/27 07:24
xx	Opportunity Lost (M)	Mainstream	2011/05/05 09:57	2011/05/05 09:57
y	Opportunity Created (M)	Mainstream	2011/06/23 06:41	2011/06/23 06:41
y	Opportunity Won (M)	Mainstream	2011/06/29 10:13	2011/06/29 10:13
yy	Opportunity Created (M)	Mainstream	2011/01/27 13:18	2011/01/27 13:18
yy	Opportunity Lost (M)	Mainstream	2011/04/01 07:48	2011/04/01 07:48
zz	Opportunity Created (M)	Mainstream	2011/01/31 06:05	2011/01/31 06:05
zz	Opportunity Lost (M)	Mainstream	2011/06/08 22:00	2011/06/08 22:00

Process Analysis - Swimlane Flowchart

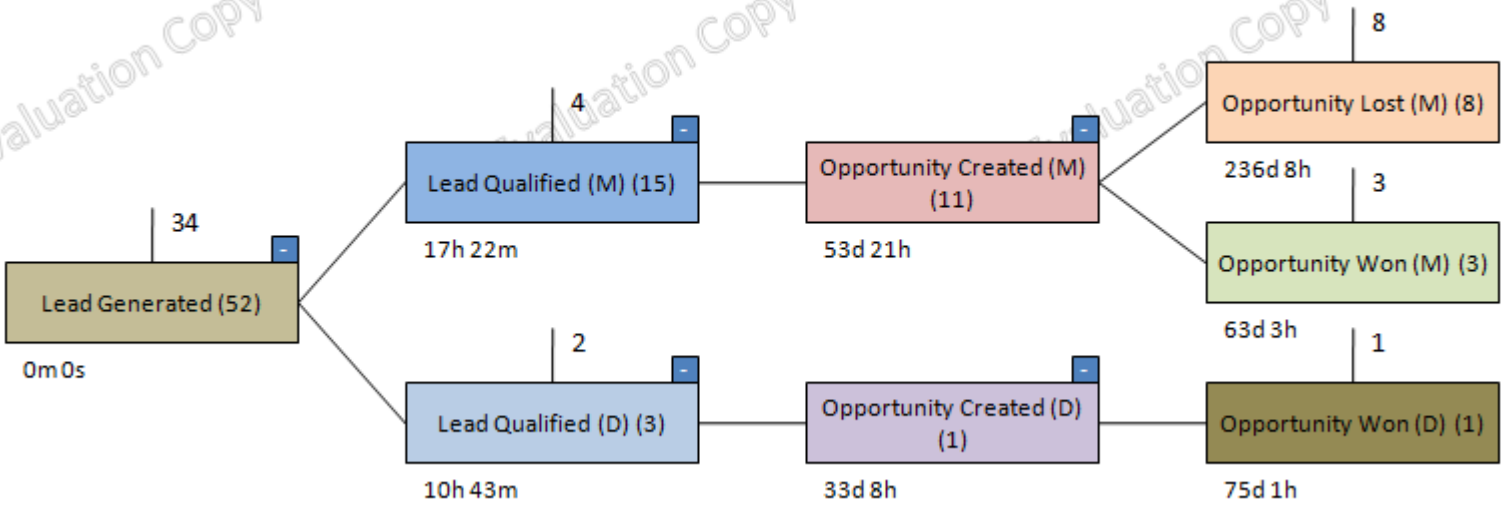


Transition durations	Lead Generated	Lead Qualified (M)	Lead Qualified (D)	Opportunity Created (M)	Opportunity Won (M)	Opportunity Created (D)	Opportunity Lost (D)	Opportunity Lost (M)	Opportunity Won (D)	END	AVERAGE
START	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Lead Generated	0:00:00	17:16:48	10:48:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	2:48:29
Lead Qualified (M)	0:00:00	0:00:00	0:00:00	1273:55:12	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	127:23:31
Lead Qualified (D)	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	785:45:36	0:00:00	0:00:00	0:00:00	0:00:00	78:34:34
Opportunity Created (M)	0:00:00	0:00:00	0:00:00	0:00:00	1461:07:12	0:00:00	0:00:00	3140:38:24	0:00:00	0:00:00	460:10:34
Opportunity Won (M)	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Opportunity Created (D)	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	6727:12:00	0:00:00	1555:55:12	0:00:00	828:18:43
Opportunity Lost (D)	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Opportunity Lost (M)	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
Opportunity Won (D)	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00	0:00:00
AVERAGE	0:00:00	1:43:41	1:04:48	127:23:31	146:06:43	78:34:34	672:43:12	314:03:50	155:35:31	0:00:00	149:43:35

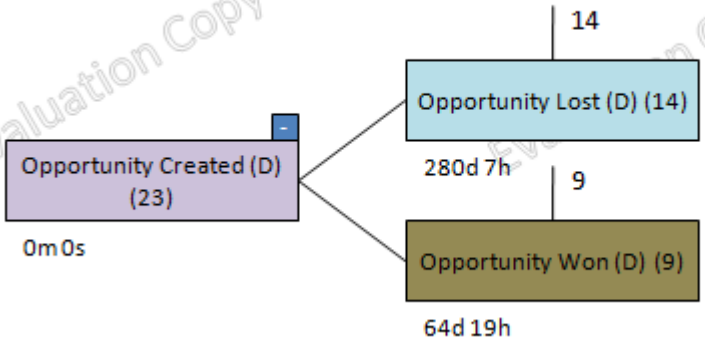
Variation Analysis



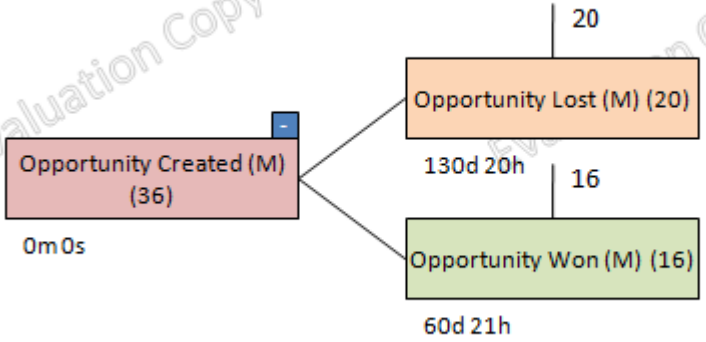
Path Analysis - Successors - Lead Generated

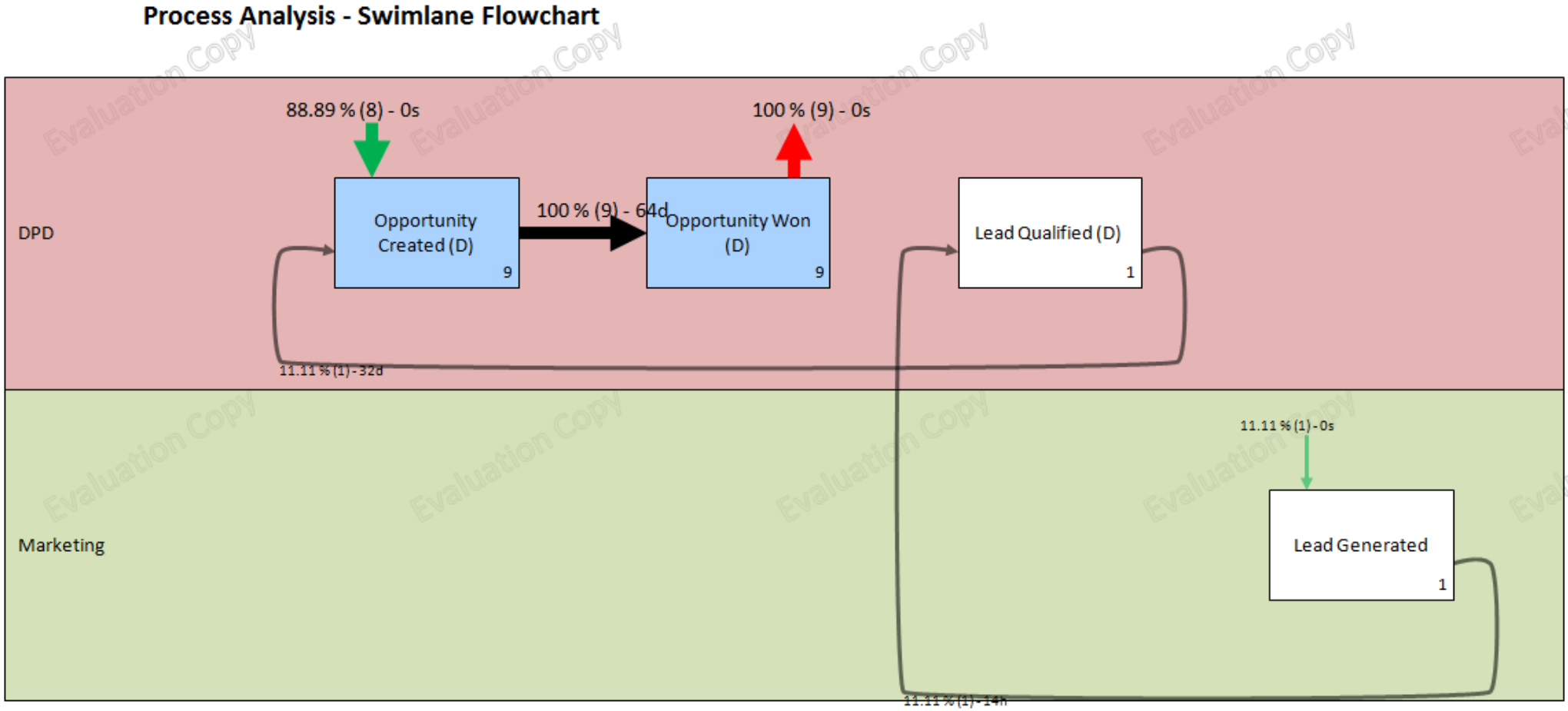


Path Analysis - Successors - Opportunity Created (D)



Path Analysis - Successors - Opportunity Created (M)




Process Analysis - Swimlane Flowchart
DPD
Marketing
88.89 % (8) - 0s
Opportunity Created (D)
9
100 % (9) - 64d
100 % (9) - 0s
Opportunity Won (D)
9
Lead Qualified (D)
1
11.11 % (1) - 32d
11.11 % (1) - 0s
Lead Generated
1
11.11 % (1) - 14h
Evaluation Copy

Process Analysis - Swimlane Flowchart