

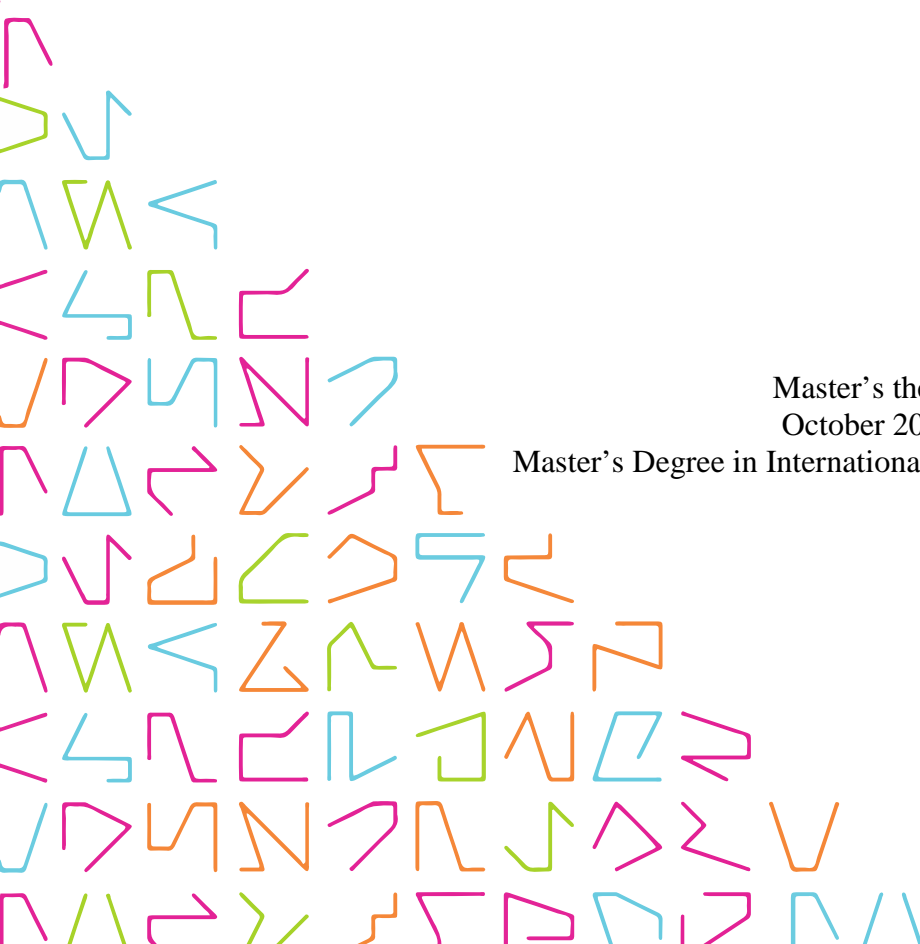
Leverage Mobile Wireless Legacy Products

Case company: EXFO OY

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Master's thesis
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Master's Degree in International Business Management



ABSTRACT

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The change in telecom market dynamics is impelling network solution providers like the case company to find solutions to sustain and grow in the market. This can be accomplished by leveraging the existing product line and investing into new innovative test and service assurance solutions. The major focus of this thesis is to analyze and evaluate the key factors current market trend, customer analysis, growth strategy, and execution process-performance. The combined results of which forms the key indicator matrix. The matrix provides the best possible solution to sustain and leverage existing product line in rapidly changing competitive market.

The research is applied research i.e. asking the correct question regarding the problem and finding the solution around it. The purpose of the research will be explanatory; as key indicator matrix creation requires explaining Market Penetration, Customer Analysis, Strategic Excellence and Execution Excellence which fulfils the company's vision.

There is a high demand of subscriber data management due to shift in consumer media consumption preferences towards wireless and streaming devices. This shift has caused high bandwidth usage and managing all subscribers' data and services efficiently has been most essential for telecommunication operator for business profitability. The combined results of the research comprehends that business exponential growth can be achieved by updating the legacy product line to support high bandwidth 100GigE capture and analysis functionality and improvements in deep packet inspection and data query performance. This will strengthen the business growth strategy to expand towards tier-1 network operators and accelerate penetration of data center, cloud and web-scale operator market.

Key words: key indicator matrix, market penetration, customer analysis, strategic excellence, execution excellence.

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ABBREVIATIONS

2G	2 nd Generation
3G	3 rd Generation
4G	4 th Generation
5G	5 th Generation
AS	Attractive Score
BCG	Boston Consulting Group
CPM	Competitive Profile Matrix
CS	Circuit Switched
CSP	Communication Service Providers
DAS	Distributes Antenna System
DPI	Deep Packet Inspection
E2E	End to End
EFE	External Factor Evaluation
EUR	Euro
FTTA	Fibre-To-The-Antenna
GDP	Gross National Product
GigE	Gigabit Ethernet
IE	Internal-External
IFE	Internal Factor Evaluation
IoT	Internet of Things
IP	Internet Protocol
LTE	Long-Term Evolution
MTR	Mean Time to Repair
NEMs	Network Equipment Manufacturers
NFV	Network Virtualization
NSPs	Network Service Providers
PEST	Political, Economic, Social, Technological
PM	Performance Management
PS	Packet Switched
QoE	Quality of Experience
QoS	Quality of Service
QSPM	Quantitative Strategic Planning Matrix
R&D	Research and Development

SDH	Synchronous Digital Hierarchy
SONET	Synchronous Optical Networking
SPACE	Strategic Position and Action Evaluation
SWOT	Strength, Weakness, Opportunities, Threats
TAMK	Tampereen Ammattikorkeakoulu
TAS	Total Attractive Score
USD	United State Dollars
WebRTC	Web Real-Time Communication

1 INTRODUCTION

1.1 Background

Growing penetration of smartphones and tablets, combined with an ongoing shift in consumer media consumption preferences towards wireless and streaming devices is causing higher use of network bandwidth. Telecommunication network operators has fierce competition in the market to meet the growing subscriber demand as well for network solution providers to provide best network testing solutions to sustain in the market.

In terms of case company providing best network testing solution means is to leverage the existing product line and invest into new innovative test and service assurance solutions. To leverage the existing product line, current market trend analysis, customer analysis, growth strategy evaluation are the key factors.

Market trend analysis means the process of evaluating changes to the company's market. This focuses on changing trends in technology, in customer needs and in company's demographics (Tanner, 2017, 11, 15). Market trend analysis evaluates the current market penetration and provides constructive solutions to improve it.

Customer analysis means to unify end user opinions and to use research to find the best direction for product and service designs. This focuses in analysing the gap between the existing product functionalities with future needs to maximize a business growth potential. The analysis is used for outlining a clearer roadmap for future growth, and can be used at both the strategic and operational levels of an organization. (Sun, 2017, 1)

Growth strategy evaluation is unique for every business. In terms of case company, it means to get answers to the following questions; Are the objective of the business appropriate i.e. Executive alignment? Are the major policies and plans appropriate i.e. Growth strategy? Do the results obtained to date confirm or refute critical assumptions on which the strategy rests i.e. Future Opportunities? (Glueck, 1980, 1). This evaluation balances between selection of goals and objective with company's execution process.

1.2 Research Scope and Objective

The major focus of this thesis is to analyse and evaluate the key factors, market trend, customer analysis, growth strategy evaluation and form a key indicator matrix. This analysis will be used by the case company to leverage mobile wireless legacy product line in a competitive market for creating new opportunities and exponential growth. The sustainable revenue coming from legacy product line will help company to invest in new innovative product and service assurance solutions.

The research is conducted as single case study where current state and practices are evaluated and improvement suggestions constructed. The case company is a leading provider of highly specialized solutions to network operators and has a competitive growth strategy. The research includes one principle question with five sub-level questions.

Research Question: How to leverage the legacy product line in the competitive market?

Answer to the following sub-level questions will formulate the key indicator matrix, which will provide the most possible solution to the principle research question.

1. What is the current market trend of the legacy product?
 - This focuses in changing market trends in technology, in customer needs and in company's demographics. It provides **Market Penetration**
2. How satisfied are customers with the legacy products and why?
3. What should be improved in current products to have exponential growth?
 - Both of these sub-level questions (2 & 3) focuses in analysing the gap between the existing product functionalities with future needs to maximize a business growth potential. **Customer Analysis.**
4. How are the current growth strategies according to the market need?
 - This focuses in company's executive alignment, growth strategy and future opportunities. Overall it is **Strategic Excellence.**

5. What kind of process execution should be followed to provide improved quality products in the market?
 - This focuses on company's process evaluation and team's performance management i.e. **Execution Excellence**.

1.3 Research Methodology

Methodology: The type of method that would be suitable for this research is 'Applied Research'. **Applied research** is about asking the correct question regarding the problem and finding the solution around it. The research is done with the intention of applying the results of the findings to solve specific problem currently being experienced in the organization. (Sekaran, 2003, 24). The focus of this research is to get the correct solution in place so that case company can sustain and leverage legacy product line to support the growth of new product line. **Evaluation research** shall be used for the market visibility evaluation and creation of key indicator matrix.

The purpose of the research will be **explanatory**; because such studies are undertaken to better comprehend the nature of the problem. (Sekaran, 2003, 135). In this research key indicator matrix creation requires explaining the current market situation, customer feedback and growth strategy evaluation that fulfils the company's vision.

A **qualitative approach** shall be used for the research. Qualitative methods aim for a complete, detailed description of observation, including the context of events and circumstances. (Moffitt, 2003, 4) It gives flexible design to evaluate issues in depth; the framework of the research can be updated based on new findings. As qualitative data is based on the case study, the formulation of key indicators or metrics for future use will be more powerful.

Target audience: The research questionnaires are addressed to sales and R&D personnel at the case company, and also to its key customers.

The primary design of the research is illustrated in Figure 1

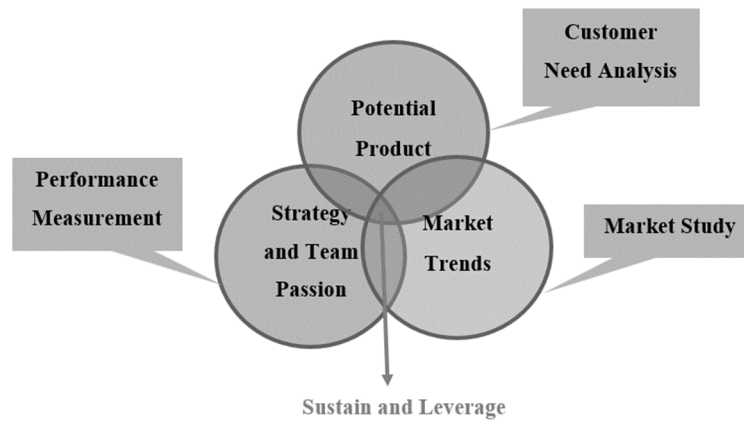


Figure 1: Research Primary Design

1.4 Research Process

Research is conducted as a single case study. First part of the research is literature review where different matrix designs are explored to define the key indicator matrix. Second part of the research includes empirical part of the study where current market trend and customer needs are analyzed, current strategic practices and its challenges are studied, root causes are identified in the case company. Third section of the research consists of construction of the key indicator matrix and proposal how to use the findings for growth.

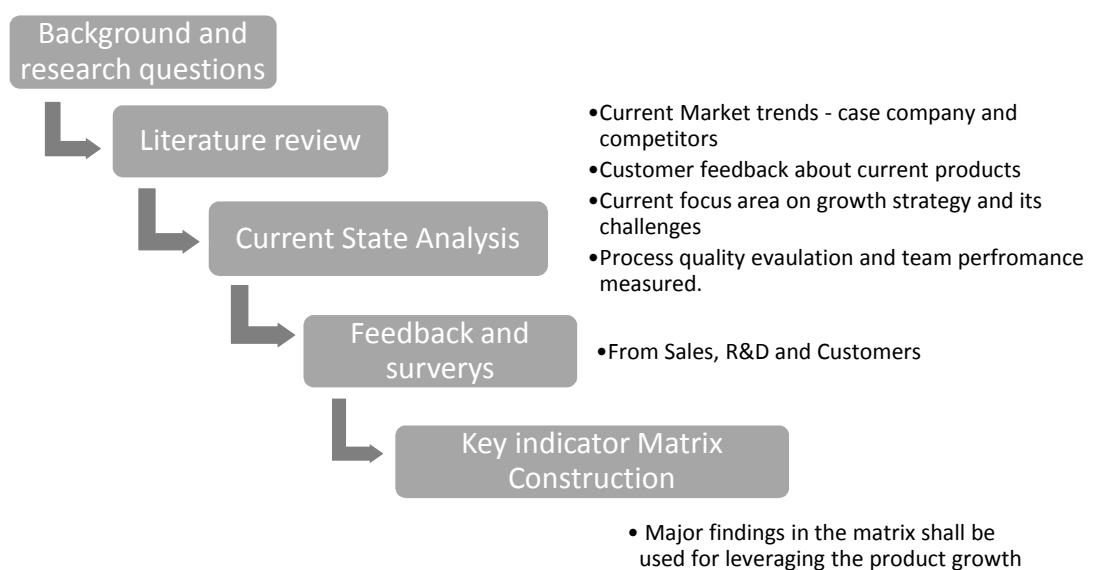


Figure 2: Research Process

Research process began when need for the study was identified at the case company. First step was to form a high level understanding of the current state of the company and to formulate the research questions. After the questions, scope and goals for the research were set and the required literature was reviewed. Relevant topics are discussed in chapter 2, and finally the chapter is concluded to the synthesis.

In chapter three current market trends, products and current business strategies are explained. The empirical research was conducted in the case company between April and October 2017. Information was gathered from different sources; case company intranet, sales tools, documentations, interviews, meetings, online sources and questionnaires. The interviews were performed as open discussions with few guiding questions. The case company trends and current strategies were mapped mainly from sales tools, interviews, online sources and internal documents. The analyses used are SWOT (Strengths, Weaknesses, Opportunities and Threats) and PEST (Political, Economic, Social and Technological) for case company strategies and trends.

In chapter four based on literature review, current state analysis and gathered information, “Key Indicator Matrix” is created with following four major quadrants; “Market penetration”, “Customer Analysis”, “Strategic Excellence” and “Execution Excellence”. Information is gathered from case company’s important customers, R&D and sales personnel via face-to-face interviews and questionnaires. SWOT and market trend analysis results are also utilized from chapter 3.

In chapter five, answers to the principle question and its five sub-level questions are discussed and summarized, utilizing the key indicator matrix key findings. Research limitation and further development are also discussed and suggested briefly.

Reliability and Validity of the data:

The data used during the research and thesis writing are authentic and valid. All the data has been checked and approved by the case company. Data has been collected and compiled to fulfil the objective of the research conducted. I was an employee of the case company and I am well aquatinted with the product line and business cases that this research focuses on.

2 LITERATURE REVIEW

This section describes different business strategy analytics matrix studied for the thesis. It describes the SWOT analysis and PEST analysis, which is used to evaluate the current market and business understanding of the case company. It highlights the key properties of "Ansoff" matrix that has been chosen to construct the final performance indicator matrix for the case company.

“Strategy is the direction and scope of an organization over the long term which achieves advantage in a changing environment through its configuration of resources and competences with the aim of fulfilling stakeholder expectations.”(Johnson, Scholes & Whittington, 2008, 62)

2.1 Business Strategy Analytics Matrix

In this thesis four different business strategy analytics matrix were studied to identify the best suitable matrix which could be improved for the fulfilment of case company research scope.

1. PEST Analysis
2. SWOT Analysis
3. Ansoff Matrix
4. Quantitative Strategic Planning Matrix (QSPM)

2.1.1 PEST Analysis

PEST Analysis is a simple and widely used tool that helps to analyse the Political, Economic, Social, and Technological changes in a business environment. It helps to identify the external factors within the business environment that impacts the business operations. It also encourages strategic thinking within an organization.

The output of the PEST analysis is subjective as it is based on changing data so it is good to update the analysis results iteratively.

Political;

Political factors include government attitudes to employment, consumer protection, the environment, taxation, trade restrictions and social reforms, as well as the burden of bureaucracy and the level of corruption (FME, PESTEL Analysis. 2013, 12).

Economical;

Economic factors refer to all the key economic variables often relate to political actions. (Law, 2016, 73). Those factors are as follows: GDP (gross national product), inflation rates, currency exchange rates, taxes, labour rates, trading regulations, stock exchange, and demand-supply rate.

Social;

Social factors are important dynamics of the market trends analysis as it focuses on the forces within the society. These factors include; Attitude towards products and services, population growth and its distribution, income and lifestyle statistics, education and career trends, religion and beliefs, cultural and social mix.

Technological;

Changing pace of technology impacts the market trends rapidly and enormously. Following are the technological factors which are influential; Quality and pricing, automation, network coverage, outsourcing, legislation, changes in telecommunication, transport and distribution, life cycle of current technology etc.

Why PEST analysis is done for the research?

In this research PEST analysis is used for initial market trend analysis for the case company because it looks at a "big picture" factors that might influence a market and a decision. The results from the analysis shall be used to classify opportunities and threats within SWOT analysis.

2.1.2 SWOT Analysis

SWOT analysis is a technique that is performed for product, services and markets when deciding on the best strategy for achieving future growth. The process involves identifying the strengths and weaknesses of the organization, and opportunities and threats present in the market that it operates in. The first letter of each of these four factors creates the acronym SWOT. (FME, SWOT Analysis. 2013, 6-8)

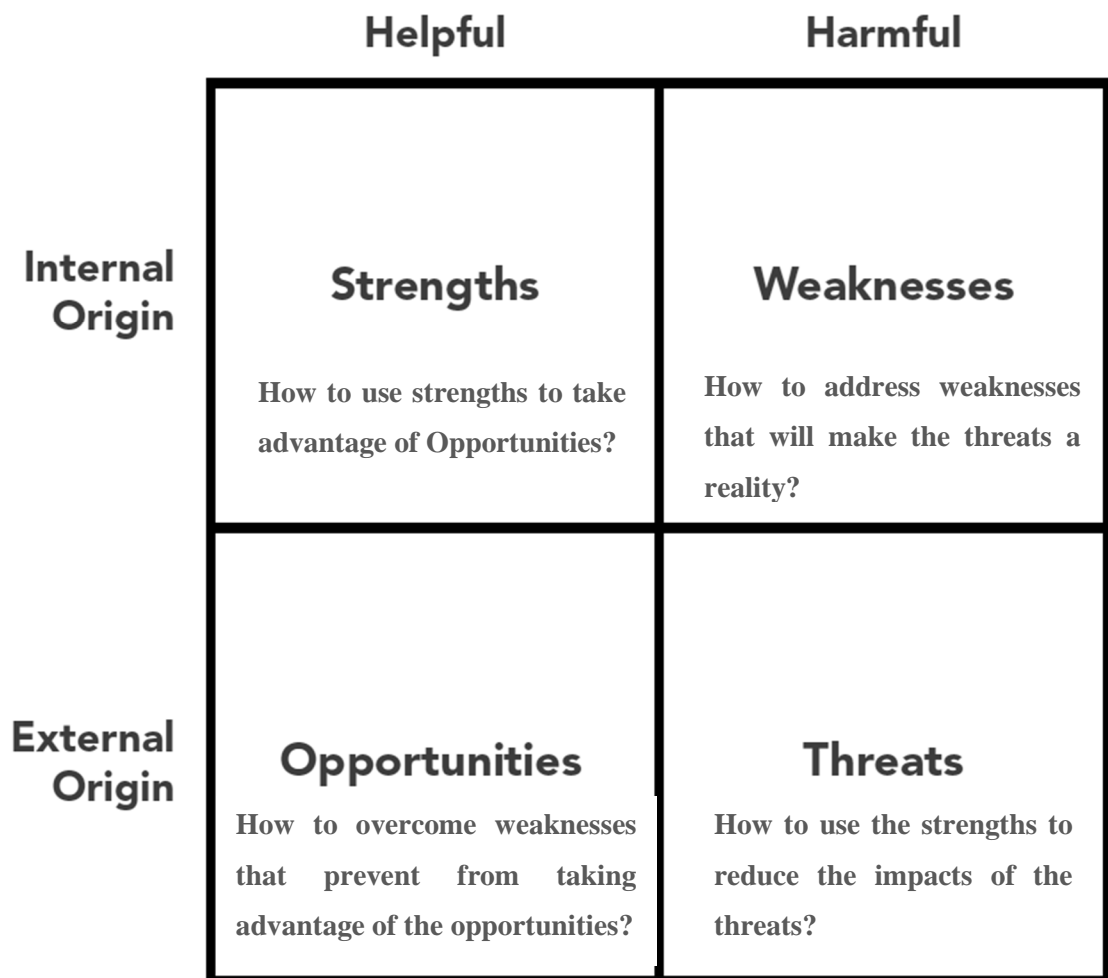


Figure 3: SWOT basic structure

(Adapted by author from various sources)

The purpose of SWOT analysis is to identify the strategies, which match with organization resources, capabilities to fulfil the demands of the market where the organization competes. SWOT analysis is very versatile and popular tool, which involves lots of subjective decision-making at each stage. It is an iterative process and its scope depends largely on the business objective under consideration.

Terminology description of SWOT is as follows,

Strengths

These are internal factors, which can be controlled and helps organization to achieve its objectives. It provides an added value, a competitive advantage. Some of the Strengths of an organization could be core competencies in key areas, proprietary technology, product innovation skills, superior technological skills, good market value, loyal customers, patents, cost effective advantage, proven R&D and management. Strengths should be identified and evaluated properly by iteratively.

Weaknesses

These are internal factors which organization has some measure of control but hinders in achieving its objectives. It lowers the value of offering and competitive advantage. Some of the weaknesses of an organization could be unclear strategic vision, bad marketing skills, unstable records in implementation problems, weak market image, missing competencies, lack of good management, narrow product line, below average distribution network, financial instability to changing strategical moves, higher cost level. Despite of the fact weaknesses highlights the areas of the management that are poorly managed it is very important that accurately identified and address to. There should be good set of iterative questions, which should be answered by most of the organization senior management to provide realistic assessment of weaknesses.

Opportunities

These are external factors, which cannot be controlled but are good for organization to achieve objective and generate growth. Opportunities can arise from various reasons such as emerging new technology, ability to expand rapidly with increase in market demand, possibility to expand the product line based on customer needs, ability to expand into new markets, ability to transfer skills or technological know-how to new products or businesses, falling trade barriers, changing market trends. Opportunities identified for a market or product can be a threat for another (FME, SWOT Analysis. 2013, 18).

Threats

These are external factors, which cannot be controlled and are very unfavourable for an organization's growth strategies and objectives. But an organization should always have possibility plan to deal with threats. Some of the major threats can be slower market growth, changes in customer needs, environmental factors like demographics, recession, business cycle, changes in foreign trade policy, cost increase, competitor market and product changes. One effective way to identify threats are to compare its possibility with opportunities and evaluate their impact to an organization growth and strategy objectives.

The SWOT Process is described in Figure 4

SWOT analysis is a popular and versatile platform for future planning; it is not a strategy. The details for each variable should be kept short and understandable. Many identified variables are more relative so the analysis involves lot of subjective decision-making and judgements. The variables should be prioritised and combined, never ignore soft facts like culture. It is an iterative process and its scope depends largely on the business objective under consideration.

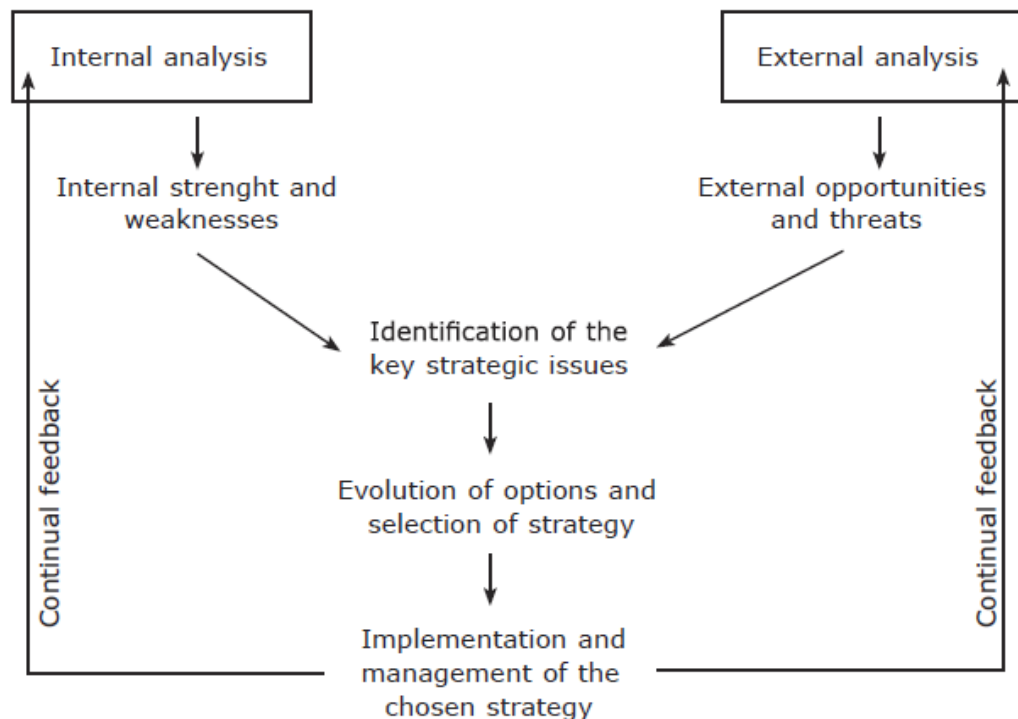


Figure 4: The SWOT Process (Riston, 2011, 43)

Why SWOT is used for initial business strategy evaluation of the case company?

SWOT analysis is usually first step for more complex and detailed analysis. It can be used as an iterative filter to reduce the information to key issue that are relevant to the organizations business objective. Decisions made for these key issue will set the business objective and strategies.

The **advantages** of the analysis are:

- It is a simple and quick way to evaluate company's strengths, weaknesses, opportunities and threats.
- It equally examines external and internal factors helping or hindering to achieve business objectives.
- The analysis can be used for many different scenarios.
- The results from the analysis can be reviewed to get the desired strategic plan i.e. using strengths to take advantage of opportunities, address weakness that can make the threats a reality etc.

The **disadvantages** of the analysis are:

- The analysis might be oversimplified.
- To get the real advantage of using the analysis it requires good judgement and precise thinking.
- It's an iterative process and results has to be updated with changing business market otherwise the analysis may lead to business decisions based on irrelevant data.
- It generates many options with no solution to select the best one.
- It does not prioritise issues.

The completion of a SWOT analysis should help organization to decide which market segments offer the best opportunities for success and profitable growth over the life cycle of the product or service. After the SWOT analysis, **Ansoff Matrix** should be used to define the best growth strategy to achieve the chosen objective.

2.1.3 Ansoff Matrix

The Ansoff Matrix is a model for analysing the approach to product-market growth strategies. It is developed by H. Ignor Ansoff in 1965 and well defined in his book "*Corporate Strategy*". According to H. Ignor Ansoff, the matrix is a business analysis methodology that links an organization's marketing strategy with its ongoing strategic direction. It provides framework to identify growth opportunities.

The Matrix presents four alternative growth strategies in the form of 2x2 table. One dimension of the matrix considers "Products" (existing and new) and the other dimension considers "Markets" (existing and new). (FME, Ansoff Matrix. 2013, 7).

Product: Businesses are built around products and services that define their value offering. Most offerings are limited in at least two ways: time, in that their relevance diminishes and redesign or renewal is usually required, and transferability, in that they tend to work best under certain market conditions. Ansoff noted that modifying the core offering is a key strategic choice. (Lowy, Hood, 2004, 135)

Market: It applies mostly to market options distinguishing between customer markets that are known and established for the company versus the rest.

The four quadrants of Matrix are:

Market Penetration:

Focus area is selling existing products in existing markets to achieve market growth.

Market Development:

Focus area is finding or developing new markets for the existing products.

Product Development:

Focus area is developing new products to introduce to the existing markets.

Diversification:

Focus area is innovating new products to sell in the new markets.

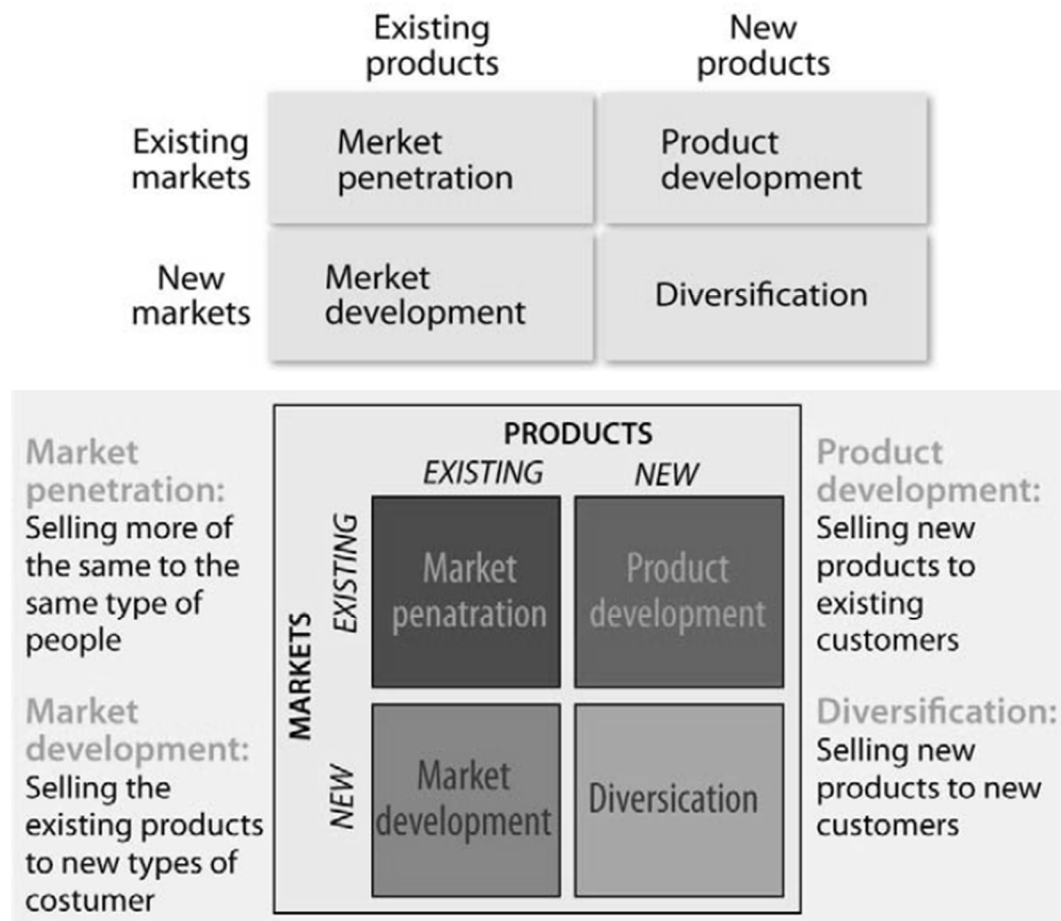


Figure 5: Ansoff Matrix (Whalley, 2010, 63)

The matrix outlines the alternative methods and options to achieve the growth targets. It never provides the final decision to whether or not to develop new products or enter new markets. It provides the implications of growing the business through existing or new products and in existing or new markets. The output from the Ansoff product-market matrix is a series of suggested growth strategies that set the direction for the business strategy. (Whalley, 2010, 63)

Detailed description of Ansoff four quadrants are as follows,

Market Penetration

Lowy, A. Hood, P. 2004, 136, in their book “*The Power of the 2x2 Matrix*” states that this is the de facto strategy: change nothing and sell more of the same to existing customers. Organization mostly considers this strategy because it has the lowest risk and the possibility of higher market gain. Market Penetration focuses on four main approaches.

1. Maintain or increase the current product’s market share: This can be achieved by aggressive marketing and sales promotion for the existing products, provide competitive yet attractive pricing or discount offers. Do more customer centric research and focused actions so that it builds the market share which might lead to winning customers from competitors in the existing market.
2. Secure dominance of growth markets by finding new demographics for the products.
3. Restructure a mature market by driving out competitors: When the market is mature there is no more sectors left to exploit than to get the market share from the competitors. This can be achieved by making the market unattractive via extensive promotional campaign and very alluring pricing strategies.
4. Increase usage by existing customers: This can be achieved via loyalty schemes, adding value or improving the products.

The market penetration marketing strategy relies mainly on how well company knows its market, competitor activities and its product.

Market Development

A well-developed product can be introduced into new markets to extend its value. This is ideal when little modification is required and room for growth in the original market is restricted. (Lowy, Hood, 2004, 136). This strategy can be approached in follows ways,

1. New geographical markets i.e. expanding to new horizons by exporting the product to new countries by utilizing the sales or distributor channels present in the new market.

2. New product dimensions or packaging i.e. refactor the product existing marketing requirements to fit the new market needs.
3. New distribution channels i.e. establish new retail outlets.
4. Different pricing policies to attract different customers or create new market segments i.e. providing the customer to change their purchases according to the market need.

Product Development

Marketers understand the enormous value of a positive customer relationship and the goodwill and trust that go with it. This relationship capital allows a company to make new product offers more effectively and inexpensively to existing customers than to new ones. (Lowy, Hood, 2004, 136). This strategy may require the development of new competencies and requires the business to develop modified products, which can appeal to existing markets. (Whalley, 2010, 65).

Product development strategy focuses on three main areas,

1. Research & Development (R&D): Investigates the new technologies, processes, materials, competences and resource required develop new product.
2. Customer needs assessment: Investigates the current requirements so that it can be added to the upcoming new product development.
3. Brand extension means launching the new product under existing brand name but in different category to leverage existing customer base and brand loyalty.

For new product development the product should be either associated with current product or matched customer requirements or it reinvents the existing products.

Diversification

Diversification represents a total strategic overhaul, simultaneously trading in both Product and Market. It is the most challenging, costly, and risky of the options. (Lowy, Hood, 2004, 136).

Diversification strategy requires new relationship and skills development. Companies select this strategy in joint ventures with others or when there is serve crisis looming. The strategy should set four main objectives.

1. Extensive and honest assessment of the risks involved.
2. Clear expectation of potential gain
3. Access to capital and willingness to invest
4. Right balance of risk vs. rewards

Diversification can occur at two levels: either at the business unit level or at an organization level. When it happens at the business unit level the organization expands into a new segment of its current market. When it happens at the organizational level, integration of new organization into the existing one happens. (FME, 2013, 22)

There are three approaches to implement the policy of diversification:

- **Full Diversification**

In this approach an organization offers very new product to an unknown market. This approach is risky and time consuming.

- **Backward Diversification**

In this approach an organization offers product that is preceding version of the current product.

- **Forward Diversification**

In this approach an organization offers product that is advanced version of the current product.

Why Ansoff Matrix is selected?

The Ansoff matrix four strategies and framework fits very well for detailed analysis of thesis research objectives. Strategies shall be improved to form the key indicator matrix which case company can use to leverage mobile wireless legacy product line in a competitive market and gain exponential growth.

Important **advantages** of the Matrix are as follows,

- It determines the best strategy to increase sales.
- It easy to use and provides flexibility to modify it to fit desired requirements of the organization's business vision.
- It is a management tool useful to analyse the strategic position of the company and set objectives for the way forward.
- It indicates the level of risk associated with each strategy thus encouraging management to focus carefully on the impact of any decision made.
- It also increases brand loyalty.
- The matrix helps to explore in detail the different directions for the strategic growth that a company would take.

2.1.4 QSPM – For Advanced Development

Quantitative Strategy Planning Matrix (QSPM) is an alternative strategic management methodology, which can be used for the advanced or future development of output generated from this thesis. It is an analytic method for comparing feasible alternative actions. The methodology tries to select the best strategy by using input from other management matrix and some computations. The Strategic management consists of three different phases, Strategy formulation, implementation and evaluation. QSPM belongs to strategy formulation and It falls under the “Stage 3” of its framework which helps and organization to take accurate strategical decision.

Strategy formulation framework three different stages are as follows,

Stage 1 is an input stage, which consists of External Factor Evaluation (EFE) Matrix, Competitive Profile Matrix (CPM) and Internal Factor Evaluation (IFE) Matrix. It summarizes the basic input information.

Stage 2 is a matching stage, which focuses on generating feasible alternative strategies by aligning key external and internal factors. It consists of SWOT, Strategic Position and Action Evaluation (SPACE) Matrix, Boston Consulting Group (BCG) Matrix, Internal-External (IE) Matrix and Grand Strategy Matrix.

Stage 3 is decision stage consisting for QSPM, which uses input information from stage 1 and stage 2 to construct relative attractiveness for each feasible alternative strategy thus providing objective basis for selection specific strategies.

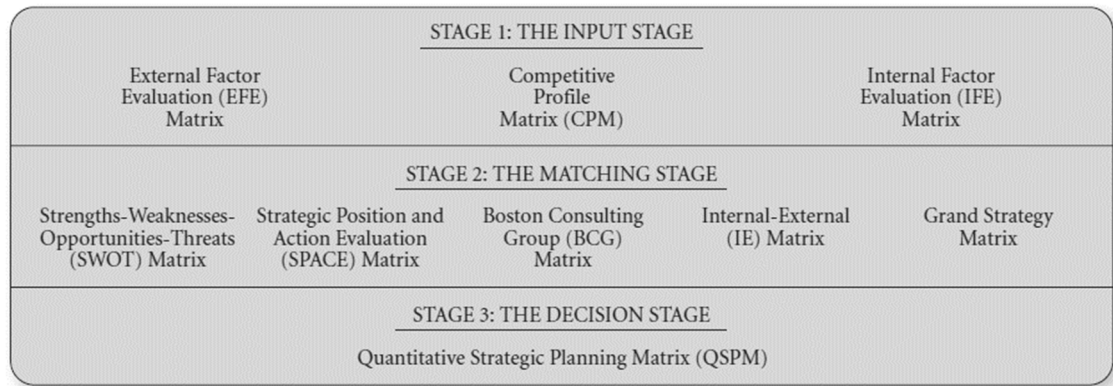


Figure 6: The Strategy Formulation Framework

(Fred, Forest, 2015, 258)

Steps to create a QSPM:

1. Identify the company's key external opportunities and threats and internal strength and weaknesses in the left column of QSPM. This can be done using the EFE & IFE matrix.
2. Assign to each key external and internal factor some weight. These weights from the IFE and EFE matrices.
3. Formulation of the type of the strategy company would like to pursue. This can be done using the SWOT analysis, SPACE matrix analysis, BCG matrix model, or the IE matrix model.
4. Determine Attractiveness Scores (AS). It is a numerical value assigned for each alternative strategy and is determined by examining each key external and internal factors. The range of AS is 1= not attractive, 2 = somewhat attractive, 3 = reasonable attractive and 4 = highly attractive.
5. Total Attractiveness Scores (TAS) are defined by multiplying weights formulated in step 3 by Attractiveness Scores determined in step 4 in each row.

6. Calculate the Sum Total Attractiveness Score by adding all Total Attractiveness Scores in each strategy column of the QSPM.

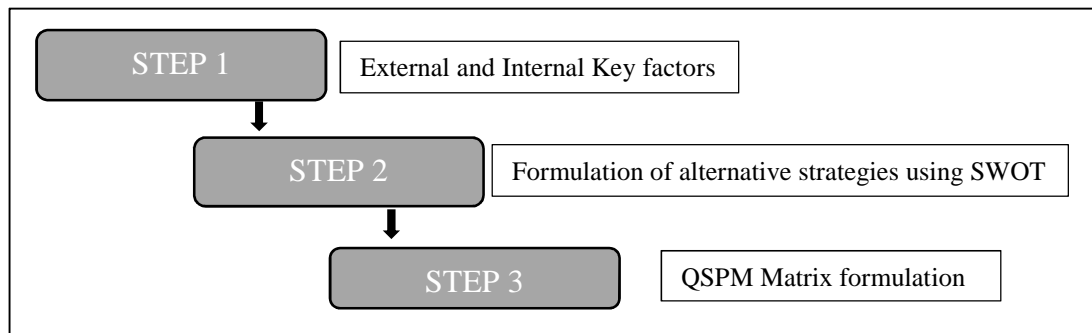


Figure 7: QSPM Basic Steps

	Alternative strategies						
	Weight	Strategy 1		Strategy 2		Strategy 3	
		AS	TAS	AS	TAS	AS	TAS
<i>Key external factors</i>							
Economy	0.25	1	.25	3	.75	2	.50
Political/legal/governmental	0.30	–		–		–	
Social/cultural/demographic/environmental	0.10	1	.10	2	.20	3	.30
Technological	0.20	–		–		–	
Competitive	0.15	2	.30	1	.15	3	.45
<i>External total</i>	1.00						
<i>Key internal factors</i>							
Management	0.15	3	.45	2	.30	1	.15
Marketing	0.25	–		–		–	
Finance/accounting	0.20	–		–		–	
Production/operations	0.15	3	.45	1	.15	2	.30
Research and development	0.20	2	.40	1	.20	3	.60
Management information systems	0.05	1	.05	2	.10	3	.15
<i>Internal total</i>	1.00						
<i>Sum total attractiveness scores</i>	2.00	13	2.00	12	1.85	17	2.45

Figure 8: General Quantitative Strategy Planning Matrix

(Meredith, Forest, Fred & David. 2016, 5)

Pros QSPM,

- There is no limit to the set of strategies that can be examined at once sequentially and simultaneously using QSPM.
- Integration of applicable external and internal factors in the decision making process improves the possibility best final strategic decision for the organisation.

Cons QSPM,

- Requires judgemental decisions and assumptions.
- It can be based only on good prerequisite information and matching analysis
- Only strategies in a given set are evaluated relative to each other.

2.2 Synthesis

Based on the literature review SWOT and PEST analysis shall be used for current market, strategies and product state analysis of the case company. The Ansoff Matrix framework shall be used to create the key indicator matrix for the case company's business strategies. Ansoff Matrix four quadrants shall be modified as shown in Figure 9 to develop the framework of key indicator matrix.



Figure 9: Framework of Key Indicator Matrix

Market Penetration

Market penetration focuses in analysing market share/sales of existing products in existing market i.e. it is the measure of percentage of the market that company's product or service is able to capture. It also analyses how the change in technology, customer needs and company's demographics are affecting different business strategies currently followed by the case company. How those strategies can be developed further to increase the sales and achieve growth. Market Penetration strategic approach requires detailed market and competitors intelligence.

The thesis takes into consideration of Ansoff marketing penetration strategic module to formulate the analysis results.

Customer Analysis

Customer analysis is vital for any effective business strategy. A business or company should follow through the three different stages of customer analysis.

1. Know its target customer i.e. identify current customers, split them into groups with similar traits and requirements. The more detailed is the understanding of the target customer the better.
2. Understand the need of identified group of customers, analyse what bridges these customers together.
3. Evaluate how the company's product or service meets the customer requirements. Then based on gap analysis formulate the future business strategy to approach the customer needs.

Customer analysis focuses in new or improved functional growth of products or services offered to the customer in existing market.

Strategic Excellence

Strategic Excellence focuses in finding the best possible growth strategies and opportunities in the new market with existing product. In strategic excellence for the case company, possible area of competitive advantage is identified, the desired business state is envisioned, and opportunities are identified, screened. Combined output of this forms the best possible business strategy to leverage the legacy product line of the case company.

Execution Excellence

Execution excellence focuses on two objectives,

- First: Organization process evaluation to provide quality product (new-existing) to meet the new market trends.
- Second: Performance Management to form a team and optimize it to perform best of its capabilities i.e. "Team Passion".

3 THE CASE COMPANY AND ITS CURRENT STATE

3.1 Organization Background

The research case company is EXFO. It is a leading provider of next-generation test and services assurance solutions for wireless and wireline network operators and network solution vendors in the global telecommunications industry. Founded in 1985, today EXFO has approximately 1500 employees in 25 countries; its headquarters is in Quebec City, Canada. EXFO's product offering consists of service solutions as well as many physical products that are required for the offered services. It is one of the largest deployments of active service assurance, which offers innovative solutions to mobile and IP fixed networks.

This research is done for the wireless division of EXFO OY located in Oulu, Finland. The Finnish division was established in 1991 as Nethawk Oyj, acquired by EXFO in 2010 (EXFO Press Release 2010); the office employs approximately 100 people and specialises in wireless network solutions. This unit focuses in providing per deployment lab testing and live network troubleshooting for network equipment manufacturers (NEMs) and network service providers (NSPs).

Currently this wireless division of EXFO is going through a transition from a legacy product line to new product line. At this phase it is important to identify the market penetration and customer satisfaction levels of the legacy products. Understanding these two key aspects will aid in continuing to support the legacy products, whilst at the same time contributing key information to new product development and all important revenue generation to fuel continued growth.

The focus of this analysis will be on gathering information about the market EXFO is operating in, using secondary data; and the main part will be the results of the primary data collection about EXFO's products, and future product requirements of EXFO's customers. The legacy products that this research is concentrating are "PowerHawk Pro" and "TravelHawk Pro".

3.2 Products

Network operators are investing significantly in their network due to rapid growth of subscribers, devices and services. They want to provide innovative solutions adding greater value to its customers.

Even though they are investing heavily in their network, they face many technical and business challenges to deploy and manage their live network services. They require extensive testing on the network elements in live network environment. NEMs and NSPs needs to verify to specification, functionality, capacity, interoperability, quality of experience (QoE) and quality of service (QoS). All these functionalities are provided by EXFO's legacy wireless network products "PowerHawk Pro" and "TravelHawk Pro".

PowerHawk Pro

PowerHawk Pro is a multiuser live network analyzer for line-rate data capture on 1GigE and 10GigE networks. It enables network service optimization and troubleshooting through real-time key performance indicators and detailed user-plane analysis. It correlates both control-plane and user-plane traffic across all interfaces to show full, end-to-end view of both signalling and user-plane data. (EXFO Specification Sheet, 2016, 2).



Figure 10: EXFO PowerHawk Pro (EXFO Specification Sheet, 2016, 1)

This product was developed by EXFO Oulu R&D and came to market four years ago.

TravelHawk Pro

TravelHawk Pro is a portable wireless network troubleshooting tool for data capture and analysis on multiple 1GigE and 10GigE Ethernet links. It improves network analysis, optimization and troubleshooting time, and it is designed for three main operations: long-term evolution (LTE)/IMS, and packet-switched (PS) core and circuit-switched (CS) core end-to-end network analysis, Internet protocol (IP) application data analysis and data capturing. The capacity to support all three operations in a portable form factor is what makes this tool so powerful. Plus, the TravelHawk Pro dramatically improved network quality and decreases the average mean time to repair from days to hours. (EXFO Specification Sheet, 2016, 2).



Figure 11: EXFO TravelHawk Pro (EXFO Specification Sheet, 2016, 1)

This product was developed by EXFO Oulu R&D and came to market three and a half years ago.

Both of these products need to be upgraded so that it is possible to serve the market demand of growing data usage. The data usage rates for subscriber networks are ever increasing and moving towards 100GigE. For more on trends, refer section 3.3.3.

3.3 Current Market State

EXFO provides testing equipment and services for wireless and wireline networks in the telecommunications industry. Telecommunications is a highly segmented industry and due to its broad product and service offering, EXFO can be identified as operating in number of these segments, for example:

- Electronic test & measurement instrument manufacturing (D&B, Hoovers. 2017)
- Global portable fibre optic test equipment (EXFO Press Release, 2017)
- Optical networking-transceiver (Ratner, 2017)
- Protocol analyzer and network monitoring (EXFO Press Release, 2010)

This section describes the current market outlook and trends of the case company. The data gathered is from various online sources, internal sales tools and face-to-face interviews with EXFO's sales personnel who were also kind enough to share some of their own in-house market research data. At first it describes the high level view of the telecommunications industry, and then narrows down to specific products this research is about. This is because EXFO's products and services are all highly complementary, and the activities of the key players have significant impact on EXFO's success.

3.3.1 Size & Growth

In 2015 the total revenue generated in the global telecommunications services industry was EUR 1.1 trillion, this figure has been steadily growing since 2012 and is forecasted to reach EUR 1.2 trillion by 2019, reference Figure 12.

This market growth is being fuelled by the modern era's insatiable appetite for connectivity. In his outlook Deloitte (Wigginton, 2017), identifies smartphone usage as one component driving continued growth in this industry, citing evidence of "Unites States consumers are looking at their devices more than 9 billion times a day in the aggregate—up to 13 percentage from last year" and that sales of smartphones remain strong. In general, they report that "penetration and use across the telecommunications

ecosystem continue to increase in many key categories”. Trends are investigated further in section 3.3.3

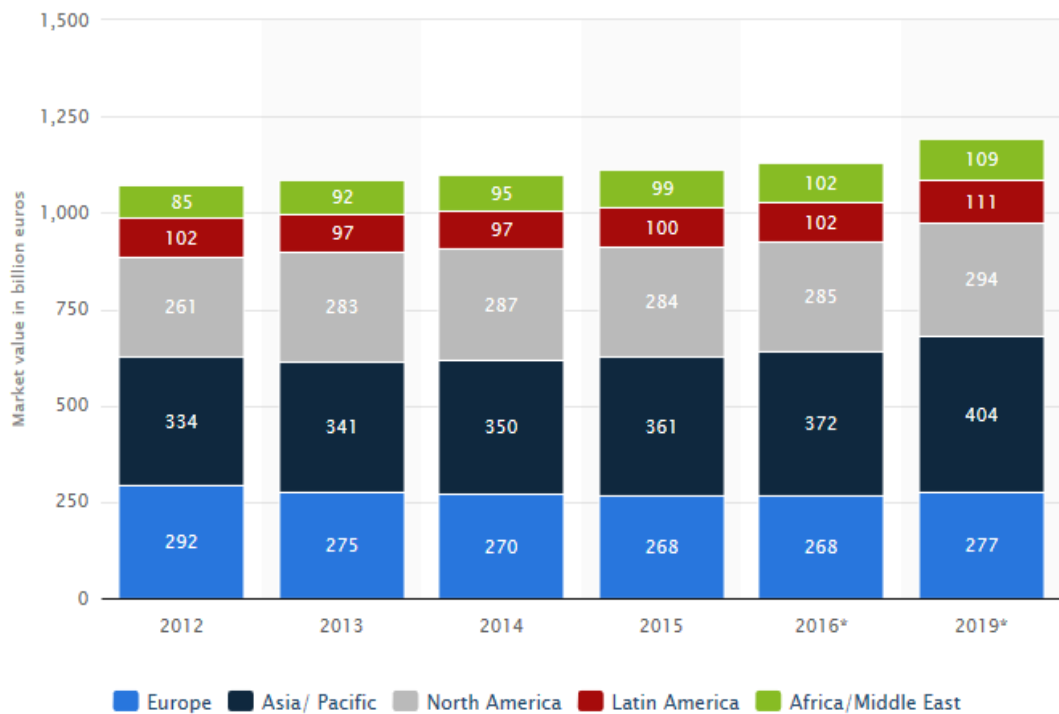


Figure 12: Global telecommunications services industry revenue (EUR) by region 2012 - 2015. 2016 & 2019 are forecasts (Statista, 2017, 3).

This growth creates significant opportunities in EXFO’s specific market segments in two key ways:

1. Increasing usage of existing infrastructure puts a strain on networks (EXFO’s products and support services could be used to optimize the network)
2. Investment in new, and upgrading networks (EXFO equipment and professional services could be used for design, testing and implementation)

In these segments EXFO shows total available market of USD 4.2 billion, they are serving USD 2.2 billion (EXFO Presentations, 2017).

3.3.2 Structure & Key Players

An Ernst & Young report, 2015 segments the telecommunications industry revenue as shown in Figure 13. In this representation, EXFO's segment would be the "Infrastructure and platform vendors" with a 5% share of the market. Network Operators clearly hold the largest controlling segment.

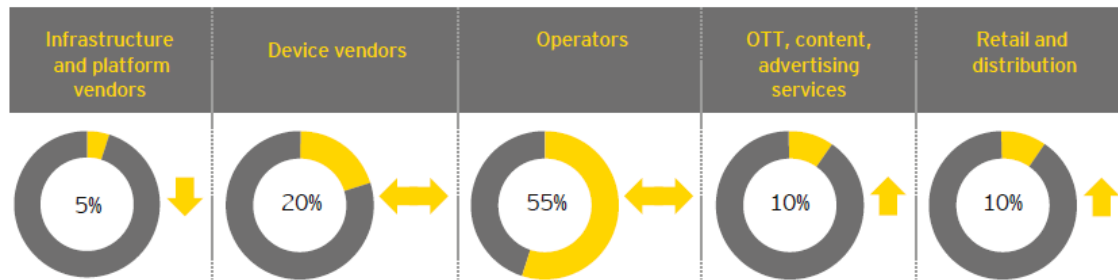


Figure 13: Telecommunications industry value chain - 2015 share of revenues by segment (Ernst & Young, 2015, 13)

The largest network operators in 2015 was China Mobile, followed by United State companies, Verizon (a key customer of EXFO's wireless division, Oulu) and AT&T; it is worth noting that these are amongst some of the largest companies in the world (Chen, 2015).

Two of EXFO's key competitors in their segment are Netscout Systems and Viavi Solutions Inc. (EXFO, 2017). Both of these companies are based in the United States of America and have recently been going through an acquisition based growth phase.

	2015	2016
Netscout	1	1
Viavi	3	2
EXFO	2	3

Figure 14: Key competitor revenue comparison (by position) (Viavi, 2017; Netscout, 2017; EXFO, 2017)

Netscout and Viavi both manufacture network analyzers that directly compete with the EXFO products, which this customer analysis is focusing on.

Other identified competitors are:

- Quintech Electronics & Communications Inc. (Unites States of America)
- ToyoDenki (Japan)
- GL Communications Inc. (Unites States of America)
- Astellia (France)
- Polystar (Sweden)

3.3.3 Trends – PEST Analysis

The most relevant trends in the telecommunications industry that have impacts on EXFO's market segments and the area of research are covered in a brief by PEST analysis:

- **Political**
 - o Government's appetite for supporting heavy investment in network upgrades e.g. 4G - 5G.
- **Economic**
 - o Capital spending has a chance of accelerating under a better growth, higher inflation expectation environment. (Ratner, 2017)
 - o Mergers and acquisitions are becoming more common to support higher levels of investment and achieve geographic growth. (Ernst & Young, 2015; Wigginton, 2017)
 - o More capital investment is needed to maintain network integrity and feed fast Internet speeds to businesses and individuals alike. (Ernst & Young, 2015)
- **Social**
 - o Roll out of networks in China (Ernst & Young, 2015)
 - o Higher-quality websites, mobile data applications and high definition video streaming are fuelling the rapid growth in global broadband demand, which is putting a strain on network capacity. (Ratner, 2017; Ernst & Young, 2015)

- Technological

- Roll out of 100GigE transmission networks and 100GigE optical upgrade cycle. (Ratner, 2017)
- Continued capital deployment from telecom operators into 4G and preparation for 5G. (Ernst & Young, 2015)
- Increased capital expenditures in constrained network environments (Ratner, 2017)
- Realisation of the IoT ‘Internet of Things’ (Wigginton, 2017)

3.3.4 Market Share

This section provides details about EXFO’s current market share for legacy product line. The data is collected from face-to-face interviews with EXFO’s sales personnel who also shared some of their own in-house market research data. Three EXFO’s sales personnel were interviewed, Interview questions with summarized answers are described in **Appendix 1**. Figure 15 shows that legacy analyzer (1GigE/10GigE) has current market share of 7% (average of PowerHawk Pro 6% and TravelHawk Pro 8%). It also states that EXFO is one of the top five players in this space with sales dominated by Europe and America region.

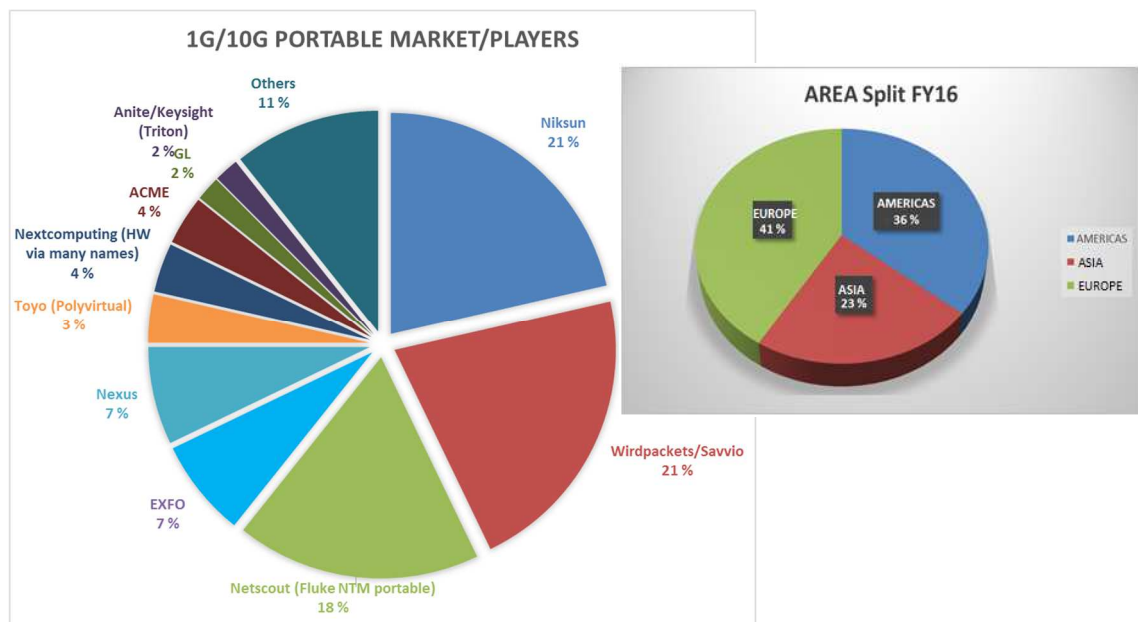


Figure 15: EXFO market share data - geographical sales split in portable wireless network troubleshooting tools

3.4 Current Business Strategy

EXFO's market is evolving considerably and it requires continuous strategic planning and innovative solutions to sustain and grow. Utmost important value for EXFO is customer satisfaction. Customers are the central part in any decision-making and strategy planning process. Considering current business growth strategy, there are four major focus objective. Those are as follows;

The information is gathered from EXFO's intranet, sales and marketing documentation (Lemonde, 2016) to define the growth strategies.

1. Transform into solution partner, trusted advisor to provide E2E solution.

This strategy means to provide full end-to-end solution portfolio, converge & virtualize IP services and make over 100 deployments worldwide for service assurance and analytics software.

Service assurance and analytics software is a probe-based systems targeted for medium to large network operators. It is E2E solution with fully integrated passive/active monitoring and infrastructure polling to assure service-level agreements. It is also real-time analytics for service experience visibility and unmatched network performance. And it monitors multi-play services with a single platform.

This strategy is planned because customers are seeking end-to-end solutions to enhance service quality and network performance. End-to-end solutions also delivers higher margin.

2. Increase wireless presence

This strategy means to provide multi-technology platforms, optical testing and automation solutions. It will focus on IMS, WebRTC large-scale emulation to test session boarder controllers, gateways and routers.

This strategy is planned because mobile network operators are investing significantly in wireless backhaul, optical-related solutions i.e. small cells, DAS and FTTA.

3. Expand and share the wallet with tier-1 network operators

This strategy is about expanding more towards tier-1 network operators with contract wins, key new product approvals and expanded account penetration. The key focus area of this strategy is to provide multi-service analyzers for SONET/SDN, 10M to 100GigE Ethernet rates; Comprehensive portfolio for wireless backhaul and front haul; Pioneered new standard for Ethernet testing. Currently EXFO serves about 80 of the top-100 network operators worldwide. As the clear No. 2 supplier in the portable telecom test market, EXFO has plenty of room for growth, the most advanced solutions to gain market share and strong brand equity in terms of excellence and execution. (Lemonde, 2016, 9-12)

This strategy is planned because about 20% of network operators account for 80% of total spending. Top-15 global operators account for highest share of capital spending.

4. Accelerate Penetration of data centre, cloud and web-scale operator markets

This strategy focuses on providing network virtualization, IoT solutions and data centre management solutions via API-based automation and rich analytics. This strategy also plans to maintain a firm control on costs; hence reducing operating expenses year-after-year. Another aspect of growth is EXFO's streamlined go-to-market approach, sharper R&D focus combined with leaner organization, contributes significantly on earnings leverages.

This strategy is planned because web-scale operators are spending at a rapid and significantly higher rate than network operators i.e. accelerating profitability by combining revenue growth with tight control on expenses. IoT is upcoming technology trend.

3.5 Case Company - SWOT Analysis

This section describes SWOT analysis performed for the case company taking into consideration its current business strategy defined in section 3.4. The process identifies internal strengths and weaknesses of the organization, and external opportunities and threats present in the market that it operates in. The results from PEST analysis (section 3.3.3) is also used to classify the opportunities and threats from political, economic, social and technological stand point.

Data is gathered from meetings and discussion with sales and R&D personnel. During meeting PEST analysis results and current business strategies were presented and discussed.

Strengths:

- Experienced business units and customized products to meet the market need.
- Organization has good operation efficiency and strives for customer satisfaction.
- The industry shows a strong diversification.
- Access to comparable industries is possible.
- Strong foothold in network troubleshooting tools, end-to-end solutions and optical testing solutions.
- In comparison to competitors (Astellia, Polystar, GL Communications), EXFO's legacy analyzer product line provides elite class performance, multi-technology support and scalable multi-probe solutions.

Weakness:

- Distributed and small business units.
- Not good enough solution to handle big subscriber level data i.e. lacks improved functionality in the product line to win changing market deals.
- Average distribution network.
- Adequate marketing strategies.

Opportunities:

- New venture towards real-time big subscriber data enablement with virtual experience probe.
- Roll out of 100GigE transmission networks and 100GigE optical upgrade cycle.

- Roll out of networks in big countries like China and India
- Telecom operators continued capital deployment into 4G and preparation for 5G and IoT.
- Government's appetite for supporting heavy investment in network upgrades e.g. 4G - 5G.
- Steady growth rates and profitability.
- Investment level at a constant increase.

Threats:

- Rapidly changing market.
- Substantial increase in subscriber/network data causing demand towards high performing solution and tools.
- Rising cost of raw materials and labour.
- Mobile data applications, high definition video streaming and higher-quality websites are fuelling the rapid growth in global broadband demand, which is putting a strain on network capacity.
- Mergers and acquisitions are becoming more common to support higher levels of investment.



Figure 16: Case Company SWOT Analysis considering current Business strategies

4 RESEARCH AND ANALYSIS

4.1 Research Overview

This part of the research is about constructing the “key indicator matrix” based on research findings. Key indicator matrix shall suggest the best possible combination of market trend, customer requirements, growth strategy, and organization process and team performance to be used by the case company to leverage mobile wireless legacy product line in a competitive market.

Primary source of data and sample size: There are four sets of data collection and analysis for four quadrants of key indicator matrix.

Market Penetration:

Face-to-face interview with three EXFO sales personnel provided input for

- Evaluation of current market trends of the current legacy products, results are available in section 3.3.4
- Evaluation of future market penetration based on technology and company demographic changes.
- Identification of target key customers for customer analysis research.

Customer Analysis:

Feedback from three target key customers using questionnaire forms provided input for

- Evaluation of how the company's product or service meets the customer requirements.

Strategic Excellence:

SWOT analysis results (refer section 3.5) provided input for

- Identification of growth strategies and opportunities.

Feedback from 10 personnel (R&D and Sales) provided priority order of best possible growth strategy that case company should follow.

Execution Excellence:

Feedback from 15 R&D personnel using questionnaire forms provided input for

- Evaluation of organization current process to provide quality product.

Face-to-face interview with R&D Director provided input for

- Performance Management to form a team and optimize it to perform best of its capabilities i.e. "Team Passion".

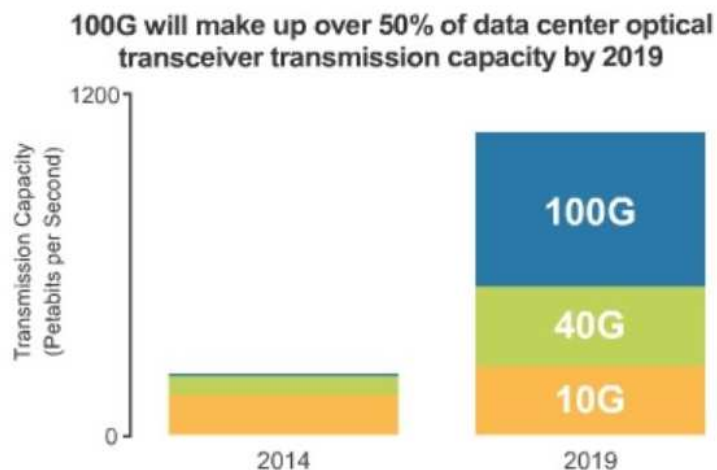
The final output will be to combine the four data sets into a key indicator matrix.

4.2 Key Findings

This section describes the key finding for each quadrant of key indicator matrix.

4.2.1 Market Penetration

This section focuses on evaluation of future market penetration based on technology and demographic changes. Figure 17 below is a mixture of charts representing how the EXFO's sales team forecast growth in optical transceivers that are tested using legacy analyser products. These charts predict a clear change in behaviour of the market: data loads of mobile networks is increasing due to constantly rising use of Internet data by many subscribers and the network vendors and manufactures are focusing more towards 100GigE data centres.



40G/100G optical transceiver market will be dominated by network equipment manufacturers (NEMs)

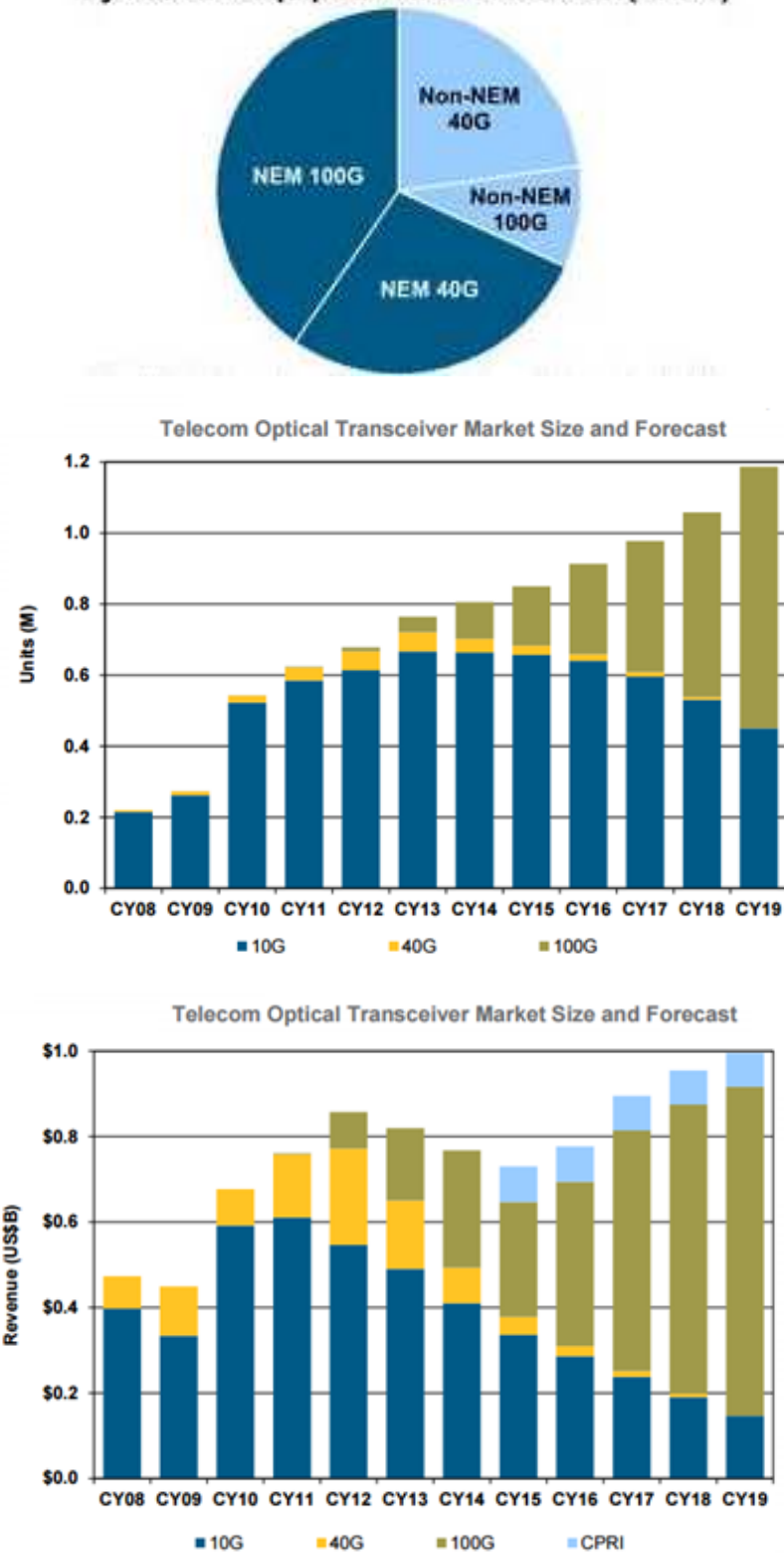


Figure 17: EXFO growth forecasts

Based on the forecast results, if EXFO invests on 100GigE data testing (capture, analysis and troubleshooting), there is a possibility that EXFO market share will grow from 7% to be doubled by calendar year 2019.

4.2.2 Customer Analysis

The customer analysis was conducted using a survey questionnaire (refer Appendix 2). The survey questions were formulated to provide feedback for current functionality of the legacy products and to indicate areas that are most important for product improvement based on market trends and geographical locations. The survey was conducted with the top three customers of EXFO legacy products.

Customer Feedback, the results in Figure 18 shows that the key customers are satisfied with the legacy products because of its **Functionality** and **Usability**.

Scale	Excellent = 5, Good = 4, Average = 3, Poor = 2, Terrible = 1			
		Customer 1	Customer 2	Customer 3
Functionality		5	4	4
Performance		4	3	3
Usability		4	4	3
Reliability and Portability		3	5	4



Figure 18: Customer feedback on legacy products

Functionality means network data capture, analysis, optimization and troubleshooting for technologies like 2G, 3G, LTE, IMS, PS Core, CS core and IP application data.

Performance means data capture and analysis is supported on multiple 1GigE and 10GigE Ethernet links, control plane and user plane data query performance.

Usability means very user-centric and interactive user interface showing logical connection between different network interfaces and subscriber data.

Reliability and Portability means it is possible to take legacy product to any customer environment to analyse and troubleshoot the network data i.e. decreases the average mean time to repair from days to hours. Data quality and results shown are reliable.

Improvement features based on market area, the results in Figure 19 shows the key customers would like the legacy or new product line to focus on 100GigE capture and analysis functionality and improvements in deep packet inspection (DPI) data query performance. The market area signifies mobile data functions and subscriber in use globally. Based on global market area trend, customer identified the need for new features.

Scale	Definitely = 4, Tentative Yes = 3, No = 2, Never = 1				
		Asia	Europe	America	
100G data rate		4	4	4	
Subscriber based KPI Analysis		2	3	3	
Performance increase		3	4	4	
Virtualized probe		3	3	4	
IoT support		2	3	3	

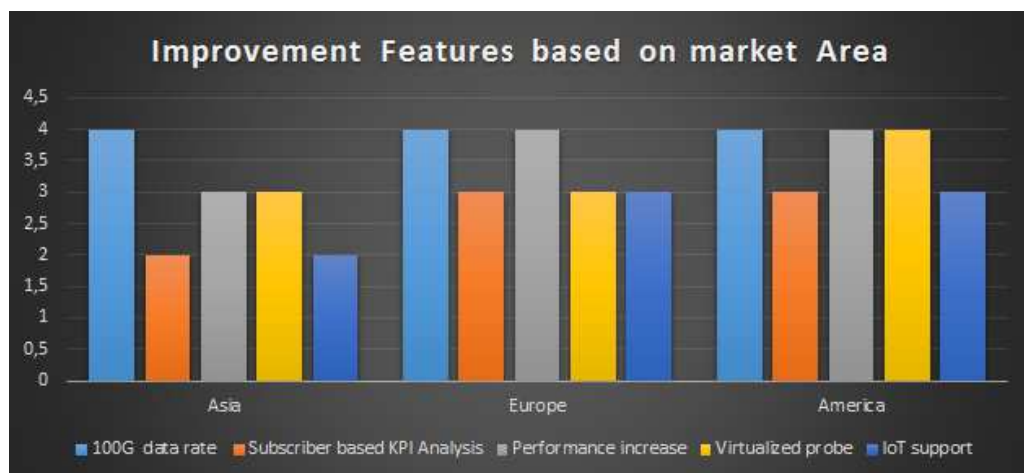


Figure 19: Improvement features based on market area

The gap analysis, current legacy product fulfils the customer requirement for technology support and user centric graphical representation. But due to market change to support increased demand of subscriber data the focus is more towards supporting 100GigE with higher capture, analysis and data query performance. Results also showed that American market classified virtualized probe with real-time enablement as a future demand.

4.2.3 Strategic Excellence

This section provides priority order of best possible growth strategy that case company should follow in order to increase the market share and have an exponential growth. The questionnaire used for this survey is described in Appendix 3. The internal survey results comprehends three categories for strategic excellence, refer below to Figure 20.

Executive Alignment, all executive members of the organization should agree and put effort on the same direction to turn strategic intentions into real business results. So according to internal survey results the organization executive alignment should be “*Improve Sales Efficiency*”. Business executive alignment should be “*Expand relationship with Communication Service Provider (CSP) executive*” because CSPs are deploying fibre everywhere and upgrading transmission rate to 100GigE to handle ongoing bandwidth. CSPs virtualization network functions to accelerate introduction of new services and reduce operating costs.

Business growth strategy should emphasis more towards “*expanding and sharing the wallet with tier-1 network operators*” with key new product approval having comprehensive portfolio. “*Penetration of data centre, could and web-scale operator markets*” is also long term effective strategy to generate revenue. (Refer section 3.4 for business growth strategy details).

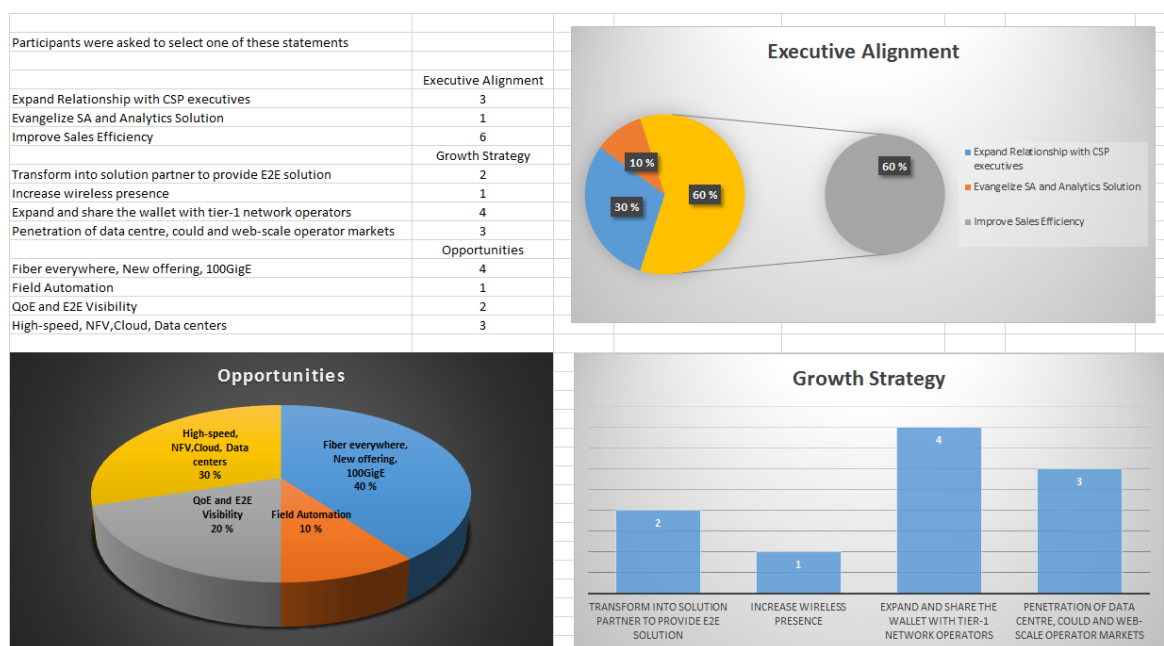


Figure 20: Strategic Excellence Survey Results

Opportunities that best suits the growth strategy are “*fiber everywhere, new offering, 100GigE*” and “*High-speed, NFV, Cloud, Data centers*”. There results highly comprises SWOT analysis opportunities identified in section 3.5

4.2.4 Execution Excellence

Execution excellence is evaluated using a survey questionnaire (refer Appendix 4) and interview with R&D director (refer Appendix 5). The survey questions are formulated to evaluate EXFO’s current product development process quality. The results focus more towards product development that meets the quality of the changing market trends. The interview questions are formulated to find the answers to common challenges in team performance management.

According to survey results shown in Figure 21, product development process quality, to sustain the current legacy product line is just average. So to provide quality products that will be well recognized in market by existing and new customer, case company should focus more towards strategies planned according to business vision. Never change strategy frequently but make iterations to it based on changing trends. And the process should focus on more customer centric delivery.

Scale	Excellent = 5, Good = 4, Average = 3, Poor = 2, Terrible = 1		
	Definitely = 4, Tentative Yes = 3, No = 2, Never = 1		
	R&D Group 1	R&D Group 2	R&D Group 3
Product development process quality	3	4	3
Strategy according to business vision	3	2	3
Customer centric delivery	3	3	3



Figure 21: Excellence evaluation results

Performance Management: “Team Building” to achieve successful execution

Few common challenges in Performance Management are:

1. Resource management:

- Inadequate team skill set, low motivation level and not a team player. Not able to cope up in multicultural working environment.
- **Solution 1:** Select the team members, which have balanced skill set to drive project to completion. Evaluate the strength and weakness of team members to optimize team's ability. Motivate by giving tasks that are challenging yet matches individual expertise. Promote discussion and communication with team members.

2. Leadership:

- Inadequately trained or inexperienced project manager. Manager is allocated based on availability not on the skill set.
- Sometimes new managers can micromanage projects and ask for every updates/details, which might affect the productivity of the team.
- Managers, not knowing when to ask for help or even say yes for everything. Ignoring team mistakes.
- **Solution 2:**
 - Select project manager that has management skills as well as technical expertise that matches the deliverables of the project. A leader who has a bird's eye view for project requirements, understands technical specification and knows how to give tasks to team member's abilities. Manager should have skills to evaluate the problems (if arises in project) and if necessary ask for help at the right time. They should also understand teams schedule and limitation so that work flows is adequate enough and is not making team to overwork.
 - Scope of the project should be well understood by the team members. Weekly status updates and progress are required which will help to see delays in advance.

3. Metrics:

- Not having a Metric for definition of done (team performance vs. business targets) or a system to approve and track changes.
- **Solution 3:** Metric for definition of done should be set based on the quality of the feature delivered, how well requirements are satisfied based on customer request (Proactive measures). Proper tool to trace any changes in the software hardware development

4. Stakeholder:

- No one in high level willing to take ownership of the project.
- **Solution 4:** Someone in high level should take full ownership of the project and its success and also correct setup for relevant information communication needed for stakeholder's decisions-making.

Strategy for achieving and sustaining the growth

- Execute solution 1 to 4 and follow-up performance metrics by measuring and monitoring leading indicator based on overall business strategy.
- Performance of individuals and departments is directly linked to the growth strategy and successful execution

4.3 Key Indicator Matrix with Results

This section formulates the “Key Indicator Matrix” based on the analysis and evaluation results from chapters 3 (current market state, current business strategy and case company SWOT analysis) and key findings, refer section 4.2.

The framework of the matrix is already defined in chapter 2.2 which is based on Ansoff Matrix. In that framework the results are added and now the “**Key indicator Matrix**” is as follows:

The 1st set of results: *To sustain in existing market with current mobile wireless legacy product line.*



Figure 22: Key Indicator Matrix- Result 1

The 2nd set of results: *To leverage mobile wireless legacy product line in a competitive market for creating new opportunities and exponential growth.*



Figure 23: Key Indicator Matrix- Result 2

Since by year 2021 there will be 9.1 billion mobile subscribers, 7.7 billion mobile broadband subscribers, 26 billion connected devices and 10X mobile data traffic growth (Lemonde, 2016, 7), the case company has already started investing on 100GigE testing solutions as stated by Figure 23: Key Indicator Matrix- Result 2, to increase market share and have exponential growth. Network Virtualization and 5G are future revenue generating ventures.

5 CONCLUSION AND RECOMMENDATION

This section discusses and summarizes answers to the principle research question and its five sub-level questions utilizing the key indicator matrix results. Research limitation and further development are also recommended.

5.1 Research Output

Sub-level questions:

1. *What is the current market trend of the legacy product?*

Legacy analyzer (1GigE/10GigE) has current market share of 7% (average of PowerHawk Pro 6% and TravelHawk Pro 8%). EXFO is one of the top five players in network troubleshooting solutions with sales dominated by Europe and America region. Two of EXFO's key competitors in their segment are Netscout Systems and Viavi Solutions Inc. The global market penetration of EXFO in telecommunication service industry is USD 2.2 Billion. To sustain the current market share aggressive marketing and sales promotion for the existing products is required. Also increase the usage by existing customers via loyalty schemes and added value to products.

The market is moving rapidly towards telecommunication optical transceivers with 100GigE capacity. Therefore, the sales forecasts that the case company should invest to support 100GigE data testing solution in legacy product line. This way there is a possibility that EXFO market share will grow from 7% to be doubled by calendar year 2019.

2. *How satisfied are customers with the legacy products and why?*

The customers are quite satisfied with legacy products because it provides network data capture, analysis, optimization and troubleshooting for technologies like 2G, 3G, LTE, IMS, PS Core, CS core and IP application data. It has good user-centric and interactive user interface showing logical connection between different network interfaces and subscriber data. Portability is also one aspect customer prefers as it decreases the average mean time to repair (MTR) from days to hours.

3. *What should be improved in current products to have exponential growth?*

To leverage in a competitive market and to create new opportunities, legacy product line should focus on supporting 100GigE with higher capture, analysis and data query performance. This is required because market is changing to support increased demand of subscriber data. For future, case company can have competitive edge with new venture towards real-time big subscriber data enablement with virtual experience probe.

The sustainable revenue coming from improved legacy product line will help company to invest in new innovative product and service assurance solutions focusing on 5G and IoT.

4. *How are the current growth strategies according to the market need?*

To sustain existing legacy product line in the existing market, the growth strategy should be “Transform into solution partner, trusted advisor to provide E2E solution” and “Increase wireless presence” because the case company has strong foothold in network troubleshooting tools and end-to-end testing solutions. In comparison to its competitors (Astellia, Polystar, GL Communications), the case company’s legacy analyzer product line provides elite class performance, multi-technology support and scalable multi-probe solutions.

To leverage new-improved product line in existing or new market the growth strategy should be “Expand and share the wallet with tier-1 network operators” and accelerate “Penetration of data centre, cloud and web-scale operator markets” because of roll out of 100GigE transmission networks and 100GigE optical upgrade cycle and constant increase in investment level for it. There are also new ventures towards real-time big subscriber data enablement with virtual experience probe. Opportunities in market that best suits the growth strategy are “fiber everywhere, new offering, 100GigE” and “High-speed, NFV, Cloud, Data centers”. Executive Alignment, that turn strategic intentions into real business results are “Improve Sales Efficiency” and “Expand relationship with Communication Service Provider (CSP) executive”, because CSPs are deploying fibre everywhere and upgrading transmission rate to 100GigE to handle ongoing

bandwidth. CSPs virtualization network functions to accelerate introduction of new services and reduce operating costs.

5. *What kind of process execution should be followed to provide improved quality products in the market?*

Current process execution to sustain current legacy product line is just average according to the R&D survey results. So, to provide quality products that will be well recognized in market by existing and new customers, the case company should focus more towards strategies planned according to business vision and make customer centric delivery.

Performance management i.e. team building to achieve successful process execution and growth should consider four critical points:

- Resource Management: Select the team members, which have balanced skill set to drive to project to completion. Motivate and promote discussion and communication within the team.
- Leadership: Select project manager that has management skills as well as technical expertise that matches the deliverables of the project. Scope of the project should be well understood by the team members.
- Metrics: Metric for definition of done should be set based on the quality of the feature delivered and how well requirements are satisfied based on customer request.
- Stakeholder: Someone in high level should take full ownership of the project and its success.

Principle Research Question:

How to leverage the legacy product line in the competitive market?

The market trend and customer analysis, growth strategies and process evaluation completed in this research provides case company with some key insights to its wireless division products and how to develop them. The key indicator matrix formulated with the answers for sub-level questions, has put a very solid foundation on further business strategic vision and market share growth.

Exponential revenue growth can be achieved by updating the legacy product line to support 100GigE capture and analysis functionality and improving deep packet inspection (DPI) and data query performance. The improved product line should be brought to the market well ahead of the competitors. This will strengthen the business growth strategy to expand towards tier-1 network operators as 20% of network operator's account for 80% of total spending. Top-15 global operators account for highest share of capital spending. This move can be reinforced further by providing customers oriented requirements fulfilment with committed team and improving sales efficiency by aggressive marketing and loyalty schemes.

5.2 Research Limitations and Future Recommendations

Research limitations are shortcoming or condition that are not fulfilled during the ongoing research work. Future recommendations are actions that can be taken to eliminate the shortcoming or lessen the conditions influence.

This research focused on identifying key external factors of the market trends and internal factors of the organization i.e. process, team performance etc. Business strategy evaluation was completed using SWOT analysis. It provided combined results for case company to define its growth and vision for upcoming fiscal year. But this research does not consider periodic iterative process and updates that are required to improve the company's growth and vision for long term.

This can be further improved by using Quantitative Strategy planning Matrix (QSPM) (refer section 2.1.4) which uses input from external and internal factor and SWOT analysis to construct relative attractiveness for each feasible alternative strategy thus providing objective basis for selection specific strategies. Relative attractiveness given to each strategy can be iterated based on changing external and internal factors. Integration of applicable external and internal factors in the decision making process improves the possibility for best final strategic decision for the organisation.

For advanced research work use of Quantitative Strategy planning Matrix (QSPM) is highly recommended.

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APPENDICES

Appendix 1. Interview questions for legacy Analyzer market share research.

Department: Sales

Question 1: What is the current market share of PowerHawk Pro?

Summarized answer: PowerHawk Pro has market share of 6% because it is a multiuser live network analyzer for line-rate data capture on 1 GigE and 10 GigE networks. It provides real-time troubleshooting functionality with live key performance indicators.

Question 2: What is the current market share of TravelHawk Pro?

Summarized answer: TravelHawk Pro has market share of 8% because it is a portable wireless network-troubleshooting tool for data capture and analysis on multiple 1G and 10G Ethernet links. It provides analysis of user plane and control plane data for post processing troubleshooting.

Question 3: How is the geographical sales split for legacy analyzers?

Summarized answer: PowerHawk Pro sales split ranges are as follows; Europe 30%-40%, Americas 25%-35%, Asia 18%-25%. TravelHawk Pro sales split ranges are as follows; Europe 35%-42%, Americas 28%-36%, Asia 15%-22%.

Question 4: What are the current technology changes in the existing market for legacy analyzers?

Summarized answer: Technology is moving towards virtual networks and upgrade from 4G to 5G. More emphasis is given by customers to have troubleshooting tool, which has performance of 100GigE capture and analysis.

Question 5: Who are the target customers for legacy analyzers?

Summarized answer: The target customers for legacy analyzers are *Customer 1*, *Customer 2*, *Customer 3*.

Appendix 2. Legacy Product line questionnaire to key customers

Product analysis based on Customer Feedback Survey for Legacy Analyzers

PLEASE SELECT THE BEST POSSIBLE ANSWER

Customer:

Department:

Customer feedback about current product

1. How do customer rate the product based on its functionality?

☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Terrible

2. How do customer rate the product based on its usability?

☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Terrible

3. How do you customer the product based on its performance?

☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Terrible

4. How do customer rate the product based on its reliability and portability?

☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Terrible

Improvement requirements that can boost the sales

1. Should the product be improved to support 100G data rate?

☐ Definitely ☐ Tentative Yes ☐ Yes ☐ Never

2. Should the product be improved to support subscriber based KPI analysis?

☐ Definitely ☐ Tentative Yes ☐ Yes ☐ Never

3. Should the product increase the performance by 10%?

☐ Definitely ☐ Tentative Yes ☐ Yes ☐ Never

4. Should the product support IOT?

☐ Definitely ☐ Tentative Yes ☐ Yes ☐ Never

THANK YOU!

Appendix 3. Strategic Excellence Survey questionnaire

Growth Strategy Survey for Legacy Analyzers

PLEASE SELECT THE BEST POSSIBLE ANSWER

Department:

Growth Strategy Evaluation

1. Where the focus should be in executive alignment?

- ☐ Expand Relationship with CSP executives
- ☐ Evangelize SA and Analytics Solution
- ☐ Improve Sales Efficiency

2. Where the focus should be in growth strategy?

- ☐ Transform into Solution partner to provide E2E solution
- ☐ Increase Wireless Presence
- ☐ Expand and share the wallet with tier-1 network operators
- ☐ Penetration of data center, cloud and web-scale operator markets

3. Where the focus should be in opportunities?

- ☐ Fiber everywhere, New offering, 100GigE
- ☐ Field Automation
- ☐ QoE and E2E Visibility
- ☐ High-Speed,NFV,Cloud,Data centers

THANK YOU!

Appendix 4. Executive Excellence Survey Questionnaire

PLEASE SELECT THE BEST POSSIBLE ANSWER

Group:

Execution Evaluation

1. How is current product development process quality?

[To sustain the current product line]

☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Terrible

2. Are the execution strategy according to the business vision?

☐ Definitely ☐ Tentative Yes ☐ No ☐ Never

3. Does the process focus on customer centric delivery?

☐ Definitely ☐ Tentative Yes ☐ No ☐ Never

THANK YOU!

Appendix 5. Interview questions for Performance Management

Face-to-face interview with R&D Director, answers highlights the main points addressed during the interview.

Question 1: What are the common challenges that are faced during team building?

Answer: The main challenges faced during the team building are

- Resource management i.e. selecting the team with best competences.
- Leadership i.e. selecting project manager who is driven and can deliver project deliverables.
- In adequate definition of done process
- Stakeholders responsibility

Question 2: What kind of qualities should be recognized in the project manager?

Answer: Selected project manager should have both skill set, management and technical. He/she should have the ability to look at the project requirements from team as well as customer point of view. The project and team schedule should be well understood. He/she should do weekly status updates and progress are which will help to see delays in advance.

Question 3: Why is definition of done so important?

Answer: definition of done is proactive measure to check the feature deliverable before the release and review phase for the best software quality with excellent performance delivery.

Question 4: What other factors affect the performance management?

Answer: Other factors that might affect the performance management are

- Definition of project scope: Frequent change is project scope. Not consistent deliverables.
- Schedule and effort estimates: Not flexible schedule of the project and over optimistic effort estimates from team members might delay or completely ruin the project timeline and future roadmap.

Question 5: What kind of role stakeholders have in successful execution of project?

Answer: The roles of stakeholders are to take full ownership of the project deliverables and take corrective and accurate measure that helps in business decision-making.

Question 6: How is the team competence measured?

Answer: Team competence is measured based on quality of the deliverables, time taken to complete it, risk or delay caused by the resources during the project execution, deployment and maintenance capabilities. All these are measured during the execution phase as well as during maintenance phase of the product. Lesson learned meetings after completion of every project are highly recommended.