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Developing a Balanced Scorecard for Porto Technical Centre - YAZAKI

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Dedicated to the loving memory of Daniela Martins

1986-2010

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"Not everything that can be counted counts,
and not everything that counts can be counted."

Albert Einstein

ABSTRACT

In a highly competitive and fast paced business environment, where intangible assets play an increased role in success, strategy execution and performance management are the top challenges executives face. The Balanced Scorecard is a structured business performance measurement system that goes beyond lagging indicators such as basic financial metrics to measures that derive future direction and success, while aligning the organisation around strategy and making strategy everyone's job.

The aim of this project is the development of a Balanced Scorecard for Porto Technical Centre, the European shared services centre of YAZAKI, the world's largest producer of wiring harnesses for the automotive industry. This study intends to contribute towards a clear understanding of the journey an organisation undertakes while developing its Scorecard. This management tool has not been widely explored in this field, and its development has been hampered by the industry complexity.

The project comprised the entire development process of the Balanced Scorecard, since the definition of the mission, vision, values and strategy, to the development of the objectives, measures and their cause-and-effect relationships, targets and initiatives for each of the scorecard perspectives. The work performed was the first step in developing a comprehensive Scorecard for Porto Technical Centre, from which all departmental, and ultimately personal scorecards, will be aligned. Additionally, the case study established the foundations for a successful implementation and further cascading of the Balanced Scorecard throughout the organisation, bearing in mind its dynamic nature, and that performance measures should be reviewed periodically to ensure they continue to reflect the strategy and the issues of importance to success.

Keywords: performance measurement; strategy execution; Balanced Scorecard; case study; automotive industry.

RESUMO

Num ambiente de negócios altamente competitivo, onde os ativos intangíveis desempenham um papel crescente no sucesso, a execução da estratégia e a gestão de desempenho estão no topo dos desafios enfrentados pelos executivos dos dias de hoje. O Balanced Scorecard é um sistema de medição de desempenho estruturado que vai além dos básicos indicadores financeiros, que dão informação acerca da performance passada, para as medidas que indicam direção futura e conduzem ao sucesso, alinhando a organização em torno da estratégia.

O objetivo deste projeto é o desenvolvimento de um Balanced Scorecard para o Porto Technical Centre, o centro europeu de serviços partilhados da YAZAKI, o maior produtor mundial de cablagens para a indústria automóvel. Além disso, este estudo pretende contribuir para a clara compreensão do processo de desenvolvimento de um Balanced Scorecard numa organização, recorrendo à aplicação empírica numa indústria onde o Balanced Scorecard não foi amplamente explorado, e onde o seu desenvolvimento é dificultado pela complexidade da mesma.

O projeto compreende o processo de desenvolvimento do Balanced Scorecard desde a definição da missão, visão, valores e estratégia, até ao desenvolvimento dos objetivos, medidas e suas relações de causa e efeito, metas e iniciativas para cada uma das quatro perspetivas do Balanced Scorecard. O trabalho realizado foi o primeiro passo no desenvolvimento de um Scorecard abrangente para o Porto Technical Centre, a partir do qual todos os scorecards departamentais e, finalmente, pessoais, estarão alinhados. O estudo de caso estabeleceu ainda as bases para uma implementação bem sucedida, assim como para o desenvolvimento do Balanced Scorecard "em cascata" por toda a organização. Tendo em conta a natureza dinâmica da ferramenta, as medidas de desempenho devem ser revistas periodicamente para garantir que continuam a refletir a estratégia e as questões de importância para o sucesso.

Palavras-chave: medição do desempenho; estratégia; Balanced Scorecard; estudo de caso; indústria automóvel.

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LIST OF ABBREVIATIONS

ABC	Activity Based Costing
ACAP	Associação Automóvel de Portugal
AEP	Associação Empresarial de Portugal
AFIA	Associação de Fabricantes para a Indústria Automóvel
BIP	Business Improvement Processes
BIT	Business Improvement Tools
BOS	Business Operating System
BSC	Balanced Scorecard
CAD	Computer-aided Design
CAE	Código de Actividade Económica
CAE	Computer-aided engineering
CFO	Chief Financial Officer
COMBU	Component Business Unit
CPI	Consumer Price Index
CPS	Collaborative Project Scorecard
CRM	Customer Relationship Management
CSC	Customer Service Centre
CV	*Curriculum Vitae*
EBIT	Earnings Before Interest and Taxes
EDS	Electric Distribution Systems
EIBU	Electronic Instrument Business Unit
ELV	End Life Vehicle
ESD	External Services Development

ETA	Estimated Time Acceptance / Arrival
ETD	Estimated Time Delivery
EV	Electric Vehicle
EVA	Economic Value Added
GCT	Global Costing Tool
GDP	Gross Domestic Product
G/M	Gross Margin
GQRS-C	Global Quality Requirement Supplier
HEV	Hybrid Electric Vehicle
HR	Human Resources
IFT	Ideas From Team
IMDS	International Material Datasheet
IT	Information Technology
JB	Jig Board
JLR	Jaguar Land Rover
KSF	Key Success Factor
KPI	Key Performance Indicator
MDS	Material Datasheet
MHT	Man Hour Tracking
MIT	Margin Improvement Tool
NSD	New Service Development
NYS	New YAZAKI System
OBS	Operating Business Sector
OEM	Original Equipment Manufacturer

PM	Performance Measurement
PMP	Performance Management Process
PPM	Parts per Million
PPSS	Permanent Power Supply System
PSA	Peugeot Citroën
PTC	Porto Technical Centre
QCC	Quality Control Circle
QCD	Quality, Cost & Delivery
QCDE	Quality, Cost, Delivery & Environment
RFQ	Request For Quotation
ROI	Return On Investment
R&D	Research & Development
SG&A	Selling, General and Administrative Expenses
SME	Small and medium enterprise
STD	Standard
TDC	Technical Documentation Centre
VSM	Value Stream Map
WHE	Wire Harness Engineering
YC	YAZAKI Corporation
YDB	YAZAKI Database
YEL	YAZAKI Europe Limited
YSE	YAZAKI Saltano de Ovar Produtos Eléctricos, Lda.
YSP	YAZAKI Saltano de Portugal
YTD	Year-to-date

I. INTRODUCTION

This section presents the objective and fundament of this work, gives an insight on the performance management systems subject matter, in particular the Balanced Scorecard, and explains the structure of the work developed.

The project aims to define performance measures for the service provided by Porto Technical Centre, the services centre of Yazaki Saltano de Ovar, Produtos Eléctricos, Lda. The performance management tool proposed by the organisation was the Balanced Scorecard (from now on BSC).

1.1 Background

Performance measurement, and more recently performance management, is a subject that has been in the spotlight of organisations' management in the last decades. According to Kaplan and Norton (2004b) between 70 and 90% of organisations fail to execute their strategies. Performance measurement plays a key role in translating an organisation's strategy into desired behaviours and results (Liu & Rong, 2009 citing Van der Stede, Chow & Lin, 2006). "Performance measures drive accountability, visibility, and transparency; inspire and motivate all employees; provide direction for the organisation; and encourage alignment from top to bottom" (Tyagi & Gupta, 2008). The primary challenge managers face is the gap between strategy and execution. Strategy, initiatives, resources and risk are addressed at the senior executive level of an organisation, but they are not tied to day-to-day activities. As a result, organisations are able to measure performance, but are unable to manage it (Tyagi & Gupta, 2008).

Over the past two decades, the BSC has become a widely advocated management tool for strategy operationalization and performance management, commonly associated with "best practices". A recent Bain & Company survey of more than eleven thousand companies on five continents found that the BSC was used by 47% of responding organisations, a higher adoption rate than some other well-known management tools like Supply Chain Management (39%), Customer Segmentation (42%) and Total Quality Management (38%) (Rigby, 2011). According to Kaplan and

Norton, the developers of the BSC, "the name reflected the balance between financial and non-financial measures, between lagging and leading indicators, and between external and internal performance perspectives" (Kaplan & Norton, 1996a).

The framework provides an enhancement to traditional management control systems by looking beyond financial measures to incorporate non-financial measures. The BSC suggests we see the organisation from four perspectives: to the traditional financial perspective, Kaplan and Norton (1992) added the client, the internal process, and the learning and growth perspectives. Learning & Growth constitute the essential foundation for success in today's knowledge age, measuring and managing the performance of the organisation's key Internal Business Processes, as well as the focus on Customer's needs and satisfaction will ultimately lead to improved Financial results.

Furthermore, the BSC encompasses intangible assets' value creation that has direct impact on revenue and profit, through chains of cause-and-effect relationships – Strategy Maps[1] (Kaplan & Norton, 2001a citing Huselid, 1995). Research has indicated that upwards 75% of value in today's organisation is derived from intangible assets (Niven, 2002). This is dramatically justified by the increasing role of services in today's economy, as even productive companies are adding value to their products and achieving competitive advantages through services. In the automotive industry the increased importance of services has even led to a shift in profit generation, as many automakers are generating more profit from services than they are from their core vehicle business (Cucuzza & Frezell, 2003).

The implementation of the BSC and its cascading throughout the entire organisation will allow each department, team, and ultimately each individual to understand and be aware of their role and contribution to achieve the objectives of the organisation. Moreover, for successful performance management the BSC is not complete with its implementation, it has to be updated continuously to follow an organisation's strategy evolution and adapt to external environmental changes.

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[1] Strategy Maps are defined by Kaplan & Norton as a visual framework of the cause-and-effect relationships among the components of an organisation's strategy, and it is used to integrate the four perspectives of the BSC – financial, customer, internal business processes and learning and growth (Kaplan & Norton, 2004b).

The use of the BSC in the automotive industry has been limited compared with other industries (Cucuzza & Frezell, 2003). This dissertation aims to be a contribution to the literature in the application of the BSC in a specific area of the automotive industry, the engineering services.

1.2 Purpose and Motivations of the Project

Developing a BSC for the Technical Centre (Porto Technical Centre – PTC) of Yazaki Saltano de Ovar was a challenge proposed by the manager of Costing & Pricing, Helena Dias. In 2009 PTC's managers had started the exercise of creating balanced scorecards for each of the fourteen departments of the service centre. However, most managers had little knowledge about the tool, and given the complexity of the subject the fruits resulting from this effort were scarce. A new approach was then undertaken: to first develop a comprehensive Balanced Scorecard for PTC, to which all departmental scorecards would be aligned.

The challenge of developing a management tool as complex as the BSC in a service environment was crucial while choosing the master thesis project, since it would require a deep knowledge of the organisation and its strategic management. Thus, the research could involve two subjects of great interest, the influence of the Japanese culture in work practices and procedures, as well as the lean management tools employed in everyday activities. Though these subjects have not been addressed specifically on this project, they were experienced by the author of the study during the contact with the organisation, the people and their working methods and day-to-day activities. The curiosity to understand the complex relationships between the various actors in the automotive industry value chain also played a major incentive.

The study also aims to reduce the identified gap in the development of the Balanced Scorecard management framework in the specific area of engineering services in the subsector of automotive components, a major export sector in Portugal.

This thesis only encompasses the development of the Balanced Scorecard and not its implementation, due to the time constraints[2]. The aim is to define the key performance measures that translate PTC's strategy and vision, as well as the targets and initiatives that should be defined so that PTC can follow its strategy and achieve its vision. The future implementation of the management system will allow realizing the vision and strategy of PTC through the objectives and performance indicators chosen, as well as manage intangible assets such as employee knowledge and customer relationships, key elements of value creation in today's economy.

1.3 Structure of the Dissertation

This document is organized into eight chapters. In chapter I the problematic under study was introduced in terms of theoretical background, research gap and its purpose, and the justification for choosing this project was presented. The study begins with a brief analysis of the automotive industry and the sub sector of automotive components (chapter II). The third chapter characterizes the YAZAKI Group and Porto Technical Centre (PTC), the case studied in this work. Chapter IV presents the literature review undertaken on performance management systems, in particular the Balanced Scorecard. In chapter V the methodological approach for this study is addressed, clarifying the research methods and choices made in the project. The process of the development of a Balanced Scorecard for PTC is explained in chapter VI. Chapter VII presents the main findings of the project and concludes the dissertation with the limitations of this study and suggestions for future work.

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[2] The Project was only developed within the organisation during the period from October 2010 to June 2011 (8 months) and by a team working on it in part-time.

II. THE SUBSECTOR OF COMPONENTS FOR THE AUTOMOTIVE INDUSTRY

Yazaki Saltano de Ovar Produtos Eléctricos, Ltd. is embedded on the subsector of components for automobiles, more specifically, on the manufacturing of other wires and electric and electronic cables (CAE – 23720).

The automotive industry is totally globalized and has a very complex value chain, both organisationally and technologically, and is seen as a barometer of the global economy.

In recent years, there has been a process of mergers, acquisitions and strategic alliances that have been intended to increase the dimension of companies, to ensure its global presence as well as the ability to leverage synergies and economies of scale, to reduce costs and increase profitability (ACAP, 2010).

The automotive industry in Portugal represents a significant portion of GDP[3], national exportation and has a big social impact. It represents a universe of 33,000 companies, 2.7% of total employment in Portugal (a total of 138,000 direct jobs), and achieves a turnover of 24 billion Euros (15% of GDP). The production of motor vehicles and their components is a major export sector in Portugal representing, in 2008, 14.4% of total products exported[4].

The automotive components sector[5] consists of about 180 to 200 companies (mostly SMEs[6]), with areas of activity from the production of engines or engine parts to manufacture of moulds and tools. It represents 2.2% of GDP, with a turnover close to 4.8 billion Euros, and employs 40,000 workers directly. It is the second national export (about 3.98 billion Euros)[7].

This chapter intended to enhance the importance of the subsector, where PTC operates, for the Portuguese economy. The next chapter characterizes the organisation, as to allow a better understanding of the context in which the BSC is to be implemented.

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[3] Gross Domestic Product
[4] 2008 data from ACAP – Associação Automóvel de Portugal.
[5] See Annex I - The Subsector of components for the Automotive Industry
[6] Small and medium enterprises
[7] 2009 data from AFIA – Associação de Fabricantes para a Indústria Automóvel.

III. THE YAZAKI GROUP AND PORTO TECHNICAL CENTRE[8]

3.1 YAZAKI Corporation and YAZAKI Europe

YAZAKI was founded in 1929, when Sadami Yazaki began selling wiring harnesses for automobiles in Japan. After important changes in governmental regulations in 1935, Japanese companies were allowed to start domestic automotive production, which allowed Mr. Yazaki to expand his business greatly. The first plant opened in 1938, and in 1941, YAZAKI Electric Wire Industrial Co. Ltd. was established with about 70 employees. In 1949, Sadami Yazaki made an important strategic decision: to focus on the production of automotive wiring harnesses, a ground-breaking decision which resulted in today's global leadership.

Today, YAZAKI is located in 39 countries all around the world[9], and this fact shows the company's concern for being close to customers – "Globally there, wherever you are" is one of the company's mottos. The YAZAKI Group is also strongly committed to the environment since 1974, when it created the first cooling system powered by solar energy. Currently, the Environment & Energy Equipment Sector is the second largest business area of the company (representing 17% of total product sales), offering several products that support the supply and utilization of the various energy sources, such as gas, electricity, and solar heat. Electricity transmission cables, gas security systems, air conditioning equipment, and solar powered systems are some of these products. Regarding the Automotive Sector, YAZAKI Corporation presents itself as a Total Manufacturing Supplier, from R&D to final assembly and delivery worldwide. YAZAKI holds a leading position in the worldwide wiring harness market. Furthermore, its product line includes fibre optics, display and clock modules, power centres, electronics, combination switches, connectors, terminals and high voltage cables and components[10].

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[8] See Appendix I – YAZAKI and PTC – Company Identification
[9] Employing more than 179,000 people.
[10] *In* www.yazaki-europe.com

Figure 1 shows the structure of the YAZAKI Group, which consists of research and development centres, manufacturing sites, sales centres and local administration centres (Yazaki Europe Ltd., for example). PTC is embedded in the "YAZAKI Group Research and Development Centres" cluster, which provides services to plants worldwide, and supports all the YAZAKIs around the world in the provision of services and products to automotive customers, the Original Equipment Manufacturers (OEM).
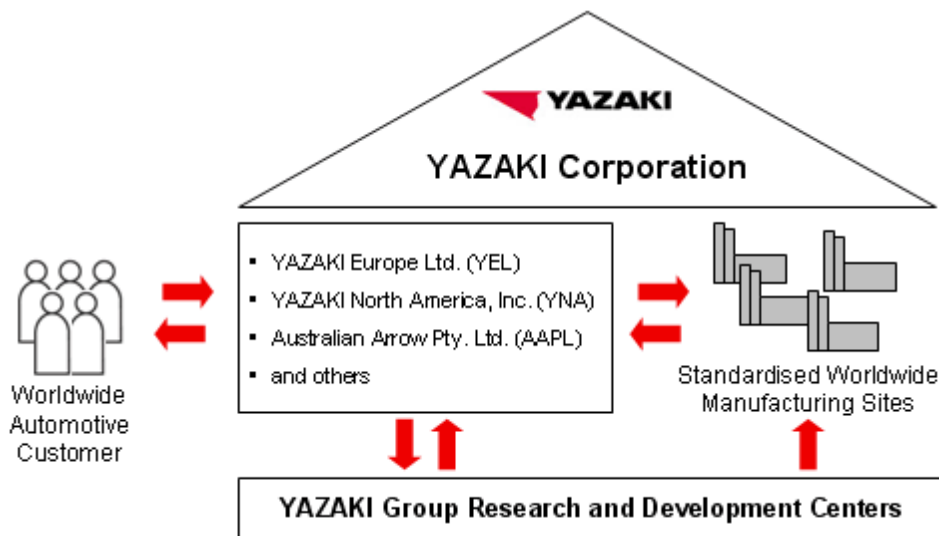
FIGURE 1 - The YAZAKI Group Structure
Source: www.yazaki-europe.com

The YAZAKI Group has also been expanding into new business sectors, such as the Nursing Care Business, Recycling Business and Agribusiness.

YAZAKI Europe (YEL) is established in 1980 with the opening of the first European sales office located in the UK, and in 1986 the first European production plant opened in Portugal. It is now present in 18 countries, with 16 Customer Service Centres (CSC), 15 plants and 2 Development Offices, employing about 50,000 people.

3.2 YAZAKI in Portugal

YAZAKI Saltano de Portugal (YSP) arises in 1986 in Serzedo, Vila Nova de Gaia, with the establishment of the first YAZAKI plant in the country, in Ovar. YAZAKI Saltano de Ovar Produtos Eléctricos, Lda. (YSE) was then established as an extension of the YSP, which became the company's headquarters in Portugal, with the main office still located in Gaia.

On figure 2, one can see how the YSE falls within the YAZAKI Group, and its three major areas: Components Manufacturing (COMBU – Component Business Unit), Wire Harness Manufacturing (EIBU – Electronic Instrument Business Unit and Porto Technical Centre (PTC)[11].
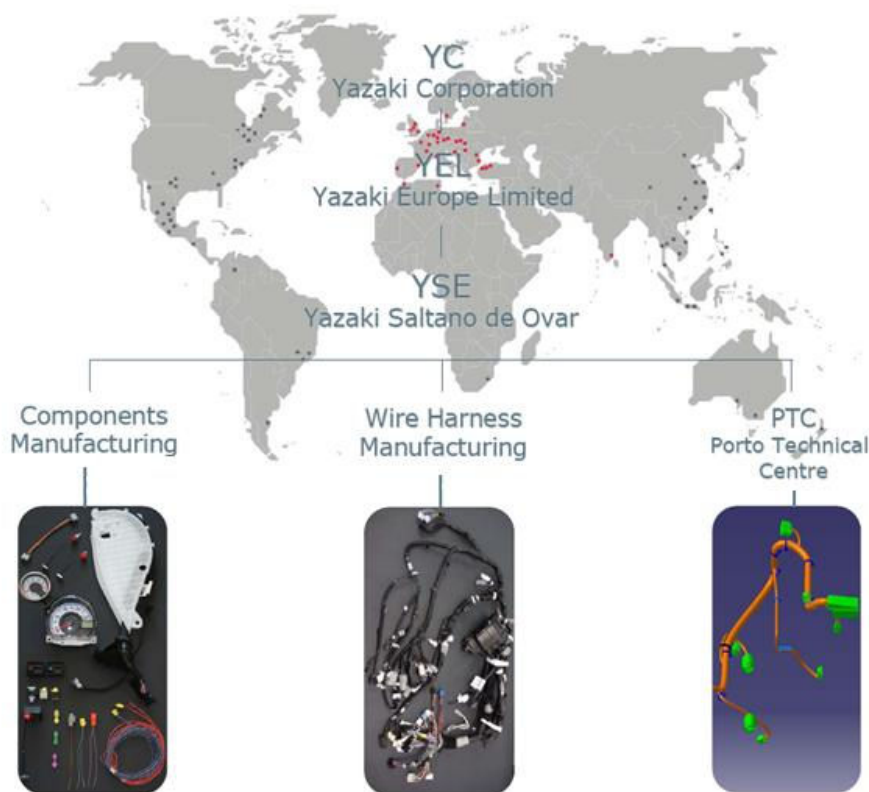
FIGURE 2 - YAZAKI Saltano de Ovar and its three areas: components, Wire Harness and Engineering
Source: Welcome to PTC - Presentation Slides (2010)

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[11] Where the BSC is to be implemented.

3.3 Porto Technical Centre (PTC)

The services centre PTC was only established in 2001, although some of the services it now offers have started to become available still at the office of YSP in Vila Nova de Gaia. In February 2010 PTC is transferred to a new building in Ovar, closely located to the laboratory and the factory. This new building was built specifically to receive PTC and accommodate its more than 300 employees in a large open space, and was officially inaugurated by the Chairman of YAZAKI Corporation, Mr. Shinji Yazaki (son of the founder) on October 1st 2010.

PTC centralizes some of the activities of the European R&D structure to minimize costs. The decision to create the Porto Technical Centre in Portugal was essentially because of the existence of the Yazaki Saltano de Portugal activities, Manufacturing Design and the Laboratory, which already worked for all European sites, and also because of the 15 years know-how in wire harness production.

Currently, PTC consists of a group of people with different skills and experiences, framed structurally in different departments, being its main objective the supply and the availability of a set of services and activities to customers, mostly (about 95%) on the EDS (Electric Distribution Systems) scope. PTC's Customers[12] are essentially the YAZAKI Customer Service Centres (CSC), normally located, as close as possible, to the main OEM's automobile plants and the YAZAKI manufacturing plants. PTC is defined within the YAZAKI Group as a "non-profit organisation"[13], as it exists to support CSC's (like a back-office), so that they can provide YAZAKI services to the OEM's. PTC's competition is mainly internal (within YAZAKI), the manufacturing plants in some services, and the CSC's who want to regain the engineering services.

Presently, PTC is headed by Eng. Jorge Fontes and consists of 14 departments[14], each of these with a manager[15], and a group of team leaders and employees associated:

- Data Management;

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[12] See Annex III – PTC's Customers
[13] According to Eng. Jorge Fontes, PTC General Manager.
[14] See Appendix II – PTC's Departments and Services
[15] See Annex II – PTC's Organisational Chart

- Wire Harness Engineering (WHE);

- CAD Systems;

- Business Improvement Tools (BIT);

- Digital Factory / Jig Board (JB) Layout;

- Component Design;

- Manufacturing Engineering;

- Operational Support;

- Sales & Marketing;

- Costing & Pricing;

- Crimping Centre;

- Global Service;

- Checker Fixture;

- Laboratory.

To summarize, PTC performs studies on product and manufacturing engineering, prepares all wire harness (EDS), components (COMBU) and speedometer systems, gathers and provides information on various technical aspects of the automotive industry, and performs tests and laboratory trials, crimping activities[16], and produces its own crimping tools[17].

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[16] See Appendix III – PTC Key Process Map (Flowchart)
[17] This is the only area that is not service, and due to the high prices of the crimping tools, this product accounts for one third of the sales volume of PTC.

IV. LITERATURE REVIEW

This chapter covers the theoretical context of the study, analysing the state of the art of organisational performance measurement and management systems. The research focuses on the Balanced Scorecard management tool, its application in services, and in the automotive industry in particular.

4.1 Performance Measurement / Management Systems

"When you can measure what you are speaking about, and express it in numbers, you know something about it… [otherwise] your knowledge is of a meagre and unsatisfactory kind."

Lord Kelvin, 1824-1907

Neely, Gregory & Platts (1995) define performance measurement as "the process of quantifying action, where measurement is the process of quantification and actions leads to performance". The same authors state that a performance measurement system can be defined as "the set of metrics used to quantify both the efficiency and effectiveness of actions".

Performance measurement and, in more recent years, performance management and its link to strategy, is a topic that has been extensively explored and subject to discussion for many years. Several frameworks, criteria and principles of performance measurement system design have emerged in the literature over the years.

Peter Drucker suggested that few factors are as important to the performance of an organisation as measurement; and performance measurement is increasingly crucial to survive in today's complex and competitive marketplace. The traditional method of measurement has been financial. However, by the early 1980s, the financial measures once monitored started to be viewed as no longer appropriate to be the sole criteria for accessing organisational success, as they "provide an historical view, giving little indication of future performance" (Bruns, 1998). Other criticisms to the singular use of financial measures of performance include the fact they can't capture today's

organisational value creating activities (the so called intangible assets), the "focus on short-term gains at the expense of long-term value creation [such as research and development] may lead to sub-optimization of the organisation's resources" (Stenzel, 2007) and the fact that this type of measure is not relevant in many levels of the organisation. Attention was driven to how organisations can replace their traditionally cost based measurement systems with ones that reflect their current objectives and environment.

In 1954, Drucker already argued that a "balanced" measurement system should be developed[18], however, only later, frameworks balancing financial and non-financial measures started to emerge. The Performance Measurement Matrix (Keegan, Eiler & Jones, 1989), the Balanced Scorecard (Kaplan & Norton, 1992), and the Performance Prism (Kennerley & Neely, 2000) are some of the multidimensional and balanced models created to support organisational development.

More recently, academic communities and consultants suggest that ineffective management of the evolution of measurement systems is causing a "new measurement crisis". Performance measurement systems need to be dynamic, and measures should effectively change over time to cope with changes in internal and external environment, reflect the strategic direction, and ensure organisational success. Wisner and Fawcett (1991) acknowledge the need for performance measures to be reviewed and changed to ensure the measures remain relevant (Kennerley & Neely, 2002).

The Balanced Scorecard is perhaps the best known performance management framework. Kaplan and Norton articles on their framework continue to be the most frequently cited over the years. Table 1 shows the on-going dominance of the Balanced Scorecard on the field of performance measurement.

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[18] "Market standing, innovation, productivity, physical and financial resources, profitability, manager performance and development, worker performance and attitude, and responsibility" are appropriate performance criteria says Drucker in his 1954 publication The Practice of Management (Drucker, 1954).

Year	Most Cited	Second most cited	Third most cited	Fourth most cited	Fifth most cited
2004	Kaplan and Norton (1992)	Kaplan and Norton (1996)	Kaplan and Norton (1996a, b)	Neely *et al.* (1995)	Charnes *et al.* (1978)
2003	Kaplan and Norton (1992)	Kaplan and Norton (1996a, b)	Kaplan (2000)	Marshall (2000)	Neely *et al.* (1995)
2002	Kaplan and Norton (1992)	Kaplan and Norton (1996a, b)	Lynch and Cross (1991)	Kaplan and Norton (1996a, b)	Johnson (1997)
2001	Kaplan and Norton (1992)	Kaplan and Norton (1996a, b)	Kaplan and Norton (1996a, b)	Charnes *et al.* (1978)	Dixon *et al.* (1990)
2000	Kaplan and Norton (1992)	Charnes *et al.* (1978)	Kaplan and Norton (1996a, b)	Dixon *et al.* (1990)	Eccles (1991)
1999	Kaplan and Norton (1992)	Kaplan and Norton (1996a, b)	Charnes *et al.* (1978)	Neely *et al.* (1995)	Kaplan and Norton (1996a, b)
1998	Kaplan and Norton (1992)	Dixon *et al.* (1990)	Kaplan and Norton (1993)	Porter (1985)	Neely *et al.* (1995)
1997	Charnes *et al.* (1978)	Kaplan and Norton (1992)	Kaplan (1990)	Dixon *et al.* (1990)	Eccles (1991)
1996	Palmer (1996)	Kaplan and Norton (1992)	Dixon *et al.* (1990)	Plamer (1985)	Charnes *et al.* (1978)
1995	Kaplan and Norton (1992)	Parasuraman (1985)	Charnes *et al.* (1978)	Banker *et al.* (1984)	Kaplan (1983)

TABLE 1 - Citation frequencies annual count
Source: Neely (2005)

According to the last annual survey of management tools and trends undertaken by Bain & Company[19], the Balanced Scorecard was used by 47% of the companies, with a satisfaction level of 3,83 (in a scale of 1 to 5).

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[19] The latest questionnaire was conducted in January 2011 and reflects behaviour in 2010. With this 13th survey, Bain & Company now has a database of more than 11,000 respondents from companies in a broad range of industries and can systematically trace the effectiveness of 25 management tools over the years.
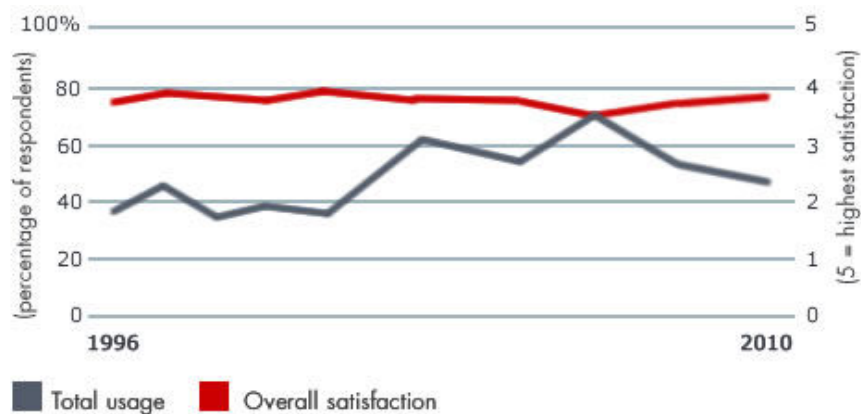
FIGURE 3 - Total usage and overall satisfaction with the Balanced Scorecard from 1996 to 2010
Source: www.bain.com

Figure 3 represents the usage and satisfaction of the organisations included in the study with the tool, over the years. Even though the overall satisfaction rating has remained stable, the usage of the Balanced Scorecard framework has been slightly declining in recent years. On the Management & Tools Trends 2011 survey report, Bain & Company doesn't provide a justification for this decline, but projects an increase in the Balance Scorecard use in 2011 of 16% (47% actual 2010 usage vs. 63% projected 2011 usage).

4.2 The Balanced Scorecard

The Balanced Scorecard was developed by Robert Kaplan, Professor of Accounting at the Harvard Business School, and the consultant David Norton. The origins of the concept can be traced back to many sources, namely the 'Tableau de Bord'[20], a management tool introduced in France in the 1930s, and a project developed in General Electric in the 1950's[21].

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[20] The 'Tableau de Bord' was described as a 'dashboard' used by managers to monitor the operational performance of their organisations (Bessire and Backer, 2005).
[21] The project team recommended that divisional performance should be measured by one financial and seven non-financial metrics: profitability, market share, productivity, product leadership, public responsibility, personnel development, employee attitudes, and balance between short-range and long-range objectives (Kaplan, 2010).

In 1992, Kaplan and Norton introduced the Balanced Scorecard in a Harvard Business Review article based on a multi-company research project to study performance measurement in companies whose intangible assets played a central role in value creation (Nolan Norton Institute, 1991). The companies studied, as well as Kaplan and Norton, were convinced that the reliance on financial indicators of performance was affecting their ability to create value in a new extremely competitive business environment. While they provide an excellent review of what has happened in the past, they are inadequate in addressing the real value-creating mechanisms in today's organisations – the intangible assets such as knowledge and networks of relationships (Niven, 2002). If companies were to improve the management of their intangible assets, they had to integrate the measurement of intangible assets into their management systems (Kaplan, 2010).

The study culminated in the establishment of a set of performance indicators covering all relevant aspects of the organisation, considering all its stakeholders and providing a short and long term perspective, with a strong association with strategy (Niven, 2002). The BSC includes financial measures as the ultimate outcome measures for company success, but complements these with operational measures from three additional perspectives - customer, internal processes, and learning and growth. Operational measures are considered the drivers of future financial performance (Kaplan & Norton, 1992) and long-term shareholder value. Thus, Kaplan and Norton's work gradually broaden the concept from (i) defining the BSC as a comprehensive performance measurement system into (ii) the BSC as management tool for describing, communicating and implementing strategy (Kaplan, 2010), to facilitate and control performance measurement and management and align departmental and personal goals to overall strategy (Nørreklit, 2000).

In "Using the Balanced Scorecard as a Strategic Management System" (1996b), Kaplan and Norton state the BSC relies on four processes to bind short-term activities to long-term objectives: (1) Translating the vision, (2) Communicating and linking, (3) Business planning, and (4) Feedback and learning (See Figure 4).

Managing Strategy: Four Processes

Translating the Vision
☐ Clarifying the vision
☐ Gaining consensus

Communicating and Linking
☐ Communicating and educating
☐ Setting goals
☐ Linking rewards to performance measures

Balanced Scorecard

Feedback and Learning
☐ Articulating the shared vision
☐ Supplying strategic feedback
☐ Facilitating strategy review and learning

Business Planning
☐ Setting targets
☐ Aligning strategic initiatives
☐ Allocating resources
☐ Establishing milestones

FIGURE 4 - Managing Strategy: Four Processes
Source: Kaplan & Norton (1996b)

All the measures in the BSC serve as translations of the organisation's strategy. Vision and strategy are at the centre of the BSC system, not financial controls as in many organisations. The BSC is ideally created through a shared understanding and translation of the organisation's strategy into objectives, measures, targets, and initiatives, in each of the four typical scorecard perspectives - Financial, Customer, Internal Processes and Employee Learning & Growth – providing answer to four basic questions (See Figure 5).
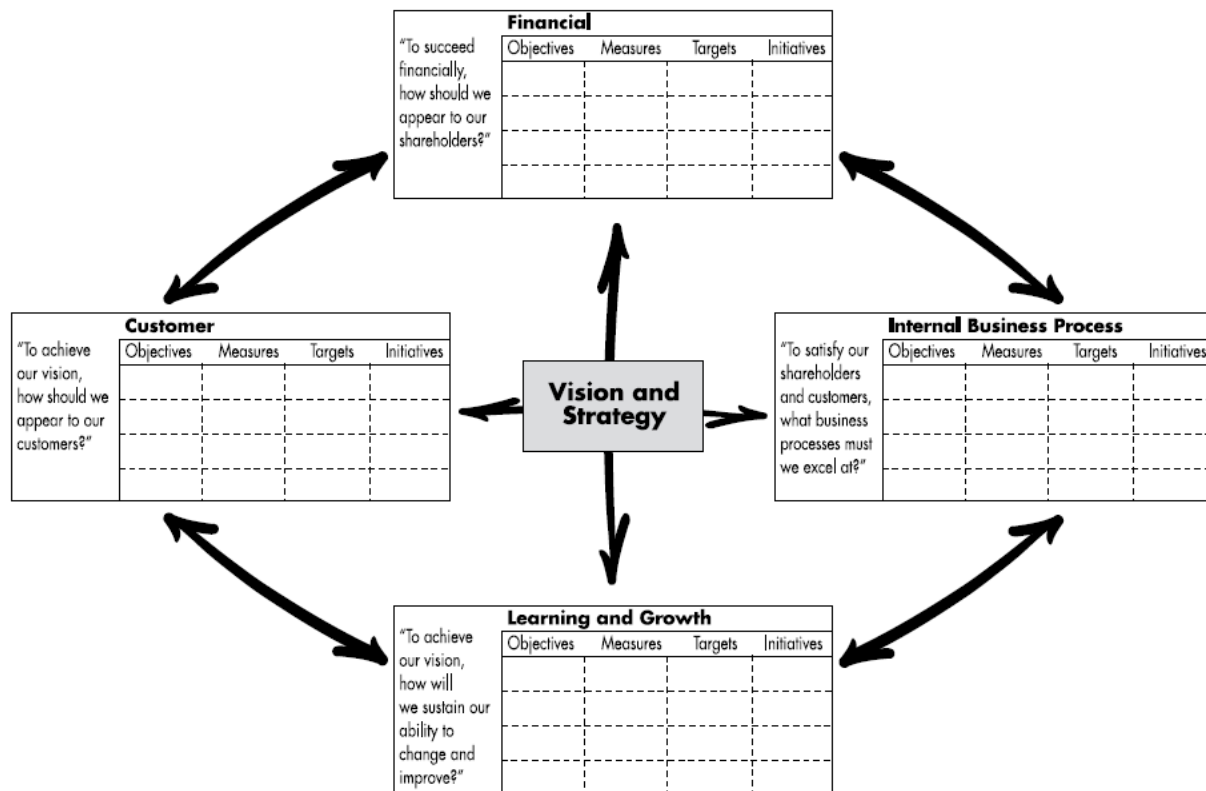
Managing Strategy: Four Processes

FIGURE 5 - Translating Vision and Strategy: Four Perspectives
Source: Kaplan & Norton (1996b)

Before selecting metrics (or measures), companies should describe what they are attempting to achieve with their strategies, and the four BSC perspectives provide a robust structure for companies to express their strategic objectives (Kaplan, 2010). At the end of the business planning process (Figure 4), managers should have set targets for the long-term objectives they would like to achieve in all four scorecard perspectives, as well as identified the strategic initiatives required and allocated the necessary resources to those initiatives (Kaplan & Norton, 1993 and 1996b). Targets can be changed over time, allowing an evolution of performance linked to the strategic objectives (Kaplan & Norton, 2004b), as strategy itself may evolve in response to changes in the company's competitive, market, and technological environments (Kaplan & Norton, 1996b).

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By limiting information to only four perspectives, the BSC also limits the number of measures used, forcing managers to exclusively focus on those that are most critical to their business. The brevity and focus of the BSC was also presented as having value with respect to the need to efficiently and effectively communicate priorities within organisations (Kaplan & Norton, 1992). However, there's a flexible approach to the Scorecard, as the number of perspectives may change and different perspectives can be added. Kaplan and Norton (1996a) themselves suggest that the four perspectives "should be considered a template, not a straitjacket". Many organisations have followed this advice and developed perspectives for innovation, research and development, environment, suppliers, leadership, and community.

According to Kaplan and Norton (2001b), the BSC can be used to help create the strategy-focused organisation, as the tool has uses beyond performance measurement to strategic management. The strategy-focused organisation is based on a common set of five principles: (i) translate the strategy to operational terms; (ii) align the organisation to the strategy; (iii) make strategy everyone's day job; (iv) make strategy a continual process; and (v) mobilise leadership for change.

Using the BSC as a strategic management system implies the alignment of every employee's actions with overall organisational goals. When a scorecard is disseminated up and down the organisational chart, strategy becomes a tool available to everyone (Kaplan & Norton, 1996b). This "cascading" of the BSC is critical should organisations hope to enjoy the benefits of greater employee knowledge of, and focus on, key organisational strategies (Niven, 2002). The cascading process can result in different department scorecards, which derive from the organisational one, and even reach personal scorecards. "The personal scorecard helps to communicate corporate and unit objectives to the people and teams performing the work (Kaplan & Norton, 1996b)."

Since it became popular in the early 1990s, the BSC framework has undergone changes over time. Nowadays, academics recognise three distinct generations of BSC design, developments that have improved the utility of the BSC as a strategic management tool (Cobbold & Lawrie, 2002). These progresses to the initial framework will be addressed in the following subsections.

4.2.1 Second Generation Balanced Scorecards – Strategy Maps

While many organisations have used a combination of financial and non-financial measures in the past, what sets the BSC apart is the concept of cause-and-effect linkages. A well-constructed scorecard will tell the story of an organisation's strategy through a series of linked performance measures weaving through the four perspectives (Niven, 2002). At this stage, the use of strategic-linkage models, often called the second generation of scorecards, are very useful to ensure that the objectives set for the four BSC perspectives support the organisation's strategy (Kaplan & Norton, 2000).

In "Conceptual Foundations of the Balanced Scorecard" (2010), Robert S. Kaplan acknowledges the importance of the establishment of the strategic objectives prior to the definition of the measures – "while our initial article had a subtitle, "Measures that derive Performance", we soon learned that we had to start not with the measures but with descriptions of what the company wanted to accomplish. It turned out that the selection of measures was much simpler after company executives described their strategies through the multiple strategic objectives in the four BSC perspectives". Furthermore, the BSC authors argue that the casual relationships should be defined between strategic objectives[22] (Kaplan & Norton, 2000, 2001a, 2004b)[23]; Kaplan (2010) states "today, all BSC projects build a strategy map of strategic objectives first and only afterwards select metrics for each objective". Figure 6 presents Kaplan and Norton's strategy map template and provides a "normative checklist for a strategy's components and interrelationships" (Kaplan & Norton, 2004b). According to the authors, the financial and customer perspectives in strategy maps and Balanced Scorecards describe the outcomes, that is, what the organisation hopes to achieve. Processes in the internal and learning & growth perspectives drive the strategy; they describe how the organisation will implement the strategy (Kaplan & Norton, 2004b). "The strategy map links intangible assets and critical processes to the value proposition and customer and financial outcomes (Kaplan, 2010)."

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[22] The terms strategic objectives (Kaplan and Norton, 1993) refers to short sentences which clarified the nature of the "goals" described in 1992.

[23] The authors first introduced linkages between measures. One paper published at the beginning of 1996 illustrates and describes linkage as occurring between measures (Kaplan and Norton, 1996b). A second one published in the autumn of the same year illustrates and describes linkage as occurring between strategic objectives (Kaplan and Norton, 1996c).

Productivity Strategy

Growth Strategy

Financial Perspective

Long-Term Shareholder Value

Improve Cost Structure

Increase Asset Utilization

Expand Revenue Opportunities

Enhance Customer Value

Customer Perspective

Customer Value Proposition

Price | Quality | Availability | Selection | Functionality | Service | Partnership | Brand

Product / Service Attributes — Relationship — Image

Process Perspective

Operations Management Processes
Supply
Produce
Distribute
Manage Risk

Customer Management Processes
Select Customers
Acquire New Customers
Retain Existing Customers
Grow Business with Customers

Innovation Processes
Identify New Opportunities
Select the R&D Portfolio
Design and Develop
Launch

Regulatory & Social Processes
Environment
Safety & Health
Employment
Community

Learning & Growth Perspective

Human Capital

Information Capital

Organization Capital
Culture | Leadership | Alignment | Teamwork

FIGURE 6 - A Strategy Map Represents How the Organisation Creates Value
Source: Kaplan & Norton (2004b)

Though concurring with the definition of the strategic objectives before choosing the measures, some authors (e.g. Nørreklit, 2000; Niven, 2002) advocate that the hypothesis reflecting strategy comes to life through the interplay and interdependencies among the financial and nonfinancial measures that relate to specific strategic objectives. Niven (2002) argues that the process of linking measures through a series of cause-and-effect relationships describes the organisation's strategy, "the specific path you will follow to achieve your strategy". "A good Balanced Scorecard should contain a mix of core outcome measures (lagging indicators) and the performance drivers that lead to improved performance on those metrics (leading indicators) (Niven, 2002)". The same author (2002) says that when building the cause-and-effect linkages one should start by creating the story from the lagging indicators of performance in each of the four perspectives, and then consider the leading indicators of performance for each. Besides representing the lag and lead measures of performance and their interrelationships, Niven also includes the objectives from which the measures derive in the strategy map (See Figure 7).
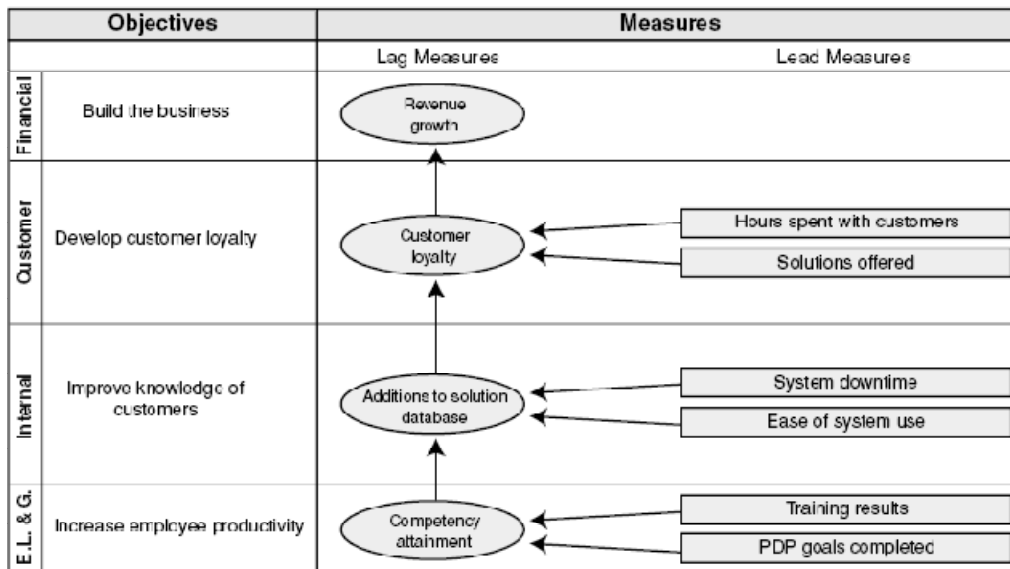
FIGURE 7 - Cause-and-effect linkages on the Balanced Scorecard
Source: Niven (2002)

Measure-based linkages provided a richer model of causality, but presented conceptual problems – for example, encouraging the use of various forms of analysis to validate measure selection based on numerical correlations between measures (Cobbold & Lawrie, 2004).

Cobbold and Lawrie (2004) summarize this second generation of BSCs in two main innovations: the new measure selection process helped particularly with the filtering issue – "the strategic objective itself gave a justification for the selection of one measure over another out of the many possible candidates for inclusion in each perspective" – and in causality. However, despite the developments and improvements in this second generation, there was still a concern with how the measures should be grouped ("clustering"). Arguments against the standard layout for a strategic linkage model[24] have been advanced suggesting that for many organisations this causal flow is inappropriate, either because it leaves out one or more important clusters (e.g. Kennerley & Neely, 2000) or because the causality links cannot be justified (e.g.

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[24] "(...) causality flowing across the four perspectives (…) from learning and growth through internal business processes and customer and ending up at financial" (Cobbold and Lawrie, 2004)

Nørreklit, 2000). Moreover, organisations developing second-generation balanced scorecards found significant practical problems with measure selection and target setting (e.g. Barney, Radnor, Johnston & Mahon, 2004).

Aiming to overcome these flaws, a third generation of Scorecards is referred in the literature.

4.2.2 Third Generation Balanced Scorecards

The origin of the developments on third-generation balanced scorecard models stem from the issues relating to the validation of strategic objective selection and target setting, and intended to give better functionality and more strategic relevance to the framework.

Neely *et al.* (2003) outline the challenges of the third generation of performance measurement approaches:

(1) Models must reflect the static and dynamic realities of organisations but at the same time without losing appropriateness as a managerial tool;

(2) Must move from data to information and provide rigorous information especially for the intangible value drivers in organisations;

(3) The models must be practical and aligned with other organisational processes in order to allow actions to be taken;

(4) Must seek increasingly robust ways of demonstrating the cash flow implications of the non-financial and intangible organisational value drivers.

In order to keep any model relevant, third generation frameworks must evolve with the change that takes place in organisations (Neely *et al.,* 2003).

Particularly in the BSC framework, third generation is characterized by two primary enhancements identified by Cobbold and Lawrie (2004): the destination statement and the strategic linkage model with only "activity" and "outcome" perspectives. A destination statement is a description, ideally including quantitative detail, of what the organisation is likely to look like at an agreed future date, aiming to identify inconsistencies in the profile of objectives chosen and act as a useful reference point for the target setting process (adapted from Cobbold & Lawrie, 2004). Typically the destination statement is sub-divided into descriptive categories that serve a similar purpose (but may have different labels) to the "perspectives" in first- and second-generation balanced scorecards (Cobbold & Lawrie, 2004). This different strategic linkage model is a simplification of the strategy map, "with a single "outcome" perspective replacing the financial and customer perspectives, and a single "activity" perspective replacing the learning & growth and internal business process perspectives" (Lawrie, Cobbold & Marshall, 2004; Barney *et al.*, 2004). Third-generation balanced scorecard offers enhanced utility and practicality over previous designs (Cobbold & Lawrie, 2004).

In their 2004 paper "Designing a strategic management system using the third-generation balanced scorecard - A case study", Cobbold, Lawrie & Issa describe the development and implementation of a third-generation BSC within Zamil Air Conditioners (ZAC), a Saudi Arabian leading manufacturer of commercial and industrial air conditioning systems.

ZAC's destination statement "consisted of about sixty distinct descriptive statements grouped in four headings: financial and market characteristics, external relationships, activities and processes and organisation and culture. The document described how the organisation would look in 2008 (i.e. five years ahead), and contained a mixture of qualitative and quantitative statements" (Cobbold *et al.*, 2004). Regarding the strategic linkage model, "the objectives were grouped according to whether they related to activities to be carried out by ZAC (activity objectives), or hoped for consequences of these (or other) action (outcome objectives)" (Cobbold *et al.*, 2004). Figure 8 shows the diagram with the representation of the short and medium term objectives organised into cause-and effect-linkages.
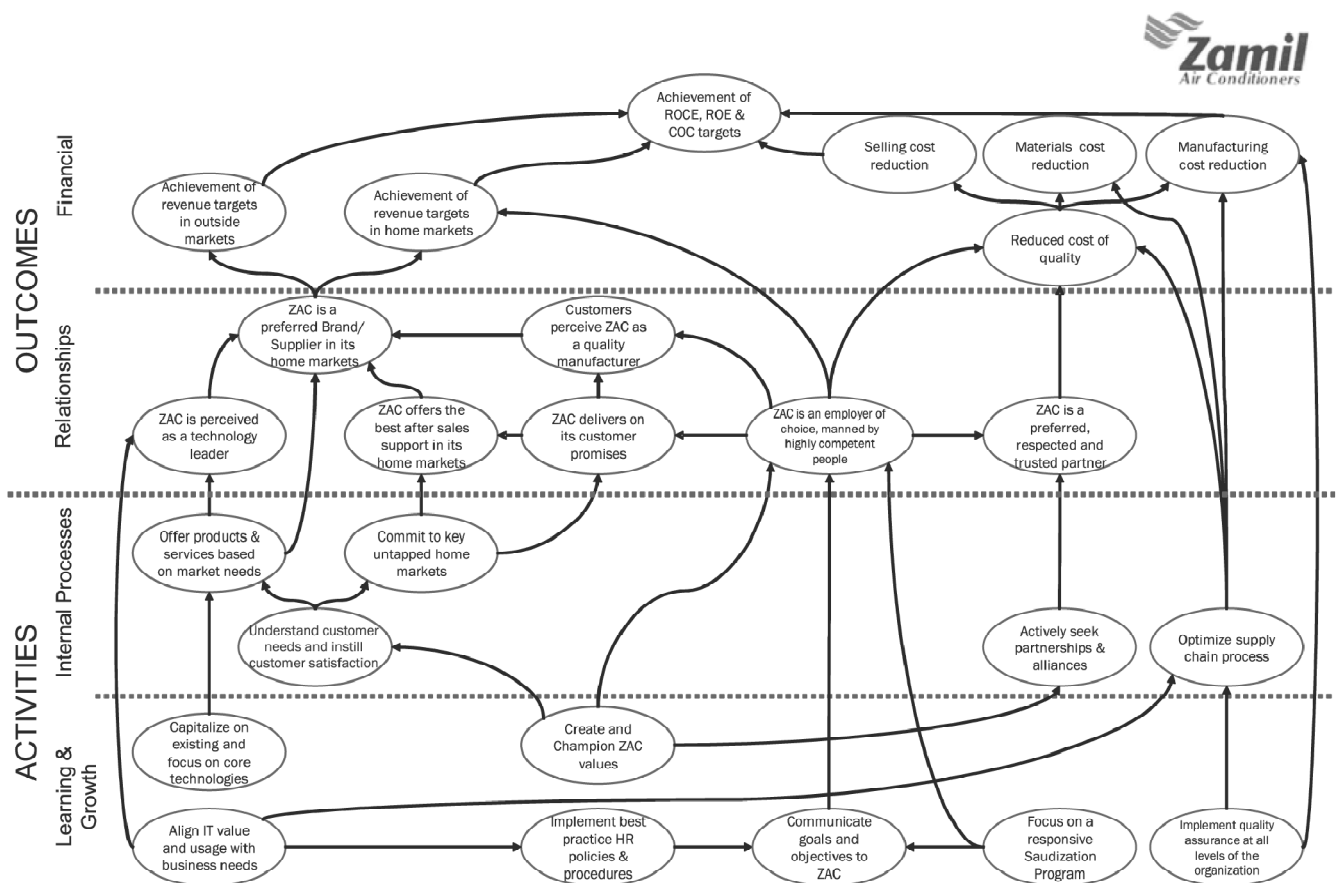

FIGURE 8 - ZAC strategic linkage model (draft)
Source: Cobbold, Lawrie & Issa (2004)

For each objective, performance measures that would inform the management team whether or not the objective was being achieved were chosen, as well as targets and initiatives important to attain the agreed strategic goals. According to the authors it was interesting to note, at the end of the project, the extent to which the outputs of the process align with the strategic goals set out in the original plan developed by the business development director, as well as the clear change in management behaviour.

In "Effective quality management through third-generation balanced scorecard", Andersen, Lawrie and Savic (2004) acknowledge third-generation BSCs role in quality initiatives success, and illustrate how it supports effective application of a number of popular quality management tools. This third-generation BSC has "shown to offer effective methods of linkage to a range of the most common quality management tools used by Western organisations: helping to close the divide between quality management and strategic control processes in an organisation" – "an explicit link between strategy and operational initiatives is a critical success factor in deriving long-term benefits from quality initiatives" (Andersen *et al.*, 2004).

Despite the evolution and developments on the BSC framework since the early 1990s, several criticisms have been pointed out by both academics and practitioners over the years. Some of these will now be addressed.

4.2.3 Criticisms to the Balanced Scorecard Framework

The BSC has attracted much attention from both practitioners and academics over the years as it is presented as a useful management system for strategy execution, which integrates strategy and operations (Kaplan, 2010)[25]. The essence of the BSC is its focus, its simplicity, and its vision (Kaplan 2010 citing Larry Brady[26]). However, the literature notes some weaknesses in the design proposition, questions the veracity of

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[25] According to Kaplan (2010), the various activities for strategy development, planning, alignment, operational planning, operational control, and strategy control are integrated within a comprehensive management system.
[26] Then president of the FMC Corporation.

key assumptions and relationships the framework relies on, and presents some difficulties in the BSC implementation.

Some authors (e.g. Bontis, Dragonetti, Jacobsen & Roos, 1999) consider the BSC a relatively rigid management tool, as the perspectives can limit the key success factors identification[27], as well as the measures chosen. Considerations on the external environment are limited to customers (Bontis *et al.*, 1999). Neely *et al.* (1995) point out a "serious flaw" concerning perspectives: "if a manager was to introduce a set of measures solely based on it, he would not be able to answer one of the most fundamental questions of all – what are our competitors doing (the competitor perspective)?". Brignall (2002) says the BSC ignores two significant stakeholders: environment and social matters. Given the increasing tendencies to outsource, organisations become ever more dependent on their supply chain and/or networks (Neely, 2005) – hence the rise of research exploring the issue of how to measure supply chain performance (Neely, 2005 citing Beamon, 1999). Although Kaplan and Norton mention that the four perspectives "should be considered a template, not a straitjacket", and organisations should fit the number of perspectives to their context (Kaplan & Norton, 1996a), Bontis *et al.* (1999) consider that by treating the perspectives like a comprehensive classification of all possible measures the authors contradict that statement. Some have also argued that there is a danger that organisations implementing BSCs can become too obsessed with performance measurement, potentially at the expense of performance management (Neely, Kennerley & Martinez, 2004).

Strategy maps, key tools for designing and deploying BSCs, have often been refer to have a very static and linear nature (Neely, 2005). They assume a logical and causal set of relationships between dimensions of organisational performance, yet in reality these relationships are recursive and dynamic (Brignall, 2002; Nørreklit, 2000). Nørreklit (2000) argues that the causality claimed to hold between perspectives is problematic and makes reference to the confusion of cause and effect with finality along

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[27] "(…) because some KFSs (indeed, probably most of them) will be cross-perspective "(Bontis *et al.*, 1999).

Kaplan and Norton's literature[28]. The same author states there is not a causal but rather a logical relationship among the areas analysed – "Customer satisfaction does not necessarily yield good financial results" (Nørreklit, 2000). Therefore, "the BSC makes invalid assumptions, which may lead to the anticipation of performance indicators which are faulty, resulting in sub-optimal performance" (Nørreklit, 2000). Furthermore, the same author states the BSC is "not a valid strategic management tool, mainly because it does not ensure any organisational rooting, but also because it has problems ensuring environmental rooting. Consequently, a gap must be expected between the strategy expressed in the actions actually undertaken and the strategy planned" (Nørreklit, 2000). Nørreklit (2000), also alleges that the BSC concept is based on persuasive rhetoric rather than convincing theory based on empirical underpinnings.

The time dimension is also a concern referred by academics regarding the BSC. Nørreklit (2000) concluded the BSC model, as presented by Kaplan and Norton (1992, 1993, 1996b), lack a time-lag dimension because it measures different activities at the same point in time, and the various time scales of the different areas of the scorecard are not considered. "Whereas the effect of some activities (e.g. dismissal of several part-time employees) is almost immediate, the impact of others (e.g. investments in R&D processes) will be recognized only later, or gradually over time" (Johansen, Skoog, Backlund & Almqvist, 2006). However, producing measurements on a regular and systematized basis enables some of the time gaps between different activities to be taken into account even when they are measured at the same time (Johansen *et al.*, 2006 citing Skoog, 2003a).

Another problem to the BSC identified is its consideration of employees and innovation. Employees are considered "almost as an afterthought, (...) lumped together with IT systems in the Learning & Growth perspective" (Bontis *et al.*, 1999). However, Kaplan (2010) states the BSC deliberately did not label its fourth perspective the "employees" or "people" perspective (...) to signal they were not taking a pure

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[28] "The consequence of assuming finality is that the relationships among the various perspectives become more ambiguous and less simple, complexity increases and many of the techniques suggested for the balanced scorecard will be impracticable. Furthermore, if Kaplan and Norton are assuming finality instead of causality, then the balanced scorecard is no different from many other approaches. (Nørreklit, 2000)"

stakeholder approach – "Under the BSC approach, employee objectives always appear in the learning and growth perspective but they get there because they are necessary for the strategy, not because someone has labelled them as a stakeholder" (Kaplan, 2010). Additionally, it was often said companies didn't have metrics that linked employees capabilities to the strategy (Kaplan, 2010), issue addressed by Norton on a research project (in 2002 and 2003) with human resources professionals to explore how to better link measurement of human resources to strategic objectives. The concept of strategic human capital readiness and the linkages to information capital and organisational capital (See Figure 6) resulted from this work (Kaplan & Norton, 2004b).

Innovation, the result of human learning and action, is part of the Internal Business Process perspective – "It feels almost as if innovation is considered a routine, something the organisation can do without the people, or at least independently of them. As a consequence, the specific challenge of managing people and their knowledge is underestimated by the BSC" (Bontis *et al.*, 1999). Voelpel, Leibold and Eckhoff (2006) proposed five explanations about why the BSC fails to support innovation and employee empowerment. In that same year, Kaplan and Norton published "Response to S. Voelpel et al. "The tyranny of the Balanced Scorecard in the innovation economy"", with quotes from their published articles and books that directly contradict those positions.

Regarding implementation, it is important to take into account the dynamic nature of organisations. Studies of measurement system implementation suggest that typical implementations take between 18 and 24 months (Bourne, Mills, Wilcox, Neely & Platts, 2000), yet rarely are organisations stable for this length of time (Neely, 2005). Lipe and Salteiro argue the BSC is costly in terms of cash and time (2000) and that the volume of data may overload human decision-makers (2002).

Linking compensation to the scorecard to align organisational strategy carries risks - "does the company have the right measures on the scorecard? Does it have valid and reliable data for the selected measures? Could unintended or unexpected consequences arise from the way the targets for the measures are achieved?" (Kaplan & Norton, 1996b). Jensen (2001) argues the BSC "is flawed because it presents

managers with scorecard which gives no score – that is no single-valued measure how they have performed". In "Conceptual Foundations of the Balanced Scorecard (2010), Kaplan agrees with Jensen that "managers cannot be paid by a set of un-weighted performance metrics (...) ultimately, if a company wants to set bonuses based on measured performance, it must reward based on a single measure (either a stock market or an accounting based metric) or provide a weighting among the multiple measures a manager has been instructed to improve".

Due to various shortcomings, the BSC elements need to be adapted in the service context. The next subchapter covers performance measurement and the use of the BSC in service organisations.

4.3 The Balanced in Service Organisations

Service has become the dominant sector in the world economy. However, there is still a lack of literature on performance measurement (PM), specifically about the construction of Balanced Scorecards for service organisations. Even though the economic environment is now service-dominant, the majority of performance systems in use today were developed in the manufacturing context (Tyagi & Gupta, 2008).

Indeed, much of the literature on performance measurement has ignored the predominance of services in today's advanced economies, and the distinctive needs of services when measuring, monitoring and evaluating performance (Ballentine & Brignall, 1995). Reliance upon accounting-based performance indicators has been highlighted as inadequate in the service sector (e.g. Fitzgerald & Moon, 1996), and it has been stated that there's a "need to identify performance measures that are broader in focus and include qualitative measures" (e.g. Phillips, 2007), as corporate strategies in services depend even more on non-financial and subjective dimensions of performance. The balanced scorecard, with its financial, customer, internal business processes and learning and growth perspectives, has been widely adopted by manufacturing, service, non-profit and government organisations around the world.

As services have very distinctive characteristics compared to products (intangible vs. tangible, heterogeneous vs. standardized, perishable vs. non-perishable, simultaneous production and consumption vs. production separate from consumption[29]), their processes are different, and it's important to have that in mind to develop a well-constructed Balanced Scorecard for a service organisation.

Fitzgerald et al. (1991) propose a normative model for performance measurement in service businesses, based on a case study research into performance measurement in eleven large for-profit UK service businesses. They adopted a feed forward/feedback control model in which PM is part of feedback control, being a stimulus to appropriate action and organisational learning at the right level of the organisation and stage of the decision-making process (Ballentine & Brignall, 1995). The suggested model consists of six dimensions of performance, measuring results (competitiveness measures such as market share or sales growth rate, and financial measures such as cost, profit and value-added) and the determinants of that strategy's success (quality, flexibility, resource utilization and innovation). Interactions and trade-offs between the six dimensions consideration during the process of strategy formulation should lead to better-balanced strategic plans (adapted from Fitzgerald, Johnston, Brignall, Silvestro & Voss (1991)).

Ballantine and Brignall (1995 and 1996) identified twelve relevant propositions[30] to PM system design through a gap analysis of the literature on PM, existing models and their 1995 PM framework[31]. The authors refer to this work as an agenda for future research that may confirm or confound these propositions and, in their opinion, should include questionnaire surveys, and cross-sectional and longitudinal case studies.

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[29] There is no academic consensus on the distinctive characteristics of services. The ones presented here are the characteristics of services compared to goods presented by Zeithaml, Bitner & Gremler in the 2006 book "Services Marketing – Integrating Customer Focus Across the Firm". Gupta and Tyagi (2008) argue that the main differences between services and manufacturing operations include service focus, interaction with customers and customer participation, job skills, intellectual component, compensation, process and experience management, perception of research and development in services, and performance measurements.
[30] The propositions relate to the level of organizational analysis, contingent factors relevant to PM system design, and the type of information architecture appropriate for successful implementation of PM system, among others.
[31] The Ballantine and Brignall (1995) PM framework uses the concepts of core, non-core and contingent factors to make sense of the literature on PM.

During the 1990s a team of researchers at Harvard University introduced an alternative framework that attempted to match measurement with business strategy particularly in service organisations. The Service Profit Chain (Heskett, Sasser & Schlesinger, 1997) assesses the sources of profitability and growth in labour-dominated service firms, with the purpose of enabling managers to focus on (predominantly) quantifiable measures that lead to financial performance measures. However, focusing as it does on the service delivery aspects of performance, the model is useful but does not represent a holistic approach to managing service based organisations (Evans, 2005).

In the book Six Sigma Business Scorecard (2007), Praveen Gupta presented scorecards from a process perspective, typing scorecards to business processes. The four typical perspectives were extended, to include Leadership and Profitability, Management and Improvement, Employees and Innovation, Purchasing and Supplier Management, Operational Execution, Sales and Distribution, and Service and Growth. This work left business process people more excited about the potential of scorecard systems and led Gupta to move to a broader view of processes, to cope with the challenges of aligning process measures with strategies and corporate performance systems.

"A Complete and Balanced Service Scorecard" (2008), by Tyagi and Gupta, represents an important contribution to the literature on performance management of services organisations. It reflects the differences between service and manufacturing processes, and focuses on the concerns and problems of monitoring and measuring the performance of service business organisations. Special attention is also devoted to how one can organize measures to predict business trends. The Service Scorecard is composed by seven elements presented by the authors with the mnemonic GLACIER: Growth, Leadership, Acceleration, Collaboration, Innovation, Execution, and Retention. As in the BSC by Kaplan and Norton, there exists a casual relationship between each element on the scorecard, with the aim here to "achieve the fundamental strategy of any business: sustained profitable growth".

According to the authors, the main business performance challenge[32] service organisations face is the difficulty of measuring their most critical asset, human resources. The negative connotation associated with measuring human productivity and the difficulty to measure it for further improvement lead them to argue that scorecards must identify process-based measurements rather than events or outcome-based measurements. "The Service Scorecard should balance cost and revenue, improvement and innovation, management and employees, and execution and growth." Thus, it "must also balance the objective and subjective measurements, which are sometimes difficult to measure but that must be measured".

Kaplan & Norton's BSC has also been referred by academics as a framework suitable to measure new service development (NSD) performance (e.g. Storey & Kelly, 2001). Since the 1990s, there has been an upsurge in academic interest related to NSD performance measures in the developed countries (Liu and Rong, 2009 citing Johne & Storey, 1998), but there is still a lack of consensus regarding how to measure NSD performance. Liu & Rong literature review on NSD performance indicated that a variety of different measures of NSD success can be structured into the BSC framework, as the BSC frame can capture information on all aspects of NSD activities. The same authors argue that "according to the BSC framework, the complexity of NSD requires managers to be able to view performance in the four perspectives simultaneously. Thus, the four complementary dimensions are the critical dimensions to NSD performance."

The BSC is now adopted in a multitude of services. A diverse range of research documenting the application of BSC in differing industrial and public service contexts has been reported. For example, there exists relevant case study literature on BSC implementation on education (Lawrence & Sharma, 2002; Karathanos & Karathanos, 2005), tourism (Phillips, 1999; Evans, 2005; Phillips & Louvieris, 2005), retailing (Thomas, Gable & Dickinson, 1999) and health care (Wachtel, Hartford & Hughes, 1999; Wisniewski & Ólafsson, 2004), to name a few. From the different cases analysed it seems organisations opt to adapt the framework to their environment and needs –

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[32] Other challenges to designing performance measurement systems for services are the following: added variability due to customer involvement, importance of employee engagement, and service innovation and inclusion of partnership focus.

"Whilst the four traditional perspectives can be adequate, they frequently need re-labelling to have relevance" (Wisniewski & Ólafsson, 2004).

The next sub chapter presents a literature review on the application of the BSC to the automotive industry.

4.4 The Balanced in the Automotive Industry

As mentioned at the beginning of this dissertation, the use of the Balanced Scorecard in the automotive industry has been limited compared with other industries (Cucuzza & Frezell, 2003). Cucuzza and Frezell (2003) pointed out that the dynamic nature of this industry makes it difficult to execute the basic fundamentals of the framework and presented the several challenges automotive industry faces when developing and implementing the scorecard, examining them in the typical four scorecard perspectives.

Regarding the financial perspective, the authors mentioned that the conservatism of the automotive industry in reporting financial information has made the implementation of balanced scorecards a challenge "in an industry so deeply rooted in traditional financial measurement". As for the customer perspective, the authors emphasise the importance of the product in customer satisfaction particularly in this industry – "by focusing exclusively on traditional customer measures, an automotive balanced scorecard would miss the important dimensions of product and product innovation that are really driving customer strategies in the industry today". The automotive industry also has the challenge of having two sets of customers to measure – dealer networks and end consumers, and both the customer perspective and measurements vastly differ between the dealer and the customer (Cucuzza & Frezell, 2003). On the topic of internal business processes, measuring and managing the performance of outsourced non-core components of the business is key – "for purposes of designing a balanced scorecard it is important to measure the virtual enterprise (considering the broad supplier network required to build an automobile) - not just the internal business processes - to address the total risk profile of the extended enterprise.

Concerning the learning and growth perspective, Cucuzza and Frezell refer to the challenge of developing a scorecard that can measure the trade-off between scale ("get big" to survive) and agility ("get fast" to respond to new competitors and challenges), key factors in this industry. Furthermore, they argue "automakers and suppliers fail to leverage knowledge globally within their complex, fast-moving organisations".

"The balanced scorecard of the future will not stop at the four walls of the company, but will extend deep into the supply chain and reach out to end consumers."

<div align="right">Cucuzza & Frezell, 2003</div>

The number and percentage of automotive suppliers contributing to the value creation chain has highly increased and will continue to rise (Niebecker, Eager & Moulton, 2010). The network complexity ascends continuously: globalization and heterogeneous markets have increased the number of product variants dramatically, more dynamic markets increase the internal complexity of OEMs and automotive suppliers, and many OEMs produce in multiple countries and have to coordinate all these sites and the associated complexity (adapted from Schoeller, 2007) – See Figure 9. Schoeller (2007) mentions complexity management as the next big challenge in the automotive industry.
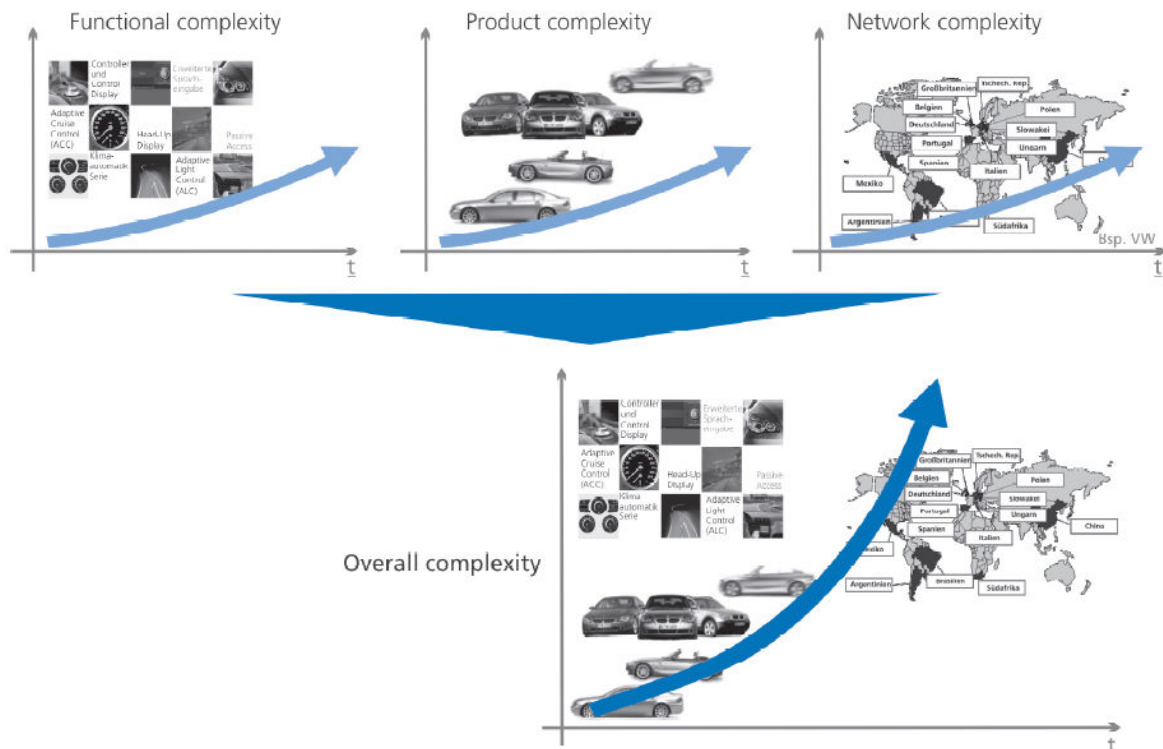
FIGURE 9 - The automotive industry – Increasing overall complexity
Source: Schoeller (2007)

Major OEMs co-operate with hundreds of different suppliers[33], and managing
performance across the supply chain plays a major challenge for automotive industry
managers. Schmitz and Platts (2003) acknowledge the scarcity of literature offering
guidance on performance measurement and management in the inter-organisational
context. They conducted a study in five vehicle manufacturers in Europe with regards to
their practices of supplier evaluation and proposed a conceptual framework for the roles
of supplier performance measurement. Their study suggests that the use of
performance measurement in the inter-organisational performance measurement
emphasises different roles than the use of intra-organisational performance
measurement. Moreover, they also found that the companies contacted for their case
studies were more interested in performance measurement that helps them in the
management of their supply base and in the communication between suppliers and the

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[33] For example, one of the vehicle manufacturers studied by Schmitz and Platts in 2002 had a database
of around 3000 supplier sites in Europe.

OEM or between different departments of the OEM than in highly integrative and holistic supply chain measurement systems that cover the whole supply chain.

An increasing number of project partners are required for the development and manufacturing of a vehicle. The previously referred great structural changes the automotive industry has undergone in the last years, has changed the way automotive projects are managed across its complex and intricate chain of players. The industry requires adapted methods to improve performance of cross-company and collaborative projects and to reduce project product recalls and project failures. The understanding of common goals and of the mutual purpose to create new products is essential for high performance in collaboration (Niebecker, 2009).

A research project carried out by Niebecker *et al.* (2009) "lead to the conclusion that a strategic scorecard method based on the Balanced Scorecard concept by Kaplan and Norton is capable to improve cross-company project management and reduce existing difficulties in typical product development collaboration, such as communication or collaborative risk management (Niebeker, 2009). The Project Scorecard is typically derived from the Business Scorecard and the Collaborative Project Scorecard is then developed based on the common goals of a cross-company project (Niebecker *et al.,* 2010) – see Figure 10.
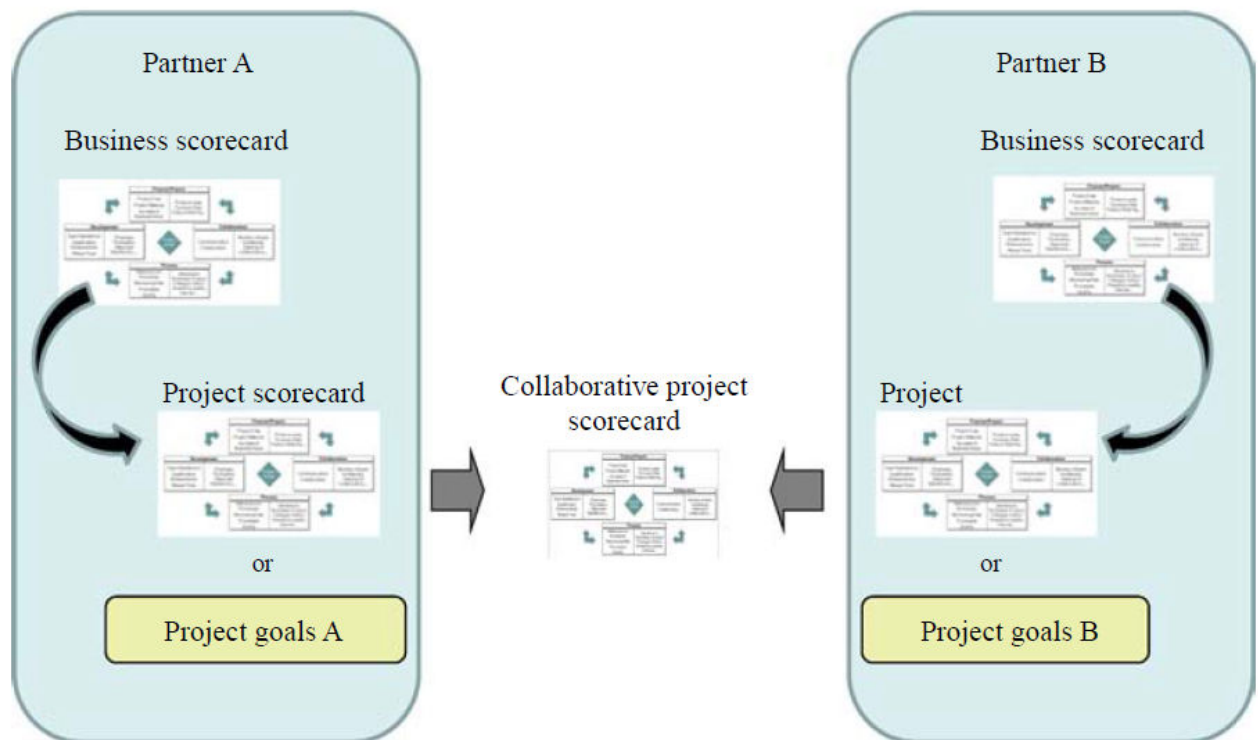
FIGURE 10 - The Collaborative Project Scorecard
Source: Niebecker (2009)

It is essential that all partners come together to discuss and clarify their common project goals and strategies before the project is already in progress (Niebecker *et al.*, 2010). A common definition of project goals, leading and lagging indicators to measure the status and defining corrective action are core elements of the Collaborative Project Scorecard (from now on CPS) concept (Niebeker, 2009). The concept is derived from business strategies for an improved alignment of common project goals with business objectives, and enables the project manager to create operational indicators that can be controlled on a strategic level by the CPS (Niebeker, 2009). As presented in the BSC literature review (section 4.2.1), the CPS framework also requires the development of a collaborative project strategy map (Niebecker *et al.*, 2010), that should be discussed with all project managers to evaluate interdependencies and cause-and-effect relationships between measures for efficient project control.

In a context of global competition and decreasing profits from product sales, the after-sales services and activities constitute a relevant profit source as well as a key differentiator for manufacturing companies and resellers (Gaiardelli, Saccani & Songini, 2007). The shift in profit generation away from vehicles and into financing, parts businesses and services places yet another challenge to performance management in the automotive industry – "many automakers are generating more profit from financing and service parts then they are from their core vehicle business" (Cucuzza & Frezell, 2003). These increasingly important businesses have to be taken into consideration by scorecard designers, and its particularities should be specially addressed when developing the scorecard, as they represent "one of the few constant connections that customers have with a brand" (Gallagher, Mitchke & Rogers, 2005). The perception of after-sales as a source of competitive advantage and business opportunity requires a shift from a traditional product-centric view to a customer-centric-view (Gaiardelli *et al.*, 2007). Although recognized as a significant source of revenue and profit, after-sales and in particular its performance measurement system has not been thoroughly addressed by management research as well as industrial practice (Gaiardelli *et al.*, 2007). In the paper "Performance measurement of the after-sales service network – Evidence from the automotive industry" (2007), Gaiardelli *et al.* propose a reference framework for the performance measurement of after-sales results and activities, adopting an inter-organisational perspective, with an integrated and multi-attribute set of measures defined at every level of the after-sales supply chain. The authors state the framework can be used to identify the impact of the specific performance results obtained by each actor on the overall after-sales service supply chain performance at the process level (through a direct relationship) and at the other levels (indirectly).

References of the application of the BSC framework particularly on engineering services in the automotive industry were not found in the literature. The methodology undertaken to address the development of a BSC for the shared engineering services centre of Yazaki Saltano de Ovar will be addressed in the next chapter.

V. METHODOLOGY

This chapter discusses the approach adopted in this study regarding research methods employed in relation to other possible approaches in social sciences. Firstly, the research questions were defined, as they are crucial in guiding the literature search, data collection and analysis, and to choose the research methodology to adopt. The research strategy and design and the techniques for data collection and analysis are then explained and justified in relation to other possible alternatives.

5.1 Research Questions

The purpose of this project is the definition of performance measures for the engineering services provided by the services centre of Yazaki Saltano de Ovar, Produtos Eléctricos Lda. – Porto Technical Centre – using the Balanced Scorecard management tool. Although literature was found regarding the implementation of the BSC in the automotive industry, and particularly in the after sales service, there is a lack of data and studies on its application on the specific engineering services field. The project also aims to find a solution for a problem identified in PTC, the lack of non-financial performance indicators monitored. This study attempts to answer the following questions:

- What are the key performance measures (financial and non-financial) that translate PTC's strategy and vision, and therefore should be monitored?
- What are the targets and initiatives that should be defined so that PTC can follow its strategy and achieve its vision?

5.2 Research Strategy and Design

As this was a project developed in an organisation, regarding the type of research design it can be said this refers to a case study – "The basic case study entails the detailed and intensive analysis of a single case" (Bryman, 2008: 52). Although this

type of research design is normally associated with qualitative methods, as "this methods are viewed as particularly helpful in the generation of an intensive, detailed examination of the case", this project combined both quantitative and qualitative research in the first part of the study, the definition of PTC's values. According to Bryman (2008:53), "*case studies are frequently sites for the employment of both quantitative and qualitative research*". Moreover, Trochim (2006) advocates that qualitative and quantitative data are intimately related to each other – "All quantitative data is based upon qualitative judgments; and all qualitative data can be described and manipulated numerically". Over the subsequent stages of the project, only methods associated with qualitative research were employed.

5.2.1 Data Collection and Analysis

The research methods used for data collection will now be addressed. A literature review on the state-of-the art of the Balanced Scorecard subject, and its application in other companies was carried out throughout the project - extra-organisation data collection. This theoretical background[34] allowed to identify the type of information required for the project, and to design a BSC activity planning[35].

Initially[36], the focus was the integration in the organisation, the direct observation of the different activities carried out in PTC, and the acknowledgement of PTC's mission, vision, values and culture (cf. formally defined and what is perceived by employees). However, PTC didn't have its own mission, values, vision and strategy formally stated. These had to be defined in order to build a BSC that could translate and communicate them throughout the organisation.

To involve all employees right at the beginning of the study and build awareness to the BSC project, a web survey was administered to help determining PTC's values. The questionnaire was developed based on the methodology for constructing web questionnaires defined by authors such as Bryman (2008) and Dillman (2000). The

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[34] Steps proposed by Kaplan & Norton (1996a) and Niven (2002).
[35] Appendix IV – BSC Activity Planning.
[36] Period from October to November 2010.

choice for this type of questionnaire had to do with its well-known advantages, such as the cheap (no fees) and quick administration, absence of interviewer effects, no interviewer variability, and convenience for respondents, along with the fact that all PTC employees have a computer. In order to avoid low response rates, the questionnaire was sent with an email explaining the reasons for the research, and why it was important, was short, all questions were closed, and clear instructions were given. The requirement to answer all questions eliminated the possibility of unanswered questions, though not forcing the respondent to answer a question before moving on to the next one.

On the first part of the questionnaire, employees were asked personal questions such as gender, age, number of years working at YAZAKI and the department to which they belonged. On the second part, they were asked to rank ten values represented by sentences. The development of the survey was preceded by a few semi-structured interviews to people with many YAZAKI years, to understand what values could be suitable and should be on the questionnaire.

Before the administration of the web survey, a pre-test was performed to a group of employees to verify if there were any difficulties in reading and instructions comprehension. Subsequently, due to the problems identified, the survey that was firstly designed in English (the YAZAKI language) was developed in Portuguese, and the instructions for the second part of the questionnaire were rewritten, to better clarify what was asked.

The survey was only open for three days (from 6th to 9th of January 2011), so that people wouldn't forget to answer it. As the questionnaire was anonymous, it was not possible to follow up each non respondent, but an email was sent on the last day to remember the need to fill the online survey.

Google Docs was the online application used to support the development and dissemination of the survey, since it enables the automatic data download to Excel. This facilitated the subsequent data analysis[37].

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[37] See Appendix VI – PTC's Values Survey and Results Analysis.

As for PTC activities, semi-structured interviews were also conducted to all PTC managers, to better understand what each department was responsible for, and the main activities each one developed.

This first stage of the project also comprised the analysis of financial and non-financial documents – data collection in the organisation - aiming to gather background material[38]. Using documents as sources of data and semi-structured interviews are typical research methods associated with qualitative research.

After the development and communication of PTC's mission, vision, values and strategic business plan, the second stage of the project began[39] – the actual construction of a Balance Scorecard for PTC. Even though at an initial approach it was considered of interest to involve all PTC managers on the project, resorting to semi-structured interviews and focus groups research methods, it was finally agreed to engage, at this stage of the process, only some of them.

The individual interviews would allow gathering inputs from each one of the managers separately, understand their perception about the mission, vision, values and strategy of PTC and realize whether all managers were aligned with respect to these elements. It would also be interesting to compare their views on what should be measured in the organisation. As for focus groups, these can be interesting as they allow individuals to argue with each other and challenge each other's views - "an individual may answer in a certain way during focus group, but, as he or she listens to other's answers, he or she may want to quantify or modify a view" (Bryman, 2008: 475) – and to develop an understanding about why people feel the way they do, generating a considerable amount of relevant data for the researcher. Given the advantages found, these methods may be used in the implementation phase of the BSC.

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[38] Materials on company strategy, files documenting the history of key organizational changes, information on the services provided, information on recruitment and training, clients and employees' satisfaction questionnaires and their results, and files containing the performance measures already being monitored.

[39] Period from February to June 2011.

However, only the semi-structured interviews were conducted, and with a different objective. Both managers and some employees were interviewed, but the aim was only to better understand their activity, and business and operational processes in PTC. The choice for this type of interview instead of a structured type relates to its flexibility, the greater possibility to capture the interviewee's point of view, the opportunity to ask new questions that follow up the respondent's replies, and the fact that the interviewee may be interviewed in several occasions. The existence of a previously prepared guide allows the interviewer not to forget asking relevant questions, while enabling to capture the perceptions and opinions of the interviewee and adjust the focus of the interview and research as significant issues may emerge in the course of the interviews. Data collected in these interviews was taken into account for the development of the BSC, namely in the definition of the measures.

Throughout the whole project, periodical meetings of the BSC team occurred, to discuss ideas on performance measures to be monitored, define targets and initiatives to achieve the strategic objectives.

5.2.2 Reliability, replicability, and validity

Writers on case study research whose point of orientation lies primarily with a qualitative research strategy tend to play down or ignore the salience of these factors, whereas those writers who have been strongly influenced by the quantitative research strategy tend to depict them as more significant (Bryman, 2008).

According to Stenbacka (2001), "the concept of reliability is even misleading in qualitative research. If a quantitative study is discussed with reliability as a criterion, the consequence is rather that the study is no good". On the other hand, Patton (2002) states that validity and reliability are two factors which any qualitative researcher should be concerned about while designing a study, analysing results and judging the quality of the study. In his article Understanding Reliability and Validity in Qualitative Research (2003), Golafshani refers to the use of triangulation in qualitative research – "as used in quantitative research to test the reliability and validity can also illuminate some ways to

test or maximize the validity and reliability of a qualitative study". Other writers, like Guba and Lincoln (1994), suggest other criteria for quality in qualitative paradigms: credibility, transferability, dependability, confirmability, authenticity.

Particularly in case study research, the issue of generalization or external validity has appeared in the literature with regularity. It is a frequent criticism of case study research that the results are not widely applicable in real life (Tellis, 1997). However, Yin (1994) provided the assertion that external validity could be achieved from theoretical relationships and from these generalizations could be made. In this case study in particular, since the Balanced Scorecard derives from the strategy, mission, vision, and values identified for a specific organisation, it may be considered to have low external validity, due to the fact findings cannot be generalized across social settings. Nevertheless, the methodology adopted to develop the Balanced Scorecard can be replicable in other contexts.

Regarding the use of the quantitative research strategy on this study, the ecological validity of the data collected through the web survey should also be considered, as the subject addressed may be very sensitive.

After addressing the methodology followed throughout the project, the research results and work development will be presented in the following chapters.

VI. BALANCED SCORECARD DEVELOPMENT

This section seeks to explain the whole process of the development of the Balanced Scorecard for PTC. It starts with the planning and development steps followed in the BSC project, based on a literature review. Then, objectives, measures, targets and initiatives defined for each BSC perspective are presented, along with the strategic map representing the cause-and-effect relationships between the chosen measures.

6.1 Planning and Developing a Balanced Scorecard

Kaplan & Norton (1996a) and Niven (2002) divide the process of construction and implementation of a Balanced Scorecard in three main phases:

- Planning – steps or tasks that should take place before starting the construction of the BSC;
- Development - steps or tasks involved in the actual construction of the BSC;
- Implementation[40] - steps or tasks involved in putting the BSC to work.

6.1.1 The Planning Phase

On this phase, the following steps, adapted from the steps proposed by Niven (2002), were followed:

❖ Step 1: Development of objectives for the Balanced Scorecard

Niven (2002) claims that determining objectives in developing the BSC will go a long way in securing the evolution of the management tool in the organisation. Moreover, the Scorecard must be embedded in the management systems, becoming the cornerstone for management analysis, support and decision making, to ensure its transition from a measurement tool to a management system.

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[40] This last phase will be presented on the last chapter, under the Future Work section, where a methodology for the BSC implementation in PTC is suggested.

The development of a BSC for PTC aims to:

- Communicate the organisational strategy and the measures linked to the strategic objectives;
- Improve employees' understanding of how their day-to-day actions can contribute to realizing the company's vision;
- Work the inner motivational drivers of employees, bringing soul into their everyday attitude and performance;
- Provide to all staff a common unity of purpose;
- Translate the mission statement into specific measures that reflect the factors that customers really value, in order to improve their satisfaction;
- Align improvement initiatives, all BIPs[41];
- Align departmental and individual scorecards (to be developed in the future) with a global scorecard for PTC – "translate the organisation's high-level strategic objectives and measures into objectives and measures for operating units and individuals" (Kaplan & Norton, 1996b)[42];
- Link compensation systems with scorecard performance measures that translate the organisational strategy.

❖ Step 2: Build the Balanced Scorecard team

The development of a project of this magnitude and complexity should involve, from the beginning, the organisation's stakeholders. However, in PTC, the strategy was to involve on the initial stages of the BSC development only the manager responsible for this BIP[43], Eng. Anabela Pimentão, PTC's general manager, Eng. Jorge Fontes, the Yazaki Europe (YEL)[44] in the development of the strategy, and the entire involvement of Carolina Horta, the author of this project. Other stakeholders will be involved on the validation process, before the implementation of the final BSC.

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[41] Business Improvement Processes – activities developed in PTC for the continuous improvement of the organisation.
[42] This process is called "Cascading the Balanced Scorecard" (Niven, 2002).
[43] The development of a Balanced Scorecard for PTC is embedded on BIP 4.
[44] In the person of the Engineering Vice-President Lyndon Carillo.

PTC's main stakeholders include the following:

- Internal Stakeholders:
    - General Manager;
    - Departmental managers;
    - Team leaders;
    - Remaining employees.

- External Stakeholders:
    - Customers;
    - YEL;
    - Suppliers.

❖ <u>Step 3</u>: Project Plan Formulation

The BSC team established, on the beginning of October 2010, a plan for the project, including a timeline for all the different stages of the process of building a BSC. The planned and real time each activity took place can be seen on Appendix IV[45].

❖ <u>Step 4</u>: BSC Communication Plan Development

"The Balanced Scorecard is a change project, and most change efforts struggle to succeed, with the lack of communication being a chief cause of the potential failure."

Niven, 2002

A BSC Communication Plan was also developed by the BSC team to ensure awareness of the BSC at all levels of the organisation, provide education on key BSC concepts and generate engagement and commitment of internal stakeholders[46].

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[45] See Appendix IV – BSC Activity Planning.
[46] See Appendix V – BSC Communication Plan.

6.1.2 The Development Phase

At this stage, the following steps, adapted from the steps proposed by Niven (2002), were followed:

❖ Step 1: Gather background material

As referred in Chapter V, this initial step had the purpose of gathering material about past performance and the metrics followed, as well as documentation useful to establish objectives, measures, targets and initiatives for the four perspectives of the BSC (e.g. customer satisfaction survey, information about PTC's activities, etc.). Thus, a literature review on the state-of-the-art of this subject was conducted[47].

❖ Step 2: Develop mission, values, vision and strategy

As PTC didn't have its own mission, values, vision and strategy formally stated[48], these had to be defined in order to build a BSC that could translate and communicate them throughout the organisation. To involve all employees right at the beginning of the project and build awareness, a survey to determine PTC's values was administered.

❖ Step 3: Develop objectives, measures, targets and initiatives for each of the BSC perspectives

❖ Step 4: Develop cause-and-effect linkages between the defined measures and construct the Strategy Map

❖ Step 6: Develop the BSC implementation plan.

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[47] See Chapter IV.
[48] PTC used to follow YEL mission, values, vision and strategy.

6.2 Developing the Balanced Scorecard

6.2.1 Mission, Values, Vision and Strategy Development

PTC's mission, vision and strategic guidelines were defined by Eng. Jorge Fontes on the 7th February 2011 document "Strategic Business Plan for PTC"[49].

6.2.1.1 Mission Statement

The central role of Porto Technical Centre is defined as:

"Supply excellent services and products to our customers and partners, driven by the pursuit of knowledge and continued development."

6.2.1.2 Corporate Values

A survey[50] involving all PTC employees was conducted to define PTC's corporate values. Its result was that the corporate values governing Porto Technical Centre's development will include the following:

- Passion – in everything we do, we put not only our minds, but our heart in, to make the defining difference. And what we do is what we are.
- Trust – our demeanour shall every day lead to the trust by our customers and partners, based on our experience, knowledge and attitude. We earn the trust of our partners and customers through delivering on time a quality service at the best cost in the business.
- Commitment – we deliver to meet or exceed expectations in everything we do, no matter what endeavour or need we devote ourselves to. We always honour our contracts and the needs of our customers in accordance with the respective agreements.

"My PASSION today – Your TRUST tomorrow – Our COMMITMENT always"

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[49] See Annex IV – Strategic Business Plan for Porto Technical Centre.
[50] See Appendix VI – PTC's Values Survey and Results Analysis.

6.2.1.3 Vision

The promoters' vision of Porto Technical Centre in 3-4 years' time is:

"To be the benchmark Yazaki Technical Centre, as a provider of excellence for the organisation, delivering outstanding value-for-money and quality of product and services."

6.2.1.4 Strategy

"Strategy can only be said to exist when one can identify a consistent pattern of decisions and action within a firm."

Mintzberg, 1978

PTC's strategy was developed by Eng. Jorge Fontes and was approved by Lyndon Carillo, the European Vice President of Engineering (from YEL). The Strategic Business Plan established Key Strategies and Strategic Action Programs founded on PTC's business objectives and major goals and aimed to address PTC's key strengths, weaknesses, threats and opportunities[51].

6.2.2 Defining objectives, measures, targets and initiatives

Concerning the perspectives of the BSC, although the literature regarding this issue states there is a flexible approach to the Scorecard, as the number of perspectives may change and different perspectives can be added, and a BSC for services (with seven perspectives) has been developed[52], at PTC it was decided to develop the scorecard with the typical four perspectives. This decision had to do with the fact that, in the beginning of 2010, PTC's managers started to develop BSC's for each of their departments using this approach. The project was then adjourned, and is to be continued after the implementation of the global scorecard for PTC, by which all the departmental scorecards will be aligned. This option facilitates the communication

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[51] See Annex IV – Strategic Business Plan for Porto Technical Centre.
[52] As previously presented in the literature review section, the BSC for services was developed by Rajesh and Gupta (2008).

and assimilation of the BSC throughout the organisation, as it is already a management tool known by the managers and some employees.

A set of objectives, measures, targets and initiatives was then defined for each of these perspectives, translating PTC's vision and strategy. The BSC is to be reviewed and monitored annually and updated as required.

Neely *et al.* (1995) state that a performance measure can be defined as a metric used to quantify the efficiency and/or effectiveness of an action. The number of measures to include in the BSC is very often a concern throughout its development. The question is: How many is too many? Niven (2002) states the BSC should have approximately 10 objectives and 20 measures, and gives a guideline for the distribution of measures in each perspective:

- Employee Learning and Growth: Three to six measures. These measures are the enablers of the other three perspectives.
- Internal Process: Five to ten measures. – As the identification of key processes of the organisation may span the entire organisation.
- Customer: Five to eight measures. – Measures should derive from the value proposition. In this perspective it is common to have a large number of leading indicators[53].
- Financial: Three or four measures. – The organisation should be very clear on its financial goals and not require a large number of metrics.

The measures chosen for each BSC perspective will now be presented, explained, and justified.

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[53] The BSC should comprise a number of leading (performance drivers) and lagging indicators (outcome measures), as well as a balanced number of short, medium and long-term measures of performance.

6.2.2.1 Employee Learning and Growth Perspective

"The measures developed in the Learning and Growth perspective are really the enablers of all other measures on the Scorecard. Think of them as the roots of a tree that will ultimately lead through the trunk of internal processes to the branches of customer results, and finally to the leaves of financial returns."

Paul R. Niven, 2002

This perspective of the BSC is concerned with the identification of the necessary infrastructure for the company to grow and develop in the long run. The measures outlined in this perspective "are the foundation on which the entire house of a Balanced Scorecard is built" (Niven, 2002), they are what makes it possible to achieve the goals set in the other three perspectives.

Kaplan and Norton (1996a) argue that there are three sources for learning and growth in a company: people, systems and organisational procedures, suggesting for this perspective measures of employee capabilities, information systems capabilities, and employee motivation and empowerment (Kaplan & Norton, 1996a - 127).

This perspective of the BSC aims to invest in employees training and qualification, on the improvement of information systems and the alignment of procedures and routines of the company. Employee skills and training, employee satisfaction, the number of employee suggestions implemented to improve processes, availability of information and alignment are some of the measures that can be included in this perspective.

Having this in mind and the Strategic Plan for PTC, the objectives defined for the Learning & Growth perspective were:

- Achieve practical acknowledgement of PTC's values in the everyday operation, as per individual description;
- Lead staff to a greater task background knowledge for a more complete service provision;
- Improve communication (inbound/outbound) and management team and departmental integration;
- Continued Human Capital Development in technical and service aspects.

The measures defined were the following (see Table 2):

MEASURES
L1 - Focused and Speciality Training
L2 - Performance Management
L3 - Skills attainment
L4 - Employee Satisfaction
L5 - Absenteeism

TABLE 2 - Measures defined for the Learning & Growth Perspective

L1 - Focused and Specialty Training

This measure aims to monitor the investment in quality training to attain the key skills necessary to achieve PTC's defined vision. It is measured by the percentage of training hours from total working hours.

Training hours is a commonly used measure by companies, and is often referred in the literature as a typical measure for this perspective. The main problem of this measure is the fact it doesn't take into account the quality of the training programmes and the practical application of what was taught on employees' everyday work. Niven (2002) stresses "for training to prove effective, it must be linked to organisational goals and objectives, and companies should measure results of the training". The improvement of the Performance Management Process (PMP)[54] and the Licensing System[55] development, initiatives defined in this project, aim to address these issues, detect specific training needs, assigning adequate programmes to employees, and assess training and skills attainment.

L2 - Individual Performance Management

Drucker (1954) argued that all employees should have personal performance objectives strongly aligned to the company strategy – "Every manager […] must know

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[54] The PMP is YAZAKI's individual performance management system. The PMP and an intervention and improvement plan for this system is further developed in Appendix VIII – Human Resources at PTC and the Improvement of the Individual Performance Management System.
[55] The Licensing System Project will be further addressed in measure I5.

and understand the ultimate business goals, what is expected of him and why, what he will be measured against and how".

Performance management is the process of creating a work environment or setting in which people are enabled to perform to the best of their abilities. Performance management systems are central in all operational areas of people management. On the one hand, they serve to validate the recruitment methods of the company. On the other, to measure the individual and team contribution to achieve the strategic objectives of the organisation and also manage remuneration and incentives schemes, identify the potential of employees and diagnose training needs[56].

The PMP (Performance Management Process) is the system used across Yazaki Europe to manage individual performance. It is based on the management by objectives concept, integrates most people management areas and promotes organisational alignment.

This subject is further developed in Appendix VIII, where some improvements to the system are suggested.

L3 - Skills attainment

The third measure defined for this perspective concerns the objective of continuous human capital development and aims to evaluate PTC staff against desired skills, differentiating core competencies needed to achieve the strategy. The Licensing System[57] that is being developed aims to define the desired skills and necessary training for each task, and has as ultimate objective the increase of cross-trained employees.

L4 - Employee Satisfaction

The employee satisfaction rating is also a very common employee learning and growth measure. According to Heskett *et al.* (1997), on the Service Profit Chain,

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[56] Adapted and translated from "Manual de Gestão de Pessoas e do Capital Humano" (Cunha *et al.*, 2010).
[57] The Licensing System will be further addressed in measure I5.

external service value, customer satisfaction and loyalty, and consequently revenue growth and profitability, derive from a good internal service quality and employee satisfaction.

Employee satisfaction in PTC is assessed through the administration of a biannual survey (December and June). This survey is currently being improved, and is to include, among other important factors, employees' opinion regarding access to equipment and necessary information. The analysis of the questionnaire responses should allow the acknowledgement of areas requiring improvements, and result in the development of improvement actions.

L5 - Absenteeism

The absenteeism measure reflects employees' absence from work due to scheduled time off, illness, injury, or any other reason. In a service organisation context where establishing trustable relations with customers is crucial for business success and where QCD[58] components are the cornerstone of the service provided by PTC, this measure is deemed vital.

In recent years academics have been discussing the re-evaluation of absenteeism measurement to ensure the outcomes appropriately reflect current work practices. Hilton *et al.* (2009) advocate that absenteeism is not constrained to positive values (working less than your employer expects), it can be negative (working more than your employer expects), and argue that absenteeism measurement techniques should reflect this reality. At PTC, only positive absenteeism is considered.

6.2.2.2 Internal Business Process Perspective

In the Internal Process Perspective of the Scorecard, the key processes the firm must excel at in order to continue adding value for customers and, ultimately, shareholders, are identified. These key processes are the ones that allow organisations

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[58] Quality, Cost and Delivery.

to gain competitive advantage and differentiate themselves from competitors. The definition of the objectives of the customer's perspective will lead to the effective functioning of certain internal processes to ensure the company meets its value proposition and its customers' needs.

The BSC considers the internal processes of the entire value chain of the company, includes the product development and innovation, production, manufacturing, delivery, and post-sale service, so it also includes supplier relationships and other third-party arrangements to effectively serve customers.

In this perspective, common indicators are: defective rate, the evolution of unit costs, the percentage of certified suppliers, number of hours spent with key customers, quantities sold through new distributors and delivery time of orders.

The objectives for this perspective were defined as follow:
- Improve delivery speed of services and products;
- Improve external quality;
- Improve understanding of customer needs;
- Integration of service value components (QCD)[59]

Service value components refer to the quality, cost, and delivery of the service. Originally developed for manufacturing contexts, QCD is now used in various types of organisations, including service providers. It aims to raise standards in seven key areas: quality of finished products/services, on-time delivery, staff productivity, stock levels, efficiency of equipment, added value and floor space[60]. As for PTC, the floor space is not applicable, as we are talking about a service organisation. Thinking in terms of QCD helps keep organisations focused, as the measures of QCD give a coherent and overall analysis of performance and provide the basis for continuous measurement and to prioritize improvement efforts.

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[59] "It doesn't matter what type of organisation you work for, there are three things that you need to excel at if you just want to even get an entrance ticket in today's global competitive environment. What are these three things? They are: Quality, Cost and Delivery." *In* http://www.leankaizen.co.uk/quality-cost-delivery.html
[60] *In* http://www.mas.bis.gov.uk/east-midlands/events/training/qcd

Jorge Fontes resumes QCD at PTC as "providing a quality and consistent service, with low costs and 100% delivery according to agreed date with customer". According to Marco Neves, the PTC's Quality Manager, "Quality is measured through the customer satisfaction survey[61], the rate of customer complaints translated into Ppm[62], and internal defects; Delivery is measured by sector, as it is hard to have a single and common indicator because activities are very different; and Cost is given by the sales efficiency measure". YAZAKI already started using the term QCDE, given the company's large concern with the environment.

The measures defined for the Internal Processes Perspective were (see Table 3):

MEASURES
I_1 - Time per deliverable unit
I_2 - % of utilization of equipment resources
I_3 - Delivery performance
I_4 - Sales Efficiency
I_5 - Internal audits resulting actions
I_6 - Promotion and implementation of improvement solutions
I_7 - External Quality and service value

TABLE 3 - Measures defined for the Internal Processes Perspective

I_1 - Time per deliverable unit

Time per deliverable unit refers to the lead time between request (standard) and delivery. This concept has different denominations within the various PTC departments. In the WHE department, this time span is called time per circuit. Figure 11, extracted from the MHT (Man Hour Tracking) System, shows the time per circuit performance of this department since the beginning of term 70 (July 2010) until April. The performance results are shown in pink and compared to the year-to-date (YTD) target (1,66) and the

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[61] See Annex V – PTC's Customer Satisfaction Survey.
[62] Ppm – parts per million. As an example, on the WHE department it is calculated as follows:

$$\frac{num.\,defects}{num.\,of\,circuits} \; x \; 1,000,000 = X \; ppm$$

YTD, calculated by the sum of the values of the previous 12 months (accumulated value) divided by 12.
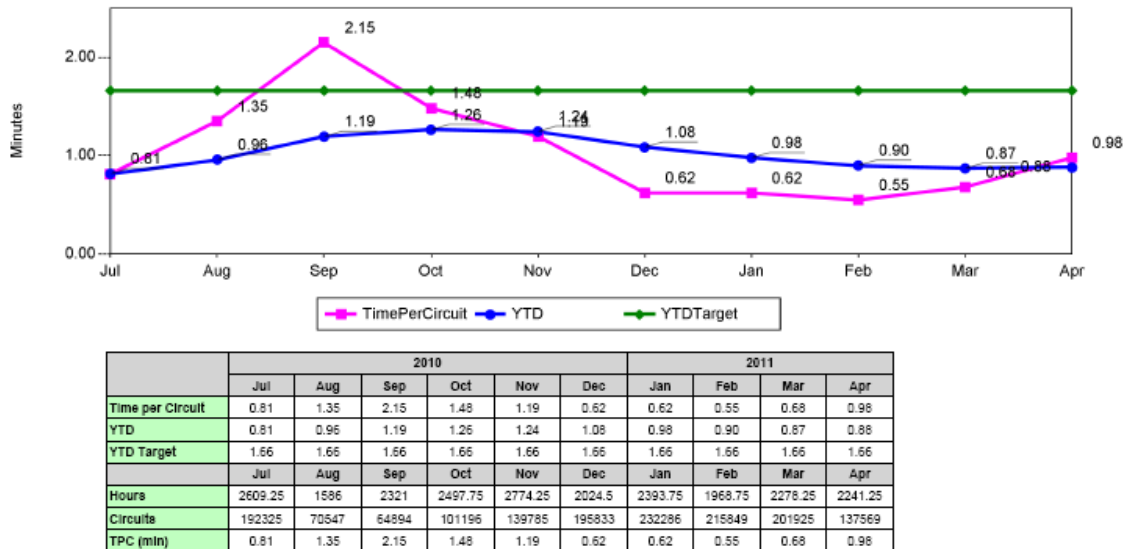

FIGURE 11 - WHE Time per Circuit Performance
Source: MHT System

I2 - % of utilization of equipment resources

This measure aims to monitor the utilization of equipment resources, with the ultimate objective of maximizing their use. Although all PTC employees have a computer, only some of these are equipped with the necessary software and licenses to perform some activities. It is then necessary to optimize resource sharing in order to make the best use of available resources.

I3 - Delivery performance

This measure, or on-time delivery, is a common measure in this perspective. In the development of this BSC it was decided to include this measure both on the internal process and customer perspectives, as it was verified customer perceptions on delivery

(expressed on the annual customer satisfaction survey) were different from what internal data indicated. This is also one of the reasons that motivate the improvement of the customer satisfaction survey.

Figure 12 shows the delivery performance of the WHE department since the beginning of term 70 (July 2010) until April 2011. As one can see on the graph, the majority of projects were delivered on time and even earlier. On the table below, the monthly percentage of on-time delivery is presented. This measure is calculated by the following formula:

$$\frac{ETA}{ETD} \times 100\%$$

Where:

ETA – Estimated Time Acceptance / Arrival

ETD – Estimated Time Delivery

Part Numbers on Agree Date - Flag 1
Manufacturing Design Activity
WHE-PSA,RT,TEA2+,Faurecia

On Time = 100% Target
= 98% Threshold

			2010						2011	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Earlier (%)	25.89	20.03	0.00	9.97	10.99	22.75	3.69	11.56	22.57	7.05
On Time (%)	74.11	79.97	100.00	90.03	89.01	76.77	96.31	88.44	77.43	92.95
Delay (%)	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Monthly (%)	100.00	100.00	100.00	100.00	100.00	99.52	100.00	100.00	100.00	100.00
YTD (%)	100.00	100.00	100.00	100.00	100.00	99.89	99.91	99.93	99.94	99.94
Earlier (Qty)	292	116	0	57	90	235	50	119	216	53
On Time (Qty)	836	463	366	515	729	793	1306	910	741	699
Delay (Qty)	0	0	0	0	0	5	0	0	0	0
YTD Delay	0	0	0	0	0	5	5	5	5	5
Part NO. QTY	1128	579	366	572	819	1033	1356	1029	957	752
YTD Part NO. QTY	1128	1707	2073	2645	3464	4497	5853	6882	7839	8591

FIGURE 12 - WHE Delivery Performance
Source: MHT System

I4 - Sales Efficiency

Sales Efficiency is normally defined as the performance measure of the relationship between sales volume or value and individual and total selling costs from the sales department. However, in PTC there is no sales department, all employees work to sell services per hour. Therefore, this measure is calculated in a different perspective, representing the percentage of capacity hours sold. This value should be higher or equal to 92%, considering the targeted values for absenteeism (2%), overtime (3%), and training (3%) from productive hours.

I5 - Internal audits resulting actions

Internal audits or Focused or Moto Activity Audits are activities that aim to assess if the Moto[63] Activity is being performed correctly. The activity emerged after a quality analysis performed in 2004 to a YAZAKI plant in Japan. 80% of the detected problems were associated with the 5S Methodology, Training, and Change Management (4M). Consequently, a reformulation on the way these tools were being used took place, applying them with much more rigor, aiming to improve overall quality. Moto Activity was initially created for manufacturing, but was developed in PTC for the office context. The Moto Activity is one of the components of the New YAZAKI System (NYS).

The NYS is a kaizen philosophy and a top-down lean reform process in a wide scope that aims to sustain the company's competitiveness and prepare it for the future. The system emerges to cope with the changing automotive environment, with increasing partnerships between the various car manufacturers (e.g. Renault / Nissan, Ford / Volvo, etc.), short life products (models constantly changing), numerous different variations on the same car model, and big fluctuations in production. An objective of the NYS is to increase the ability to react quickly to the changes requested by clients with respect to variety of products/services, quality, and cost. The key to success must be the identification of waste (Muda), and its elimination. Rui Silva, the NYS Coordinator, resumes the NYS as "a machine composed by several tools and activities that leads to

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[63] Moto refers to origins, foundation, basics, and norms – "it's building the foundations going back to basics in order to restore the grounds and standards", said Rui Silva, the NYS Coordinator.

continuous improvement", and in PTC it is "the seed of lean philosophies in the office/service context".

The following tools and techniques that compose the NYS are used in PTC for different processes: 5 S Standardized Methodology, Licensing System, and 4M – Change Management.

❖ 5 S Standardized Methodology

The 5 S Methodology was elevated to a different level, becoming associated to each activity performed[64]. Indicators / rules were created to make it measurable. The traditional 5 S[65] started to be applied with much more rigor.
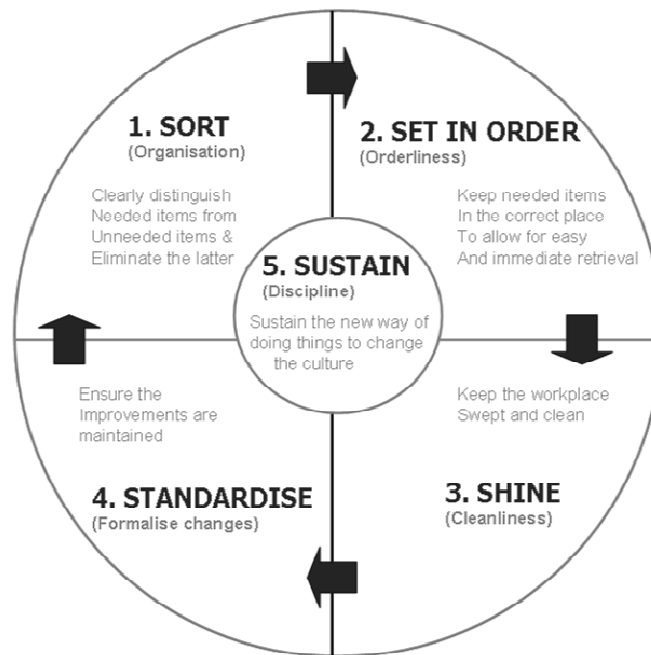
FIGURE 13 - The 5 S Methodology
Source: http://www.epa.gov/lean/environment/methods/fives.htm

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[64] Task analyses, defining what is necessary to perform the task and eliminate what is not are some of the steps used while applying the 5 S Standardized Methodology.
[65] The traditional 5 S are: Seiri (sorting, organization of the workplace, elimination of unnecessary materials), Seiton (set in order, place for everything), Seiso (shine, cleaning, removing of wastes, dust etc.), Seiketsu (standardize, constant place for things, constant rules of organization, storage and keeping cleanness), and Shitsuke (sustain, automatic realization of above-mentioned rules) (In http://www.epa.gov/lean/environment/methods/fives.htm).

Particularly in the office/service context in PTC, the Standardized 5 S Methodology is reflected in:

- categorising everything in the workplace;
- eliminating all unnecessary items, to allow more space, time, organisation, and make the workplace more enjoyable;
- the storing and properly identification of the necessary items in designated locations, as standardized layout and positioning allow to save time and increase productivity;
- clearly defined cleaning procedures to create a better, more enjoyable and more efficient workplace;
- clearly defined norms each employee must respect, whose objectives, contents and methods should be explained by managers and team leaders to ensure these are understood by all.

❖ Licensing System

The training system was developed into a licensing system, where employees go through, firstly, theoretical training which is assessed by a test, followed by practical learning (on-the-job training) if the results were satisfactory, and a new assessment. Licensed employees receive (or complete) a card indicating the activities they are licensed to perform (see Figure 14). This process also includes license renewals, to ensure employees' knowledge updating in the various processes or areas.

FIGURE 14 - Example of temporary licensing card
Source: Moto Activity Presentation Slides (2010)

The licensing system is already used all over the YSE plant, and is to be implemented in PTC. As mentioned before, this system aims to increase cross-trained employees and service quality.

❖ 4 M – Change Management

Regarding change management, mechanisms were created to track changes on the different 4M[66] since the beginning of the process until the final result. Information is key. Services, processes, etc. that have undergone change must be well identified, ensuring everyone understands the change, its progress should be visible and understandable by all. Therefore, it is also important to ensure the necessary training to all employees and managers involved in the situation.

There exists an Audit Plan for PTC. The system that had the assessment flexibility of a 0 to 10 scale changed to a 0 or 1 system ("it is or it is not"[67]). These audits can only be performed by licensed employees in Moto Activity. In PTC these audits are performed by Rui Silva and Marco Neves[68]. After each audit, a report with the following steps is prepared: Subject / Report, Area, Problem / Finding, Root Causes / Actions, Implementation Date, Responsible, and Follow-up. Corrective and preventive actions are the actions that may arise from these audits. The number of these actions implemented according to agreed date is already closely monitored by the Quality Department.

Corrective and Preventive Actions may also arise from other sources:

▪ Customer Complaints – the monthly report BOS (Business Operating System) is prepared and presents the trend and target of defects, a Pareto analysis of the five most common defects, an action summary for the most frequent defects, and

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[66] The 4M are: Man (change of operators), Machine (new, updating or improving facility), Method (changes in process (operations, working conditions, etc.)), Material (raw material, parts change, packing change or auxiliaries).
[67] Said Rui Silva, the NYS Coordinator.
[68] External Audits are performed by a certified external entity and follow the same procedures.

the monthly action monitor per department to deploy methodologies and leverage synergies.

▪ Internal Defects (detected internally).

▪ Suggestions from employees – IFT (ideas from team) System.

▪ YAZAKI Complaints (non YSE) – complaints should be received by the department that originated them and by the quality department. A meeting to analyse the complaint and establish corrective action takes place, and the 8D (disciplines) Report is developed. The Report comprises 8 disciplines to follow: (1) Concern (where the complaint details are explained), (2) Containment Actions, Who and When, (3) identification of the Root Cause using the 5 Why Methodology, (4) Interim Countermeasures / Actions, (5) Permanent Countermeasures, Countermeasure Verifications, (6) Control, (7) Prevention Action, and (8) Actions follow-up (determine whether they were implemented and their effectiveness).

▪ YSE Complaints – almost 500 prototypes and service parts complaints per year. Responsible department receives, analyses and responds to complaint and the quality department compiles the information. The person responsible for the actions and follow-up is identified.

I6 - Promotion and implementation of improvement solutions

Improvement solutions at PTC may come from various sources: customer complaints, internal defects, internal audits, ideas from team (IFT), quality control circles (QCC), 5 S Methodology, Jishuken, the value stream map (VSM) method and 10 Muda.

These different improvement solutions sources, that were not previously mentioned, will now be addressed thoroughly:

❖ IFT (Ideas From Team)

Ideas from team emerge through an intranet system that works as a suggestion box for things that employees want to see improved. Ideas are then analysed by the NYS team and directed to the departments that should be involved in the process improvement. The development and implementation of the solution and its results are

closely monitored. The best suggestion and the best resolution win a prize. IFTs can lead to Jishuken and QCC projects.

❖ QCC (Quality Control Circle)

Quality Control Circles started in Japan as a voluntary initiative of some people who gathered after work to discuss quality problems and try to solve them. An entity called Quality Circles was eventually created, and techniques for analysing and solving problems were developed. Nowadays, quality circles are still voluntary and seek to solve quality problems in their own work, and often also deal with efficiency problems. Solutions often do not happen within the organisation, but through the action of external entities to the circle, which may be beyond the control of the circle in terms of time. After six months of work, a presentation for the organisation takes place, and the teams are assessed by a jury composed of internal managers and team leaders. The winner quality circle will join the European presentation, and if it is selected at this stage it will present in Japan, representing the YEL.

❖ Jishuken

Jishuken are projects related to the improvement of some processes, composed by multidisciplinary teams that normally work to find solutions to an identified problem. It is more intensive than QCC, as its duration is normally only 2 days. There are three types of Jishuken: internal (PTC), regional (PTC, YSE and Yazaki Plant in Romania), and European.

❖ VSM (Value Stream Map)

"The VSM method is a visualization tool that helps to understand and streamline work processes using the techniques of Lean Manufacturing. The goal is to identify, demonstrate and decrease waste in the process.[69]" Teams are asked to use this method to identify points of failure, bottlenecks, and possibilities for improvement. The 10 Muda are widely used here.

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[69] *In* http://www.valuebasedmanagement.net

❖ <u>10 Muda</u>

The NYS has added three Muda to the traditional and well-known seven forms of waste identified by Shigeo Shingo (see Figure 15). "Waste is the use of any material or resource beyond what the customer requires and is willing to pay for. Lean Manufacturing aims to identify and eliminate waste to improve the performance of the business.[70]"
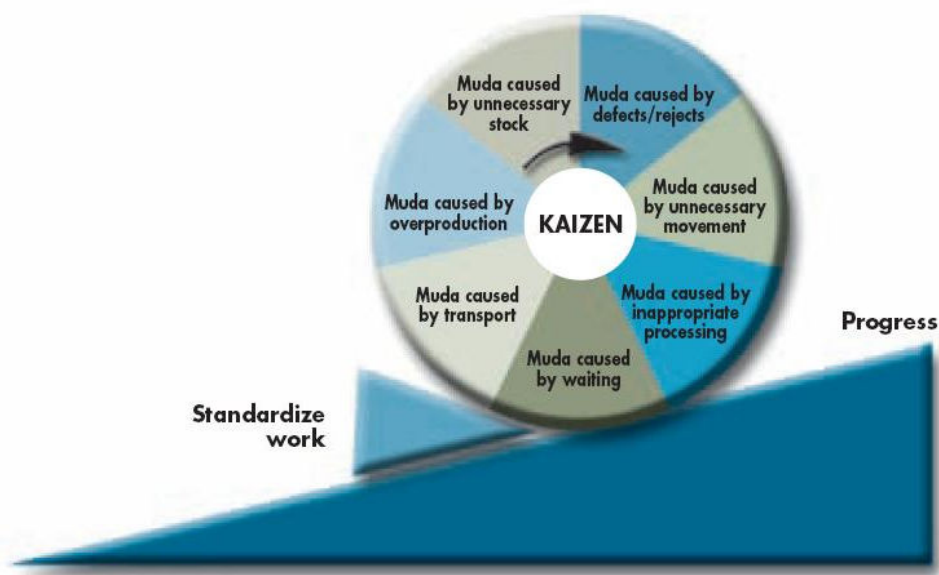
FIGURE 15 - The 7 MUDA
Source: www.trilogiq.com

The NYS team added the following:

- The waste of not capitalizing the training possibilities;
- The waste of people not applying the knowledge acquired in training on their daily work;
- The waste of not taking advantage of the synergies of group work.

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[70] *In* www.beyondlean.com

I7 - External Quality and service value

This measure is currently monitored through the annual customer satisfaction survey. It is assessed by the global average of ratings on question 9 – Quality, Accuracy, and Correctness of work / documentation provided, and by the ratings to quality ratio of the performed services assessed from customers regarding the external services provided by the Laboratory. However, external quality and service value raises the issue of customer expectations vs. customer perceptions.

In their 1994 article "Putting the Service Profit-Chain to Work", Heskett *et al.* argue that "Ultimately service quality is a function of the gap between perceptions of the actual service experienced and what a customer expected before receiving that service", and that "Value is always relative because it is based both on perceptions of the way a service is delivered and on initial customer expectations".

As there is not a close and on-site provision of PTC services to customers it is sometimes not easy to understand customers' real expectations for the service. The defined initiative to improve the customer satisfaction survey using the SERVQUAL model aims to better understand these service expectations and reduce the gap between what was expected and the perceptions of the service received.

6.2.2.3 Customer Perspective

The Customer Perspective represents the company's strategy into specific objectives to meet the target customers and allows a clear identification and assessment of the value propositions addressed to them. When choosing measures for this perspective, organisations must answer two critical questions: "Who are our target customers? and What is our value proposition in serving them?"

The customer value proposition describes how an organisation will differentiate and, consequently, what markets it will serve. Establishing a value proposition is a good way to determine leading indicators for the Customer Perspective, where "more than anywhere else in the Balanced Scorecard, the mix of lag and lead indicators is vital" (Niven, 2002).

Bearing in mind the three "disciplines" defined by Treacy and Wiersema in the Discipline of Market Leaders (1995), PTC defines its value proposition as Operational Excellence, as Eng. Jorge Fontes believes the organisation should deliver operational excellence in order to be customer intimate. Organisations pursuing this value proposition discipline focus on low price, convenience, and often "no frills", while a customer intimacy value proposition means doing whatever it takes to provide solutions for customers' unique needs, focusing on long-term relationship building.

As defined on the Strategic Business Plan, in order to maintain its customers, sustain its position in the market, and be better than competition, the following objectives were defined for PTC in this perspective:

- Develop customer loyalty;
- Acknowledgement as partner with customers for business support;
- To be perceived as a value-for-money business proposition;
- Complete service provision portfolio in core competence areas;
- Achieve an improved externalization profile through a more outward drive.

The measures chosen for this perspective were (see Table 4):

MEASURES
C1 - Customer Loyalty
C2 - Customer Satisfaction
C3 - Improve services portfolio
C4 - New added-value solutions
C5 - Additional new brought-in activities
C6 - Additional staff performing new brought-in activities
C7 - Delivery Performance
C8 - Addressing of customer complaints
C9 - Increase Portfolio of External Customers

TABLE 4 - Measures defined for the Customer Perspective

C1 - Customer Loyalty

"Customer loyalty is when an organisation receives the ultimate reward for the way it interacts with its customers. Loyal customers buy more, buy longer and tell more people"[71].

It is important to acknowledge the fact that both parties in the customer-firm relationship can benefit from customer retention. "Sometimes these relationship benefits keep customers loyal to a firm more than the attributes of the core service" (Zeithaml *et al.*, 2006). The same authors, in their book "Services Marketing – Integrating Customer Focus Across the Firm", state the different types of benefits both customers and firms get from maintaining long-term relationships. Benefits for customers include "confidence benefits" (comprising, among others, feelings of trust on the provider), "social benefits" (the social relationship with service providers makes it less likely customers will switch to competitors), and "special treatment benefits" like being given a special deal or price. Regarding the benefits for the firm, in addition to the economic benefits associated with maintaining and developing a loyal customer base, the authors also refer to "customer behaviour benefits" like the free advertising provided through word-of-mouth, and "human resource management benefits", as customers may be able to contribute to the coproduction of the service because of their experience and knowledge of the service provider.

At PTC, customer loyalty is not yet being monitored, but with the established objective to increase the portfolio of external customers this issue becomes relevant. Customer retention is to be assessed through the sales per customer progression. Another source to measure customer loyalty is the customer satisfaction survey, where questions such as "Do you prefer our services to competitor offerings?" or "Will you purchase our services again?" could be included.

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[71] *In* http://www.customerservicebasics.com/customer-loyalty-definition.htm

C2 - Customer Satisfaction

Customer satisfaction is one of the most commonly used measures in this perspective. It aims to measure the overall satisfaction level of PTC customers with the service provided in each year. It is given by the average of customer satisfaction for each department / activity and items assessed on the annual customer satisfaction survey.

C3 - Improve services portfolio

Improving the services portfolio should contribute to retain existing customers and attract new external customers. The services portfolio can be improved by improving existing services provided by PTC, or by increasing the number of offerings. For the BSC it was decided the services portfolio improvement, as for now, should be measured by the number of new added-value solutions for customers and the number of additional new activities brought-in to PTC.

C4 - New added-value solutions

New added-value solutions refer to new solutions developed by PTC to respond to customer needs and expectations and that add value to the service provision. This measure aims to achieve customers' and potential customers' acknowledgement of PTC as an added-value solution provider that develops real world required solutions for organisations.

C5 - Additional new brought-in activities

Bringing activities performed at other sites to PTC is another way to improve and extend the services portfolio. The "acknowledgement as a value-for-money solution provider" is one of PTC's key strategic guidelines. To increase the number of brought-in activities it is crucial to highlight the business sense of service transfer to PTC.

C6 - Additional staff performing new brought-in activities

Monitoring the number of staff performing new brought-in activities is another way to measure the increase on services and activities provided by PTC.

C7 - Delivery Performance

As for now, delivery performance is assessed by customers through the customer satisfaction survey, and is given by the global average of assessments to question 4 – "Delivery time of products / services according to agreed date".

C8 - Addressing of customer complaints

Proper addressing of customer complaints is critical to customer satisfaction and retention. Addressing of customer complaints should follow the defined service recovery system to minimize customer dissatisfaction from service failures.

Regarding the Service Recovery System, PTC has a Contingency Plan, where all situations that may jeopardize the service/product delivery to customer and what to do should they arise are described. Twenty seven different situations that apply to all PTC departments were identified, as well as the respective emergency actions and responsible department. Examples of identified problems are operators' absenteeism, components shortage, natural disasters, terrorism, and IT problems. There is also a predefined email to send to customers when these situations occur.

This measure's defined key performance indicator is the lead time to address customer complaints and time to closure according to the lead times established at the Contingency Plan.

C9 - Increase Portfolio of External Customers

The objective to increase the portfolio of external customers has often been referred throughout this work. Although data on this measure is available at the Operating Business Sector (OBS) it is not yet monitored. Expanding the portfolio of external customers will allow sales progression and an improved externalization profile. Developing a website for PTC and a Marketing Plan to identify potential customers and

communicate PTC services are some of the initiatives defined to achieve the established target for this measure.

6.2.2.4 Financial Perspective

The measures in this perspective tell us whether our strategy execution, which is detailed through measures chosen in the other perspectives, is leading to improved bottom-line results. If the company's efforts, for example, in increasing customer satisfaction or on-time delivery, don't translate in improvements on the organisation's financial returns they are of limited value.

Classical lagging indicators are normally encountered in the Financial Perspective. Typical examples include profitability, revenue growth, gross margin, ROI (Return On Investment) and EVA (Economic Value Added).

For the Financial perspective, the following objectives were defined:

- Assure maintenance of price to customer for 10 years (2011-2021)
- Sales progression – not sales increase, as there can be sales progression without increase by, for instance, redefining the mix of sales;
- EBIT sustenance.

The performance measures defined for this perspective, in order to determine whether the objectives above are being achieved and that the strategy is being successfully implemented were (see Table 5):

MEASURES
F1 - SG&A Costs
F2 - Compounded Hourly Cost
F3 - Price-to-customer
F4 - Sales Progression
F5 - EBIT Control

TABLE 5 - Measures defined for the Financial Perspective

F1 - SG&A Costs

Selling, General and Administrative expenses is an income statement item that presents major non-production costs. Reducing costs is crucial in PTC to assure the maintenance of the established price-to-customer. However, PTC's strategy regarding customers may increase these costs. Kaplan and Narayana (2001) state that for many companies capturing business by meeting customers' expectations for increased service often means: "smaller, more frequent deliveries; direct deliveries to the customer's end-use location; managing more complex rebate and pricing schemes; maintaining information on customer usage; producing and stocking a greater variety of products; and supporting more communication channels". While all of these services create value and loyalty among customers, they also increase non-production costs. Therefore, it is important to monitor SG&A Costs while monitoring other measures that translate PTC's strategy.

F2 - Compounded Hourly Cost

The compounded hourly cost represents the average of departmental hourly cost rate, the hourly cost of providing the service. Achieving a low compounded hourly cost will assure maintenance of price-to-customer for 10 years, one of PTC's strategic objectives.

F3 - Price-to-customer

All services provided by PTC are sold in "hours spent to provide the service". Price-to-customer is the established sales price per hour. As mentioned before, it is one of the main PTC strategic goals to maintain the price-to-customer for the next 10 years.

F4 - Sales Progression

Sales or sales per customer are common measures on the BSC financial perspective. Nonetheless, it was decided to include the sales progression measure instead, as it may provide more detailed information. Jorge Fontes gave the following examples "we can have sales progression without having an increase in sales by redefining the mix of sales" and "we can sell the same X hours but increase the EBIT of those hours".

F5 - EBIT Control

Earnings Before Interest and Taxes is a commonly reported measure of pre-tax profitability. As previously mention, PTC is defined within the YAZAKI Group as a "non-profit organisation", a support and cost centre. For this reason, it is established PTC's EBIT should be zero (established target). Furthermore, "achieve an improved externalisation profile through a more outward drive" and increase the portfolio of external customers are also stated as PTC's business objectives. Earnings from external customers should balance cost activities developed by PTC to ensure a zero EBIT.

After defining the objectives and the measures for each perspective of the BSC, targets[72] for each performance measure were set, as well as initiatives[73] to meet those targets. The BSC Measures Dictionary (Appendix VI) compiles important information for each measure chosen, as well as the Summary of the Balanced Scorecard for PTC (Appendix IX).

In their book "Strategy Maps" (2004b), Kaplan and Norton argue that "initiatives create results and thus the implementation of the strategy is managed through the monitoring of strategic initiatives". Although it is common to define timelines

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[72] A target can be defined as a quantitative representation of the performance measure at some point in the future (the desired future level of performance). Targets establishment allows performance data to give the feedback necessary for analysis and decision making.
[73] Initiatives are the action steps, processes, and plans that will help ensure performance targets are met or exceeded.

to achieve targets and to prioritize initiatives, these actions were not undertaken in this project.

The initiatives defined for each perspective of PTC's Balanced Scorecard are presented on the following tables. Some initiatives are already in progress, whereas others will be deployed in the future.

	INITIATIVES
EMPLOYEE LEARNING & GROWTH	Communication Training Programme
	Improved training programme selection procedures
	Follow-up of training results through practical evaluation (possibility to link with Performance Management Process)
	Maximize usage of improved skill sets
	Improve the Performance Management Process System, integrating all people management areas.
	Expand its application to all PTC employees
	Development of focused and speciality theoretical and on-the-job training programmes
	Introduce PTC Licensing System as in production
	Follow-up on training effectiveness – written and practical tests and knowledge recycling
	Develop new employee satisfaction survey
	Promote active Communication Plan
	Promote pleasant working environment
	High focus on human relation management
	Provide adequate work tools
	Focus on Human Capital development
	Close expert and targeted support
	Personalized follow-up of recurrent absenteeism

TABLE 6 - Initiatives defined for the Learning & Growth Perspective

	INITIATIVES
INTERNAL PROCESS	Eliminate MUDA from business and operational processes
	Operational skills attainment
	Improved process development
	Technological improvement
	New Yazaki System (NYS) as operational tool
	Create OEE (Overall Equipment Effectiveness) metrics as in production
	Develop computer utilization online schedule
	Coach customers to real capabilities
	Coach staff to QCD elements as key to business survival
	Clearly define the provider-to-customer path
	Assurance of metric data availability for control and follow-up
	Assurance of awareness to ratio management
	Ensure corrective and preventive action plan fulfilment
	Audits reports follow-up
	Continuous improvement of QCD metrics
	Promote the development and encourage employees to suggest improvement solutions
	Follow-up and clearance of all quality issues
	Focus marketing on value-for-money business proposition

TABLE 7 - Initiatives defined for the Internal Process Perspective

75

INITIATIVES
Improve quality and know-how of customers' needs - Customer Relationship Management Project (CRM)
Challenge customers on service development needs and expectations
Coach customers to real capabilities
Complete service provision portfolio in core competence areas
Follow service recovery system
Develop new customer satisfaction survey using SERVQUAL
Increase time spent with customers and co-location of PTC staff at customer support sites
Highlight business sense of service transfer to PTC
Assessment of opportunities study within YEL
Coach staff to QCD elements as key to business survival
Promote external communication and marketing approaches
Development of personalized complaints and caring system
Improve services portfolio (ESD and Lab)
PTC website development
Marketing Plan development - identify potential customers and communicate PTC services

(CUSTOMER)

TABLE 8 - Initiatives defined for the Customer Perspective

INITIATIVES
Improve SG&A Costs by yearly fixed percentage through expense reduction
Ensure contained salary progression through CPI indexing (below)
Continued sales progression in lower cost activities
Finance operation through external customer revenue maximisation

(FINANCIAL)

TABLE 9 - Initiatives defined for the Financial Perspective

6.2.3 Developing cause-and-effect relationships

The development of cause-and-effect relationships between the measures defined was the next step. According to Niven (2002), this stage is a vital topic, as it tells the story of the organisation strategy through a series of linked measures. The objectives, measures and relationships between the measures are represented on the strategy map, "a visual representation of the linked components of an organisation's strategy" (Kaplan & Norton, 2004b).

To develop PTC's strategy map it was decided to adopt the model proposed by Niven on his 2002 book "Balanced scorecard step by step: maximizing performance and maintaining results". Although the strategic objectives are also present in the map, the story of the organisation strategy is represented through a series of cause-and-effect

relationships between the different measures defined. The choice for this different type of approach to strategy mapping had to do with the BSC team belief that this template would provide a more objective result, and that the general representation of the relationships between strategic objectives could have low significance throughout the organisation.

The cause-and-effect relationships, at this stage, were defined resting on subjective and qualitative judgments. In the long-run, these correlations and causation among the BSC measures are to be validated and documented, and even quantified, allowing for a strategic learning through continuous strategic review.

STRATEGY MAP – Cause-and-effect linkages in the BSC

<u>Mission Statement</u>: The central purpose and role of Porto Technical Centre is "supply excellent services and products to our customers and partners, driven by the pursuit of knowledge and continued development".

<u>Vision</u>: The promoters' vision of Porto Technical Centre in 3-4 years' time is "to be the benchmark YAZAKI Technical Centre, as a provider of excellence for the organisation, delivering outstanding value-for-money and quality of product and services".
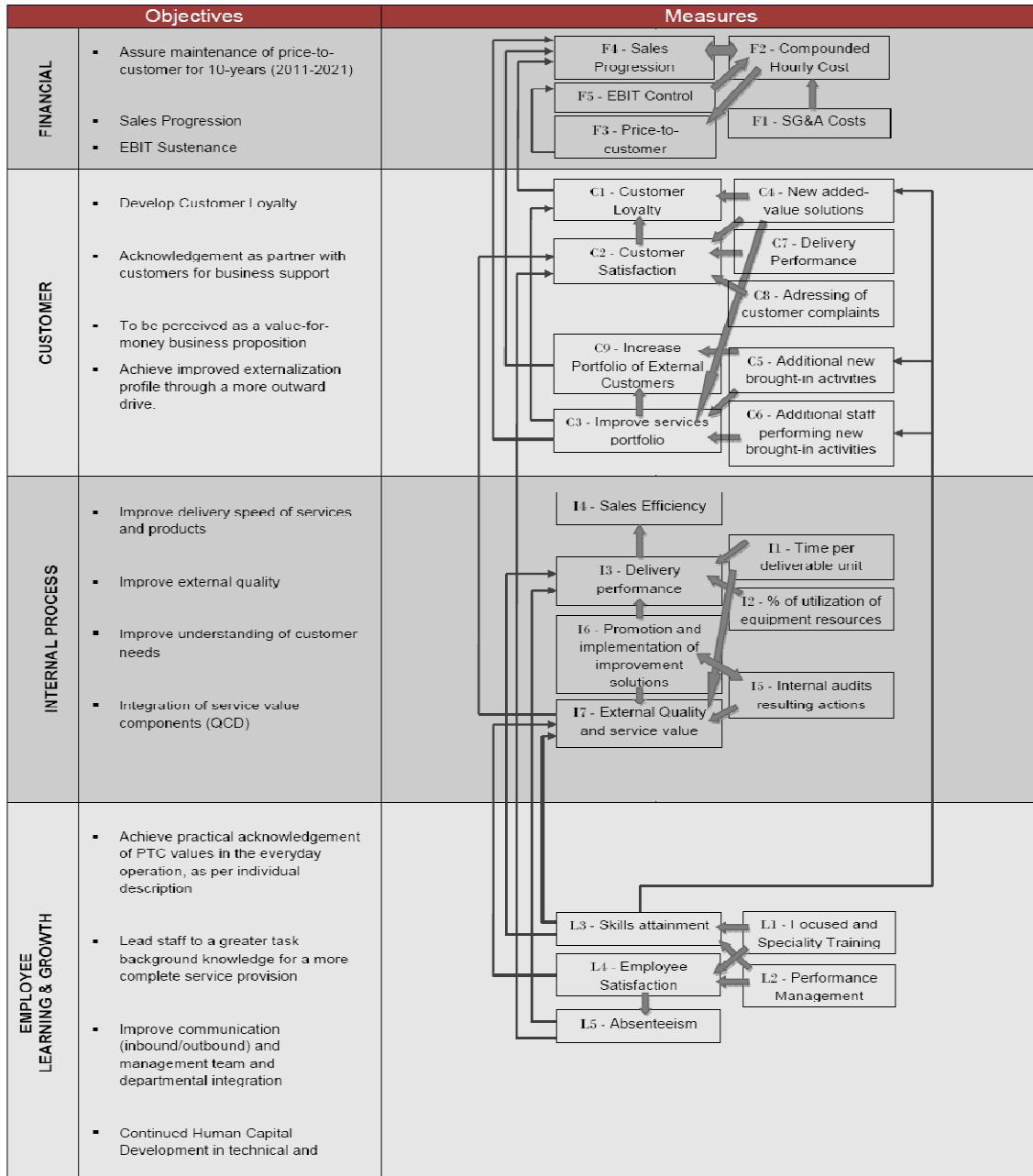
FIGURE 16 - PTC's Strategy Map – Representing cause-and-effect relationships between measures on the BSC

As mentioned before, measures on the Learning & Growth perspective are the enablers of every other measure on the Balanced Scorecard. The strategy map "illustrates the relationships that link desired outcomes in the customer and financial perspectives to outstanding performance in critical internal processes" (Kaplan & Norton, 2004b). Cause-and-effect relationships exist within each perspective, and connections between measures from different perspectives are also present. These relationships can be unidirectional, bidirectional or inverted. The performance on the defined measures should lead to the establishment of PTC's mission and vision – see Figure 16.

On the Learning & Growth perspective, a focused and speciality training ($L1$), as well as a good performance management system ($L2$) will allow employees to attain and develop the necessary internal skills ($L3$) to respond to customer needs and innovate. This should be supported by a culture that promotes creativity, innovation, teamwork and knowledge sharing. The performance management system ($L2$) and training ($L1$) also influence employee satisfaction ($L4$) which, in turn, reduces absenteeism ($L5$).

In order to attain the objectives defined for the Internal Process perspective, a decrease on the time per deliverable unit ($I1$), and an improved utilization of equipment resources ($I2$) will be needed. This operational efficiency gain will lead to a better delivery performance ($I3$) and sales efficiency ($I4$) increase. The corrective and preventive actions resulting from internal audits ($I5$) will enhance the promotion and implementation of improvement solutions ($I6$), improving the external quality and service value ($I7$) and the delivery performance ($I3$).

Thus, to sustain a complete customer solution strategy, satisfy ($C2$) and retain customers ($C1$), the services portfolio must be improved ($C3$), through the development of new added-value solutions ($C4$), and augmentation of new brought-in activities ($C5$) and staff performing those activities ($C6$). Customers' perception of delivery ($C7$) has to be good and complaints should be addressed properly ($C8$), following the service recovery system methodology. As for the achievement of an improved externalization

profile, the portfolio of external customers should be expanded (C9), through an enhanced services portfolio (C3).

In the financial perspective, SG&A Costs should be controlled (F1), in order to maintain the compounded hourly cost (F2) and consequently the price-to-customer (F3). There exists a bidirectional relationship between the sales progression (F4) and the compounded hourly cost (F2), being the latter also influenced by the EBIT Control (F5).

Regarding the relationships between measures along different perspectives, it is important to highlight that absenteeism (L5) influences the delivery performance (I3) and customer satisfaction (C2), due to the lack of stability to build trusted relationships. According to Heskett *et al.* (1997) on Service Profit Chain, employee satisfaction (L4) influences external service value (I8), customer satisfaction (C2) and loyalty (C1), and consequently, in this particular case, sales progression (F4). Satisfied and motivated employees (L4) will be more proactive in the development and implementation of improvement solutions (I6). Key skills attainment (L3) allows for the improvement of delivery performance (I3), increases staff performing new brought-in activities (C6), the number of additional new brought-in activities (C5) and the development of new added-value solutions (C4). The improvement of the services portfolio (C3) and external customers' portfolio (C9) influences sales progression (F4), which is also influenced by customer loyalty (C1).

VII. CONCLUSION AND FUTURE WORK

This chapter presents the main findings of the project developed, addresses the challenges and motivations in developing the BSC for PTC, and is concluded with suggestions for future work to be undertaken in order to ensure organisational alignment and embed the BSC in PTC's management system.

7.1 Conclusions of the project

This project intends to be a contribution to the literature on performance management, with the empirical application of the BSC framework in a service provider. The study comprised two parts: theoretical (literature review) and practical (case study).

A literature review on BSC and its development and application particularly in service contexts and the automotive industry was conducted from the beginning till the end of the project. It provided the knowledge on the different performance management tools and the various applications of the BSC in diverse contexts, thus allowing to identify the strengths and weaknesses of different approaches to the development of a BSC.

Regarding the case study part of the project, the BSC was developed in an organisational context, Porto Technical Centre, the European shared services centre of YAZAKI, the world's largest producer of wiring harnesses for the automotive industry. After establishing the BSC team, the first steps towards the BSC development were the definition of PTC's mission, vision, values and strategy. The mission, vision and strategy were developed by Eng. Jorge Fontes, PTC's General Manager, and the values were defined based on a questionnaire to which all employees had access. Besides collecting information to define PTC's values, the questionnaire and the dissemination of its results aimed to communicate the beginning of the project of development of a BSC for PTC. The following steps included interviews with managers from all departments to gain a better understanding of the complexity of the work performed on the organisation, and to gather information on the measures already monitored and applicable to the various departments, as well as the targets and initiatives that could be

adequate. After the interviews, the BSC team defined, for each of the four BSC perspectives, the Strategic Objectives, Measures, Key Performance Indicators, Targets and Initiatives and developed the Strategy Map for PTC, a visual representation of the cause-and-effect relationships between the established measures.

The project comprised the first step on the development of a BSC for PTC and established the foundations for a successful implementation and further cascading of the Balanced Scorecard throughout the organisation. The comprehensive Scorecard developed aimed at communicating the strategic objectives and measures across the organisation, and to establish the guidelines from which all departmental scorecards (next step on cascading the BSC down the organisation) should be aligned.

The goals that were established at the beginning of the project have been attained: the key performance measures (financial and non-financial) that translate PTC's strategy and vision where defined, as well as the targets and initiatives required to achieve the long-term goals, in all four scorecard perspectives. Appendix XI summarizes, for each perspective, the Strategic Objectives, Measures, Key Performance Indicators (KPI's), Targets and Initiatives defined throughout this project. PTC's strategy was also viewed as a set of hypothesis about cause-and-effect relationships through the Strategy Map representation. The importance and relevance of the study relate to fact that the project explores the development and application of the BSC to the reality of a given organisation – case study. Furthermore, the empirical application of the management tool takes place in a complex industry where the Balanced Scorecard has not been widely explored.

7.2 Limitations of the project

This project was subject to practical limitations, such as time constraints, resources, and limitations imposed by PTC.

The Scorecard for PTC was developed within the organisation by the development team members in part-time, during the period between October 2010 and June 2011 (8 months if full time is considered). Niven (2002) talks about 4 to 12 months

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to get from the planning phase to the step where the development of the BSC implementation plan is addressed – steps encompassed in this project. Thus, time has finally limited some project decisions, such as the non-involvement of more people from the organisation in the development of the BSC.

Involving all managers of PTC in the BSC development process would have been a valuable contribution to the project, as people from different areas and complementary skills could have brought diverse ideas and the work could have generated further discussion and productive brainstorming. Furthermore, involving them since the beginning of the process would increase the likelihood they will act as ambassadors of the Scorecard within their department, thereby increasing knowledge and enthusiasm for the tool (Niven, 2002).

To address this issue, it was decided that the BSC implementation should start with a workshop with all PTC managers to present the work developed, inform who is responsible for each measure, and how all BSC information will be compiled and monitored. Eccles (1991) states that the last component of corporate information architecture is the set of rules that governs the flow of information. "Who is responsible for how measures are taken? Who actually generates the data? Who receives and analyses them? Who is responsible for changing the rules?" The BSC measures dictionary[74] (template adapted from Niven, 2002), aims to address these questions, clarifying the Owner and Data Collector of each measure, the data source and calculation formula. Besides the opportunity to communicate and educate, the workshop should also aim to validate the measures, discuss refinements and improvements, and gather feedback on the Scorecard and request input regarding what it would take to ensure its successful implementation throughout the entire organisation.

The access to people from YAZAKI, besides PTC was also constrained, since it was decided to focus all efforts specifically on PTC staff. However, it would have been positive to have the contribution of the people responsible for transversal areas at YAZAKI in Portugal. It was not possible to speak with the CFO and contacts with the Human Resources manager where scarce.

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[74] See Appendix VII – BSC Measures Dictionary.

Another limitation in developing the BSC was the decision to use the BSC with the traditional four perspectives as advocated by Kaplan and Norton (1992), to facilitate the further cascading of the BSC throughout the organisation. Adopting a BSC with perspectives more tailored to the organisational context or the BSC for service organisations as developed by Tyaghi and Gupta (2008), would allow a different focus on key success factors for PTC such as service innovation and a partnership mind-set. Since one of the strategic objectives define for PTC was the "Acknowledge as partner with customers for business support", and since PTC is a shared service centre and most of its customers are partners, it would have proved to be interesting to include a perspective for partners, thus differentiating them from customers. Tyaghi and Gupta (2008), advocate that a robust performance measurement system in a service context should include the element of partnership management, bearing in mind important measures of collaboration with service partners such as accuracy or reliability of service, mutual trust, and partner satisfaction. The development of the BSC was also restricted by the metrics that where already defined and monitored by PTC and that management decided should be maintained on the BSC, and by the dimension of the initiatives defined to achieve the organisation's defined strategy and vision. Additionally, most measures defined are long term measures, and Niven (2002) advocates one should limit the number of semi-annual or annual measures in the Scorecard, as a measure that is updated only once a year is of limited value when using the scorecard as a management tool to make adjustments based on performance results.

7.3 Suggestions for future work

Implementation is the next step to continue the project of the BSC for PTC. As mentioned in the previous sub-chapter, it was decided that this phase of the project should start with a workshop to present the work done to all PTC managers, validate the BSC, and decide on the best way to proceed with its implementation.

The BSC measures dictionary should play an important role in facilitating the operationalization of the BSC framework. Taking into account the number of measures defined and the fact that data is currently not available to all of them, a gradual

implementation should be considered, starting with the introduction of the most important indicators whose information is already available. Meanwhile, the other measure owners and data collectors should work to gather and process the necessary information to introduce all measures on the scorecard, and complete its implementation.

After this stage, a new workshop ought to be conducted to present and embed all PTC employees on the scorecard performance and strategic management system. BSC awareness throughout PTC should also be helped by top down continuous communication. The BSC should also be posted on the intranet, including the background on the strategic and operational significance of the measures and the future plans for cascading the Scorecard throughout PTC.

The role of the IT team should also be referred, as the BSC preparation, analysis, and data distribution should be automated, i.e. must be supported by an information system. This tools are now so developed that they not only perform the task of reporting results, but also provide mechanisms for mapping strategies, displaying complex cause-and-effect linkages and perform sophisticated "what if" scenario planning (Niven, 2002). It would be interesting to have the information in a dashboard system, providing tables, charts, graphs and any other visual information relating to the performance of the BSC. Whether to purchase a BSC software and integrate it with the existing information tools, or develop an internal solution is something that should be analysed and considered in detail.

Upon the implementation, to consolidate the developed Scorecard, it is crucial to validate the Strategy Map through the analysis of results over time, testing and checking whether the assumptions made about the cause-and-effect relationships between the lag and lead measures hold true. Furthermore, it is important to quantify these relationships, and supply details such as timing and magnitude of the relationships between measures, and develop opinions on the strength of correlations (Niven, 2002). Besides the targets already defined for each measure, it is important to establish milestones for the measures, aiming to mark progress toward achieving the strategic

goals (Kaplan & Norton, 1996b). Regarding the initiatives defined, it is essential to rank them in order to make resource allocation decisions.

Once the comprehensive BSC for PTC is fully embedded in the organisation and its management system, the next step is to start the process of "Cascading the BSC" throughout the organisation. After the organisation's BSC has been developed, each department determines measures for its own scorecard – "the organisation's high-level strategic objectives and measures must be translated into objectives and measures for operating units and individuals" (Kaplan & Norton, 1996b). . Cascading the BSC will ensure the alignment of goals from top to bottom and allows all employees the opportunity to demonstrate how their specific actions are helping the company fulfil its strategic objectives. At the cascading process, employee knowledge and understanding of the objectives and measures that make up the high-level Scorecard is crucial. At this stage the BSC for PTC should already be a common communication tool, well spread and understood by all PTC employees.

The first step on the cascading of PTC's Scorecard will be the development of departmental scorecards and possibly shared services BSCs (as the IT service unit). Department managers must consider both the overall organisational objectives and strategy and their own strategy, and ask the question "What can we do at our level to help the organisation achieve its goals?". The measures chosen for the unit's BSC should describe what the unit must do to accomplish its strategy, which will in turn help the organisation accomplish its objectives (Lipe & Salterio, 2000). Kaplan and Norton (1993) state that the measures on the unit's scorecard should be specifically designed to fit the unit's "mission, strategy, technology, and culture." In the remaining steps of BSC implementation, managers set targets and budgets, and over time, receive feedback on the strategies of the departments and the organisation by evaluating performance relative to the scorecard defined measures.

Cascading the BSC to personal scorecards is a stage that must be considered, as it helps to communicate corporate and business unit objectives to the people and teams performing the work, enabling them to translate the objectives into meaningful tasks and targets for themselves. (Kaplan & Norton, 1996b). Organisations cascading to

this level will gain the maximum from the BSC by ensuring that all employees, regardless of function or level, have developed objectives and measures that align with overall organisation objectives (Niven, 2002).

Linking the BSC to Performance Evaluation and Compensation is one of the final steps on BSC implementation. Kaplan and Norton (1996b) indicate that it is problematic to ask managers to focus on BSC measures if managers' and employees' compensation and evaluation are based on traditional financial measures. It is vital that the individual performance management (including the evaluation and the compensation) is indexed to the BSC and its performance indicators. Individual, team, and departmental objectives should be aligned with PTC's strategy and objectives. In addition to ensure alignment between personal and organisational goals, this last cascading stage of the BSC will also help employees understand how success on their performance review will positively impact the organisation's success. Niven (2002) refers the following benefits to be derived from cascading the BSC to the individual employee level[75]: builds awareness of the BSC, generates commitment to the Scorecard, increases comprehension of aligned Scorecards, offers a clear line of sight from employee goals to organisational strategy, and builds support for the employee goal-setting process.

"Designing the scorecard is not a one-time event – it is an on-going process. Just as a company revisits its strategy periodically, it must also revisit its scorecard to ensure that it is consistent with company's business strategy."

Cuccuza & Frezell, 2003

To conclude, it is crucial to bear in mind that the BSC is a dynamic tool, flexible and capable of change, so that performance measures remain relevant and continue to reflect the issues of importance to success. Performance measures and strategic planning should be reviewed periodically in order to ensure that they are still valid in light of current and anticipated business conditions and that the measures chosen still coherently describe the organisation's strategy.

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[75] This subject is further addressed in Appendix VIII - Human Resources at PTC and the Improvement of the Individual Performance Management System.

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APPENDICES

Appendix I – YAZAKI and PTC – Company Identification

Name

YAZAKI Saltano de Ovar Produtos Eléctricos, Lda. (YSE)

Location

Avenida D. Manuel 1, Zona Industrial de Ovar
3880-109 Ovar

Economic Activity Code (CAE)

27320 - Manufacturing of other wire and electric and electronic cables

Activity Sector

Production of electronic components for automobiles

Main Activity

Activity: Manufacturing industry

Category: Transformation of other wires and cables

Type of products

Electric Components, Electronic Components and Wire

Wire Harnesses
Source: www.yazaki-europe.com
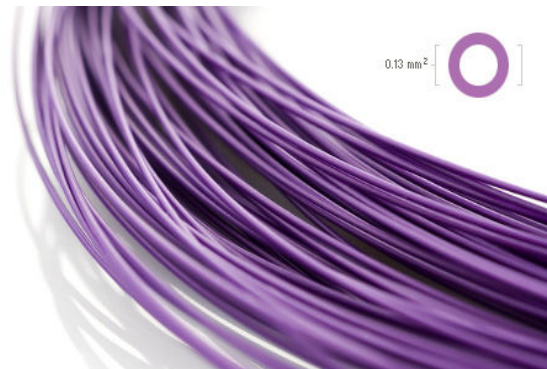
Wires
Source: www.yazaki-europe.com

Terminals
Source: www.yazaki-europe.com

Crimping Tool
Source: www.yazaki-europe.com

Wires crimped (with terminals)

Source: www.yazaki-europe.com
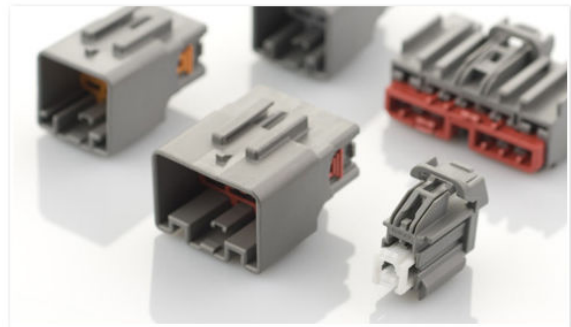
Connectors (where the crimped wires are inserted)
Source: www.yazaki-europe.com
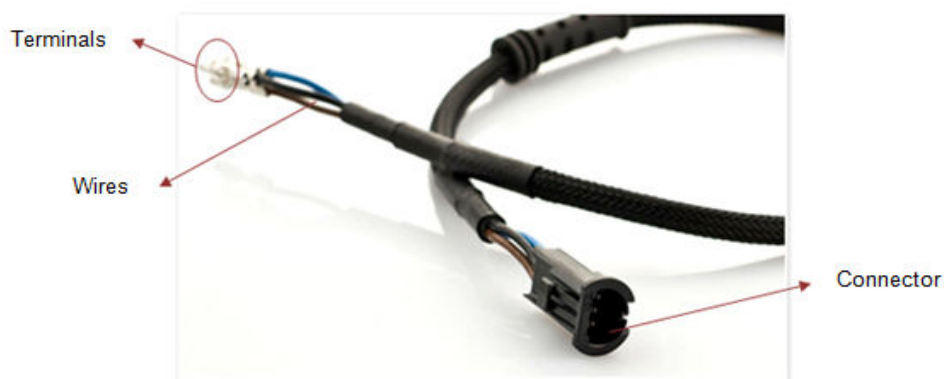
Wire harness (sample of wires with crimped terminals and connector)

Legal Status

Private Limited Company

Foundation

30th of July 1986

Number of Employees

1,546 (January 2011)

Logo

Historical Analysis

1986: Fundation (July, 30th)

1988: Establishment of Laboratory Services

1989: Closing down of the old factory (Aug)

1989: Inauguration of Gaia Factory (Oct)

1991: Start-up of production in Ovar Factory (Nov)

1993: Automotive wire production start-up (Mar)

1994: Components production start-up (Aug)

1998: Transfer to new Laboratory in Ovar

2001: Creation of Porto Technical Centre (PTC)

2010: PTC Transfer into a new building in Ovar

Projects

Wire Harness for Trucks and Light Commercials

Wire Harness for Forklifts and Battery Cables

Wire Harness for automobiles

Wire Harness Prototypes and Spare Parts

Non-Automotive Applications of Wire Harness

Name

Porto Technical Centre (PTC)

Location

Avenida D. Manuel 1, Zona Industrial de Ovar
3880-109 Ovar

Main Activity

Providing services to Customer Service Centres (CSC's), OEM's and Plants

Foundation

2001

Number of Employees

310 (January 2011)

PTC Employees by Department

Legend:
- Data Management
- Wire Harness engineering (WHE)
- CAD Systems & SW Development & Business Improvement Tools (BIT)
- Digital Fatcory/Jig Board Layout
- Component Design
- Manufacturing Engineering
- Operational Support
- Costing&Pricing
- Crimping Center
- Global Service
- Checker Fixture
- Laboratory
- Outros

Pie chart values: 11%, 55%, 5%, 1%, 3%, 2%, 0%, 4%, 8%, 2%, 1%, 7%, 1%
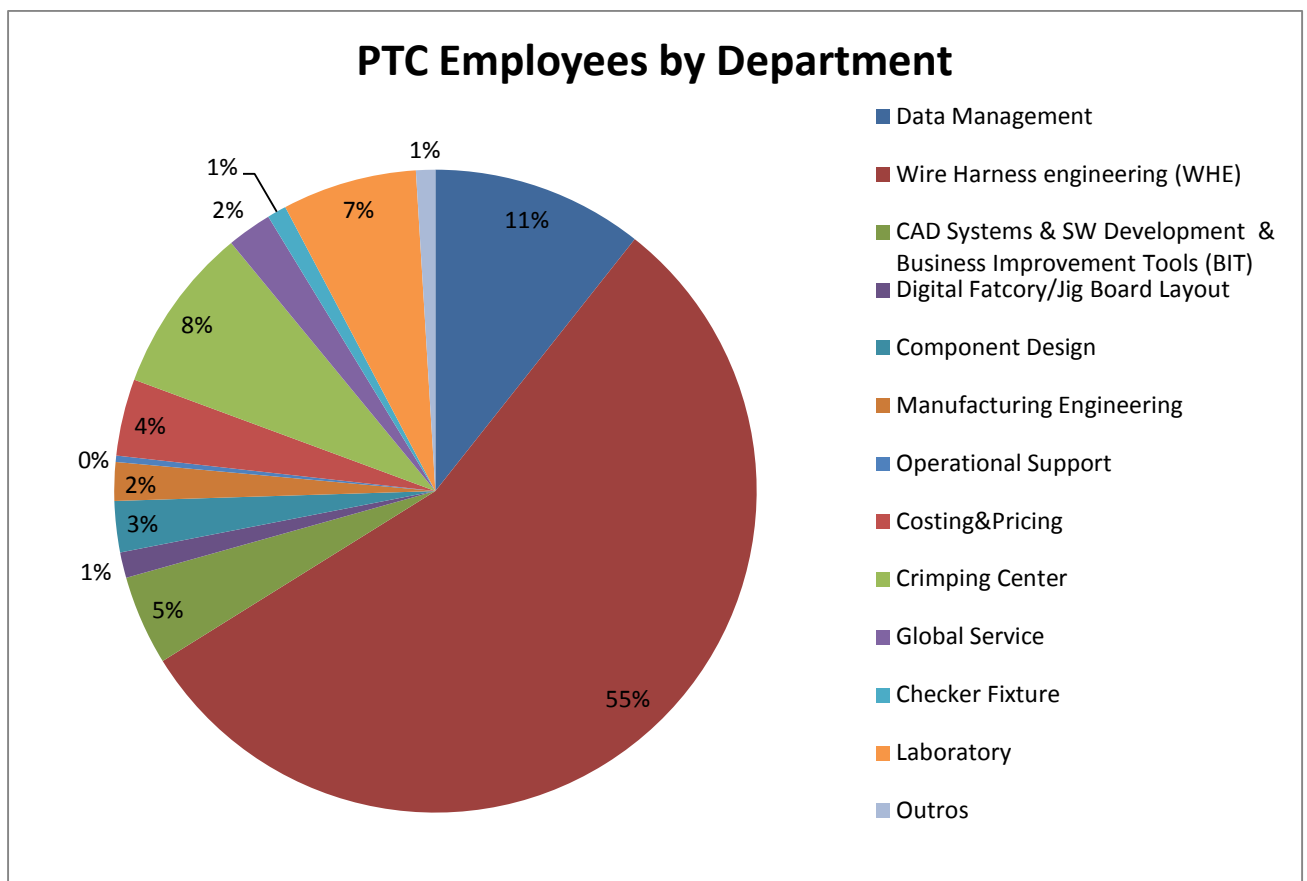
PTC Employees by Department

Logo

YAZAKI
PTC

Historical Analysis

1987: Origins in Manufacturing Design from YSP

1988: Establishment of Laboratory Services

1994: First International Customer – YDS (Slovakia)

1998: Transfer to New Laboratory in Ovar

2001: Creation of Porto Technical Centre (PTC)
      New services: Technical Documentation Centre

2002: New services: Supply Management Support

2003: New services: Central Costing & Crimping Centre
      Laboratory achieves ISO 17025 certification

2005: New services: Global Service

2007: New services: Component Design

2010: Transfer into dedicated new building in Ovar
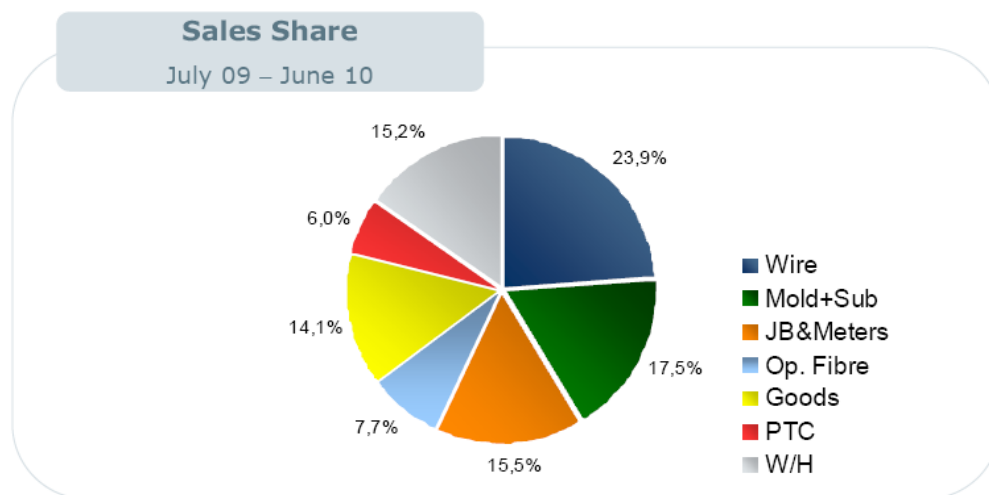
PTC Sales Share on YAZAKI Saltano de Ovar (July '09 – June '10)
Source: YAZAKI Portugal Presentation Slides (2010)

Appendix II – PTC's Departments and Services
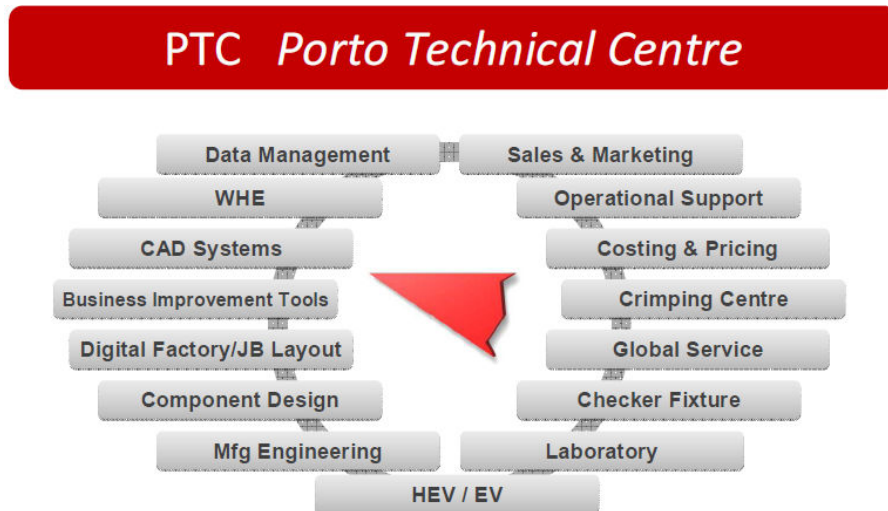
PTC's departments
Source: YAZAKI Portugal Presentation Slides (2010)

This appendix presents the services offered by each department of Porto Technical Centre. Information on this subject was collected via interviews with the managers responsible for the different departments.

Data Management

- Technical Documentation Centre (TDC)
    - contact suppliers and obtain technical documentation from components – designs, specifications and PSW (documents for components' approval);
    - make the documents available on E_matrix;
    - components approval.
- YAZAKI Database (YDB)
    - responsible for assigning YAZAKI numbers to the components used by YEL.

- ELV[76] / IMDS[77]
  - contact suppliers and obtain the material data sheet (MDS) from components, which are the products YAZAKI sells to ensure they conform to the European directives.

Wire Harness Engineering (WHE)

- Studies and presents technical solutions for electrical components to the automotive industry;
- Receives scheme and data from the customer to create a manufacturing design and various outputs to meet the needs of the factory on production;
- Creation of the Technical Dossier of the Product with technical information to the customer;
- Support to Manufacturing Plants and Customer Service Centres;
- Value Analysis, Value Engineering and Design for Manufacturing activities;
- Output for Costing, Data Management and customer.

CAD Systems

- Business Improvement Tools (BIT) → software development;
- Technical Databases → registration and maintenance of databases of CAD applications;
- CAD Infrastructure → support to applications and IT infrastructure (help desk) and software control and maintenance.

Digital Factory / Jig Board (JB) Layout

- Digital Factory → responsible for the "virtualization" of the wire harness production and simulation of its installation on the vehicle through a software that

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[76] End Life Vehicle – European regulation.
[77] International Material Datasheet – database used to submit reports required by the European regulation.

makes 3D simulation of wiring. This allows the reduction of costs by building prototypes and the reduction of the development time by identifying problems on production and installation in early stages, before the wire harness production actually begins;

- Jig Board Layout → responsible for the production of the design which is placed on the assembly panel to show how the wire harness is to be mounted. This layout is sold to all European plants.

Component Design

- Components Development "Permanent Power Supply System" (PPSS);
- Development and validation of plastic components, such as guards for high voltage wiring, respecting the various YAZAKI and Customer specifications on its development.

Manufacturing Engineering

- Benchmarking → wire harness receiving from different cars to conduct studies and comparisons in order to achieve improvements;
- Costing Support Investment Calculation for RFQ's[78] → study of plant investment in launching new projects;
- *Time Studies* → plant production time studies and process improvements.

Operational Support

- Support to manufacturing plants;
- External Audits (to all Yazaki Europe and North Africa plants);
- Technical Engineering Coordination of Faurecia[79];
- Investments and purchases follow-up;
- Stationary control;

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[78] Request For Quotation.
[79] Group that produces automotive seats, bumpers, interior panels, among others.

- Responsible for the PTC building (maintenance, etc.)

Crimping Centre

- Development and production of applicators and crimping tools;
- Validation tests and definition of crimping standards;
- Responsible for providing, monitoring and support all European YAZAKI plants applicators, crimping tools, validation tests and crimping standards creation.

Global Service

- After-sales service of machines produced by YAZAKI Corporation in Japan, to all European plants (installation, training, maintenance, etc.).

Checker Fixture / Assembly Fixture

- Checker Fixture → design modules (panels) for electrical inspection of wire harness (the panel allows the electrical testing of the wire harness);
- Assembly Fixture → support design in plastic where the connector fits on the mounting panels.

Laboratory

- Trials → laboratory tests of components or assembled components (chemical, electrical, materials, mechanical and aging). This service is provided to the YAZAKI Group and other external customers.
- Wire Harness validation → laboratory tests made on a given Project (a car model), normally before the Project goes into mass production. The objective is to verify if the wire harness is in accordance to customer's requirements. The hybrid and electrical vehicles also go through these validations.
- Calibration of equipment and its management → both in the Laboratory and the YSE.

Quality Management

- Handling and analysis of customer complaints;
- Handling of internal defects;
- Internal audits (also at European level);
- Quality System Management;
- Continuous improvement activities;
- Support to multiple sector on a daily basis.

Costing & Pricing

- Development & Control → responsible for the development and control of the Global Costing Tool (GCT), tool where all quotations from the various components and products are registered through the ABC[80] (normalized) methodology;
- Costing & Pricing of wire harness and components → the GCT allows the calculation of the costing portion of the design (purchase) and the pricing portion of the design (sell). The first is associated with a plant that will produce the product, it's the selling price of the plant to the CSC. The pricing is the price that the CSC uses to sell to the customer (OEM);
- Advanced Costing → budgets all European projects or businesses and checks global conditions.

Sales & Marketing

- Laboratory Services Promotion and Sales
- CAD and Engineering Services Sales
- YAZAKI Components Promotion and Sales
- EV / HEV Service Sales and Commercial Support
- ESD - External Services Development (Training, Audits and Consulting External Services)

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[80] Activity Based Costing

Appendix III – PTC Key Process Map (Flowchart)

YAZAKI PTC

PTC Key Process Map

Business Process	Description	Owner
1. Business Strategy	Business Targets / Plan, Ops Reports	Management
2. RFQ & Quotation	New Business RFQ Enquiry	C&P
3. Product Design & Development	CAE / Customer / Components design	WHE / Comp. Des.
4. Crimping development	Crimping standard and applicators preparation	Crimp. Centre
5. Parts Database Management	CAD tools & parts D/B management	Data Man. / CAD Syst
6. Documents control	Control of supplier data	Data management
7. MAI	Measurement, analysis and improvement	Quality
8. Lab activities	Test and calibration activities	Laboratory

PTC Key Process Map flowchart showing the relationships between YEL Executive Management Responsibility, PTC Management Responsibility, Resource Management, Product Realisation processes, and Customer.

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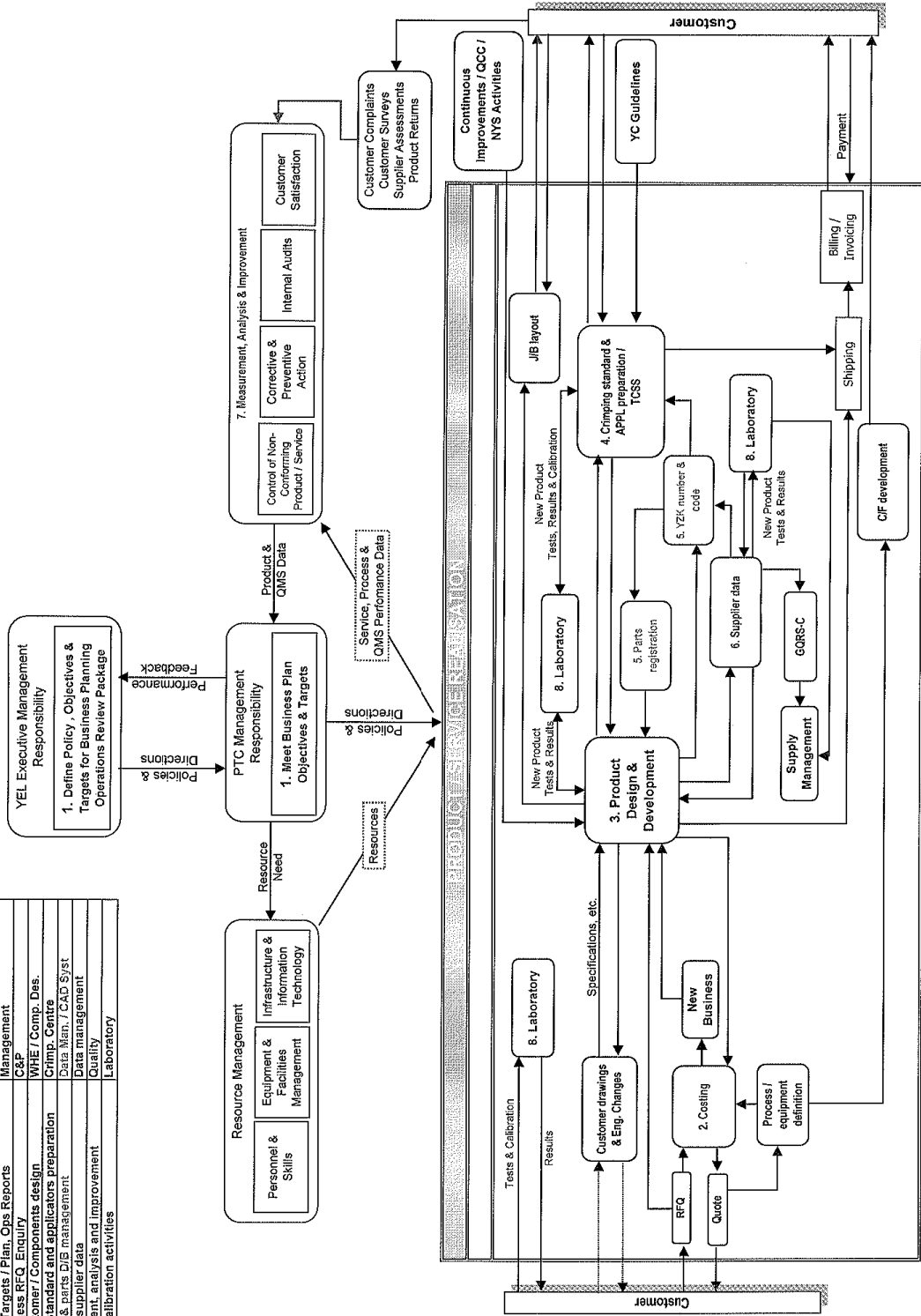
PTC Key Process Map Description

PTC Key Process Map is a graphic representation of the normal flow of activities in the service centre. The diagram will now be explained. PTC is governed by a set of policies, objectives and targets set by YAZAKI Europe (YEL) to plan their business and operations (1.). It is the responsibility of Eng. Jorge Fontes, the Director of PTC, to review these guidelines and to do the deployment to the entire organisation. PTC is always controlled by the YEL headquarters, which receives, in turn, feedback on its performance, also through its Director.

PTC's activities are supported by a set of resources: skilled people, equipment and facilities, infrastructure and information technology.

How does PTC provide its services to customers?

The costumer can request tests to its automotive components directly to PTC (Tests & Calibration), or they can be ordered under the Product Design & Development of the product at PTC. These tests are performed by the Laboratory (8.), which subsequently sends its results to the customer.

There is a great amount of information exchange with the customer, such as changes in the engineering and drawings of wire harness and components of their cars. This information (Customer drawings, Eng. Changes, Specifications, etc.) are the inputs for all the work that takes place in PTC, especially to the Product Design & Development area.

PTC can also receive a request for quotation (RFQ) from a customer. The RFQ is received by the Department of Costing & Pricing, which determines the cost and price of the wire harness and reports the quotation to the customer. The Manufacturing Engineering Department is responsible for the Investment Analysis, by setting times per work system and for the Automotive Benchmarking. If the proposal is accepted by the customer, then, PTC has a new business (that is, a new car).

The design and product development (3.) is the core business of PTC (WHE and Component Design Departments). At this stage of the process the customer receives feedback, and the need to ask the Laboratory for new tests may arise. The data is analysed and the YAZAKI parts and numbers are registered (5. Parts

registration & YZK number & code) on the databases (Data Management Department), including the CAE[81] (where the manufacturing design is registered).

Information about new suppliers (6.) (e.g. new components), such as drawings and specifications, is also stored in databases by the Data Management Department. Complaints from suppliers are registered in the Global Quality Requirement Supplier (GQRS-C) and on the Supply Management (which manages the information of all purchases), particularly complaints about prohibited substances (IMDS – International Material Datasheet).

It is also necessary to develop applicators and crimping standards (4. Crimping Centre), which serve as input for the WHE department to know which terminals are suitable for each wire. The YC (YAZAKI Corporation) Guidelines are inputs for the Crimping Centre, information that comes from Japan to produce applicators, etc. The Crimping Centre also produces crimping parts (which crimp the wire to the terminal) and test the resistance of parts. The Laboratory appears again at this stage, but now for the testing of components and not just product.

The J/B Layout is an activity that happens normally by customer request and it's about the design of the layout that allows for the production of the wire harness. This design is lately sent to the plant.

The Checker Fixture department (C/F development) designs the container where the connectors will fit.

PTC is also supported by continuous improvement activities, such as the Quality Control Circle (QCC) and the New YAZAKI System (NYS) (Lean Services activity).

After sending the product, test results, etc. to the customer, complaints are managed, customer satisfaction surveys are administered, suppliers are evaluated and sometimes products are returned. These activities come later as an input for section 7. - Measurement, Analysis and Improvement, which carries the control of non-conformities, corrective and preventive actions, internal audits and customer satisfaction analysis.

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[81] Computer-aided Engineering

Appendix IV – BSC Activity Planning

BIP4 - Balanced Scorecard

Activity Planning for 2010 and 2011

PTC | B-I-P-V

Legend:
Plan (gray)   Executed (green)   Delay (yellow)   Delay > 1month (red)
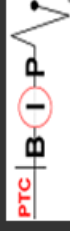
ACTIVITY	RESPONSIBLE	PLAN VS. REAL	DATE	December	January	February	March	April	May	June
Development and Validation of PTC's Values Survey	CH/JF	Plan		gray						
		Executed		green						
Survey Results Analysis	CH	Plan		gray						
		Executed		green						
Presentation of PTC's Values	JF	Plan			gray					
		Executed	11 Fev '11		yellow	green				
BSC 101 Literature Review	CH	Plan			gray	gray				
		Executed				green				
Presentation of PTC Strategic Business Plan	CH/AP & JF	Plan				yellow	gray			
		Executed	18 Fev '11				green			
Analysis of financial and non-financial documents	CH	Plan			yellow	gray				
		Executed					green			
Development of the Balanced Scorecard	CH / AP	Plan						gray	gray	gray
		Executed					green	green	green	green
Presentation of the BSC and Implementation Plan	AP & JF	Plan								
		Executed								red

Month

JF	Eng. Jorge Fontes
AP	Eng. Anabela Pimentão
CH	Carolina Horta

Appendix V – BSC Communication Plan

Balanced Scorecard Communication Plan 2011

Legend: Plan (grey) | Executed (green) | Delay (yellow) | Delay > 1month (red)

ACTIVITY	RESPONSIBLE	AUDIENCE	DELIVERY VEHICLE	PURPOSE	PLAN VS. EXECUTED	Date	January	February	March	April	May	June
Communication of PTC's mission, vision and values (established after the analysis of the survey results) and the BSC Project	JF	All employees	Presentation (Direct Contact)	Communicate	Plan		� (grey)					
				Gain Commitment	Executed	10 Fev '11	(yellow)	(green)				
Communication of PTC's strategy	JF	Managers	Meeting	Communicate and educate	Plan					(grey)		
				Report Progress	Executed	18 Apr '11				(green)		
Communicate the BSC Project and Delivery of BSC 101 literature review	AP / CH	Managers	Meeting | E-mail	Communicate and educate	Plan					(grey)		
				Report Progress	Executed					(red)		
Presentation of the final BSC and Implementation Plan	JF / AP / CH	Managers	Workshop	Communicate and educate	Plan							(grey)
				Report Next Steps	Executed							(red)

JF	Eng. Jorge Fontes
AP	Eng. Anabela Pimentão
CH	Carolina Horta

Appendix VI – PTC's Values Survey and Results Analysis

The following survey aimed to understand the importance that PTC employees give to a set of specific values identified as suitable to the organisational context. It was available online from 6th to 9th of January 2011and was divided into two parts, the first seeking to obtain some information about the individual, and the second asked the individual to order a set of sentences, representatives of values, on a preferential basis (as a ranking).

Department *

- Data Management
- Wire Harness Engineering (WHE)
- CAD Systems & SW Development
- Business Improvement Tools (BIT)
- Digital Factory / Jig Board Layout
- Component Design
- Manufacturing Engineering
- Operational Support
- Sales & Marketing
- Costing & Pricing
- Crimping Centre
- Global Service
- Checker Fixture
- Laboratory
- None of the above

Continue »

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Please order the following sentences having in mind what moves you to do your job at PTC every day:

READ CAREFULLY:

Rank the following 10 sentences in order of preference, taking into account that you may not repeat any numbers.

- "1" what you value the most

- "10" what you value less.

Feeling that you are respected personally and professionally by your team leader, manager and people in general. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Passion for the work you are doing. *

1	2	3	4	5	6	7	8	9	10
○	●	○	○	○	○	○	○	○	○

Feeling that you belong to a team. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Commitment to honour your contracts. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

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Trust in the work you are doing and in external relations. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Nice work environment. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Challenge your work represents. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Feeling that you care about your customers and partners and exist to serve them. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Felling that everybody strives for the continuous development of their team members, processes and solutions, with the aim of being better every day. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

The transparency, open communication and corporate ethics standards. *

1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○

Challenge your work represents. *

1 2 3 4 5 6 7 8 9 10

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Feeling that you care about your customers and partners and exist to serve them. *

1 2 3 4 5 6 7 8 9 10

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Felling that everybody strives for the continuous development of their team members, processes and solutions, with the aim of being better every day. *

1 2 3 4 5 6 7 8 9 10

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

The transparency, open communication and corporate ethics standards. *

1 2 3 4 5 6 7 8 9 10

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

« Back   Submit

PTC's Values Survey

The survey was answered by 137 out of the 310 employees of PTC. However, only 103 responses were considered valid, since the remaining did not comply with the instructions for completing the survey. 59% of the respondents were female and 41% male (see chart below).

Male	42	41%
Female	61	59%
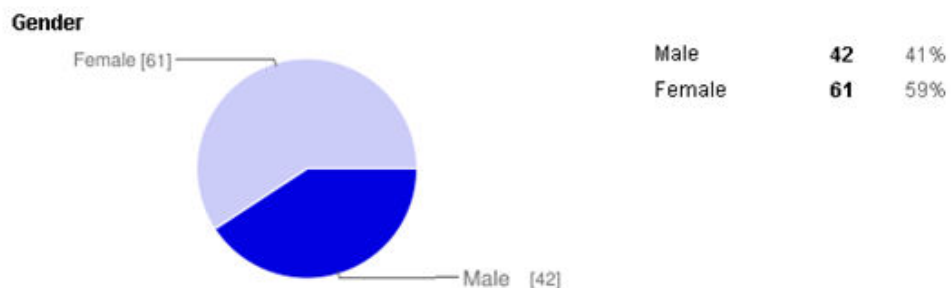
Gender of respondents

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Regarding their age, one can see that just the employees aged between 20 and 49 answered the survey (see first chart below). It is important to note that PTC has employees aged in each of the five categories represented. Concerning the time working at YAZAKI, the most representative category is "21-25 years", representing 37% of respondents (see second chart below).

Age

Age	Count	Percent
20 - 29	19	18%
30 - 39	37	36%
40 - 49	47	46%
50 - 59	0	0%
+ 60	0	0%

Age of respondents

Time working at YAZAKI

Years	Count	Percent
< 1 year	13	13%
1 - 5 years	20	19%
6 - 10 years	8	8%
11 - 15 years	6	6%
16 - 20 years	18	17%
21 - 25 years	38	37%
26 - 30 years	0	0%
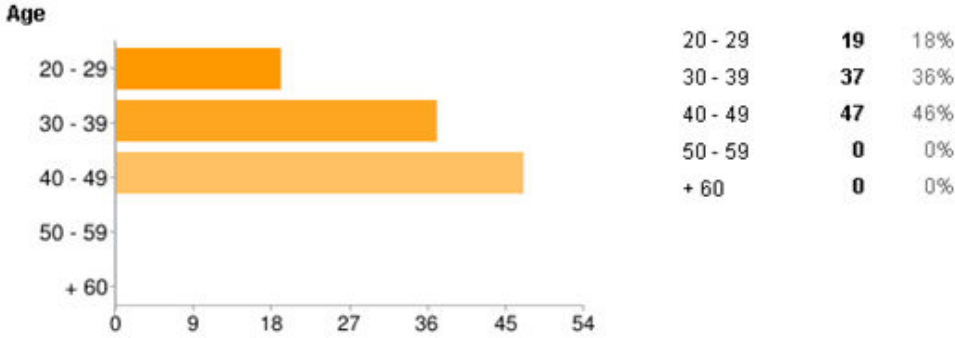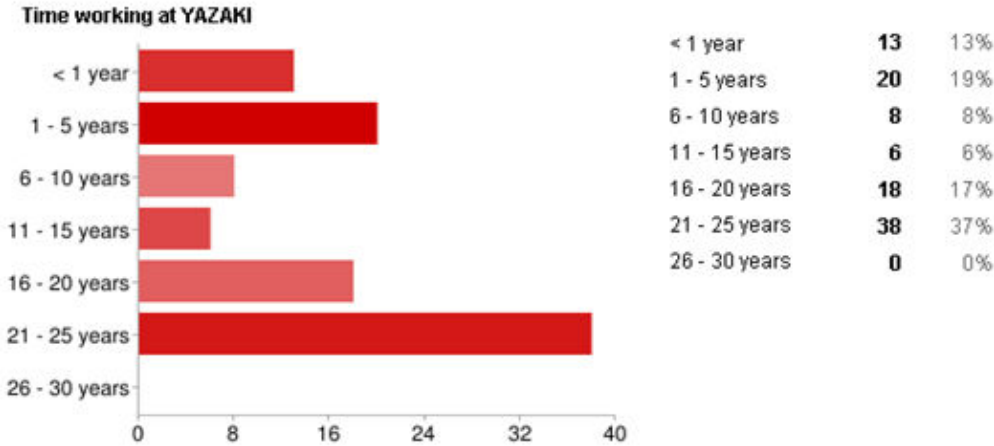
YAZAKI years

The chart below shows the responses by department. The department with the highest expression - but also the department with more employees in PTC (cf. Table) – is the Wire Harness Engineering Department (WHE). It should be noted that we did not obtain responses from the Digital Factory / Jig Board Layout, Operational Support, Sales & Marketing and Global Service departments.

Departament		
Data Management	10	10%
Wire Harness Engineering (WHE)	63	61%
CAD Systems & SW Development	4	4%
Business Improvement Tools (BIT)	1	1%
Digital Factory / Jig Board Layout	0	0%
Component Design	4	4%
Manufacturing Engineering	2	2%
Operational Support	0	0%
Costing & Pricing	5	5%
Crimping Centre	3	3%
Global Service	0	0%
Checker Fixture	1	1%
Laboratory	5	5%
None of the above	5	5%
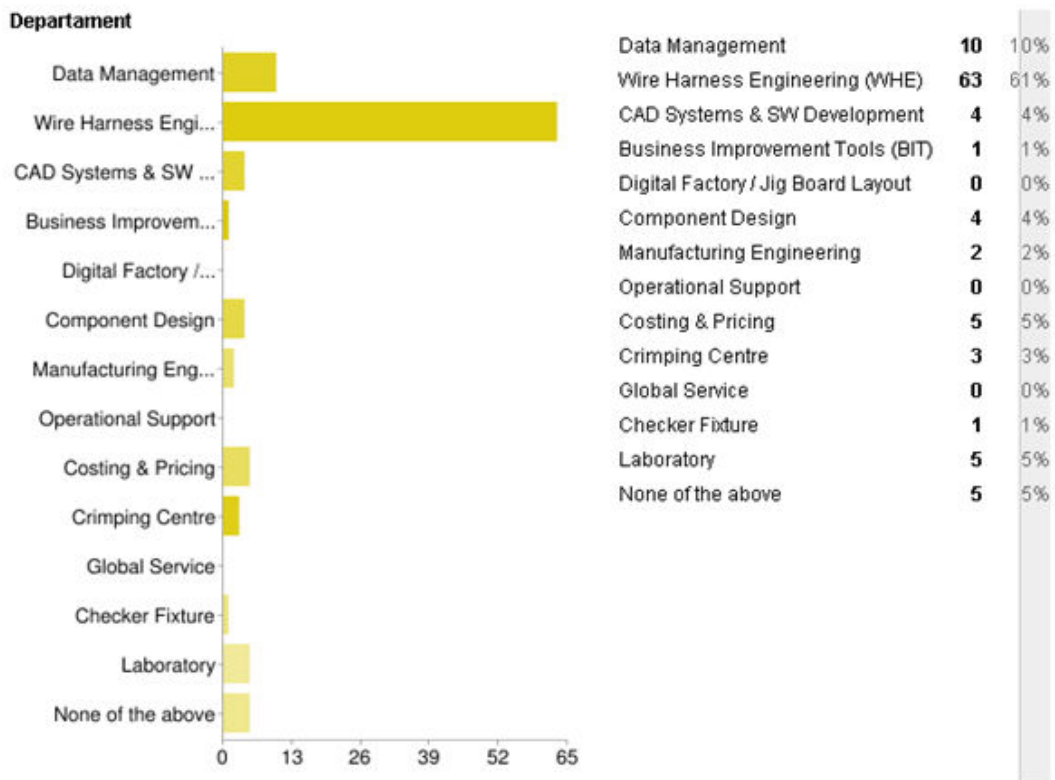
Responses by department

Department	Total	Respondents	% of Respondents
Data Management	33	10	30%
Wire Harness engineering (WHE)	172	63	37%
CAD Systems & SW Development & Business Improvement Tools (BIT)	14	5	36%
Digital Fatcory / Jig Board Layout	4	0	0%
Component Design	8	4	50%
Manufacturing Engineering	6	2	33%
Operational Support	1	0	0%
Costing & Pricing	12	5	42%
Crimping Center	26	3	12%
Global Service	7	0	0%
Checker Fixture	3	1	33%
Laboratory	21	5	24%
Other	3	5	100%

Percentage of respondents per department weighted.

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On the second part of the survey, PTC's employees were asked to evaluate the importance given to 10 specific values (represented by sentences), organizing them in a ranking of 1 to 10, assigning the rank "1" to what they most value and the rank "10" to what they value less. In the charts that follow it is possible to observe the distribution of responses, from 1 to 10, by value.

Feeling that you are respected personally and professionally by your team leader, manager and people in general.

1	21	20%
2	9	9%
3	11	11%
4	14	14%
5	10	10%
6	3	3%
7	13	13%
8	8	8%
9	9	9%
10	5	5%
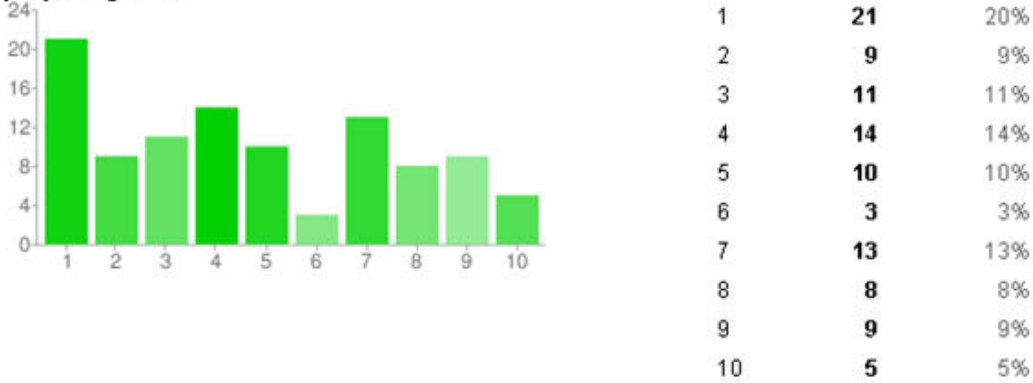
Importance attributed to the value "respect".

Passion for the work you are doing.

1	16	16%
2	14	14%
3	8	8%
4	6	6%
5	13	13%
6	6	6%
7	6	6%
8	8	8%
9	11	11%
10	15	15%
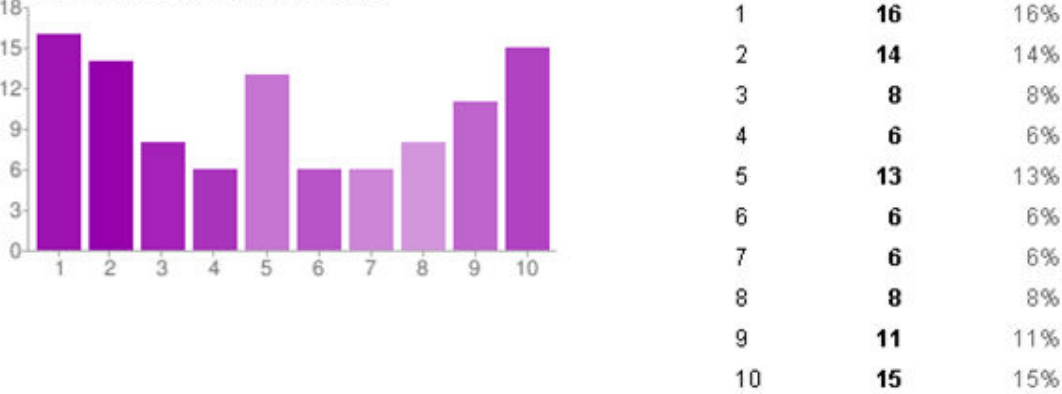
Importance attributed to the value "passion".

Feeling that you belong to a team.
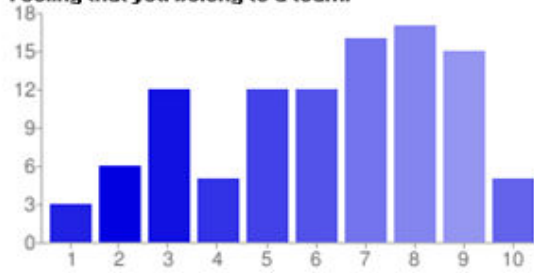
1	3	3%
2	6	6%
3	12	12%
4	5	5%
5	12	12%
6	12	12%
7	16	16%
8	17	17%
9	15	15%
10	5	5%

Importance attributed to the value "belonging to a team".

Commitment to honour your contracts.
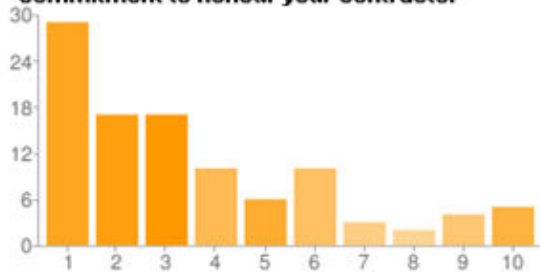
1	29	28%
2	17	17%
3	17	17%
4	10	10%
5	6	6%
6	10	10%
7	3	3%
8	2	2%
9	4	4%
10	5	5%

Importance attributed to the value "commitment".

Nice work environment.
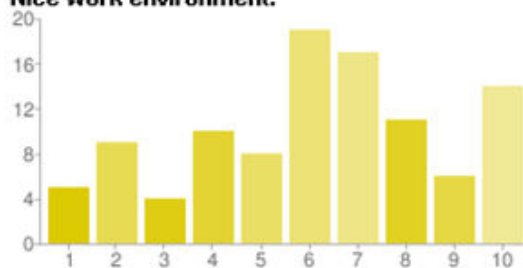
1	5	5%
2	9	9%
3	4	4%
4	10	10%
5	8	8%
6	19	18%
7	17	17%
8	11	11%
9	6	6%
10	14	14%

Importance attributed to the value "work environment".

Trust in the work you are doing and in external relations.
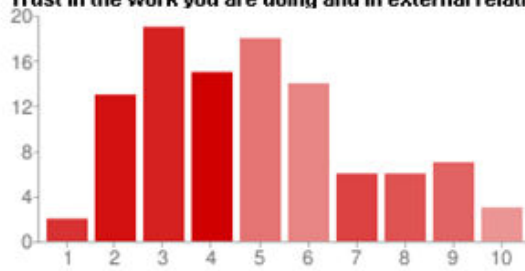
1	2	2%
2	13	13%
3	19	18%
4	15	15%
5	18	17%
6	14	14%
7	6	6%
8	6	6%
9	7	7%
10	3	3%

Importance attributed to the value "trust".

Challenge your work represents.
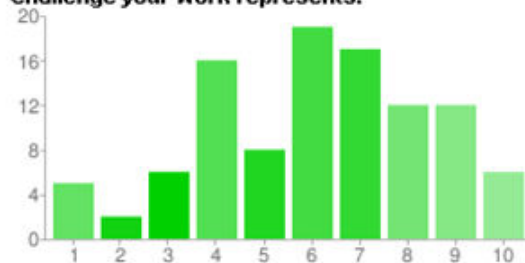
1	5	5%
2	2	2%
3	6	6%
4	16	16%
5	8	8%
6	19	18%
7	17	17%
8	12	12%
9	12	12%
10	6	6%

Importance attributed to the value "challenge the work represents".

Feeling that you care about your customers and partners and exist to serve them.

1	8	8%
2	14	14%
3	15	15%
4	12	12%
5	9	9%
6	11	11%
7	11	11%
8	15	15%
9	5	5%
10	3	3%

Importance attributed to the value "customer and partner care".

Felling that everybody strives for the continuous development of their team members, processes and solutions, with the aim of being better every day.
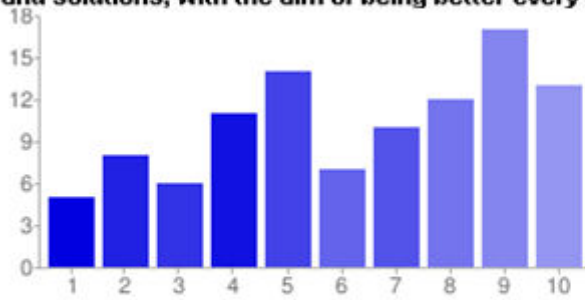
1	**5**	5%
2	**8**	8%
3	**6**	6%
4	**11**	11%
5	**14**	14%
6	**7**	7%
7	**10**	10%
8	**12**	12%
9	**17**	17%
10	**13**	13%

Importance attributed to the value "continuous improvement".

The transparency, open communication and corporate ethics standards.

1	**8**	8%
2	**10**	10%
3	**5**	5%
4	**5**	5%
5	**6**	6%
6	**2**	2%
7	**7**	7%
8	**11**	11%
9	**16**	16%
10	**33**	32%

Importance attributed to the value "transparency and ethics".

The analysis of the charts with the representation of the summary of responses per value allows us to observe that values such as respect, commitment and passion are most valued by PTC employees, whereas the sense of belonging to a team, the continuous improvement and communication are not as valued by the respondents.

Summing up the different importance attributed to each value it is possible to create a ranking of PTC's values.
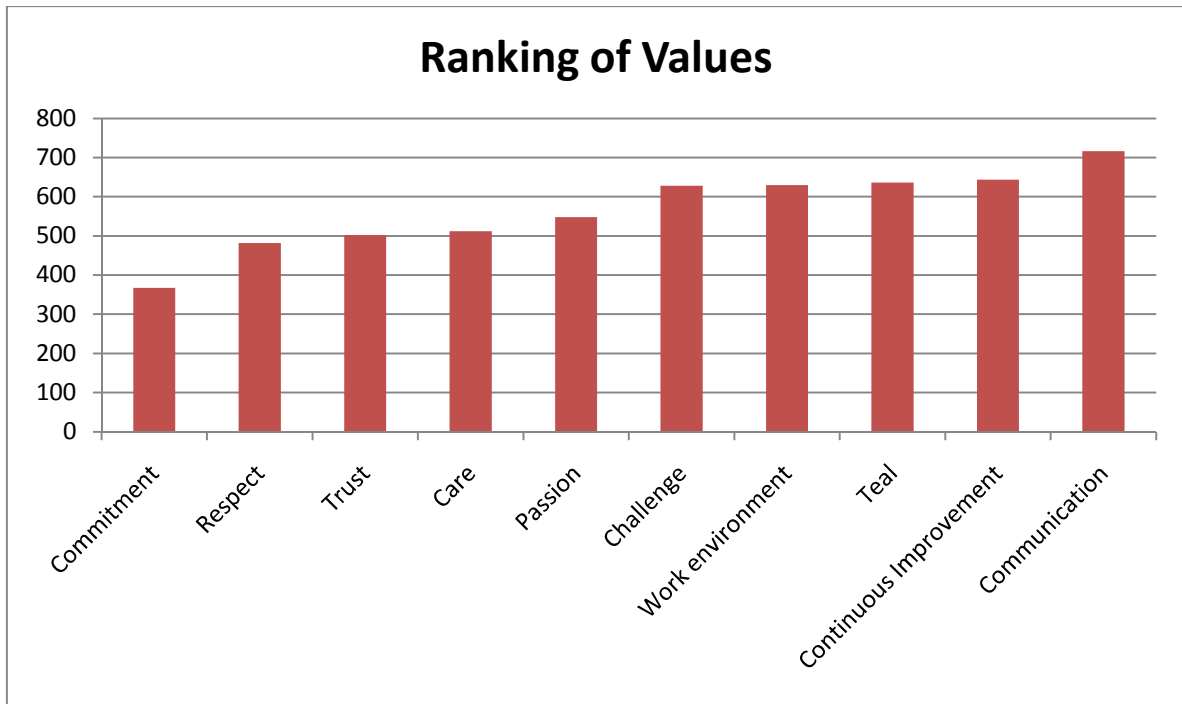
Ranking of Values

Ranking of values according to responses.

Looking at the chart above one can observe that the three values that PTC employees attribute greater importance are commitment, respect and trust, as previously seen in the individual analysis of each value.

The values that were finally set for PTC were passion, trust and commitment (values on the top 5 in the survey's ranking), as shown in the figure below.

My **P** **assion** today

Your **T** **rust** tomorrow

Our **C** **ommitment** always

PTC's Values

Appendix VII – BSC Measures Dictionary

LEARNING & GROWTH PERSPECTIVE

Perspective: Learning & Growth	*Measure Number / Name:* L1 / Focused and Specialty Training	*Owner:* Training Coordinator
Strategy: Improve inbound/outbound communication, PTC values practical acknowledgement, and Continued Human Capital development	*Objective:* Continued Human Capital development through Focused and Specialty Training	
Description: Percentage of training hours from total working hours.		

Lag / Lead: Lead	*Frequency:* Monthly	*Unit type:* Percentage	*Polarity:* High values are good

Status of the measure: Exists and is monitored.	
Formula: Training hours divided by working hours times 100%.	
Data source: Data for this measure is provided by the Metrics File (Line 9).	
Data Quality: High – Metrics File monthly updated	*Data Collector:* Manager Costing & Pricing
Baseline: T69 (July 2009 – June 2010) – 3% of total working hours	*Target:* 3% of total working hours
Target Rationale: Focused and speciality training aims to equip employees with the technical and soft skills that are crucial to their continuous development and to achieve organisational strategic objectives.	

Initiatives:	1. Communication Training Programme
	2. Improved training programme selection procedures
	3. Follow-up of training results through practical evaluation (possibility to link with Performance Management Process)
	4. Maximize usage of improved skill sets

Perspective: Learning & Growth	*Measure Number / Name:* L2 / Individual Performance	*Owner:* Human Resources Department
Strategy: Continued Human Capital Development		*Objective:* Integration of all people management areas

Description: For an individual employee, performance measurement creates a link between their own behaviour and the organisation's goals. Performance management is the process of creating a work environment or setting in which people are enabled to perform to the best of their abilities. Performance management systems are central in all operational areas of people management. One the one hand, they serve to validate the recruitment methods of the company. On the other, to measure the individual and team contribution to achieve the strategic objectives of the organisation and also manage remuneration and incentives schemes, identify the potential of employees and diagnose training needs.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Scale (1 - 6)	*Polarity:* High values are good

Status of the measure: Only measured for managers, team leaders and Costing & Pricing Department at the moment.

Formula: Average of all values resulting from the PMP questionnaire per department

Data source: Performance Management Process (PMP).

Data Quality: High – PMP results can be consulted any time and objectives accomplishment can be monitored over time	*Data Collector:* PTC Internal Communication Source
Baseline: Not applicable as it has not involved all employees yet.	*Target:* ≥ 4

Target Rationale: Performance management systems provide information on individual and team contribution to achieve the strategic objectives of the organisation.

Initiatives:	1. Improve the Performance Management Process System, integrating all people management areas.
	2. Expand its application to all PTC employees

Perspective: Learning & Growth	*Measure Number / Name:* L3 / Skills attainment	*Owner:* Human Resources Department

Strategy: Continued Human Capital Development	*Objective:* Attain key skills for continued business success

Description: Measurement of technical and soft key skills attainment.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Number	*Polarity:* High values are good

Status of the measure: Not measured at the moment.

Formula: Aware, Intermediate and Expert Tests Results

Data source: Performance Management Process, tests results, and Japanese Licensing Software.

Data Quality: High	*Data Collector:* PTC Internal Communication Source

Baseline: Not applicable	*Target:* Variable – depends on person profile and task

Target Rationale: Defined key technical and soft skills attainment are crucial to the continuous development of PTC human capital and to achieve organisational strategic objectives.

Initiatives:	1. Development of focused and speciality theoretical and on-the-job training programmes
	2. Introduce PTC Licensing System as in production
	3. Follow-up on training effectiveness – written and practical tests and knowledge recycling

Perspective: Learning & Growth	*Measure Number / Name:* L4 / Employee Satisfaction	*Owner:* PTC Internal Communication Source
Strategy: Continued Human Capital Development		*Objective:* Increase Employee Satisfaction

Description: Employee satisfaction measures the overall satisfaction level of PTC employees in each semester.

Lag / Lead: Lead	*Frequency:* Biannual	*Unit type:* Number (Scale 1-5)	*Polarity:* High values are good

Status of the measure: Exists and is monitored.

Formula: Average of all ratings on our biannual employee satisfaction survey.

Data source: Data for this measure is provided by our biannual employee satisfaction survey, developed, administered and analysed by PTC Internal Communication Source.

Data Quality: High - received from PTC Internal Communication Source	*Data Collector:* PTC Internal Communication Source
Baseline: The last survey administered (2010) indicates an overall employee satisfaction of 4.	*Target:* Global average higher than 4

Target Rationale: Achieving a good level of employee satisfaction is critical to ensure employee retention and productivity, attain a good external service value and customer satisfaction and loyalty, which consequently derive sales progression.

Initiatives:	1. Develop new employee satisfaction survey
	2. Promote active Communication Plan
	3. Promote pleasant working environment
	4. High focus on human relation management
	5. Provide adequate work tools

Perspective: Learning & Growth	Measure Number / Name: L5 / Absenteeism	Owner: Costing & Pricing Manager
Strategy: Improve QCD		Objective: Decrease Absenteeism
Description: Absence from work due to scheduled time off, illness, or any other reason, that affects total capacity (in hours of work).		

Lag / Lead: Lead	Frequency: Monthly	Unit type: Percentage	Polarity: High values are bad

Status of the measure: Exists and is monitored.

Formula: Hours not worked under the Labour Law.

Data source: Data for this measure is provided by the Man Hour Tracking System (MHT)[82]

Data Quality: High - received from the OBS Sector	Data Collector: OBS Sector
Baseline: 3%	Target: ≤ 2%

Target Rationale: Having a low rate of absenteeism is critical to develop trustable relations with customers and ensure a good delivery performance.

Initiatives:	1. Focus on Human Capital development
	2. Close expert and targeted support
	3. Personalized follow-up of recurrent absenteeism

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[82] The MHT is the system where employees allocate the hours worked to the different projects, and where absence hours are also registered, by type.

INTERNAL PROCESS PERSPECTIVE

Perspective: Internal Process	*Measure Number / Name:* I1 / Time per deliverable unit	*Owner:* General Manager
Strategy: Improve delivery speed of services and products		*Objective:* Decrease time per deliverable unit
Description: Lead time between request (standard) and delivery.		

Lag / Lead: Lead	*Frequency:* Monthly	*Unit type:* Deliverable unit	*Polarity:* High values are bad

Status of the measure: Exists and is monitored, but data from the different departments is not compiled into a single file.

Formula: Quantity of service per lead time defined with customer

Data source: Data for this measure is available on the Metrics File.

Data Quality: High – Metrics File monthly updated	*Data Collector:* Manager Costing & Pricing
Baseline: Previous process time	*Target:* As per yearly defined improvement targets issued by YEL

Target Rationale: Continuous business improvement

Initiatives:	1. Eliminate MUDA from business and operational processes
	2. Operational skills attainment
	3. Improved process development
	4. Technological improvement
	5. New Yazaki System (NYS) as operational tool

Perspective: Internal Process	*Measure Number / Name:* I2 / % of utilization of equipment resources	*Owner:* CAD Systems Manager

Strategy: Improve delivery speed of services and products	*Objective:* Optimize utilization of equipment resources

Description: Utilization of equipment resources concerns the maximization of the use of IT resources, namely computers, softwares and licenses.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Percentage	*Polarity:* High values are good

Status of the measure: Not measured at the moment. Data is available.

Formula: Logged in hours divided by total hours times 100%

Data source: Not yet available

Data Quality: High	*Data Collector:* CAD Systems Manager

Baseline: 20 – 25%	*Target:* 25%

Target Rationale: Best use of available resources.

Initiatives:	1. Create OEE (Overall Equipment Effectiveness) metrics as in production
	2. Develop computer utilization online schedule

Perspective: Internal Process	*Measure Number / Name:* I3 / Delivery performance	*Owner:* General Manager

Strategy: Improve delivery speed of services and products	*Objective:* Improve Delivery Performance

Description: Delivery performance measures the delivery performance from the organisational perspective. It may be different from the customer perspective.

Lag / Lead: Lag	*Frequency:* Monthly	*Unit type:* Percentage	*Polarity:* High values are good

Status of the measure: Exists and is monitored.

Formula: Estimated Time Arrival (ETA) divided by the Estimated Time Delivery times 100%

Data source: Data for this measure is provided by the MHT (Man Hour Tracking) hours control system to complete the Metrics File (Line 140).

Data Quality: High – Metrics File monthly updated	*Data Collector:* Manager Costing & Pricing

Baseline: T69 (July 2009 – June 2010) delivery performance average value	*Target:* 100%

Target Rationale: Important to compare perspectives on delivery performance, the customer and the organisation.

Initiatives:	1. Coach customers to real capabilities
	2. Coach staff to QCD elements as key to business survival
	3. Clearly define the provider-to-customer path

Perspective: Internal Process	Measure Number / Name: I4 / Sales Efficiency	Owner: General Manager
Strategy: Optimize internal processes.		Objective: Increase Effectiveness
Description: Sales Efficiency measures the percentage of capacity hours sold.		

Lag / Lead: Lag	Frequency: Monthly	Unit type: Percentage	Polarity: High values are good

Status of the measure: Exists and is monitored.

Formula: Hours Sold divided by the Total Capacity times 100%

Data source: Data for this measure is provided by the MHT (Man Hour Tracking) hours control system to complete the Metrics File (Line 7).

Data Quality: High – Metrics File monthly updated	Data Collector: Manager Costing & Pricing

Baseline: T69 (July 2009 – June 2010) sales efficiency value	Target: ≥ 92%

Target Rationale: Improvement of internal quality. Learning of process flaws.

Initiatives:	1. Assess and reduce MUDA of internal processes.
	2. Assurance of metric data availability for control and follow-up
	3. Assurance of awareness to ratio management

Perspective: Internal Process	*Measure Number / Name:* I5 / Internal audits resulting actions	*Owner:* Quality Manager
Strategy: Improve external quality		*Objective:* Monitoring of corrective and preventive actions
Description: Corrective and preventive actions resulting from internal audits.		

Lag / Lead: Lead	*Frequency:* Monthly	*Unit type:* Number	*Polarity:* High values are good

Status of the measure: Exists and is monitored.

Formula: Percentage of corrective / preventive actions implemented according due date (Metrics File Line 170).

Data source: Internal audits reports and percentage of corrective / preventive actions implemented according due date (Metrics File Line 170).

Data Quality: High – Metrics File monthly updated	*Owner:* Quality Manager
Baseline: T69 (July 2009 – June 2010) business year performance	*Target:* Not applicable

Target Rationale: Continuous improvement.

Initiatives:	1. Ensure corrective and preventive action plan fulfilment
	2. Audits reports follow-up
	3. Coach staff to QCD elements as key to business survival

Perspective: Internal Process	*Measure Number / Name:* I6 / Promotion and implementation of improvement solutions	*Owner:* Quality Manager

Strategy: Improve External Quality and delivery speed of products and services	*Objective:* Increase promotion and implementation of improvement solutions

Description: Improvement solutions may come from different sources: costumer complaints, internal defects, internal audits, IFT, QCC, 5 S Methodology, Jishuken, VSM Method and 10 MUDA.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Percentage	*Polarity:* High values are good

Status of the measure: Not measured at the moment. Data available.

Formula: Valid solutions implemented divided by agreed on valid solutions times 100%

Data source: Varied – NYS Department and Quality Management Team

Data Quality: High - received from NYS Department and Quality Management Team	*Data Collector:* Quality Manager

Baseline: T69 (July 2009 – June 2010) business year performance	*Target:* Complete implementation of all valid solutions

Target Rationale: Continuous improvement.

Initiatives:	1. Ensure corrective and preventive action plan fulfilment
	2. Promote the development and encourage employees to suggest improvement solutions
	3. Improved process development
	4. Technological improvement
	5. New Yazaki System (NYS) as operational tool

Perspective: Internal Process	*Measure Number / Name:* I7 / External Quality and service value	*Owner:* Quality Manager

Strategy: Improve external quality	*Objective:* Improve external quality

Description: Quality, Accuracy, Correctness of work / documentation provided and Cost / Quality ratio of the performed services (Lab) assessed from customer

Lag / Lead: Lag	*Frequency:* Annually	*Unit type:* Number (Scale 1-5)	*Polarity:* High values are good

Status of the measure: Exists and is monitored.

Formula: Global Average of assessments to question 9 - Quality, Accuracy, and Correctness of work / documentation provided.

Data source: Data for this measure is provided by our annual customer satisfaction survey, developed, administered and analysed by the Quality Department (Question 9.).

Data Quality: High - received from the Quality Department after the survey analysis	*Data Collector:* Quality Manager

Baseline: The last survey administered (2010) indicates a satisfaction with quality of 3,9.	*Target:* ≥ 4

Target Rationale: Achieving a good level of satisfaction of quality and service value is critical to customer satisfaction and retention and to attract new external customers.

Initiatives:	1. Promotion and implementation of improvement solutions
	2. Follow-up and clearance of all quality issues
	3. Continuous improvement of QCD metrics
	4. Focus marketing on value-for-money business proposition

CUSTOMER PERSPECTIVE

Perspective: Customer	*Measure Number / Name:* C1 / Customer Loyalty Rating	*Owner:* Sales & Marketing Manager
Strategy: Develop customer loyalty and acknowledgement as partner with customers for business support	*Objective:* Increase Customer Loyalty	
Description: Customer loyalty is when an organisation receives the ultimate reward for the way it interacts with its customers. Loyal customers buy more, buy longer and tell more people.		

Lag / Lead: Lag	*Frequency:* Annually	*Unit type:* Number (scale to be defined)	*Polarity:* High values are good

Status of the measure: Not measured at the moment with the objective to infer about customer loyalty. Data available.
Formula: Sales per customer
Data source: Data for this measure will be provided by Operating Business Sector (OBS) reports.

Data Quality: High - received from the Quality Department after the survey analysis	*Data Collector:* Operating Business Sector (OBS)
Baseline: P69 (period from July 2009 – June 2010) sales per customer values	*Target:* Greater than T-1 Sales

Target Rationale: Achieving a good level of customer loyalty is critical to achieve the "acknowledgement as partner with customers for business support" strategy. The cost of maintaining an existing customer is usually lower than the cost of acquiring a new one.

Initiatives:	1. Improve quality and know-how of customers' needs - Customer Relationship Management Project (CRM)
	2. Challenge customers on service development needs and expectations
	3. Coach customers to real capabilities
	4. Complete service provision portfolio in core competence areas
	5. Follow service recovery system
	6. Develop new customer satisfaction survey using SERVQUAL

Perspective: Customer	Measure Number / Name: C2 / Customer Satisfaction	Owner: Quality Manager
Strategy: Acknowledgement as partner with customers for business support	Objective: Increase Customer Satisfaction	
Description: Customer satisfaction measures the overall satisfaction level of our customers in each year. It is the average of all ratings on our annual customer satisfaction survey.		

Lag / Lead: Lag	Frequency: Annually	Unit type: Number (Scale 1-5)	Polarity: High values are good

Status of the measure: Exists and is monitored.

Formula: Average of customer satisfaction for each department/activity and items assessed.

Data source: Data for this measure is provided by our annual customer satisfaction survey, developed, administered and analysed by the Quality Department.

Data Quality: High - received from the Quality Department after the survey analysis	Data Collector: Quality Manager
Baseline: The last survey administered (2010) indicates an overall customer satisfaction of 4.	Target: Global average higher than 4

Target Rationale: Achieving a good level of customer satisfaction is critical to the "acknowledgement as partner with customers for business support" strategy.

Initiatives:	1. Improve quality and know-how of customers' needs - Customer Relationship Management Project
	2. Challenge customers on service development needs and expectations
	3. Coach customers to real capabilities
	4. Complete service provision portfolio in core competence areas
	5. Follow service recovery system
	6. Develop new customer satisfaction survey using SERVQUAL

Perspective: Customer	Measure Number / Name: C3 / Services Portfolio	Owner: Sales & Marketing Manager
Strategy: Acknowledgement as partner with customers for business support and achieve an improved externalisation profile	Objective: Improve Services Portfolio	
Description: Services portfolio is measured by the number of solutions provided to customers. It is improved by increasing the number of new added-value solutions for customers and by the additional new brought-in activities to PTC.		

Lag / Lead: Lag	Frequency: Annually	Unit type: Number	Polarity: High values are good

Status of the measure: Document with services provided and their specifications is being developed.
Formula: Number of services (new solutions to customers developed or brought-in activities.)
Data source: Gathering and/or creation of base data of provided / to-be-provided services

Data Quality: High – document will be updated whenever changes on the service portfolio occur	Data Collector: Sales & Marketing Manager
Baseline: T69 (period from July 2009 – June 2010) number of services provided	Target: Two new services per annum

Target Rationale: Improving the services portfolio should contribute to retain existing customers and attract new external customers.

Initiatives:	1. Improve quality and know-how of customers' needs - Customer Relationship Management Project
	2. Challenge customers on service development needs and expectations
	3. Complete service provision portfolio in core competence areas

Perspective: Customer	*Measure Number / Name:* C4 / New added-value solutions developed	*Owner:* General Manager

Strategy: Acknowledgement as partner with customers for business support	*Objective:* Increase development of new added-value solutions

Description: Totally new solutions developed to respond to customer specific needs that add value to the service provision.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Number	*Polarity:* High values are good

Status of the measure: Not measured at the moment. Document with provided / to-be-provided services is being developed.

Formula: Number of new added-value solutions developed from existing service portfolio.

Data source: Gathering and/or creation of base data of provided / to-be-provided services

Data Quality: High	*Data Collector:* General Manager

Baseline: T69 (period from July 2009 – June 2010) new added-value solutions developed	*Target:* One service per annum

Target Rationale: Acknowledgement as an added-value solution provider and development of real world required solutions for the organisation.

Initiatives:	1. Improve quality and know-how of customers' needs - Customer Relationship Management Project
	2. Challenge customers on service development needs and expectations
	3. Complete service provision portfolio in core competence areas
	4. Increase time spent with customers and co-location of PTC staff at customer support sites

Perspective: Customer	*Measure Number / Name:* C5 / New brought-in activities	*Owner:* General Manager

Strategy: Acknowledgement as partner with customers for business support	*Objective:* Increase additional new brought-in activities

Description: Activities performed at other sites that are brought-in to PTC.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Number	*Polarity:* High values are good

Status of the measure: Not measured at the moment. Document with provided / to-be-provided services is being developed.

Formula: Number of new activities performed at other sites that are brought-in to PTC

Data source: Gathering and/or creation of base data of provided / to-be-provided services

Data Quality: High	*Data Collector:* General Manager

Baseline: T69 (period from July 2009 – June 2010) number of new brought-in activities	*Target:* One service per annum

Target Rationale: Acknowledgement as value-for-money solution provider.

Initiatives:	1. Challenge customers on service development needs and expectations
	2. Complete service provision portfolio in core competence areas
	3. Highlight business sense of service transfer to PTC
	4. Assessment of opportunities study within YEL

Perspective: Customer	*Measure Number / Name:* C6 / Staff performing new brought-in activities	*Owner:* General Manager

Strategy: Acknowledgement as partner with customers for business support	*Objective:* Increase number of additional staff performing new brought-in activities

Description: Additional staff performing new brought-in activities.

Lag / Lead: Lead	*Frequency:* Annually	*Unit type:* Percentage	*Polarity:* High values are good

Status of the measure: Not measured at the moment. To be included on the Headcount File.

Formula: Percentage of total PTC staff performing new brought-in activities.

Data source: Headcount File

Data Quality: High - Headcount File monthly updated	*Data Collector:* General Manager

Baseline: T69 (period from July 2009 – June 2010) number of staff performing new brought-in activities	*Target:* 1% of PTC staff

Target Rationale: Actual success of business capture activities.

Initiatives:	1. Challenge customers on service development needs and expectations
	2. Complete service provision portfolio in core competence areas
	3. Highlight business sense of service transfer to PTC
	4. Assessment of opportunities study within YEL

Perspective: Customer	Measure Number / Name: C7 / Delivery Performance (external perspective)	Owner: Quality Manager
Strategy: Improve delivery speed of services and products	Objective: Improve Delivery Performance	
Description: Delivery performance (external perspective) measures the delivery performance from the customer perspective. It may be different from the organisational perspective.		
Lag / Lead: Lag	Frequency: Annually	Unit type: Number (Scale 1-5)	Polarity: High values are good
Status of the measure: Exists and is monitored. Measured through the customer satisfaction survey.		
Formula: Global average of assessments to question 4 - Delivery time of products / services according to agreed date.		
Data source: Data for this measure is provided by our annual customer satisfaction survey, developed, administered and analysed by the Quality Department (Question 4.).		
Data Quality: High - received from the Quality Department after the survey analysis	Data Collector: Quality Manager	
Baseline: The last survey administered (2010) indicates a global average of 4.	Target: ≥ 4	
Target Rationale: Important to compare perspectives on delivery performance, the customer and the organisation.		
Initiatives:	1. Coach customers to real capabilities	
	2. Coach staff to QCD elements as key to business survival	
	3. Promote external communication and marketing approaches	

Perspective: Customer	Measure Number / Name: C08 / Addressing of customer complaints	Owner: Quality Manager
Strategy: Customer satisfaction		Objective: Follow service recovery system
Description: Addressing of customer complaints should follow the defined service recovery system to minimize customer dissatisfaction from service failures.		

Lag / Lead: Lead	Frequency: Monthly	Unit type: Time	Polarity: High values are good

Status of the measure: Not measured at the moment. Data available.
Formula: Lead time to address customer complaints (and time to closure)
Data source: Data for this measure is provided by customer complaints.

Data Quality: Variable – dependent on customer description of complaint	Data Collector: Quality Manager
Baseline: T69 (period from July 2009 – June 2010) business year performance	Target: 24 hours

Target Rationale: Proper addressing of customer complaints is key to customer satisfaction and retention.

Initiatives:	1. Follow service recovery system
	2. Development of personalized complaints and caring system

Perspective: Customer	*Measure Number / Name:* C9 / Portfolio of external customers	*Owner:* General Manager
Strategy: Achieve an improved externalisation profile through a more outward drive	*Objective:* Increase portfolio of external customers	
Description: The portfolio of external customers concerns the percentage of non-Yazaki customers.		
Lag / Lead: Lag	*Frequency:* Annually	*Unit type:* Percentage	*Polarity:* High values are good
Status of the measure: Not measured at the moment. Data available at the OBS sector.		
Formula: Number of External Customers divided by Total Customers times 100%		
Data source: Data for this measure is provided by the OBS sector – portfolio of invoiced customers.		
Data Quality: High - received from OBS sector	*Data Collector:* Sales & Marketing Manager	
Baseline: T69 (period from July 2009 – June 2010) number of external customers	*Target:* 10% of total customers	
Target Rationale: Expanding the portfolio of external customers will allow sales progression and an improved externalisation profile.		
Initiatives:	1. Improve services portfolio (ESD and Lab)	
	2. PTC website development	
	3. Marketing Plan development - identify potential customers and communicate PTC services	

FINANCIAL PERSPECTIVE

Perspective: Financial	*Measure Number / Name:* F1 / SG&A Costs Control	*Owner:* General Manager
Strategy: Cost control		*Objective:* SG&A Control
Description: Selling, General and Administrative Expenses. Income statement item that presents major non-production costs.		
Lag / Lead: Lag	*Frequency:* Monthly	*Unit type:* Currency *Polarity:* High values are bad
Status of the measure: Exists and is monitored.		
Formula: Expenses		
Data source: Data for this measure is provided by the Business Warehouse (SAP) to complete the Metrics File (Line 19).		
Data Quality: High – Metrics File monthly updated	*Data Collector:* Helena Dias, Manager Costing & Pricing	
Baseline: T70 (July 2010 – June 2011) SG&A value	*Target:* As per yearly defined corporate value	
Target Rationale: Having low SG&A Costs is critical to minimize overall costs.		
Initiatives:	1. Improve SG&A Costs by yearly fixed percentage through expense reduction.	
	2. Ensure contained salary progression through CPI indexing (below)	

Perspective: Financial	Measure Number / Name: F2 / Compounded Hourly Cost	Owner: General Manager
Strategy: Assure maintenance of price-to-customer for 10 years	Objective: Maintain hourly price rate	
Description: Global Hourly Cost is the hourly cost of providing the service.		
Lag / Lead: Lag	Frequency: Monthly	Unit type: Currency	Polarity: High values are bad
Status of the measure: Exists and is monitored.		
Formula: Average of departmental hourly cost rate.		
Data source: Data for this measure is provided by the Business Warehouse (SAP) to complete the Metrics File (Line 34).		
Data Quality: High – Metrics File monthly updated	Data Collector: Manager Costing & Pricing	
Baseline: T69 (July 2009 – June 2010) hourly price rate	Target: Below T69 hourly cost rate	
Target Rationale: Achieving a low compounded hourly cost will assure maintenance of price-to-customer for 10 years.		
Initiatives:	1. Improve SG&A Costs by yearly fixed percentage through expense reduction.	

Perspective: Financial	*Measure Number / Name:* F3 / Price-to-customer	*Owner:* General Manager
Strategy: Assure maintenance of price-to-customer for 10 years		*Objective:* Monitor hourly cost vs. price rate
Description: Price-to-customer is the established sales price per hour.		

Lag / Lead: Lag	*Frequency:* Monthly	*Unit type:* Currency	*Polarity:* High values are bad

Status of the measure: Exists and is monitored.
Formula: Compounded Hourly Cost.
Data source: Data for this measure is provided by the Business Warehouse (SAP) to complete the Metrics File (Line 34).

Data Quality: High – Metrics File monthly updated	*Data Collector:* Manager Costing & Pricing
Baseline: T69 (July 2009 – June 2010) hourly price rate	*Target:* Below T69 hourly price rate

Target Rationale: Assure maintenance of price-to-customer for 10 years

Initiatives:	1. Improve SG&A Costs by yearly fixed percentage through expense reduction.

Perspective: Financial	*Measure Number / Name:* F4 / Sales Progression	*Owner:* General Manager

Strategy: Sales Progression	*Objective:* Increase Sales

Description: Sales measure the total euro amount collected for products and services provided.

Lag / Lead: Lag	*Frequency:* Monthly	*Unit type:* Currency	*Polarity:* High values are good

Status of the measure: Exists and is monitored.

Formula: Sum of Sales, Non product Sales and Service Fees Inc.

Data source: Data for this measure is provided by the Business Warehouse (SAP) to complete the Metrics File (Line 12).

Data Quality: High – Metrics File monthly updated	*Data Collector:* Manager Costing & Pricing

Baseline: T69 (July 2009 – June 2010) sales value	*Target:* ≥ T69

Target Rationale: Achieving a good sales level is critical for a positive sales progression.

Initiatives:	1. Continued sales progression in lower cost activities

Perspective: Financial	Measure Number / Name: F5 / EBIT Control		Owner: General Manager
Strategy: Increase number of external customers		Objective: Maintain EBIT equal (or higher) than zero	
Description: EBIT (Earnings Before Interest and Taxes) is a measure of a company's earning power from on-going operations, equal to earnings before deduction of interest payments and income taxes.			
Lag / Lead: Lag	Frequency: Monthly	Unit type: Currency	Polarity: High values are good
Status of the measure: Exists and is monitored.			
Formula: Earnings Before Interest and Taxes			
Data source: Data for this measure is provided by the Business Warehouse (SAP) to complete the Metrics File (Line 15).			
Data Quality: High – Metrics File monthly updated		Data Collector: Manager Costing & Pricing	
Baseline: 0		Target: 0	
Target Rationale: EBIT should be zero since PTC is defined within the Yazaki Group as a "non-profit organisation".			
Initiatives:	1. Finance operation through external customer revenue maximisation		

Appendix VIII – Human Resources at PTC and the Improvement of the Individual Performance Management System

<u>Human Resources at PTC</u>

Information on this subject was provided by Dra. Teresa Portela, the Human Resources Manager of YSE in an interview. PTC shares the Human Resources Department with the YSE. The department comprises four main areas: HR Administration, Communication & Development, Training & Development and the Central Office Service. The first is responsible for all the administrative work related to people in the organisation (hiring (including recruiting candidates, the interview process, negotiations, and signing contracts), the payroll process, benefits, training and continued professional development, annual appraisals, promotions and salaries reviewing, firing, and keeping up to date with state and tax laws). The Communication & Development is responsible for disseminating internal and external information throughout the organisation (e.g. information from YEL or YAZAKI Corporation), for the internal quarterly magazine "Planeta YAZAKI" and the PTC Newsletter, and production of documents like the "Company Profile", "Welcome Manual", "Reception and Integration Manual" and the "Manual of Conduct". As for the Central Office, this area is responsible for the management of the Guest House, the canteen and cafeterias, the car fleet, the business trips of all employees (Travel Centre) and external services (like going to the notary to certify signatures).

The recruitment of PTC employees is done either internally or externally, prioritizing the internal recruitment as a means of promoting employees and motivating them. The job requirements are communicated, employees apply, candidates' CV's are analysed, and a pre-selection takes place based on the CV before the interview. If a candidate with the desired profile is not found, the organisation resorts to external recruitment, looking for candidates on the database of spontaneous applications, advertising in newspapers and on the internet and contacting universities directly. Recruitment also takes place within YAZAKI Europe. Everyone can apply to the "internal vacancies" available all over Europe.

Regarding the socialisation process of new employees, they are welcomed by the person responsible for the training, receive the "Induction Manual", and a training

plan is developed together with the head of the department in which the employee will be integrated.

PTC has a huge concern with motivation, training and employee development. Employees are given the opportunity to raise their level of education (from the 6th to 9th grade and from the 9th to the 12th), and YAZAKI supports employees financially on external training to attain specific skills, without any contractual requirements. The HR Training & Development area of the HR Department is responsible for the entire training plan: diagnosis, implementation and follow-up. Also important to note the "Global Training", a training programme available for all YAZAKI Europe employees that takes place in the YSE, as it allows one to know the reality of components and wire harness production, the laboratory and the technical centre, the process elapsing from the wire harness engineering at PTC to the wiring panel at the YSE factory. In what motivation is concerned, Dra. Teresa Portela also talked about the Christmas Party that takes place every year in Ovar, and the Summer Camp in Japan, where employees' children can visit YAZAKI Corporation and meet Mr. Yazaki.

Performance management at PTC is centred on the PMP (Performance Management Process) document. Performance assessment is done once a year, in September.

Individual Performance Management

Performance management systems are central in all operational areas of people management. On the one hand, they serve to validate the recruitment methods of the company. On the other, to measure the individual and team contribution to achieve the strategic objectives of the organisation and also manage remuneration and incentives schemes, identify the potential of employees and diagnose training needs (Cunha *et al.*, 2010).

Performance management of PTC's employees, as well as any employee belonging to YAZAKI Europe, focuses on the PMP[83] (Performance Management Process), a performance assessment survey that is administered once a year, in September[84]. Each employee fills in the PMP, making their self-evaluation, and it is also filled by their immediate supervisor. A meeting with the supervisor follows

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[83] See Annex VI – PTC's Performance Management Process Questionnaire.
[84] Period defined by the Global Human Resources Department of YAZAKI Corporation.

(interview of assessment and development), where the assessment is discussed, skills development and improvement suggestions are made, both at staff and departmental level. Objectives and targets are defined, and there is a clear definition of measurable KPI's and skills assessment. Career progression is linked to employee performance and potential, and compensation is also associated with the PMP. If the organisation closes the year with a positive result, employees receive a bonus, which is calculated based on their performance on the defined objectives on PMP, and also takes into account absenteeism. The final PMP, after discussion, is completed online and registered on the employee's record. At the end of the meeting, individual targets aligned with the objectives of the department and the organisation are set for the following year – Goal Agreement. This is recorded in an internal system that allows follow up over the years, showing the percentage of the goal agreement that has already been achieved. In the assessment meeting of the subsequent year, the attainment of the objectives defined on the previous year is also discussed. There is a concern on PTC to provide employee feedback on a continuous and regular basis (not only on the PMP meeting) to help teams and employees understand their job duties and to develop their work skills. When interviewed on the PMP subject, Carlos Gomes, an employee from the Costing & Pricing team, said "normally we receive feedback on project, and if something goes wrong, Helena Dias[85] talks with the team to understand the causes and takes actions to prevent it from happening again".

All PTC departments are assessed by customers through a satisfaction survey that is administered annually. As most projects are long term and partnership relations with customers exist, customers usually give feedback of individual performances to managers. Helena Dias said "I always listen to customer reviews about attitude, added value and potential of employees and seek to find out what they would like to see more in each person".

Regarding compensation systems, bonuses are awarded to all team members but with different weightings, assigned according to the results obtained on the PMP, absenteeism and comparison with other team members.

As for training, this subject is included at the end of the PMP, aiming to discuss the areas in which the employee needs improvement, and define the courses that should be taken in order to develop certain skills.

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[85] The manager of Costing & Pricing.

With regard to career development, Dra. Teresa Portela, said that it is based on performance; nevertheless the career development is conditioned by the legal agreement that establishes categories and automatic progression based on a number of years in each category. Cunha *et al.* (2010) argue that career progression should be based on potential, not performance.

Recruitment validation policies are not related with the PMP, but with the Operational Functions Manual, document that describes each function of PTC.

PMP Strengths

- Self-assessment, assessment from direct supervisors and customers – The purpose of this feedback is to allow each employee to receive several performance feedbacks, which increases the objectivity of the assessment (Cunha *et al.*, 2010), and to give each individual the opportunity of understanding his or her strengths and weaknesses, and contributes to clarify which aspects of his or her work need professional development.

- The continuous feedback and open communication between employees and managers in most departments allows the continuous improvement and development of high performance teams;

- There is a major concern with the assessment of the development potential of each employee;

- Benchmarking to compare results – "after the PMP, YEL prepares a ranking that compares for example the costing teams of different YAZAKI's"[86].

- Performance assessment system allows fair comparison of performances;

- The fact that PMP gives the opportunity to assign different weights to each assessment factor, through the "Job relevance" column, allows adapting a questionnaire that covers a variety of tasks to a specific function;

- Covers the technical and behavioural skills, and also features personality, through the utilization of the graphic scale or attributes method – which consists in the assessment of performance on a scale (in this case 1-6) for various attributes;

- All tables have the column "Development Remarks", which allows adding additional notes;

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[86] Explained Dra. Helena Dias.

- Includes an evaluation of the previous period for comparison with the period being analysed;

- Includes training needs for the next period (on/near-the-job and off-the-job);

- Assesses whether the training pursued during the period under review has served to acquire new skills and how they were applied in the workplace, and, consequently, which were the results of its application;

- Includes goal agreement to develop the potential of the individual and their skills;

- Ends with the evaluation of the supervisor about the potential of the individual and its career progression.

PMP Weaknesses

- PMP is not aligned with the specific mission, vision, values and strategy defined for PTC (although these are aligned with the mission, vision, values and strategy of YEL, where the PMP is based);

- PMP is in English - to note that a big part of PTC employees only possess the 12th grade or less, and may not have sufficient level of English to enable them to understand some parts of the PMP[87];

- Very extensive and detailed;

- "Made for managers – line staff in general doesn't understand what results orientation mean"[88];

- Career progression is based on performance and not on potential[89];

- Supervisors don't have training on how to carry out the performance assessments – "There is a manual, and the HR department is always available to give information and help, but it is mainly a top-down learning process", said Helena Dias.

Intervention and Improvement Plan

Following the BSC Project and the cascading of the BSC till individual performance, it would be worthwhile considering the development of a performance management survey just for PTC, as it is the only shared services centre in YAZAKI

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[87] As an example, it was verified on an interview that an employee with the 12th grade did not understand the meaning of "Entrepreneurial Skills".
[88] Pointed out by Dra. Helena Dias.
[89] According to Dra. Teresa Portela.

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Europe. The survey would be fully aligned with PTC's recently declared mission, vision, values and strategy, would be available both in Portuguese and English (as PTC has employees from different nationalities), and it should also be more focused on the service.

Another important aspect is the training of evaluators to make them aware of the importance of performance assessment and their role throughout the process, since we noticed that many have difficulties in performing the assessment and think it is very subjective[90]. In this area it seems crucial that evaluators understand the performance management as a strategic framework, and its articulation with other areas of people management.

Beyond the commitment to training and to complement the PMP Manual, an "Evaluator Manual" should be created, as a means to disseminate the assessment tool and its impact on the different areas of people management and development, thus contributing to transform the assessment moment in a moment of dialogue and commitment to objectives.

As for the 360 Degree Feedback Assessment, type of assessment in vogue these days, since PTC employees already do their self-assessment and feedback is provided by direct supervisors and customers, it is suggested feedback is also given by peers and subordinates. It would be interesting to have all these assessments in a compiled report for each employee. To compile and compare ratings of different evaluators, producing charts that allow for a rapid reading of results[91], as well as suggestions for development and improvement on the various dimensions assessed.

Although the performance management system is not aligned with the mission, vision, values and strategy defined for PTC, there is a concern with rewarding good performance (even though wages are fixed, employees are awarded bonuses that vary according to performance), as well as promoting on potential in some departments.

The BSC project aims to minimise some of the weaknesses found, as well as to allow each employee to understand their contribution to the success of PTC. This is also complemented with a project to improve communication and coaching to managers and team leaders, which is considered of great importance in terms of self-knowledge, self-assessment, and consequently self-development.

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[90] Perceived in interviews with managers.
[91] Annex VII – Examples of charts compiling assessments from different evaluators.

Appendix IX – Summary of the Balanced Scorecard for Porto Technical Centre

Please see A3 document attached to this report.

ANNEXES

Annex I –The Subsector of components for the Automotive Industry[92]
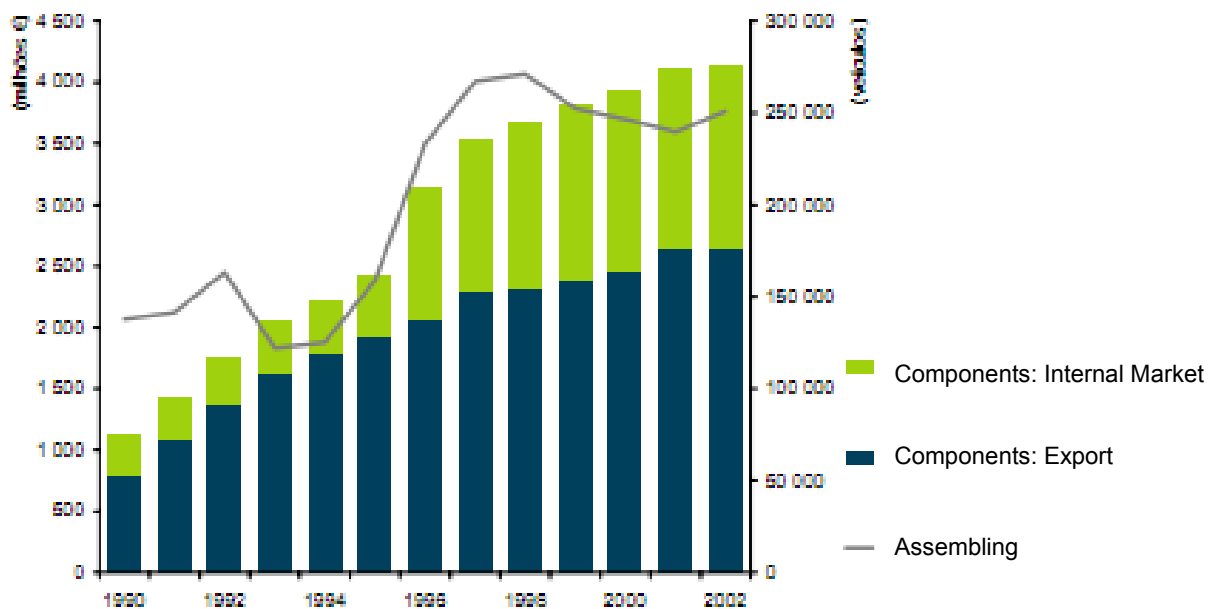
Evolution of the Components Sector in Portugal
Source: AFIA

Indicators	2009
Nr. of companies	180-200
Turnover (millions of EUR)	3.680
Exports (% of turnover)	80,0
Nr. Of employees (annual average)	38.500
Share in GDP (%)	2,2
Share of Exports of Goods (%)	6,3
Share on Employment (%, industry)	4,4
Cost of work in the automotive industry (EUR/hour)	13,72

Key Indicators
Source: AFIA

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[92] The categories in which YAZAKI Saltano de Ovar is placed are underlined in red.
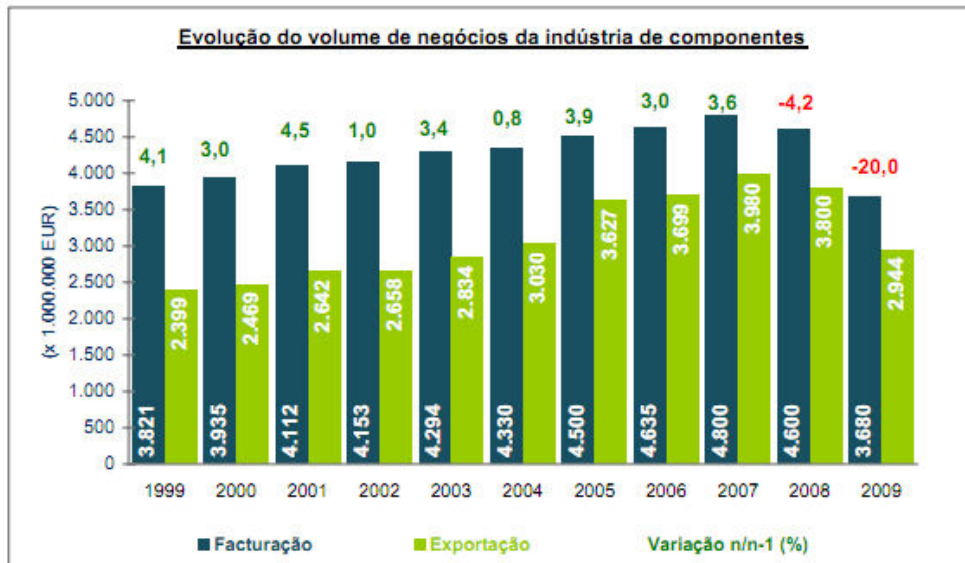
Automotive Components Industry: Turnover Evolution (millions of euros)
Source: AFIA
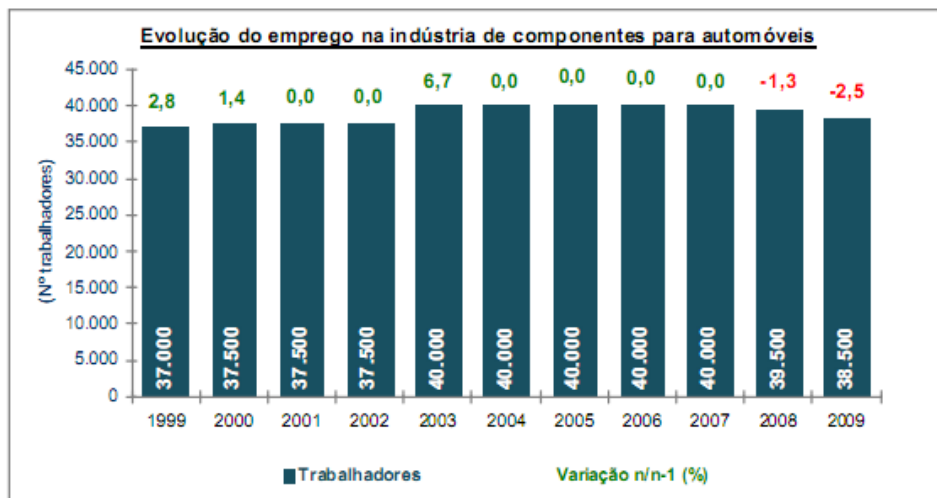
Evolution of the Number of Workers in the automotive components industry
Source: AFIA

Country	% billing
Germany	25,5
Portugal	20,0
Spain	18,3
France	13,4
United Kingdom	5,7
New EU members *	4,8
Belgium	2,7
USA	2,6
Italy	1,9
Sweden	1,1
Austria	0,9
Turkey	0,4
Brazil	0,4
Morocco	0,2
Other	2,0

* New EU members - Slovakia, Slovenia, Hungary, Poland, Czech Republic and Romania

Distribution of turnover by country (2009)
Source: AFIA

Main Customers (alphabetically)	
BMW	Mahle
Continental	Mitsubishi
Daimler	Nissan
Delphi	PSA Peugeut Citroen
Faurecia	Renault
Fiat	Robert Bosch
Ford	Toyota
General Motors	TRW
Johnson Controls	Visteon
Lear	Volkswagen

Main Customers
Source: AFIA

Nr. of companies	% of companies
[0 - 50[	20,3
[50 - 100[	16
[100-250[	34,2
[250-500[	18,2
[500 - ...[	11,2

Sector size (% of companies by categories of number of employees)
Source: AFIA

Sub-sector	% of billing of the sector
Electric and Electronic Equipment	28,9
Interiors	23,6
Chassis, Brakes, Suspension, Steering and Wheels	20,1
Motors and their components	13,5
Exteriors	7,3
Moulds and tools	3,3
Metallurgy	1,6
Organic Products and Chemicals	1,5
Support Services	0,3

Distribution of companies by subsector (by turnover)
Source: AFIA

Districts	% of companies
Aveiro	22,5
Porto	18,7
Setúbal	12,3
Braga	10,7
Leiria	9,1
Lisboa	4,8
Santarém	4,8
Viana do Castelo	3,7
Évora	3,2
Viseu	3,2
Coimbra	2,1
Portalegre	2,1
Guarda	1,1
Bragança	0,5
Castelo Branco	0,5
Vila Real	0,5

Geographical Distribution of companies (% of firms)
Source: AFIA

Regarding the specific area of manufacturing of other wire and electric and electronic cables (CAE: 27320), in Portugal there are a total of 25 companies with this primary business activity code. The following data is from 2008 and was extracted from AEP's[93] website.

Districts	Nr. of companies	% of companies	Sales	Employees
Angra do Heroísmo	0	0,0%	0	0
Aveiro	3	15,0%	143.858.730	396
Beja	0	0,0%	0	0
Braga	3	15,0%	164.423.985	357
Bragança	0	0,0%	0	0
Castelo Branco	0	0,0%	0	0
Coimbra	1	5,0%	1.715	30
Évora	0	0,0%	0	0
Faro	0	0,0%	0	0
Funchal	0	0,0%	0	0
Guarda	1	5,0%	93.311.823	210
Horta	0	0,0%	0	0
Leiria	0	0,0%	0	0
Lisboa	3	15,0%	175.091.089	319
Ponta Delgada	0	0,0%	0	0
Portalegre	1	5,0%	411.359	2
Porto	7	35,0%	207.490.003	527
Santarém	0	0,0%	0	0
Setúbal	0	0,0%	0	0
Viana do Castelo	1	5,0%	17.031.923	107
Vila Real	0	0,0%	0	0
Viseu	0	0,0%	0	0
Total	**20**	**100%**	**801.620.627**	**1.948**

Companies and Location
Source: AEP

Sub-sectors	Nr. of companies	% of companies	Sales	Employees
27320	20	100,0%	801.620.627	1.948
Total	20	100,0%	801.620.627	1.948

Companies and Sub-sectors
Source: AEP

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[93] AEP - Associação Empresarial de Portugal

Type of society	Nr. of companies	% of companies	Sales	Employees
Empresa Individual	1	5,0%	430.000	9
Sociedade Anónima	8	40,0%	581.532.177	1.266
Sociedade Por Quotas	10	50,0%	202.626.527	566
Soc. Unip por Quotas	1	5,0%	17.031.923	107
Total	20	100,0%	801.620.627	1.948

Types of Companies
Source: AEP

Year of Establishment	Nr. of companies	% of companies	Sales	Employees
Less than 2 years	0	0,0%	0	0
2 to 5 years	0	0,0%	0	0
5 to 10 years	1	6,3%	617.038	0
More than 10 years	15	93,8%	799.975.942	1.945
Total	18	100,0%	800.592.981	1.945

Companies and year of establishment, sales and number of employees
Source: AEP

Annex II – PTC's Organisational Chart
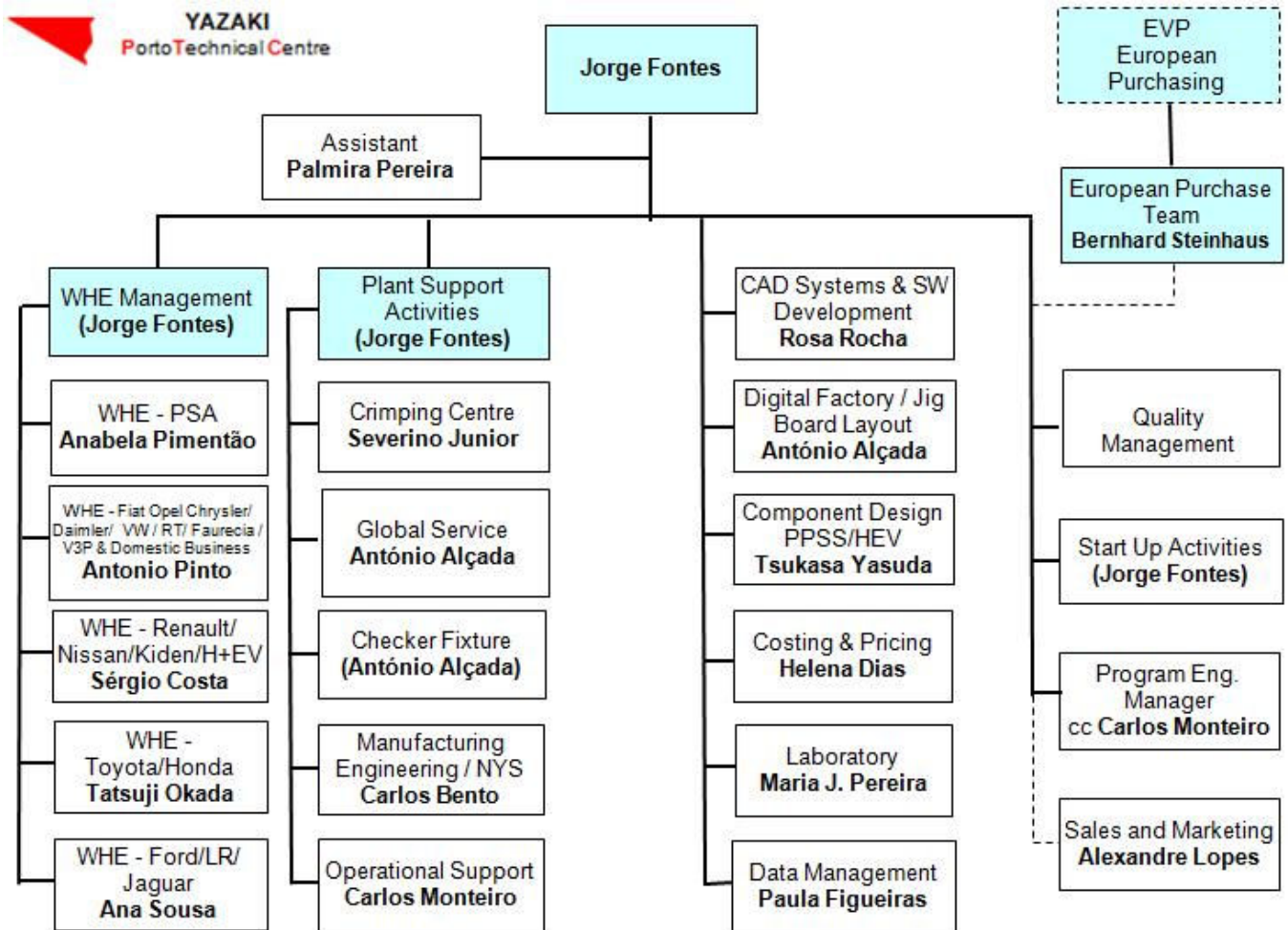
Source: PTC

Annex III – PTC's Customers

Customer Debtor	City
A Metalúrgica do Corvo, Lda	Vila Nova de Gaia
A. Raymond Italiana	
Adapt	91700 Ste Genevieve des Bois
ASK Industries S.p.A.	Italy
Delfinger Tanger	
EIBU_Local	
EKS	Mashad
Elbil Norge AS	Oslo
EP	Köln
EP-1	Köln
EP-SM	Koln
Hesto Harness (PTY)Ltd	Durban, soudt africa
PEMI	Tangerang, tailandia
Plastovar - Técnica e Indústria de Plásticos, Lda	Ovar
Polisport Plásticos, S.A	Carregosa
RICARDO & BARBOSA LDA	S. Pedro da Cova
SULEVE LTD	Lever
SY-2	
SYA	Shantou Special Economic Zone
SY-B	Brake ford
SY-LG	Lagarene renault
SY-R	Reisengurg bmw
TAP-B	Tambon Bangpla Amphoe Bang Phli
Taro Plast S.p.a.	Parma
TATA	OEM
TJY	Tianjin
TYA	
Yazaki do Brasil Ltda (YBL)	Tatuí
Yazaki Internacional do Brasil(YIB)	Brasil
Yazaki Kenitra SA	kinitra marrocos
YBE	bulgaria
YC-1	Worldwide Head Quarter (Yazaki Corporation)
YCIC	Shangai
YCT-T	Timisoara
YEL-B	belgium
YEL-BL	Opglabbeek
YEL-C	Binley
YEL-D	Mansfield Road
YEL-EH	Helmond
YEL-F	Moerfelden-Walldorf
YEL-G	Goteborg
YEL-HH	Hemel
YEL-K	Koln
YEL-K COMBU	Koln
YELK-GME	Köln
YEL-NC	Gateshead
YEL-P	Le Chesnay

YEL-S	Leinfelden - Echterdingen
YEL-SW	Swindon
YEL-SYB Sales	Opglabbeek
YEL-T	Torino
YEL-WB	wolfsburg
YEL-Z	Zagreb
YKE	Köln
YMO	Tanger
YNA	Yazaki north america
YOT-G	Gemlik turquia
YOT-K	Kuzuluk turquia
YRL	Romenia
YSE	Ovar
YSK	Prievisza
YTMI	Singalong
YTU	Tunisia
YUL	uzhgordd
YUY	Uyazaki Urugai
YWT-C	Pilsen
YWT-I	India
YWT-S	Michaelovk
YWT-T	Mudanya

Plants in Europe	
HQ America, El Paso Plant	
HQ	
SY CSC	Siemens Yazaki
CSC	
External clients from the Laboratory or Suppliers	
OEM	

Source: PTC

PTC's Original Equipment Manufacturer (OEM) Customers
Source: PTC's Presentation Slides

Strategic Business Plan for
Porto Technical Centre

7th February 2011

This document comprises a strategic plan for Porto Technical Centre. It reviews its strengths, weaknesses, threats and opportunities; presents a series of fundamental statements relating to Porto Technical Centre's vision, mission, values and objectives; and sets out Porto Technical Centre's proposed strategies, goals and action programs.

SWOT Analysis

This strategic plan addresses the following key strengths, weaknesses, threats and opportunities which apply to Porto Technical Centre now and in the foreseeable future:

STRENGTHS	WEAKNESSES
■ Management team and workforce experience; ■ Business knowledge; ■ QCD performance; ■ Services integration (in-house and inc YSE); ■ Operating systems integration; ■ Dependability, adaptability and process solidity; ■ Workforce stability and low attrition rate; ■ Mobile and flexible workforce; ■ Competitive hourly rate.	■ Communication (Inbound/outbound); ■ Management Team Integration; ■ High-level technical ability; ■ Understanding of fundamental core of performed functions; ■ Externalisation - active promotion of PTC service in CSCs and plants.
OPPORTUNITIES	THREATS
■ Extended support to manufacturing organisation; ■ Technological high-end knowledge; ■ Workforce base-knowledge consolidation; ■ Fundamental engineering & Integrated project management; ■ Partnership development (in & out) inc acknowledgement as solution provider; ■ Hard-core data processing; ■ Integration of overlapping functions PTC/YEL - synergy enhancement for YEL.	■ Excessive visibility; ■ Rate of growth; ■ Non-Yazaki based development visions; ■ Charge rate development over the second decade; ■ Flexibility of local labour law.

Vision

The promoters' vision of Porto Technical Centre in 3-4 years' time is:

To be the benchmark Yazaki Technical Centre, as a provider of excellence for the organisation, delivering outstanding value-for-money and quality of product and services.

Mission Statement

The central purpose and role of Porto Technical Centre is defined as:

Supply excellent services and products to our customers and partners, driven by the pursuit of knowledge and continued development.

Corporate Values

The corporate values governing Porto Technical Centre's development will include the following:

- **Passion** - in everything we do, we put not only our minds, but our heart in, to make the defining difference. And what we do is what we are.
- **Trust** - our demeanour shall every day lead to the trust by our customers and partners, based on our experience, knowledge and attitude. We earn the trust of our partners and customers through delivering on time a quality service to the best cost in the business.
- **Commitment** - we deliver to meet or exceed expectations in everything we do, no matter what endeavour or need we devote ourselves to. We always honour our contracts and the needs of our customers in accordance with the respective agreements.

My PASSION today - Your TRUST tomorrow - Our COMMITMENT always

Business Objectives

Longer term business objectives of Porto Technical Centre are summarized as:

- Externally: achieve an improved externalisation profile through a more outward drive. Complete service provision portfolio in core competence areas. Be perceived as a value-for-money business proposition.
- Internally: achieve practical acknowledgment of PTC values - Passion, Trust and Commitment - in the everyday operation, as per their individual

description. Maintain the performance metrics trend of the last 5 years. Lead staff to greater task background knowledge for a more complete service provision.

Key Strategies

The following critical strategies will be pursued by Porto Technical Centre:

1. Assure maintenance of price-to-customer for 10-years
2. Continued Human Capital development in technical and service aspects
3. Sustained and integrated technological evolution for maximisation of effectiveness
4. Business consolidation through maximising of existing strengths
5. Develop integration of procedures in a worldwide approach – Lead worldwide Tech Centres cooperation
6. Improve delivery speed of services and products

The following important strategies will also be followed:

1. Provision of high-availability data storage solution
2. Development of new added-value solutions for customers, including for processes and resources
3. Acknowledgement as partner with customers for business support

Major Goals

The following key targets will be achieved by Porto Technical Centre over the next 3-4 years:

- Maintain hourly rate at 2001 level up to 2021, ensuring breakeven
- Develop fully functional staff Licensing System
- Re-profiling of provided services
- Creation of dedicated Tooling Centre
- Establishment of sub-managed service providers

Strategic Action Programs

The following strategic action programs will be implemented:

1. Yearly Term Objectives - in-line with Engineering VP issue, followed by specific PTC deployment by Director for application by Managers. Yazaki yearly term basis.

2. 5-YSP - 5-year Strategic Plan. Major departmental alignment with overall business objectives. Led by Director, Approved by YEL Corporate Executives, deployed by Director and Managers according to specific plan.

3. BIP - Business Improvement Programme. As per dedicated document, led by Director, deployed by Director and Managers according to specific plan, on a yearly basis of a three-year approach.

4. OBS - Operational Business Sector. Financial management of PTC, through financial planning, budgeting, invoicing, cost controlling and assessment methodologies application. Monthly and yearly planning and assessment.

Source: PTC

Annex V – PTC's Customer Satisfaction Survey

YAZAKI	Evaluation of the Services Performed by PTC
Porto Technical Centre	Porto Technical Centre
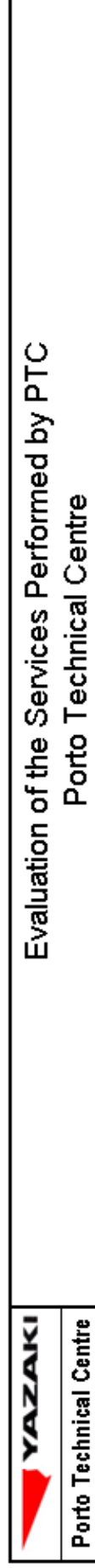
Customer identification (Plant / CSC): _____

In order to improve our performance regarding Quality, Efficiency/Delivery and Services continuously, we would appreciate it if you can fill in this form. This evaluation should be based on the last **year**.

The following appraisal should be completed by the persons that are directly affected / related by our services.
The appraisal can be prepared as a team effort and combined into one report, however please indicate the responsible person for each activity appraised.

Please complete only the areas applicable to your organization and evaluate according to the following key:

1 – Bad   4 – Good
2 – Mediocre   5 – Very Good
3 – Sufficient
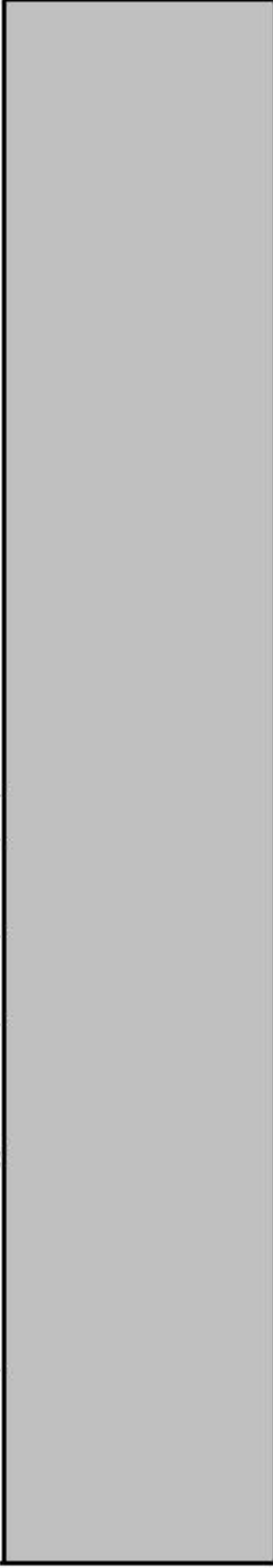
In case of evaluation 1 or 2, please justify

Comments and suggestions to help us to improve the quality of our services
Which products /services would you like to implement in addition to the current ones?

Activity	1. Relations with the team (in the communication)	2. Competence level of involved technical staff (Skills, knowledge, Experience)	3. Demonstration of the listed and service attitude	4. Delivery time of products / services according to agreed date	5. Lead time of requested products / services	6. Coordination, follow up and progress feedback (Information of product's status / product)	7. Ability to react the customer needs (new / urgent request)	8. PTC services / products are adequate to your needs	9. Quality, Accuracy, Correctness of work / documentation provided	10. Effectiveness in treatment of customer problems	11. Innovation and improvement ability	12. Cost / Quality ratio of the performed services. Only laboratory	Evaluation performed by (name / function)
Applicator Design, Assembly & Delivery (Severino Junior)													
CAD System & Sw Development (Rosa Pinto)													
Component Data Handling (TDC) (Paula Figueiras)													
Components Design (Tsukasa Yasuda)													
Costing & Pricing (Helena Dias)													
Crimping Standard Activities (TCSS) (Severino Junior)													
Design Engineering - Ford / Jaguar / Land Rover / Volvo / McLaren (Ana Sousa)													
Design Engineering - Opel / Fiat / Daimler Chrysler / VW / Dom Bus. / RT (Faureda / António Pinto)													
Design Engineering - PSA (Anabela Pimenta)													
Design Engineering - Renault / Nissan / HEV (Sérgio Costa)													
Design Engineering - Toyota / Honda (Tateuji Okada)													
Digital Factory - Schematics & Simulations (António Algada)													
Global Service GE-YEL (António Algada)													
Laboratory (M.João Pereira)													
Manufacturing Design - Ford / Jaguar / Land Rover / Volvo / McLaren (Ana Sousa)													
Manufacturing Design - Opel / Fiat / Daimler Chrysler / VW / Dom Bus. / RT / Faureda (António Pinto)													
Manufacturing Design - PSA (Anabela Pimenta)													
Manufacturing Design - Renault / Nissan / HEV (Sérgio Costa)													
Manufacturing Design - Toyota / Honda (Tateuji Okada)													
Manufacturing Engineering (Carlos Bento)													
Material Data Handling (IMDS, ELV, etc) (Paula Figueiras)													
Start-Up Activities (Complexity Studies, Development Tools, ...) (Jorge Fontes)													
YELDB (Yzk Part Number & Codes Management) (Paula Figueiras)													

Please include here your comments and suggestions to help us to improve the quality of our services:

Which products /services would you like to implement in addition to the current ones?

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Annex VI – PTC's Performance Management Process (PMP)

Performance Management Process

2010-11-10 Status: in progress 5219

Employee's First Name:	Florbela	Employee's Last Name:	Lopes	Line Manager's Name:	Helena Dias
Employee's ID Number:	2281	Cost Center:	8120110300	Line Manager's Job Title:	Costing & Pricing Manager
Department:	Data Management	Location:	PTC		
Years in current position:	6	Job Title:	TBD	PMP Meeting Date:	2010-11-10

JOB FUNCTION REVIEW: Please discuss the following items at the beginning of the appraisal meeting.
Do you understand the Company organisation, its products and systems? Do you understand how your position fits into the overall structure? Does the Job Description give an accurate representation of your role? (if not, please adjust)

Chapter A: Technical Competencies

Technical Competencies/ Professional Skills	Observed	Development Remarks
Please list up to 5 competencies that you want to discuss	☹ ☺ ☻ 1 | 2 | 3 | 4 | 5 | 6	Training on the job Project work Learning by doing Seminar
Analysis & Reporting Skill Technical knowledge relating to reports services tool.	actual period ○ ○ ○ ○ ◉ ○ last period ○ ○ ◉ ○ ○ ○	
English language knowledge	actual period last period ○ ○ ○ ◉ ○ ○	
	actual period last period	
	actual period last period	
	actual period last period	

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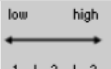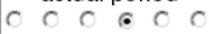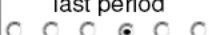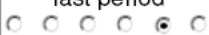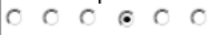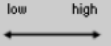
2010-11-10 Status: in progress 5219

Tools and Techniques	Behavior Description	Observed (1–6)	Job Relevance (n/a, low 1–3 high)	Development Remarks (Training on the job, Project work, Learning by doing, Seminar)
Presentation — Ability to present information effectively to an audience and to assert one's position.	• Knows presentation tools (e.g. presentation structure, visualization, rhetoric, technique of asking/ dealing with questions). • Successfully uses the tools in daily business.	actual period: 5 ●; last period: 5 ●	2 ●	
Moderation — Ability to apply techniques to guide decision-making and problem-solving processes in groups of people.	• Knows group moderating tools (e.g. collecting and structuring information, structuring and visualizing problem-solving processes). • Successfully uses the tools in daily business.	actual period: 5 ●; last period: 5 ●	3 ●	
Project Management — Ability to methodically initiate, plan, execute, control, and conclude a project.	• Knows project-management tools (planning, executing, controlling, and evaluation). • Successfully uses the tools in daily business.	actual period: 5 ●; last period: 5 ●	3 ●	
Business Process Managment — Ability to develop, run and continuously improve effective business processes.	• Knows business process management tools (developing, running, and monitoring effectiveness of business processes). • Successfully uses the tools in daily business.	actual period: 4 ●; last period: 5 ●	3 ●	
Time Managment — Ability to apply specific skills, tools, and systems to maximise efficient and effective use of time available.	• Knows time management tools (e.g. instruments to plan, prioritize and control one's own tasks). • Successfully uses the tools in daily business	actual period: 5 ●; last period: 5 ●	3 ●	
Problem Solving — Ability to apply specific tools to support the problem solving process.	• Knows problem solving tools (e.g. 8D, Ishikawa-Diagram, Mind-Mapping, Brainstorming).	actual period: 4 ●; last period: 4 ●	3 ●	
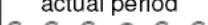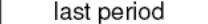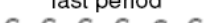
Chapter C: Other Competencies

Other Competencies	Behavior Description	Observed ☹ ☺ ☻ 1 | 2 | 3 | 4 | 5 | 6	Job Relevance n/a low→high 1 | 2 | 3	Development Remarks Training on the job Project work Learning by doing Seminar
LEADERSHIP COMPETENCIES				
Goal Orientation — Ability to derive goals from the company's strategies and commit oneself and others.	• Defines clear priorities concerning the work results of the staff. • Defines measurable and unambiguous goals. • Ensures that specific and challenging goals are set. • Tracks the achievement of objectives. Follows up on tasks. • Stays focused on goals and delivers high quality results on time. • Identifies roadblocks and removes them.	actual period ○ ○ ○ ◉ ○ ○ last period ○ ○ ○ ◉ ○ ○	○ ○ ◉ ○	
Decision Making — Ability to make confident, timely and appropriate decisions based on a calculated analysis of all available information, especially if a decision has to be based on uncertain information	• Calculates costs, benefits, risks, opportunities and utilizes data before making decisions • Makes decisions in a timely manner. • Acts quickly and decisively in difficult situations. • Demonstrates high awareness for situations that require taking a risk to improve results. • Recognizes when risks are too high. • Is committed to his/ her decisions. • Shows assertiveness when required. • Promotes lessons learnt.	actual period ○ ○ ○ ◉ ○ ○ last period ○ ○ ○ ○ ◉ ○	○ ○ ○ ◉	
Ability to Motivate — Ability to apply specific and appropriate motivation tools.	• Shows belief in his/ her own strengths, and those of employees. • Gives appropriate feedback on performance and encourages improvement where required. • Appreciates employees' contribution. • Understands and explains the importance of goals and how they were derived from higher-level goals. • Achieves commitment of his/ her staff to the goals. • Is committed to his/ her tasks. • Voluntarily offers his/ her efforts and ideas • Reacts positively to new tasks.	actual period ○ ○ ○ ◉ ○ ○ last period ○ ○ ○ ◉ ○ ○	○ ○ ◉ ○	

Other Competencies	Behavior Description	Observed			Job Relevance			Development Remarks
		☹ ☺ ☺ 1 | 2 | 3 | 4 | 5 | 6		n/a	low ⟷ high 1 | 2 | 3			Training on the job Project work Learning by doing Seminar
Personnel Development Ability to facilitate conditions that continuously improve employees' or colleagues' competencies.	• Supports the continuous, individual development of employees' competencies (knowledge, skills and abilities). • Broadens the employees' scope of tasks and responsibilities where appropriate, to further personnel development. • Creates a work environment where people can develop personally and professionally. • Develops or supports activities to promote the professional and/ or personal development of colleagues • Permanentally strives to develop his/ her own potential. • Empowers people and delegates/ distributes responsibility.	actual period ○ ○ ○ ⦿ ○ ○ last period ○ ○ ⦿ ○ ○ ○			○ ○ ⦿ ○			
Delegation and Information Ability to distribute information, tasks and responsibilities to colleagues and employees	• Assigns employees challenging tasks and sufficient space for decision-making and taking action. • Takes employees' interests and abilities into account when delegating tasks. • Informs others timely and specifically. • Distributes necessary information clearly and openly.	actual period ○ ○ ○ ⦿ ○ ○ last period ○ ○ ○ ○ ⦿ ○			○ ○ ○ ⦿			

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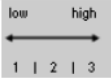
Chapter C: Other Competencies

2010-11-10 Status: in progress 5219

Other Competencies	Behavior Description	Observed ☹ ☺ 1 | 2 | 3 | 4 | 5 | 6	Job Relevance low high n/a 1 | 2 | 3	Development Remarks Training on the job Project work Learning by doing Seminar
ENTREPRENEURIAL COMPETENCIES				
Innovation Ability to generate ideas, and develop and implement them successfully into new or improved products, services, technologies, business processes or market conditions	• Questions existing structures and searches for new ways to approach them. • Always proactive towards improvement. • Develops novel solutions and/ or products. • Fosters innovation. • Is aware of market trends and best-practice. • Thinks out of the box.	actual period ○ ○ ○ ○ ⦿ ○ last period ○ ○ ○ ○ ⦿ ○	○ ○ ○ ⦿	
Strategic Thinking Ability to anticipate market development and develop appropriate strategies to generate/develop the business.	• Creates vision. • Recognizes strategic options and market opportunities. Develops ideas to optimize Yazaki's corporate/ product strategy. • Develops solutions to achieve the strategic goals. • Promotes buy-in from the organization	actual period ○ ○ ⦿ ○ ○ ○ last period ○ ○ ⦿ ○ ○ ○	○ ⦿ ○ ○	
Focus on results Ability to focus one's behaviour on promoting business results.	• Focuses all activities on value added for Yazaki. • Always seeks opportunities for promoting business results. • Behaves in accordance with Yazaki's Code of Conduct. • Has a good feeling for revealing and making use of synergies.	actual period ○ ○ ○ ⦿ ○ ○ last period ○ ○ ○ ⦿ ○ ○	○ ○ ⦿ ○	
Customer Focus Ability to focus one's behaviour on the internal and external customers' needs and requirements.	• Understands customers' requirements and reacts appropriately. • Develops an effective business relationship between the customer and the company. • Looks for opportunities to receive internal and external customer feedback concerning the company's/ department's performance. • Demonstrates credibility. • Responds timely to customers' requests. • Strives to provide added value and excellent quality services to the customer.	actual period ○ ○ ○ ○ ⦿ ○ last period ○ ○ ○ ○ ⦿ ○	○ ○ ○ ⦿	

Chapter C: Other Competencies

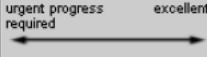| Other Competencies | Behavior Description | Oberserved ☹ 😐 ☺ 1 \| 2 \| 3 \| 4 \| 5 \| 6 | | Job Relevance n/a low ←→ high 1 \| 2 \| 3 | Development Remarks Training on the job Project work Learning by doing Seminar |
|---|---|---|---|---|
| **SELF-MANAGEMENT COMPETENCIES** | | | | |
| **Flexibility** Ability to adapt oneself quickly to changing situations and requirements. | • Adapts positively to new situations. • Copes with changing requirements. • Reacts proactively if confronted with roadblocks. | actual period ○ ○ ○ ○ ◉ ○ last period ○ ○ ○ ○ ◉ ○ | ○ ○ ○ ◉ | |
| **Behavior Under Pressure** Ability to cope under pressure and continue to perform strongly. | • Manages difficult situations successfully. • Remains effective even under pressure. • Confidently meets challenges. | actual period ○ ○ ○ ○ ◉ ○ last period ○ ○ ○ ○ ◉ ○ | ○ ○ ○ ◉ | |
| **Intercultural and Social Sensitivity** Ability to interpret an event or behaviour in perspective of one's own cultural/ social values and those of others, and to pick up verbal and non-verbal signals | • Is sensitive towards non-verbal signals. • Shows understanding and respect for other cultures, social differences and mentalities. • Is able to interpret the behaviour and adopt the perspective of others. • Complies with the Code of Conduct. | actual period ○ ○ ○ ◉ ○ ○ last period ○ ○ ○ ◉ ○ ○ | ○ ○ ◉ ○ | |
| **Ownership** Strong commitment to the company's values, success and goals beyond one's own responsibilities and duties. | • Is also concerned about issues outside of his/ her area of accountability to ensure that company goals are achieved. • Takes responsibility for his/ her own actions, and those of his/ her employees. • Strongly commited to the company's overall goals and proactive in their achievement. • Is personally committed to achieving excellent results. • Shows high level of cost awareness and responsible use of the company's assets. | actual period ○ ○ ○ ○ ◉ ○ last period ○ ○ ○ ○ ◉ ○ | ○ ○ ○ ◉ | |

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Chapter C: Other Competencies

Other Competencies	Behavior Description	Observed ☹ ☺ ☺ 1 | 2 | 3 | 4 | 5 | 6	Job Relevance n/a low — high 1 | 2 | 3	Development Remarks Training on the job Project work Learning by doing Seminar
SOCIAL COMPETENCIES				
Team-working Ability Ability to cooperate with people of different functions and hierarchical levels (even if conflicts of interests occur).	• Creates an environment that encourages multifunctional teamwork. • Is open to team decisions and ideas. • Participates proactively. • Collaborates efficiently with all team members.	actual period ○ ○ ○ ○ ⦿ ○ last period ○ ○ ○ ○ ⦿ ○	○ ○ ⦿ ○	
Conflict Management Ability to recognize conflicts and to facilitate solutions, and/ or to manage efficiently the existence of these conflicts.	• Handles conflicts timely. • Acts as a facilitator, moderator and contact person. • Clarifies critical points/ issues of conflicts. • Faces the conflict head-on. (Back-Bone) • Is able to create a win-win situation in conflicts or negotiations in line with the company's objectives and values.	actual period ○ ○ ○ ⦿ ○ ○ last period ○ ○ ○ ○ ⦿ ○	○ ○ ⦿ ○	
Communication Ability to use verbal and non-verbal communication skills appropriately.	• Creates relationships with people easily. • Uses listening techniques effectively. • Uses questioning techniques effectively. • Transmits clear and convincing messages. • Uses body language appropriately. • Adopts appropriate communication styles to suit the situation.	actual period ○ ○ ○ ○ ⦿ ○ last period ○ ○ ○ ○ ⦿ ○	○ ○ ⦿ ○	
Networking Ability to develop and maintain social and business contacts and to use these contacts effectively (inside and outside the company).	• Develops and maintains highly efficient business networks. • Maintains contact with relevant people. • Uses his/ her contacts to support the company's goals.	actual period ○ ○ ○ ⦿ ○ ○ last period ○ ○ ○ ⦿ ○ ○	○ ○ ⦿ ○	

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Chapter C: Other Competencies

2010-11-10 Status: in progress 5219

		Remarks
	OVERALL SUMMARY OF PERFORMANCE IN THE PERIOD UNDER REVIEW: Evaluate the overall achievement of job results, targets & objectives. What are the reasons for high or low performance?	
	urgent progress required ← excellent → 1 | 2 | 3 | 4 | 5 | 6	**Remarks**
Overall Rating	actual period ○ ○ ○ ● ○ ○ last period ○ ○ ○ ○ ● ○	Competência alterada de 5 para 4, porque neste periodo demos inicio a uma nova função (operating business), na qual a Colaboradora está a ser avaliada pelo desempenho (inicio da actividade Fev10).

EMPLOYEE'S IDEAS/ SUGGESTIONS FOR IMPROVING PERSONAL OR DEPARTMENTAL PERFORMANCE (Please discuss & note very briefly): Your ideas count!

Chapter E: Development

TRAINING & DEVELOPMENT UNDERTAKEN IN THE PERIOD UNDER REVIEW: Have the new skills been applied at work? What impact have they had on job results?		
List of training undergone during the last period	Have you been able to utilize the training knowledge in your day to day activities?	Remarks
SQL Database; Achieve competencies to preppare queries.	partly	
English language corse	partly	
	please select	
	please select	
	please select	
	please select	

Please discuss Development needs, taking into account the employee's strengths and the job requirements. Development can be achieved with On-the-Job, Near-the-Job or Off-the-Job training.
Training On/ Near-the-Job:
Action Plan: On-the-Job: definition of objectives, job enlargement, job enrichment, job rotation, project group/ project work, substitution, learning-by-doing and observation. Near the Job: quality circle, work group, experience exchange group, specific reading material.
Training Off-the-Job:
Training and Development Action Plan:

Priority	Training Catalogue	Desired Training Level	Trainings which are not included in the Training Catalogue
			Key Objectives and Expectations for the Training/ Seminar OR Training Subject/ Course Title - Training Course or Seminar Details (if already known) - Training Provider
A	Finance for Non Finance for Managers	please select	
		please select	
		please select	
		please select	
		please select	
		please select	

Chapter G: Potential and Mobility

POTENTIAL

	Manager: Please state your opinion on the employee's potential		
Level	Time frame in months 0-12	Definition	If marked E/H or V please propose next position
O	○ actual period ○ last period	Open	
F	◉ actual period ◉ last period	Employee fits best in actual position (**F**it)	
E/H	○ actual period ○ last period	Employee could take over additional responsibility within the position (**E**xpand) or Employee should be developed at the same level of responsibility to widen his/ her horizon (**H**orizontally)	
V	○ actual period ○ last period	Employee should be developed to a level with additional responsibility (**V**ertically)	

MOBILITY

Employee: Please state level of mobility. *The below is only an indication of the employee's preference and is in no way binding. The terms of any locally agreed employment contract regarding mobility will prevail.*	
Willing to be relocated/ assigned for a period of XX months	Please copy all countries you **do not want** to be assigned in the target window on the ride hand side.
not mobile	

OTHER COMMENTS/ ISSUES FROM THE EMPLOYEE AND/ OR LINE MANAGER

Source: PTC

Annex VII – Examples of charts compiling assessments from different evaluators
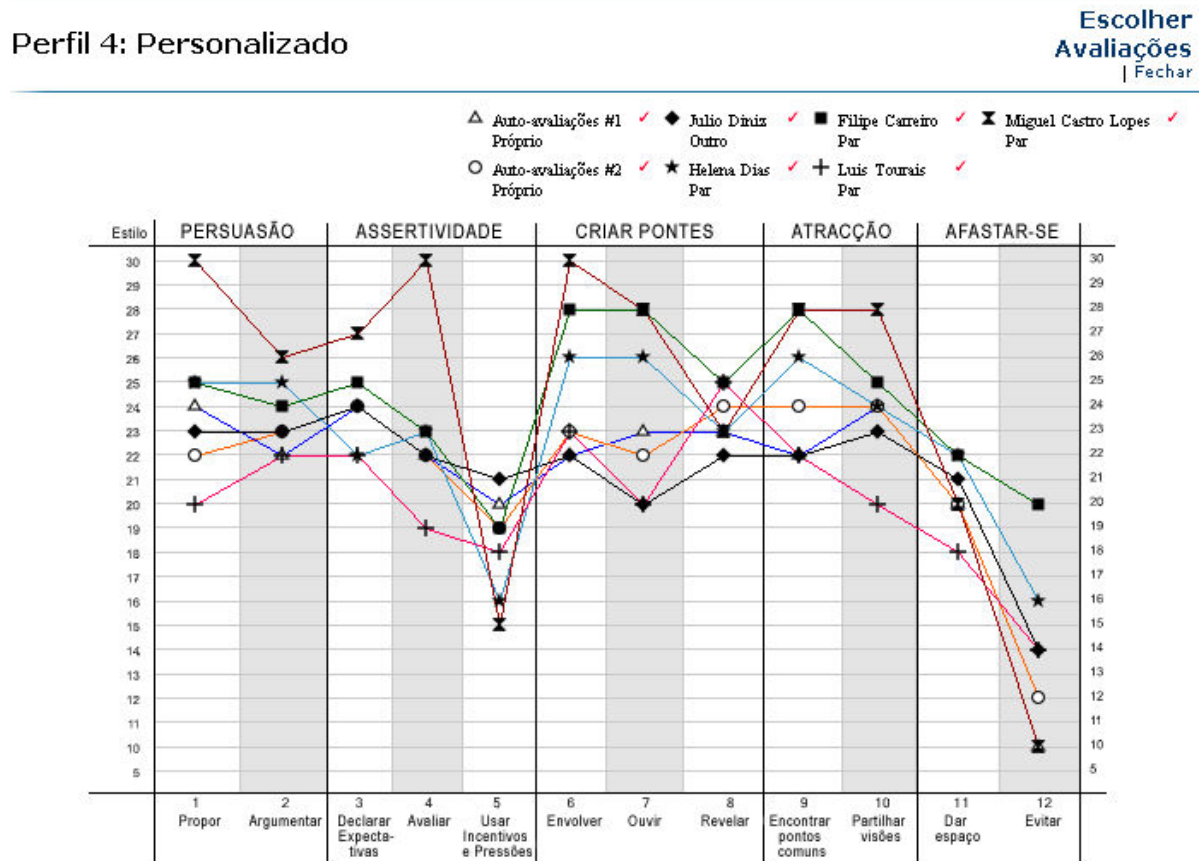
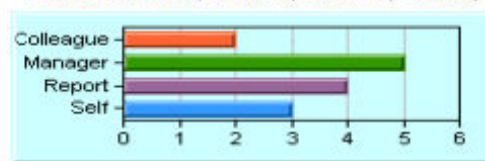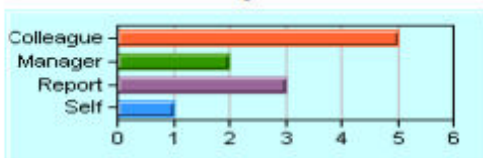Display of the evaluation made by different evaluators for some attributes.
Source: http://www.webisq.com/web/login.php
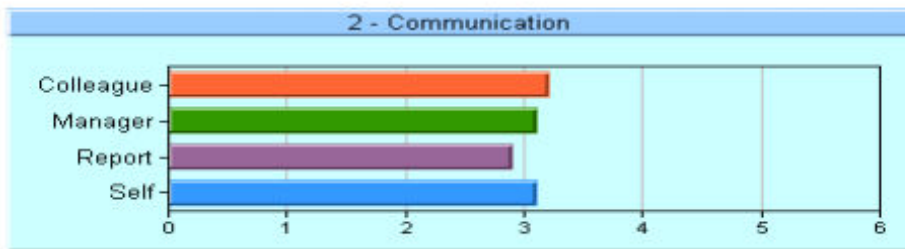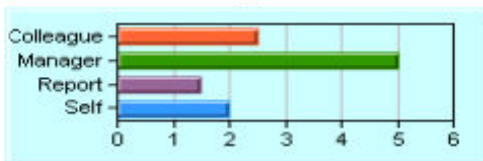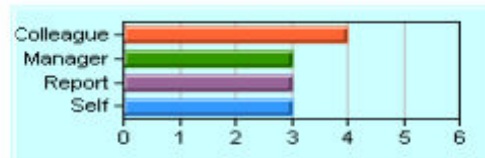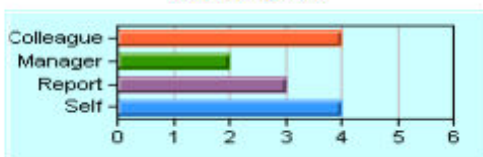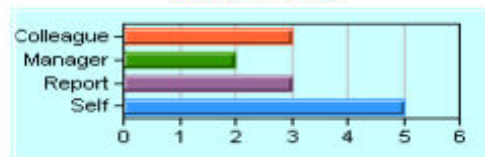
Bar charts that allow the visualisation of the different points awarded by peers, the manager, and the self-assessment.
Source: http://protostar-uk.com/
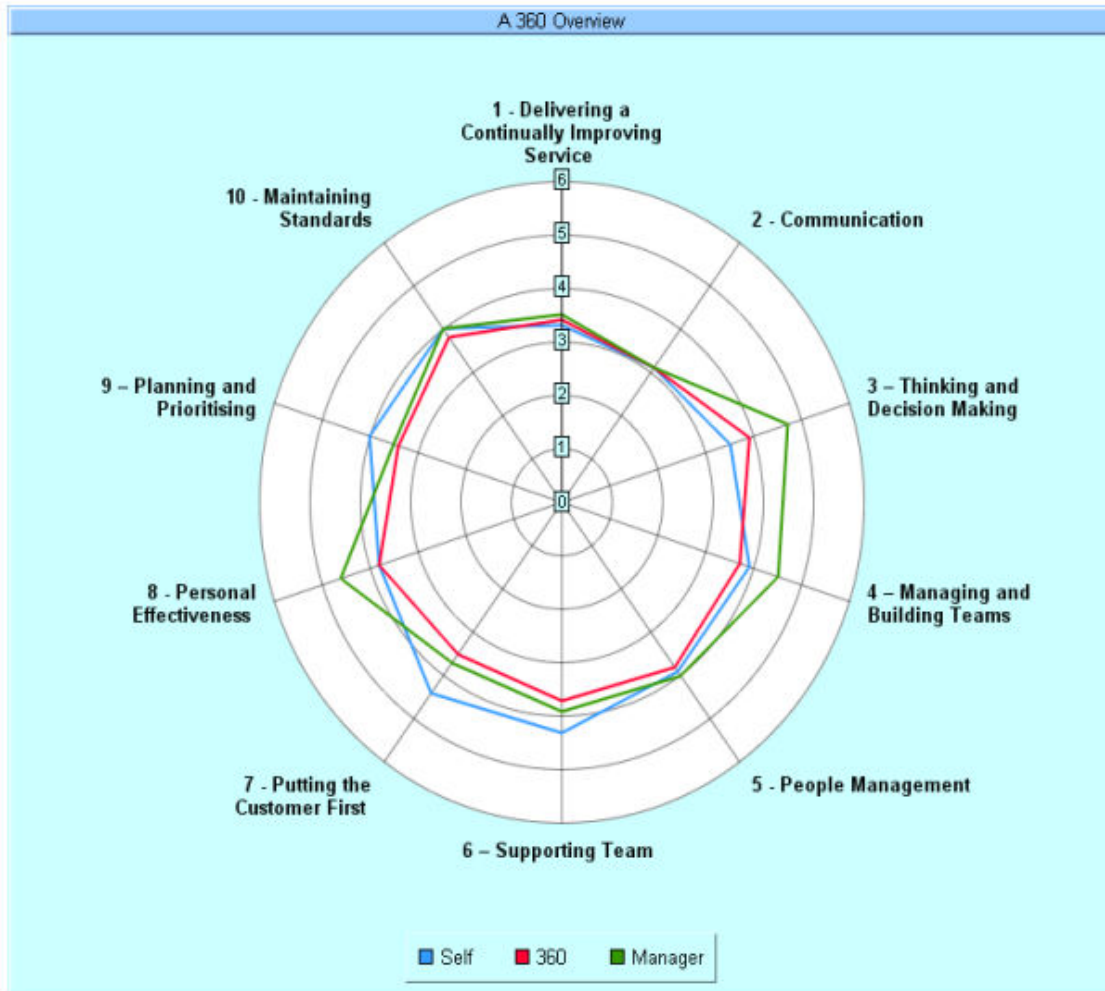
Spider Diagram that allows the comparison of the self-assessment with the 360 Degree Feedback and the assessment by the manager.

Fonte:http://protostar-uk.com/