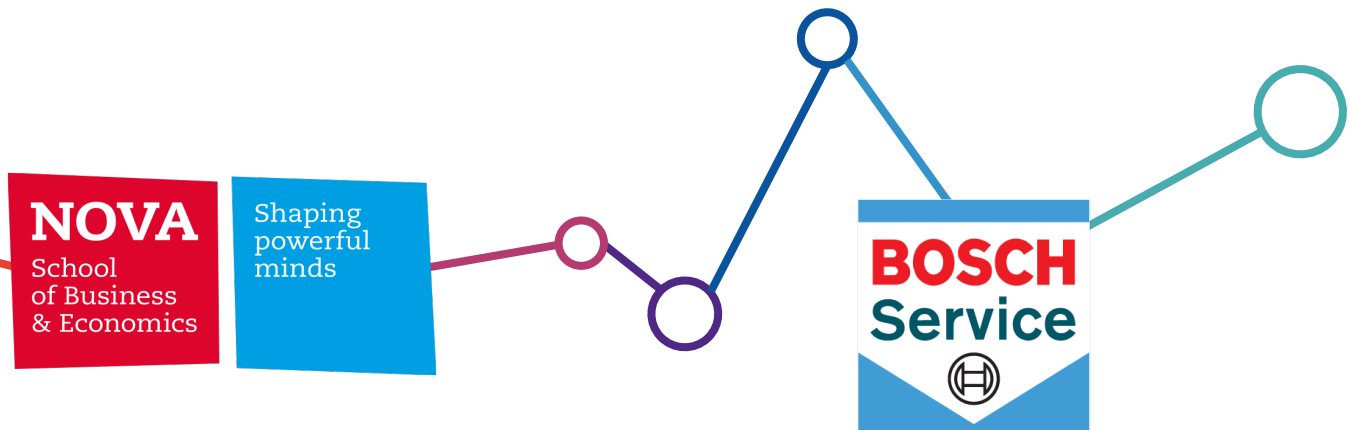


A Work Project, presented as part of the requirements for the Award of a Masters Degree in Management from the NOVA – School of Business and Economics.



AN INTERNSHIP AT ROBERT BOSCH S.A.

**SOLVING TRANSPARENCY ISSUES AT BOSCH CAR SERVICE
BY INTRODUCING AN ENTERPRISE RESOURCE PLANNING**

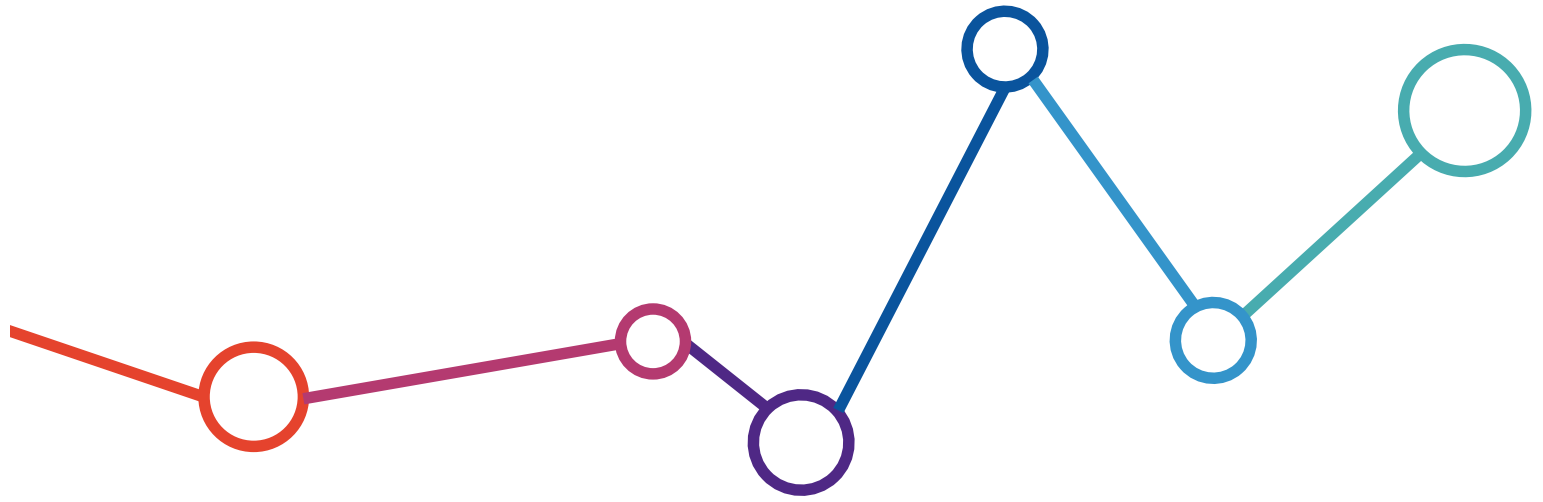
ANA SOFIA CORREIA PACHECO

2536

A Directed Research Internship (DRI) Project at Robert Bosch | Automotive Aftermarket – Bosch Car Service, carried out on the Master in Management Program, under the supervision of: Professor Carlos Marques and Trade Marketeer at Robert Bosch Portugal, Raquel Marinho.

JANUARY 6, 2017





An Internship at Robert Bosch S.A.

Solving Transparency Issues at Bosch Car Service

by Introducing an Enterprise Resource Planning

Abstract

The present Work Project shows how transparency issues can be overcome with the implementation of an Enterprise Resource Planning (ERP). The project purpose is to decide among two different software suppliers offers: Incadea and Activex. Through this paper was conducted a research to identify the costs and benefits and the communication process. Besides, a Cost-Benefit Analysis was performed to support the decision taken. In conclusion, the decision falls on Activex, fully supported and justified with several arguments.

Keywords: Bosch Car Service, Enterprise Resource Planning, Transparency.



Table of Contents

- Acknowledges..... 4
- I. Introduction.....4
- II. Bosch Group’s History.....5
- III. Bosch Car Service Concept’s Description.....6
- IV. Internship’s Description.....8
- V. Analysis of the Current Situation.....8
 - a. Transmission of the information through the network.....9
- VI. Problem’s Description..... 11
- VII. Explanation of the project13
 - a. Enterprise Resource Planning.....13
 - b. Objectives and KPI’s.....15
- VIII. Comparative Analysis..... 16
 - a. Two Software Suppliers’ Alternatives.....16
 - i. Incadea.....16
 - ii. Activex.....18
 - b. Benefits.....19
 - c. Communication Process.....21
 - d. Costs.....22
- IX. The Decision.....23
- X. Conclusion.....25
- XI. Suggestions for Future Research.....25
- XII. References.....26



Acknowledges

The realization of this work project was built on important support and incentives without whom it would have not come true and whom I will always be grateful.

To Professor Carlos Marques, for his orientation, full support, availability, knowledge transmitted, all the opinions and criticism and all the words of encouragement.

To Trade Marketeer Raquel Marinho at Robert Bosch Portugal, whose hard work, strength, availability, collaboration and support have made this work project possible. And for the opportunity given to work in an international and challenging work environment.

Lastly, I would like to thank my Family and friends, in particular, my parents and my brother, for being roles models of courage, for their unconditional support, encouragement, friendship, patience shown and total aid in overcoming my obstacles.

Professor, Internship's Advisor, Family and Friends can be the perfect influence to guide us towards a successful path. To them I dedicate my Work Project!

I. INTRODUCTION

In a more technological and digital world, companies face important challenges having the need to adapt in order to successfully stand out in the market. Well established companies are constantly in the front stage and in the spotlight, as a result, they face constant challenges in different areas, such as: profitability, competitiveness, globalization, speed change, adaptability, growth and technology.

With the desire to continue to be the number one in Portugal and stay ahead of its competition, Bosch Car Service identified the need to hold on new technological tools and introduce an Enterprise Resource Planning (ERP) to answer transparency issues, improve communication and sharing of information between the different stakeholders. Also, to be prepared for telematics and connectivity topics in the future mobility scenarios.

This ERP system is an intelligent solution, which optimizes time and, hence, money. The goal of the system is to merge information in a centralized database and manage the entire flow of the business activities. Helping managers in decision making at all corporation levels, as there is a standardization of the process, automation and storage of all business information. Besides, the implementation of this information management system diminish the occurrence of errors. This Work Project proposes to show a comparative analysis of the two software suppliers in question, Activex and Incadea, to introduce the ERP and make a final decision of the choice presenting reasonable thinking and grounded argumentation. In order to elaborate this dissertation, the student performed an internship at Robert Bosch S.A., in Automotive Aftermarket department inside the concept Bosch Car Service, in Lisbon.

II. BOSCH GROUP'S HISTORY

The company was found in Stuttgart in 1886 by Robert Bosch (1861-1942) as a “precision engineering and electricity workshop”. (Bosch Website, 2016). The Bosch Group is the leading global supplier of technology and services. It employs more than 375,000 employees worldwide (31.12.2015), who contributed to generate a turnover of 70.6 billion euros in 2015.

The company is an internationally recognized brand and synonymous of quality, innovation and seriousness. The products and services are designed to enthusiast and improve the quality of life through innovative solutions, which are useful and contribute to the preservation of natural resources. The Bosch's strategic goal is to provide innovations for a connected life.

In the universe of Bosch, the automotive technology is the area that stands out, corresponding to 62% of the business volume generated by the Bosch group (Bosch Portugal Website, 2016).

Bosch is the world leader in innovation in the automotive sector. Based on the latest technological innovation, more than 200,000 auto parts are developed by Bosch to equip cars of all brands, making them even more safe, comfortable and environmentally friendly.

III. BOSCH CAR SERVICE CONCEPT'S DESCRIPTION

The Bosch Car Service (BCS) concept is a multibrand maintenance and repair workshop in the Automotive Aftermarket area. It is the biggest multibrand workshops network in the world. Around 90,000 people work worldwide in this concept, with 13,600 garages around the world, of which 6,500 are in Europe. In Portugal, Bosch Car Service network is the biggest multibrand car workshops, relying on 138 workshops, distributed throughout the country (30.11.2016).

Introduced to the international auto repair market in 2000, the BCS concept was based on extensive experience that Robert Bosch meets as a global auto parts, components and systems' manufacturer for the world's leading car manufacturer. Due to the distinctive features of the auto repair business and with a market share higher than 40% in the multibrand maintenance and repair workshops, in Portugal this concept has filled a gap in the market, having been the second country to implement it, right after Germany.

Under the BCS concept, the partner of this network host all the reputation and trust that a brand as Bosch provides. The association to the BCS network allows the entrepreneur to develop his business in a supported away without losing his own identity, always keeping independent and responsible for his business. The outdoor image of the adherent workshop is totally exclusive and faithful to the cooperative image concept of the BCS network, in order to smooth the identification for the final customer (Bosch Car Service Portugal Website, 2016).

The company is settled in three fundamental pillars: products, know-how and orientation for the client. BCS workshops work, whenever possible, with Bosch products which represents 23% of the products needed in a workshop. The products that are not Bosch has to have the original quality or equivalent.

Regarding know-how and orientation for the client, each workshop receives training directly from Bosch, in the technical training center of Robert Bosch in Lisbon. In addition, Bosch Portugal has a Business Training Academy, which launches every year a training plan highly

diversified concerning all areas that consist of repair and maintenance car workshop in order to provide a better customer service. The technical competence covers all car brands, being possible because of the highest quality equipment, technical software and technical *hotline* developed by Bosch which includes technical information for more than 55,700 vehicles which is actualized 4 times per year. BCS workshops have professionals prepared in all areas of automotive technology and benefits from a direct technical support by Bosch, world leader as auto parts manufacturer.

Moreover, Bosch Car Service workshops offer a wide range of services, such as: fast services; air conditioning; computerized diagnostics; petrol and diesel injection; electricity/electronic; periodical maintenance; brakes, suspensions and ripping tests; maintenance, engine and general mechanics; displacement of clients' car to I.P.O.; car multimedia; periodical reviews.

These workshops are subject to constant quality audits and follows a philosophy of continuous improvement to match the Bosch quality standards. These audits follow an international quality profile defined by Robert Bosch GmbH and the on-site evaluations are carried out by an independent entity operating at the European level.

Additionally, they undergo a Client Mystery report. This is a mystery audit where a private entity pretends to be a client by scheduling a visit to the workshop to solve any kind of problem the car may have. It makes an evaluation to the service provided and see if it complies with all the criteria of the Service Excellence manual. The points evaluated are, as an example, the quality of the product, the behavior of the employees, and the overall experience in the vision of the client. In the end, it hands a report for both, workshop and Bosch, with a grade.

Unquestionably, due to its strategy and the fact of being under the umbrella of Bosch brand, this network of workshops benefits of a competitive advantage, a set of characteristics that allows the company to differentiate from its competition.

IV. INTERNSHIP'S DESCRIPTION

In order to elaborate this dissertation, the student, Ana Sofia Correia Pacheco, performed an internship at Robert Bosch S.A., in Automotive Aftermarket department inside the concept Bosch Car Service, in Lisbon, under the supervision of the Trade Marketeer for Portugal, Raquel Marinho. With a duration of 3 months, from September to November 2016. The activities undertaken in the internship are described in the exhibits section as well as the Gantt Chart. **Exhibit 1** Gantt Chart Management. **Exhibit 2** Activities undertaken in the internship. From this section onwards, it will be detailed explained the main activity developed in the internship for this work project – “Introduction of an Enterprise Resource Planning”.

V. ANALYSIS OF THE CURRENT SITUATION

In order to become a partner of this network, a contract is celebrated between Bosch Portugal and the Partner, where it is defined the yearly objectives that each party has to achieve. In the norms of the contract, both parties agree to respect each other in accordance of what was written and to promptly inform when there is the desire to change something. To the contract appendixes are attached where objectives are identified that they must comply with.

The workshop partner has to pay 1.474,00€ per year that comprises: one course of technical training; access to technical hotline and software; the budgeting computer system is to be paid directly to an external supplier. It, also, pays an annual installment of 2.500,00€, which includes several services, such as, access to Bosch Service Excellence manual, business and technical training, sponsorships and partnerships management, quality and client mystery audits, marketing advisor, two annual business advisory's visits to the workshop, among others.

In the annual purchases appendix, the workshop must achieve several objectives based on the number of technicians. For example, if a workshop has 4 experts, the general objective is

56,000€, which specifically comprises 4,000€ in Diesel, 10,800€ in Bosch braking products, 1,600 units in Bosch filters and 120 units in Bosch batteries.

Regarding to these purchases, if it achieves the established values it will benefit of a bonus system that can reach a maximum of 6.5% on purchases. The bonus system is supported 50% by Bosch and 50% by the preferred wholesalers, with the exception of bonus on batteries which is entirely supported by Bosch. The bonus calculation is exclusively conducted by Bosch. The partner can only buy Bosch products to the seven preferred wholesalers, however for the calculation of the bonus award system, only the two wholesalers to whom (s)he has made a greater volume of purchases in Bosch products counts for the system.

Concerning the competition, as all the workshops of the BCS network offer a service for a segment with high purchasing power and has a wide range of services the more directly competitors are the original manufacturers workshops, this is, BMW, Porsche, Mercedes, among others, which represents only 10% of the global market. But it is not possible to underestimate, other competitors, such as, Midas (66 workshops), Norauto and Precision (each with 25 workshops) which specialized their service in an area. Additionally, it is important to take into account the other Bosch concept, AutoCrew (53 workshops) which offers a service for a segment with medium purchasing power but offers some services equivalent to Bosch Car Service. It is, also, important to consider the workshops without brand that are a large number in the market.

a. TRANSMISSION OF THE INFORMATION THROUGH THE NETWORK

In this network, the BCS Representatives (Mr. Justino Barreiros, for center and south of Portugal, and Mr. Paulo Gomes for the north) are the primary head-on interface with the workshops. During the year there are at least two visits of the Bosch Portugal team. The

information between Bosch and BCS workshops is transmitted by email or telephone. The transmission to the final customer is made, directly, by BCS workshops.

There are two types of customers: *particular*, who has 1 to 4 particular vehicles and, *fleet*, who own numerous vehicles of a company, which saw BCS as a large network and want to be recognized as BCS customers and not of a specific workshop. These type of customers brings different responsibilities and tasks. For a BCS workshop to satisfy a *particular* customer in a service it has to access the customer database (a Customer Relationship Management, CRM, system) to be able to recognize its customer, an agenda, the invoice and the budgeting software. To deal with *fleet* customer, as an example, LeasePlan, a rental car company which has an agreement with BCS network, it has to work with three more platforms: schedule of appointments, invoice and budgeting provided by the rental company.

They also use Esi-[tronic], GT Estimate and TecDoc platforms for technical information, maintenance and repair plans and for consulting auto parts prices. See **Exhibit 3**. In addition to these 10 platforms, the workshops still use Bosch’s extranet and email, their personal email and the digital wholesalers’ catalogues. There are still some companies that has an information system for stock management. Which gives roughly, 14 platforms for each workshop to use daily.



Graphic 1 Platforms used daily by each workshop.

VI. PROBLEM DESCRIPTION

The real electronic revolution that the automobile registered in the last two decades has placed several problems to the automotive maintenance and repair market. Telematics, connectivity and increased exigency level from the customer, brings great challenges and changes. But Bosch has the path well established and now it is the time to take an action.

As stated in the previous chapters, each workshop operates with many stand-alone information systems that are developed specifically to meet their own business requirements. Concerning this complex communication process, information cannot be easily shared across functions or organizations, and was often inconsistent, irreconcilable or overdue.

Moreover, there are telematics issues that should be considered. Telematics is the remote communication of one or more informatics service sets provided through telecommunications network. It is the information and communication technologies which enables processing, squeeze, store and communication of huge amounts of data.

Another problem to have into account is connectivity. It is the ability of a program to work in a network environment and the capacity to connect with other devices. A connected car means being equipped with a communication technology that allows the data stream from the car.

The communication between the car and the cloud of data would be able to provide, as an example, continuous actualization the route based on the traffic, climate and traffic conditions and the capacity to map the closest parking lots. Also, the connectivity can occur between vehicles to avoid collisions and adjust the speed in accordance with the track flow.

In 2015, “80% of the customers’ desire to hold cars with higher connectivity” (Capgemini Report, 2015). “The number of clients that were disposable to change for cars’ manufacturers that offer a better connectivity almost duplicated, set in 37%” (Mckinsey Report, 2015).

There is still an uncertainty level concerning telematics and connectivity and, who will benefit from the connected vehicles. The workshops are aware that from March 2018 onwards, all

vehicles will have the eCall, an incorporated chip in the car, which will enable to directly communicate with the workshop and schedule an intervention/reparation when there is a malfunction. It is expected for the customers to have the possibility to choose the intended workshop to share that information. Presently, FIGIEFA (Automotive Aftermarket Association) is doing some pressure at the level of European Commission to assure that the access for automotive aftermarket is not blocked and not exclusively for the workshops of original manufacturers.

Another problem identified was the transparency and sharing of information hurdles. Currently, BCS workshops can generate a huge amount of information that can be used to benefit the business. It is crucial for companies to have the capacity to collect, store and process, manage and transform it into intelligence for business. But most of them, are not aware of the relevant numbers and are not conscious of the importance to share it to whom can manage it efficiently. Indeed, Bosch do not have access to the business of each workshop, or their financial situation, and cannot properly measure, e.g., the impact of marketing campaigns.

Success in the consumer market depends on accuracy, competency, transparency, respect, warranty, product and service's quality, price, availability and proximity. It is important to have the structure and resources to be able to follow these trends. There is a need to link the different stakeholders to a single platform to overcome these problems.

The heart of the matter goes, now, through the quick identification of faults in automated systems, which can be achieved, in its entirety, with advanced and up to date equipment. This is where Bosch, under the BCS concept, has proven to be a key partner in monitoring in all areas of activity of the auto repair company, whose main objective is to guarantee a premium service.

VII. EXPLANATION OF THE PROJECT

Consequently, with the desire to allow companies to focus on their core business, create transparency, information, telematics and connectivity, mentioned in chapter VI and keep its competitive advantage, the Iberia team presented a solution: Introduce an Enterprise Resource Planning (ERP) at BCS network. This work project consists in evaluating an investment in an ERP system by analyzing two software suppliers: Incadea and Activex. This system would re-organize the information flow of the network.

The project would improve operating effectiveness and efficiency in BCS-Bosch's sales and marketing, operations and logistics, and finance areas. The cost of the project, however, will be substantial and supported by Bosch and by each workshop to complete the complex implementation. With the ERP, BCS workshops' disparate information systems would be migrated to a single computing architecture. Employee acceptance of change is therefore critical for success. At the moment, Bosch is working hard with an eye on the future, with a great connection to the internet of things (IoT).

a. ENTERPRISE RESOURCE PLANNING

In the last two decades, the ERP software has become popular among large-sized companies. Therefore, to maintain the high level or keep growing, companies must have a proper management of their resources, data and procedures. Then, the path is the implementation of an ERP solution. The Enterprise Resource Planning (ERP) is a business management software system which integrates information of data and process from an organization in a single system to be shared within a company. "ERP [...] increase cooperation and interaction between all business units in an organization" (Harrison, 2004).

The ERP solution links all the stakeholders of a company to communicate and work through a cloud connection. "In Europe, about nine out of ten (87%) of the medium sized companies

already use solutions in the cloud. The recent adoption rate has been fast, with four out of five organization introducing this service model in their business in the last two years” (Sage, 2014). In Europe, cloud services are more embraced by the secondary sector. Among the departments with more solutions in the cloud are IT, financial and operational. “60% of the companies that do not have yet an ERP in the cloud are interesting in adopting one. 20% of the European companies already adopted in ERP solutions in the cloud” (Sage, 2014).

The digital transformation of the organizations is a reality that is winning place all over the world. The cloud is a technology that allows enterprises to manage information and process remotely. In Portugal, there are no doubts that this is the path for the medium and large sized companies. The struggle is how do companies do that path? The ERP in the cloud can be the lever for the challenges that companies face.

This tool can bring added-value for the firms, both at the level of innovation and at the level of cost reduction. “The savings reported by large European companies when adopting cloud computing systems were around 25%. One out of five, reported reductions of 50%” (Sage, 2014). “In Portugal, 13% of the organizations, with 10 or more employees, acquired some kind of service in the cloud, in the last year” (INE, 2014). Portugal still has some ground to recover vis-à-vis most European countries. “It was on the 18th position in the list of countries with companies that betake cloud services, with an adoption level equal to Luxembourg and Lithuania, and slightly below Spain. On average, 19% of the companies of the countries of the European Union betake to some cloud service” (Eurostat, 2014).

Based on the inquiry, to 358 medium and large sized companies, made by IDC (International Data Corporation) there are more organizations that are at an early stage of ERP cloud adoption than those in an advanced stage. However, the vast majority are aware, only 11% said that they had not discussed these technologies. The cloud will be generalized within the national organizations over the next two years, as will the number of services used (IDC, 2015).

When introducing a complex software, it is important to take into account the key factors that will influence the success of the implementation. These elements are “software development, testing”, IT sophistication and infrastructure, culture of the organization and “effective training”, available flexibility of the software supplier, “team management support, appropriate business and legacy systems, and effective decision-making” (Ash & Burn, 2003).

There is not a pre-design ERP software available, there is necessary to customize the solution with the activities of the company. At Bosch Car Service this system intends to analyse and monitor data and KPIs at real time. The information obtained through each workshop will be stored in Parent-company (Bosch GmbH), in Germany.

b. OBJECTIVES AND KPI'S

Upon the implementation of a new management software system it is important to define the objectives. The primary goal of the ERP system is to increase information and product availability – operating efficiency – by making the supply chain more visible and by integrating all the stakeholders in the same management platform. The company targeted information availability in 28 points. The software allows the entire workshops to connect with each other, Bosch and wholesalers by sharing information in a single system. See **Exhibit 4**.

First, Bosch does not have access to clear and transparent information that is considered critical for the centralized management and intends to improve the communication with the different stakeholders. There is a need to simplify the business relations and share valuable information. Second, all the different stakeholders must be aligned with the new strategic direction of Bosch – Progress in (new) technology – in order to guarantee that everyone follows the same rules and procedures. Currently, it is necessary too much effort to motivate the workshops’ managers to follow the recommended procedures in a common way and the follow-up process becomes archaic and often the workshops do not implement the recommendations and do not proceed

with the work process defined in the Bosch Service Excellence, guidelines to provide a quality serve, since there is no support of a proper and uniformed IT system.

Third, the lack of technological integration of the platforms that currently each workshop uses, represents an outlay of time meaningful which can be used to improve customer satisfaction and focus on the core business. There is a need to increase performance and productivity.

Last, in the automotive aftermarket, BCS's competitors have been investing on technological solutions which allow them to become more efficient, productive and valued by the final customer (B2C) and workshops (B2B). Bosch is losing competitiveness either in B2B and B2C perspectives. Hence, BCS needs to adapt to the market changes and keep the competitiveness.

With the introduction of the ERP, the team of Bosch aims to have access to:

- ♣ the customer database of BCS network;
- ♣ the history of all interventions for each customer;
- ♣ a customer database as part of BCS network and not of a particular BCS workshop;
- ♣ detailed information about intervened vehicles and service provided;
- ♣ constant adaptation of the product to the upcoming needs.

VIII. COMPARATIVE ANALYSIS

a. TWO SOFTWARE SUPPLIERS' ALTERNATIVES

i. INCADEA

Company

Incadea is a large-scale and solid multinational software provider company, founded in Germany, in 2000. It is in Portugal since 2005 with local commercial representative and since 2009 with direct presence (assembly 11 years in the Portuguese market). It has easiness to answer and coordinate international projects, currently with 23 branches and clients in more than 90 countries. Incadea was the indicated company by the Robert Bosch GmbH to develop

the international project since they are partners. Currently, it is the company working on this project in Germany and Italy.

Incadea is a strategic partner of Microsoft for the automotive sector at the international level. Incadea products are exclusively focused on automotive retail and builds on ERP MS Dynamics NAV of Microsoft. Microsoft has a wide business customer database which makes it to have a lot of experience. The MS Dynamics NAV product is the Iberia's ERP leader.

The investments needed to develop and innovate, compared to competition, are more feasible because they aim to satisfy several customers. They are leaders in volume of investments and innovation (many millions of Euros by Microsoft and Incadea).

Product

The ERP solution offered by Incadea has a partnership with Microsoft. Tax certification for each country is ensured by Microsoft as it has several clients with the same needs as Portugal. Robert Bosch GmbH has already invested in the adaptation of the product base for Bosch Service network, at an international level. An evaluation was already conducted and it was identified 8 possible adaptations for Bosch Car Service Portugal software. The product benefits from all investments in developments which Robert Bosch GmbH may do in the product base. In Bosch Portugal's opinion, Incadea might be less flexibility, regarding the multinational structure which requires approvals and process more complex compared to Activex. However, Incadea Portugal team claimed that they can perform any kind of actualization or modification in the international products (without any approval from the head office). And that the technology used allows to conjugate the local modifications with the new international versions without any problems. Price positioning high compared to competition.

Clients in Portugal

Importers; Dealers network; 1 multibrand network (Precision which has nowadays 25 workshops); 1 BCS workshops and Auto Parts' Stores.

ii. ACTIVEX

Company

Activex is a national company, which develops and commercialize IT solutions exclusively for the automotive aftermarket, founded in Portugal, in 2002 (making 14 years in the Portuguese market) and having maturity in the Portuguese market. It is very flexible since does not depend on international hubs to take a decision. Team is close to the client and flexible to move around the different workshops. They are presented “*on the road*” with clients all around the country. This company come to analysis because it is already presented in 33 BCS workshops with a high satisfaction level.

Product

The product benefited from the specific development requested by the 33 BCS adherents. There is visual reception and check-up in accordance with the BSE, available, and an integration with GT Estimate, Gestoc and TecAlliance. See **Exhibit 3**.

Currently, finalizing the integration with the LeasePlan systems, by request of several BCS. Great speed and flexibility in the development and integrations. BCS are asking Activex to integrate the online orders systems of the preferred wholesalers and Activex is ready to move on. Product totally adjusted to the workshops needs. Excellent value for money.

Clients in Portugal

33 BCS workshops; leading insurers in Portugal; ACP (Automóvel Club de Portugal) platforms; Several companies linked to the automotive area in Portugal, workshops, importers of online orders systems, retailers.

b. BENEFITS

ERP aims to improve operational effectiveness and efficiency of Bosch Car Service network at the level of the following areas: sales, marketing, operations, logistics and financial. Therefore, the company would have access to more accurate information, previously not available and, in some cases, nor even analyzed and controlled by the workshops. The ERP system would enable BCS to make its supply chain more transparent and efficient, thereby eliminating the non-existence component of collect and share of information between the franchisee and master. This system will allow the BCS network to keep its competitiveness and take advantage of being established and well-prepared when the future market changes occur.

The implementation of an ERP will allow Bosch and workshops to better serve their customers and, at the same time, reduce costs and improve efficiency. Also, it will reorganize the whole communication process and share of information between the BCS network.

Consequently, through the access to this information there will be a quick and professional customer's identification by knowing its service history, type (particular or fleet), special agreements. There will be better communication and brand goodwill. Thus, quality will increase. The transparency outcome desired will be achieved. The benefits above described extend to Bosch Portugal (RBPO), BCS workshops, final customer and preferred wholesalers.

Bosch Portugal

Bosch will have a proper control of the BCS business network. It will have access to detailed information, such as, BCS workshops' purchases & sales, wholesalers' sales, clients' portfolio, services provided and vehicles. Centralized CRM activities. Strengthen the BCS concept making it more competitive in the market and more attractive to workshops investors (B2B).

Unquestionably, there will be an increase in performance and productivity because of the access to valuable information. There will be decision-making process optimization based on detailed information. Decrease in redundancy of activities. Hence, there is a better planning and efficient strategic analysis. A better match to the market needs and turnover will increase.

Bosch Car Service Workshops

Since the process will be more efficient, they can focus on their core business, repair and maintenance of the vehicles, and productivity and performance will increase. There is an optimization of the flow of information and quality within the organization as it is organized. With this new system, workshops' managers will be able to better plan and control their business. From now onwards, it is possible to make an efficient strategic analysis because of the increase of access to information, they can make an effective planning of finances, deadlines, next year major events, suppliers payment, loans payment, stock management, this is, their receivable and expense and develop realistic profit strategies. It is also predicted that there will be customer retention and sales growth as there are an improvement in product availability. Moreover, there will be an interface in the ERP that will allow the workshops to share their repair and maintenance knowledge.

Final Customer

The customer will have a high satisfaction level, as he feels recognized as a BCS customer (because the service history is shared across the entire BCS network) and there is a better response to his needs. With the improvement in business relations between the customer and the workshop, he will trust more on the workshops and will have a higher proximity with them.

Preferred Wholesalers

The preferred wholesalers' will benefit from privileged information concerning workshops purchases and stock level and, therefore, increase their turnover by stimulating Bosch Products purchases.

This benefits analysis was based on the feedback transmitted by each workshop given between the 14th and 18th of November at the Event "Acelerador de Negócios Bosch Car Service". See **Exhibit 5 & 6**. The obtained results were a forecast of 90% perception level of positive

receptiveness by the network for the implementation of this project. And a 4% increase in turnover both for RBPO and workshops because of the better use of the resources.

c. COMMUNICATION PROCESS

Only a mature and strong network can benefit of a complex implantation as the introduction of an ERP. “Strong communication within the whole company during the implementation process increases success for ERP implementation. It allows the organization’s stakeholders to understand the goal and the expected benefits of the project as well as to share the progress of the project. An ‘open information policy’ protects the various communication failures for the project” (Al-Mashari, Al-Mudimigh, and Zairi, 2003).

The company relies itself and the employees in several pillars, notably:

- ♣ Flexibility to change: they influence changes and take advantage of the opportunities;
- ♣ Transparency and Trust: they communicate important information of the business in a transparent form and timely which is the base for a relationship of trust;
- ♣ Justice and Fairness: work in employment relations with employees and business partners fairly as a condition for business success;
- ♣ Reliability, credibility, legality: promise only what they can comply with. Undertake commitments and always develop activities in accordance with the law.

Based on these principles, from the beginning of the project Bosch is in contact with the BCS network to gather the most positive and interesting feedback from the workshops. They want to leave an enduring mark in the world, reached by an extraordinary team.

The two offers are comparable because it consists on the connection of already used software in the workshops to a single platform and user-friendly improvement to alert workshops on important information. See **Exhibit 8** Simplified representation of the structure of the ERP.

d. COSTS

This project will include costs for RBPO and for each BCS workshop. See **Exhibit 7**.

Capital Expenditures

Each workshop would need to spend 440€ or 50€, with Incadea or Activex, respectively, for each additional license required to include in the system. The annual maintenance cost per additional license would be 243€ or 50€, Incadea or Activex, respectively.

Implementation

Implementation required extensive training, creation, testing and documentation of new business processes, and installation of the ERP system. With Incadea, the product base's adaptation for Portugal would be 14.950,00€, printing adaptation (invoice, repair order, credit memo, transport guide) would be 5.000,00€, products base's validation before the pilot project would be 20.400,00€ and the pilot project for 3 workshops would be 9.000,00€. The professional training costs would be 500€ for 10 trainees.

With Activex, this initial investment supported by Bosch Portugal is significantly low because here the product is already adapted for BCS network. There is only missing the wholesalers' part and connection between the stakeholders, according to forecast, the cost would be 10.000,00€. There is no need of pilot project since it is already presented in 33 workshops. The company do not charge for professional training.

The setup package cost per workshop with 3 licenses would be 2.975,00€ with Incadea and 800€ with Activex. The migration costs per workshop would be 1.425,00€ or 600€, with Incadea or Activex, respectively.

On-going Operational

After the implementation is concluded, RBPO will have to pay to Robert Bosch GmbH hosting costs of 102€ by workshop per year to store the data collected by the ERP system. This cost

will be supported by the workshops. The annual cost to manage and maintain the new information system was forecasted to be 729€ with Incadea and 300€ with Activex.

Other costs

The expense made in Activex by the 33 workshops were 147.230,37 € on software, until 2016. Moreover, each workshop would only have to invest in software as they already have all the prerequisites of hardware. **Exhibit 9** Minimum / recommended hardware requirements.

IX. THE DECISION

The costs and benefits described in the chapter above were converted in monetary terms to compute a cost-benefit analysis. See **Exhibits 5, 6 & 7**. The ratios obtained were:

	Benefit/Cost	
	Project I	Project A
For each workshop	0,43	1,29
For RBPO	4,22	20,85

In the case of Incadea, the project is not feasible for the workshops since its benefit-cost ratio is lower than 1. So, it is clear that the product offered by Activex would be a better choice, both for workshops and for Robert Bosch Portugal since the benefit-cost ratio is higher than 1 and higher than Incadea ratio.

The choice of this report falls on Activex. First, this project would have a faster implementation since the basis of the software is already developed and implemented in 33 workshops. That would not be necessary a pilot test phase. And they would start getting these benefits right in 2017. Second, it has an insignificant cost for RBPO and the cost for each workshop seems to be feasible to support. Third, the experience of the company in the Portuguese Automotive Aftermarket is important, which has 3 more years than Incadea Portugal, having a great knowledge of the Portuguese market. Lastly, the decision does not depend on international hubs being more flexible and fast to take an action and perform it.

In the following table are summarized the arguments that led to the decision of Activex against Incadea.



Table 1 Summary of the decision.

X. CONCLUSION

The ERP's role is to monitor the processes and ensure that the company achieves its objectives. Thus, the enlargement of transparency and the decision-making process enhancement serve to see, step by step, the business and guide it in a better way to the desired results. It is also important to foresee risks, opportunities, solutions and possible outcomes.

An ERP system allows the knowledge of the business and displays, through metrics, data and research, what is working well and what can be improved. It contributes to the reduction of time and to the improvement of quality and turnover. Previously, the vision was reduced but now it will gain a large strategic scale. Furthermore, the best of a ERP system is that it adapts to the needs of the company and do not come with a predefined interface, producing more flexible models and with better reaction to the market changes.

It is important to emphasize that with the implementation of the ERP there will be raised critical risks because of the enlarging access to classified information and businesses process. It is important to well define who will have access to each information and which information will be provided in the system, in order to create a trusty and security environment for the BCS network. The limitation for the introduction of a project in this multinational lies on the complex hierarchy of the decision-making process because the full responsibility is not on the country itself but depends on the decisions taken in Spain and even higher in Germany.

XI. SUGGESTIONS FOR FUTURE RESEARCH

The suggestion would be the implementation of a client card, simplified with the new knowledge obtained by the ERP system concerning the customers' database. It would be possible for the customer to pay the expense made on the workshops and gain some points to discount later. Also, combine it with the Continente partnership, where the customers would have a direct benefit at BCS workshops if they make an expense at Continente supermarkets.

XII. REFERENCES

- Bosch Portugal Website (2016). *Bosch's History*. Retrieved from <http://www.wearebosch.com/index.pt.html> and http://www.bosch.pt/pt/pt/newsroom_11/news_10/news-detail-page_83456.php
- Bosch Car Service Website (2016). *Bosch Car Service's History and Service Quality*. Retrieved from http://www.boschcarservice.pt/boaa-pt/Product.jsp?ccat_id=120&prod_id=306&publication=5&language=pt-PT and http://www.boschcarservice.pt/boaa-pt/Product.jsp?ccat_id=120&prod_id=307&publication=5&language=pt-PT
- Enterprise Resource Planning (2016). *Information about ERP*. Retrieved from <http://www.aconsistemas.com.br/blog/sistema-erp-importancia-na-gestao-empresarial/>, <http://www.erpnews.com/change-management-with-erp-implementation/>, <http://www.erpnews.com/generation-modern-erp-begins/>, <http://www.erpnews.com/erp-implementation-small-medium-sized-organizations-smes/> and <http://www.infowester.com/erp.php>
- Activex's Website (2016). *Activex's History*. Retrieved from <http://www.activex.pt>
- Incadea's Website (2016) *Incadea's History*. Retrieved from <http://www.incadea.com>
- GT Motive Website (2016). *GT Motive's History*. Retrieved from <http://gtmotive.com/pt/empresa/a-nossa-base-de-dados>
- TecAlliance Website (2016). *TecAlliance's History*. Retrieved from <https://www.tecalliance.net/en/company/organisation/>
- Capgemini's Report (2015). *Cars Online 2015 – The evolving behavior of the connected customer*. Retrieved from <http://www.capgemini.com/cars-online-2015>
- McKinsey's Report (2015) *Competing for the connected customer: Perspectives on the opportunities created by car connectivity and automation*.
- eCall (2015). *Information about eCall*. Retrieved from <https://ec.europa.eu/digital-single-market/en/news/ecall-all-new-cars-april-2018>, <https://ec.europa.eu/digital-single-market/en/ecall-time-saved-lives-saved>
- Telemactis issues (2016). Retrieved from <http://www.jornaldasoficinas.com/pt/index.php/item/7173-a-telematica-e-o-maior-desafio-do-aftermarket>

Connectivity issues (2016). Retrieved from <http://economiadeservicos.com/2016/06/16/servicos-de-conectividade-em-automoveis/>

Harrison, J. L. (2004). *Motivations for enterprise resource planning (ERP) system implementation in public versus private sector organizations*. (Ed.D., University of Central Florida). *Theses*.

Ash, C., & Burn, J. (2003). *A strategic framework for the management of ERP enabled e-business change*. *European Journal of Operational Research*. Pages 374-387.

Al-Mashari, M., Al-Mudimigh, A., & Zairi, M. (2003). *Enterprise resource planning: A taxonomy of critical factors*. *European Journal of Operational Research*. Pages 352-364.

Sage MidMarket's Studies (2014). *Adaptação de Software de Gestão em Portugal*.

International Data Corporation, IDC (2015). *Mobile Enterprise*.

Jornal de Negócios (2014). *A "cloud" é o caminho para as empresas*. Retrieved from http://www.jornaldenegocios.pt/empresas/detalhe/a_cloud_e_o_caminho_para_as_empresas

Publico (2015). *Empresas portuguesas começam a andar na nuvem*. Retrieved from <https://www.publico.pt/tecnologia/noticia/empresas-portuguesas-comecam-a-andar-na-nuvem-1683232>

SapoTek (2014). *Portugal é terceiro na utilização da cloud entre empresas de média dimensão*. Retrieved from http://tek.sapo.pt/noticias/computadores/artigo/portugal_e_terceiro_na_utilizacao_da_cloud_entre_empresas_de_media_dimensao-1420862tek.html

Instituto Nacional de Estatística, INE (2014). *Utilização de Tecnologias da Informação e da Comunicação nas Empresas*.

Eurostat (2014). *Cloud computing services*. Retrieved from <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

Magazine Pós-Venda (2016). *Vamos assistir à maior mudança de sempre no Bosch Car Service*. Pages 28 to 34.

Auto Professional Report (2005). *Bosch Car Service o future já começou....* Pages 1 to 8.

Harvest Business School Case Study (2003). *Whirlpool Europe Case*.