AMERICAN UNIVERSITY OF BEIRUT

IMPLEMENTING A DASHBOARD MANAGEMENT SYSTEM FOR BOECKER® — NEW FRONTIER TOOL FOR BUSINESS INTELLIGENCE

by
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AN ABSTRACT OF THE PROJECT OF

Celine Milad Khalil for Master of Business Administration
Major: Business Administration

Title: Implementing a Dashboard Management System for Boecker® - New Frontier Tool for Business Intelligence

The necessity to have a Dashboard Management System at Boecker® arises from the incapability to answer intuitively business performance related questions. Therefore, the aim of this project is to transform available data into quickly readable and beautifully designed dashboards so that executive will have an empowering tool to value data and make better business decisions aligned with the strategy of Boecker®.

The SAMAS framework (Shared Values, Activities, Mission, Analytics and Structure), which combines performance management with strategic performance to reach cognitive leadership, is our reference to analyze the company and cater a dashboard management system derived from Boecker® shared values and relevant to its needs. Boecker® understand the importance of data analytics, and this project is the first step towards having data-driven strategies. Based on one-on-one interviews with managers and focus groups with key users, metrics and KPIs were short-listed to build five dashboards for Boecker® key functional areas. These dashboards reflect all aspects of business activities and the company's performance. They are functional and have as users the head of departments and country manager. Excel was used to execute low cost, dynamic, easy to use and quickly updated dashboards.

Managers who experimented the prototypes voiced big interest in implementing the system and granted a buy-in to the project once they felt the efficiency of accessing data intuitively and quickly and the large amount of analysis that can be mined from the metrics used simultaneously. They mostly highlighted the following benefits: auditing data integrity, uncovering new business opportunities, identifying cost-cutting opportunities and recognize changing business environments. Some decision makers pointed the need to add more dashboards serving diverse purposes such as marketing, food safety, forecasting and strategic dashboards...

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CHAPTER I

INTRODUCTION

The concept "you cannot manage what you cannot measure" is behind any dashboard management system. Indeed, in this MBA project, a dashboard management system will be developed for a regional public health firm, Boecker®.

Founded on January 5, 1994, Boecker® is now the largest public health company in the Middle East leading in Lebanon, Qatar, KSA, UAE, Kuwait and Jordan. The company provides world class and internationally accredited services for commercial and residential clients under five main divisions: Pest Management, Food Safety, Biosecurity, Occupational Health and Safety, and Trade. Boecker® 's Motto is to retain "extremely satisfied clients©", internally and externally. Providing high quality services and exceptional customer service are the fundamentals of Boecker® promise.

The high growth and expansion that Boecker® experienced in the last years have made internal and external data processing increasingly cumbersome. The need to increase visibility by having access to real-time data, delivered in an intuitive and actionable format, is a corner stone in Boecker®'s strategy. Therefore, Boecker® understands the stakes to become a data ready organization in order to meet its growing ambitions.

The emerging need to have similar dashboards arose from a number of challenges such as the unavailability of combined data in a single report, non-visibility of data, inefficiency in digging into clean and real-time data and no prior experience with dashboards. The dashboard will facilitate data transfer throughout the company

and add value to the decision making processes. By the means of dashboard, the manager of each department will be able to understand the current status of his/her department at a glance whereby a global vision will help in recognizing achievements, identifying gaps, pointing trends, classifying critical results and tracking objectives' accomplishment. In addition to that, the access to all dashboards gives managers and all the regional team a synchronized picture of the company's dynamics at a certain point in time which will be fundamental in aligning work between departments. The dashboards illustrate a holistic overview of the business while focusing on the interdisciplinary key generators: sales and renewals, finance, operations and human resources. Each dashboard will cover a set of business metrics and key performance indicators which were defined by organizing group meetings with stakeholders and conducting literature reviews. Data has been retrieved from Boecker® Enterprise Resource Planning (ERP) softwares, organized based on the defined objective of each dashboard and visualized by using Excel as a platform.

This project is a turning point in Boecker® reporting and decision making systems. It is organized as follows. First, a literature review conducted on the importance of dashboard will be discussed as a background to the study. Then, the methodology and implementation approach will be presented, starting by defining the project's mission and vision, determining methods used to identify the metrics, describing the built dashboards and finally identifying the source and challenges of data collection. Following that, description of the dashboard implementation tools will be addressing the design and implementation of the predefined dashboards. As a conclusion, the prototypes will be evaluated and possible opportunities for further development in Boecker® dashboard management system will be fostered.

CHAPTER II

LITERATURE REVIEW

Stephen Few (2007) defined a dashboard as "a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance." Dashboards have been a very attractive analytical tool from the beginning and continue to be at this time. Executives express an increasing interest in their adoption as a decision support tool. According to the Data Warehousing Institute in 2004, 50% of 473 specialists in the business intelligence field were using dashboards and 80 professionals started a dashboard solution in their establishments (Eckerson, 2006). Moreover, Gartner Inc. conducted a more recent survey showing that the shift from traditional reporting and data analysis to dashboards implementation is significantly growing in Western companies (Sallam, 2011).

In addition to that, dashboards were classified among the most valuable management tools in business intelligence as they deliver an overview of the business operations' performance instantly (Negash and Gray, 2008). The adoption and success of dashboards were noticed among different industries however few studies in this regard were documented. Schulte (2006) found that the implementation of a business dashboard to Edward Hospital has contributed in controlling the account receivables which increased the inflow of cash, and, Miller and Cioffi (2004) proved that progress on different levels such as performance management, accountability and budget allocation, was the result of the use of a marketing dashboard at Unisys, a global

information technology company. The diverse applications of dashboards were positively correlated with not only the productivity of the employees but also the communication of information. Thus, the dashboards are considered as an effective instrument in performance management (Velcu-Laitinen & Yigitbasioglu, 2012). Few (2006) and Rasmussen et al. (2009) have written books about the development of dashboards. This subject was also shadowed by Miller and Cioffi, (2004) and Kawamoto and Mathers (2007) in many business press. Unfortunately, handful guidance was provided for researchers and professionals in the scientific literatures which focused mainly on the incentives behind building a dashboard, the various phases in the application of dashboards, and the choice of key metrics to be displayed on the dashboards (DeBusk et al., 2003; Pauwels et al., 2009; Wind, 2005). The available articles published in academic journals didn't address the design of a dashboard. Thus, directions for designing a dashboard are missing from the equation. Furthermore, divergence in defining a correct layout for presenting the data in the dashboards was noticed in the literatures (O'Donnell and David, 2000). On the other hand, few literatures suggested that the dashboard should be designed according to the users' profile; Vessey (1991), and Dilla and Steinbart (2005) referred to the nature of tasks executed by the users, Cardinaels (2008) accounted for the user's understanding, whereas the character of the user was the main focus of Boon and Tak (1991), and Kostov and Fukuda (2001). Huber (1983) agreed with the previous theory and found that serving different types of users is quite impossible, thus the dashboards should be tailored depending on the profile of end user.

Hanoa (2009) highlighted one of the required features that should be present in any dashboards disregarding its purpose, which is the ability to assess quickly multiple facets of an organization's performance.

The selection and incorporation of KPIs in dashboards are key sources to reflect performance across the corporation (Clark, Abela, and Ambler, 2006; O'Sullivan and Abela, 2007; Wind, 2005; and Lehmann and Reibstein, 2006). Ambler and Roberts (2006), Lehmann and Reibstein (2006), and Pauwels and Joshi (2008) showed that no solo metric can measure performance effectively. Conventionally, accounting ratios and measures were the only metrics evaluating performance (Merchant and Van der Stede, 2007) up until Kaplan and Norton (1992) recommended the evaluation of financial and non-financial metrics such as customers, processes and employees' development, to have a full assessment about the performance.

CHAPTER III

METHODOLOGY & IMPLEMENTATION APPROACH

A. Vision and Mission of the Project

The developed context of our dashboards follows a cognitive structure under the Framework SAMAS (Shared Values, Analytics, Mission, Activities and Structures) connecting two theories: strategic performance management and performance measurement.

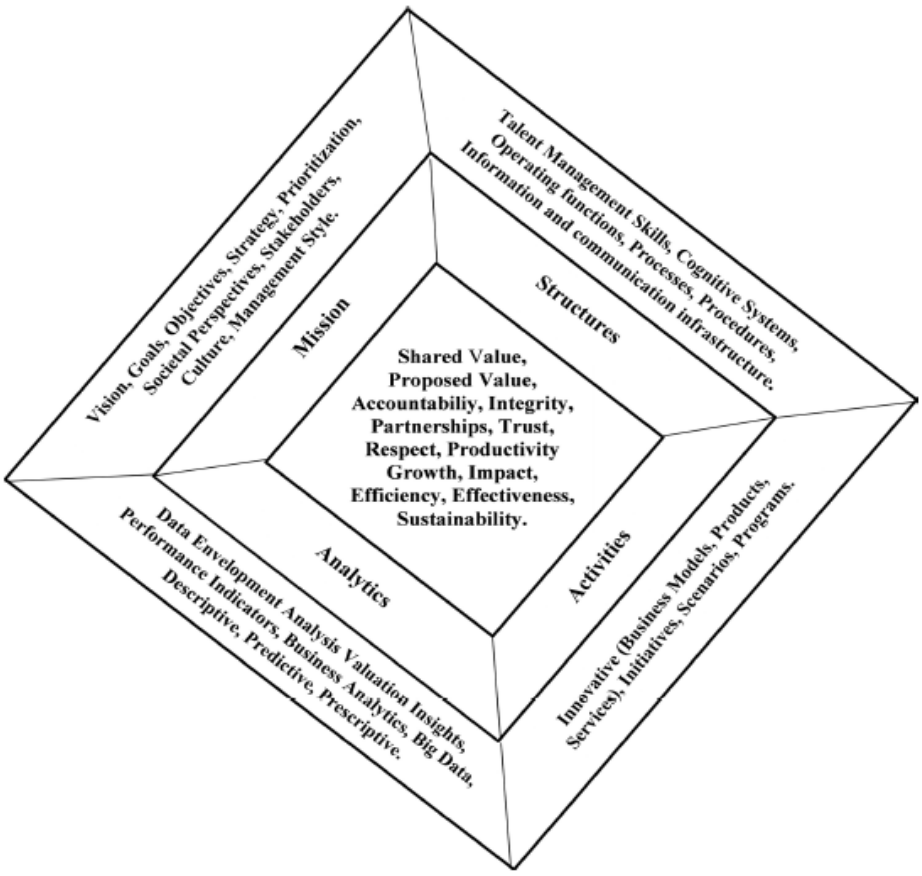


Figure 1: SAMAS Framework Definition

The incorporation of management and measurement components are keys to cognitive leadership backed up with Data Envelopment Analysis (DEA). Decision making process is therefore more knowledgeable and aligned with the organization's analytics insights. Leaders and managers will then have access to a 360-degree view of the company's structure and environment, and will be able to manage by building their decisions based on evidence instead of depending on intuitive approaches led by gut feelings (Osman et al., 2014).

The five elements of the SAMAS framework applied to Boecker® are detailed in the following section:

1. Shared Values

Values are the heart of an organization and the essence of commitment to organizational culture. Boecker® believes that "values describe what is important to an organization and, once aligned in values, ordinary people accomplish extraordinary results" (Blanchard and O'Connor, 2003). It also ensures that stakeholders understand, adapt and share common organizational values that are closely aligned with their own individual values.

Boecker® shares with its stakeholders the below four values:

- Passion: Boecker® is passionate about the business; it thrives on the relationships it creates and nurtures.
- Excellence is a living theme for Boecker®; it is attained through outstanding customer service, professionalism, quality and high-end branding.

- Integrity: Boecker® is committed to ethics and responsibility; it is the Hallmark of the way the company does business and achieves desired results.
- Forward-Thinking: Boecker® lives at the forefront of novelties through pro-activeness, innovation and development.

2. Mission, Vision and Strategy

Boecker® trusts that aligned vision, mission, strategy and values are the foundation of success going forward. Therefore, they are widely communicated and practiced by each individual in the company (leadership team, executive team, operation team…). As well, trainings and refreshers are done frequently to employees to emphasize and revive those statements. This will ensure a unified language, adopted between employees and reflected to clients.

a. Mission

Boecker® mission statement affirms who we are and what we do: "Boecker® consistently provides excellent products and services, through exceptional human capital, using the latest technologies and resources, each of which contributes to its continued worldwide expansion".

b. Vision

"To be a leading worldwide reference in public health, providing the latest and safest sustainable solutions for health, property and the environment". This vision

defines the reason of existence and the ultimate goal of Boecker® that frames its growth directions and decision making throughout the years.

c. Vision 2020

Boecker® upper management defined a Vision 2020 for each branch at the end of 2016. This short term vision is an empowerment tool and a reference to achieve the objectives and strategy by the year 2020. Lebanon's branch slogan for Vision 2020 is "Against all Odds" and has four focal points: People (having the right person in the right place), Business Excellence (improving the organization's processes and performance by delivering excellent results on all levels), Mental Availability (surpassing the brand awareness to have a brand name, linked instinctively to all public health services, on the top of mind of the end consumer) and Blue Ocean Strategy (innovating and maintaining differentiation from competitors).

Success for Lebanon's branch will be measured in 2020 based on three SMART goals measured using the following key performance indicators: Revenue generation of *x* million dollars, Net profit margin of minimum 20% and Days Sales Outstanding of maximum 70 days.

In addition, a number of barriers to strategy execution and goal achievements are being improved to guarantee the realization of Vision 2020: Inconsistent communication across the departments, Lack of strategy's understanding and embracing, Unclear vision, Incompetent personnel, Improper Management, and Shortage in resources.

3. Activities

Boecker® provides public health services since 1994. Pest management services were the first to be adopted covering two Lines of Business (LOB), residential and corporate lines. Four years later, Boecker® introduced the food safety department offering trainings, consultancy and tools to food and beverage establishments. The next developed line of business was Biosecurity that delivers products and services for residential and commercial clients. It also includes consultancy services for nurseries. Finally, the most recent addition to Boecker® lines of business is Occupational Health and Safety.

Boecker® business development area is expanding by adding sub-divisions to the existing LOBs and creating new validated services based on market needs. As a result, leaders have the urge to track, monitor and communicate performance focusing on high performance within teams and process excellence. On a global level, business excellence is only reached when all departments are interconnected by flywheels and pursue the same vision. For instance, building relations with clients, having a business development thinking, achieving financial and non-financial targets, and focusing on renewals are key behaviors crucial in achieving high performance.

Department	Services	Line of Business
Pest Management	Integrated Pest Management (Yearly & Single pest control treatments) Flying Insects Control Plan™ Heat Treatment Fumigation Bed Bugs Treatment Green Pest Control	Pest Management - Corporate Pest Management - Residential
Food Safety	Food Safety Consultancy Q-Platinum Award™ Food Safety Trainings	Food Safety
Biosecurity	Safe Childcare Certificate™ Infection Control Program™ (Yearly & Single disinfection treatments)	Biosecurity – Corporate Biosecurity – Residential
Occupational Health & Safety (OHS)	OHS Trainings OHS Lite™ Certificate	Occupational Health & Safety
Trade	Flying Insect Machines Pest Control products and equipment Microbecs™ Disinfectant Food Safety Tools	Trade

3.1. Boecker® Services and Lines of Business

4. Organization's Structure

Boecker® is an ISO 9001:2015 certified company which means that the highest level of quality management system is implemented on daily basis. The management is committed to transfer quality to all operations' levels in order to consistently offer services and products that meet customer and regulatory requirements. The ISO 9001 manual is based on continuous improvement covering business processes and procedures, and is updated on a yearly basis in order to meet evolved customer satisfaction. In addition to that, Boecker® takes pride of being a strategic partner to the Chartered Institute of Public Health-UK which is the highest authority in charge of public health in the UK, as well as being a corporate member of the Royal Society of

Public Health- UK, the International Food Protection Association-USA, and the Internatinal Food Service Executives Association-USA as well as an active member of the National Pest Management Association-USA and the British Pest Control Association-UK.

Boecker® has eight offices in the region - Lebanon, Qatar, Dubai, Abu Dhabi, Riyadh, Jeddah, Jordan and Kuwait - reporting to Boecker® Group. For instance, Lebanon branch has the largest operations among all the branches. Its workforce encompasses around 60 back office employees and 150 technicians working on-field. The organizational structure of the Group office and Lebanon's branch are detailed in appendixes I & II.

Boecker® Management style follows a top-down approach where the regional team determines the big picture of success and the overall goals for the group and branches. Then, every branch will define its own objectives and the managers will set the departments' objectives serving the accomplishment of the goals.

Boecker® culture is based on an empowering environment where each individual could learn, nurture and grow in the company. Thus, growth from within is primarily taken into consideration when recruiting. The resources are planned at the beginning of each year in order to achieve the yearly objectives and the budgeted growth.

Currently, the HR department is updating the performance evaluation process in order to have a rightful measurement of employee's contribution to the labor force, an increase in the productivity from a qualitative and quantitative perception and a precise appraisal system to reward the workforce.

5. Analytics

Boecker® data base is a valuable asset for the company. Two years ago, the manual reporting system shifted to a systematic one where data is retrieved directly from the system. Currently, Boecker® relies on its (ERP) software, Scream (Customer Relation Management, CRM) and Visual Big (accounting software), for reports development. This step was a major improvement as it reduced human errors, bias and subjectivity in report filling. Other improvements followed on several levels: data entry, data integrity and reinforcement of new reports.

Boecker® holds to the power of data analysis and the importance of having data-driven strategies. Therefore, this project is the first step towards data visualization and business intelligence. Collected datasets are displayed on dashboards to evaluate performance and retrieve key insights. Once properly implemented and adopted, this system ensures more efficient DEA.

B. Identification of Measures, Metrics and KPIs

Measures, metrics and KPIs are the main features of the dashboards. They have various drives such as system description, evolution tracking over time, performance assessment, and policies' functioning and efficacy (Martin et al. 2011). Osman et al. (2013) stated "you cannot manage what you cannot measure, what you cannot model, and what you cannot value". This explains the importance of KPI's measurement. KPIs have to be SMART: Specific and Measurable – have a defined target, Achievable and Realistic – ambitious (create motivation) and in the same time feasible (eliminate discouragement), and Time-framed – limited by deadlines. Banta & Borden (1994) also notes that KPIs should be addressed to specific users and allied with the company's

goals. Mauboussin (2012) recommends to identify the activities executed by labor to reach an objective and then link them to measures and KPIs.

Each indicator refers to one or multiple criteria: historical, provisional, technical, customer expectation and benchmark. The definition of these criteria will facilitate the interpretation of the displayed data in the dashboard. Historical criteria allow progress monitoring of either the same period of time over consecutive years, or two consecutive period of times in a specific year; for example, quarter1 and quarter 2 of the year 2017. As for the provisional criteria, they link the actual value to defined targets which will track compliance and achievements. Client expectation reference is mostly useful in a company selling world-class services and customer satisfaction depends on it. The technical and benchmark criteria are used to compare respectively the progress of the measure versus an optimal technical level and the industry standard (Guni, 2014). There is no doubt that defining the appropriate metrics is the most challenging step in the process. In the literature, different approaches were used to define performance measurement (Folan & Browne, 2005 and Neely, 1999) such as customer satisfaction, employee satisfaction, productivity, and accounting performance demonstrated respectively by Parasuraman et al., (1990), Beer et al. (1978), Sumanth, (1985), and Bromwich & Bhimani (1989) and Cooper (1987a, b).

Mainly, the selected indicators in our dashboards have historical, provisional, and customer expectation references and represent an overview of the organization status and operation effectiveness and efficiency. The performance indicators ensure a balanced approach in pursuing sustainable business success in all business units of the organization, and provide structure and content for business planning, reporting and monitoring of business development. They are all linked to Boecker® shared values.

In the following section, we will adhere to the methodology defined by Rogers et al (2011) in order to select KPIs for our dashboards. The first step is to agree on the objective of the dashboard and then short-list the measures that respond to the objective. Third, collect data by specifying the source, methodology and frequency of collection and finally, define the performed data analysis.

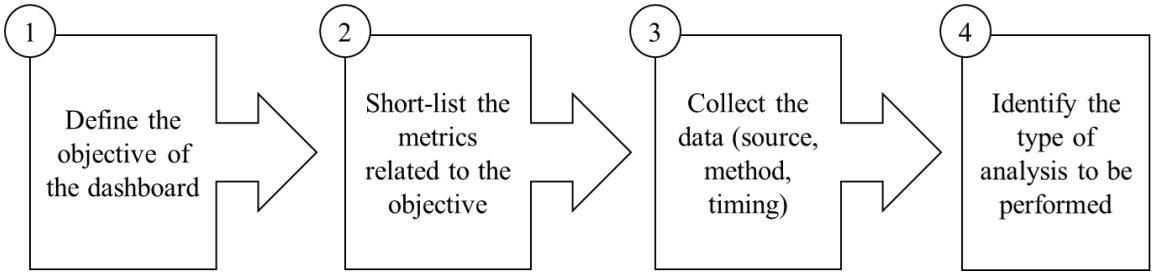


Figure 2: KPI's Selection Process

Based on the above literature reviews, interviews with managers and focus groups with key users such as Group Finance Manager, Group HR Manager, Client Service Manager, Sales Manager and Country Manager were conducted to define the dashboards' objectives based on needs in each functional area, brainstorm and rank potential metrics, elect a final batch of KPIs along with their targets, review and reiteration of selected metrics, and validate (Flapper et al. 1996). We used a bottom-up approach to generate the metrics and KPIs since we had to build our dashboards based on existing reports driven by strong and well-established processes. This lead to dashboards representing the reality of the company. The target levels of the KPIs are summarized in table 3.2. and the overall metrics and KPIs are elaborated in the next section.

KPI	Target	Responsible
Profitability	NP > 20%	Chief Accountant
Accounts Receivables	80 Days < DSO < 100 Days	Chief Accountant
Collection Reach	100% of Target	Chief Accountant
New Sales Order	100% of Target	Sales Manager
Renewal Sales Order - PC Corp.	80% of Target	Sales Manager
Renewal Sales Order - PC Resid.	70% of Target	Sales Manager
Appointment Scheduling	Maximum in 2 working days	Operations Manager
Treatment Execution	Maximum in 7 working days	Operations Manager
CB Response	Maximum in 2 working days	Operations Manager

3.2. KPI's Target Level

C. Dashboards Structure

A data-oriented culture is Boecker®'s key to success in a rapidly evolving environment. To achieve this vision, Boecker® will adopt the dashboards as a result-driven management control tool and decision support system. One dashboard per department has been created to, first, model the complexity of available information into easy to read visuals, second, reflect the situation of the business by displaying the essential metrics and KPIs to be monitored, third, enforce consistency in measurement across the business units and finally, provide fast access to business insights from all the perspectives in order to take the appropriate decisions.

Sales and renewals, finance, operations, and human resources dashboards encompass the core activities of Boecker®. The purpose of these dashboards is to communicate information and monitor performance. Hence, they are considered solution providers for the company only if the business context is part of the equation when analyzing them.

The dashboards are addressed to head of departments and group managers who will have access to a more transparent and fair performance evaluation system. They are expected to strengthen the knowledge acquirement and understanding along with the development of users' perceptual competences. Each dashboard will transform the available data into actionable information. Thus, managers will be able to observe the work of their teams on a daily, weekly, monthly, quarterly and yearly basis. The dashboard represents the tip of an iceberg once poor performance or over achievement is detected in the visual. The result is highlighted first and then the user uncovers the causes by digging into deeper analysis.

The constructed dashboards denote a competitive advantage which is flexibility. Users can compare trends, track individual versus group performance and select filters as per the targeted output from the dashboard. They are customized in regard to the user's goal based on a dynamic model (Yigitbasioglu & Velcu, 2012).

The dashboards will be updated frequently by adding the new extracted data from the systems to the source sheet of the Excel Spreadsheet. This will help the managers or executives to have real-time overview of the company's performance.

Dashboards are constructed by respecting four principles: coherence, relevance, urgency and efficiency. First, the dashboards should be coherent across all the departments and should be consolidated at higher level to add-value to all horizontal and vertical organizational levels. Second, dashboards should be relevant to the defined objective and fulfill the company's strategy. Third, urgency consists of the rapidity and frequency of updating the dashboards. Last, efficiency is determined by the actions taken once the displayed information is analyzed, otherwise, the whole process would be a waste of time, energy and money (Guni, 2014).

1. Sales and Renewals Dashboards

The sales and renewals dashboards are two of the most important dashboards for executives. They are driven by metrics and KPIs that recapitulate the sales progress and reflect the significant actualities of the business intuitively. The focus of these dashboards is on sales and recurrent sales achievements which will define the growth of the company.

Boecker® has the privilege of having clean sales data dated back to two years. The data is collected and filled on Scream, Boecker® CRM software, by the sales consultants through the whole sales process: from lead generation to offer delivery and finally closing of a contract. For the dashboards set up, data is retrieved from three reports extracted from Scream: New and Renewal Report, Non-Renewal Report and Early Risk Assessment Report. There is no defined number and perfect composition of performance measurement components (DeBusk, Brown & Killough, 2003). Therefore, after meeting with the sales manager, the choice of measures was selected based on the available data and the possible extraction of it. The sales and renewals dashboards will be updated on a weekly basis to keep a close eye on the target achievement and performance monitoring.

a. Sales Dashboard

The defined measures, metrics and KPIs for the sales dashboard are elaborated below. Data is extracted mainly from the New and Renewal Report from Scream and P&L Excel Sheet. Table 3.1. groups all the metrics used to build the sales dashboard. They are used as planning tools for managers and executives who will be able to dig

deeper for more granular evidence in complementary charts, once sensing uncommon performance (Jepson, 2010).

Metrics and KPIs	**Report**	**Source**
Monthly Sales Achievement $	P&L	Excel
YTD Sales Achievement $		
Monthly Sales Growth $		
YTD Sales Growth $		
Monthly Sales Growth %		
YTD Sales Growth %		
New VS Renewal	New & Renewal	Scream
New Sales Trend		
Renewal Sales Trend		
New Sales per Sales Consultant		
Renewal Sales per Sales Consultant		
Total Sales per LOB		
New Sales per LOB		
Renewal Sales per LOB		
New Sales per Area		
Renewal Sales per Area		
Sales Distribution by LOB & Sales Consultant		
Renewal Distribution by LOB & Sales Consultant		
Sales by Source		
Renewal by Source		
Portfolio of New Clients per Sales Consultant		
Portfolio of Renewal Clients per Consultant		
Sales Count per Invoice Amount		
Renewal Count per Invoice Amount		
Sales VS Return		
RSO per LOB		
RSO per Sales Consultant		

3.3. Sales Metrics

i. Sales Achievement - Monthly & Year to Date (YTD)

These measures show the total generated sales orders on a monthly basis and compounded. The sales manager is able to track the team performance versus the total set target.

ii. Sales Growth - Monthly & YTD

The general target level is 15% for the year 2017 and respectively 13%, 12% and 11% for 2018, 2019 and 2020. These targets were set by the regional team at the end of the year 2016 following a top-down approach that ensures the achievement of Boecker® 2020 vision. The growth KPI depends on the growth trend of the company, product development, addition of new line of business, improvement of customer service, retaining clients…

iii. New vs. Renewal

This measure defines the percentage of new contracts versus renewal contracts from total sales. It reflects the status of the business.

iv. New and Renewal Sales Trend

These metrics help the manager to monitor performance of the sales team on a monthly basis and detect any unforeseen trend. Revenue streams in dollar value, generated from new clients and renewal clients, can be observed in these two graphs.

v. New and Renewal Sales per Sales Consultant

These two KPIs identify the sales ability of each sales consultant to generate revenue for the company. The first one points the target achievement per sales consultant. It displays the total amount of money closed by a sales consultant and the percentage of closed deals vis-a-vis the budgeted amount. The sales consultant should reach at least 100% of his target on a monthly basis. Since renewals are crucial to Boecker® business model, each sales consultant should achieve at least 80% of his renewals target for the pest control corporate department and 70% for the residential department. Thus, this KPI is highlighted in our dashboard.

vi. Total, New and Renewal Sales per LOB

As mentioned before, Boecker® line of businesses (LOB) are divided as per the following: pest control residential, pest control corporate, food safety, biosecurity and trade.

These three KPIs will measure the dollar value of new, renewal and total sales per line of business. The manager is able to directly recognize outperforming and underachieving product lines from a revenue generation perspective. This will guide the manager thru the selection of adequate marketing strategies and the identification of reasons behind success and failure such as: shortage or excess in recruitment, bad or excellence performance of sales consultants, arrival or exit of a competitor…

vii. New and Renewal Sales per Area

The geographic repartition of our sales (new or renewal) is a significant measure to be tracked. The manager will be able to sense the entry of competitors in

certain areas due to unexpected low sales, check the success of marketing campaigns by area and monitor the market share of the business per area.

viii. Sales and Renewal Distribution by LOB & Sales Consultant

Given that some sales people are allowed to sell several products and services; these measures are an indicator of each sales consultant's contribution to each line of business.

ix. Sales and Renewal Source

Acquiring clients is a vital step for the company. Acquiring clients from a specific source is a crucial step in detecting the direction of sales efforts. This is a support for the user to identify the sources that generate business the most versus the ones that are inefficient.

x. Portfolio of New and Renewal Clients per Sales Consultant

These two indicators specify the clients' portfolio size of each sales consultant which illustrate the contribution of each consultant in getting new and renewals clients.

xi. Sales and Renewal Count per Invoice Amount

Number of signed contract per invoice amount accounting for a range of 250$. This dimension gives the manager an idea about the average price by line of business and for the whole operations. It is affected by the volume of contracts sold and the price of each contract. The manager will be able to track if the sales consultants are pricing

the new and renewal services as per Boecker® pricing policy and identify the bestselling categories.

xii. Sales vs Return

Lost business in dollar amount from new and renewal contracts comparatively to total sales is pinpointed in this measure. The user should deepen his analysis by moving to corresponding charts to find the reasons of high returned amount and take corrective actions.

xiii. RSO per LOB

RSO stands for Returned Sales Order. Lost business in dollar amount underlining the returns by line of business. A red flag is raised for the highest numbers of this measure. This shows that a lot of clients in this specific service stopped their contract and may be due to several reasons: unsatisfied from the service, shift to a competitor, out of business...

xiv. RSO per Sales Consultant

This measure indicates the highest return amount by sales consultant. If a trend of high amount of return for a sales consultant is detected, this is an indicator that the sales consultant has issues in his closing activity.

b. Renewal Dashboard

With over 23 years of cumulative experience in the pest control field, Boecker® currently serves a big number of residential (16,000 clients) and corporate (24,000

clients) clients in different industries. Thus, this portfolio is a big asset for Boecker®'s operations and is key to the continuity of the business. Renewals can generate revenues with fewer efforts and time spending. To insure a high rate of renewals, the whole company should be adopting this vision by maintaining extremely satisfied clients and highest quality of service.

The Non-Renewal Report extracted from Scream provides the data needed to analyze renewal and churn rates.

Boecker® pest control services are renewed on a yearly basis. Therefore, churn rates and renewal rates are calculated only for yearly contracts of Boecker®'s operations from two perspectives: revenue generated and customer retention. The equation behind the revenue renewal rate is: renewed amount of yearly contract to date over the total amount of expired contracts. On another note, customer churn rate is obtained by having the number of customers who did not join Boecker® services for the next year over the total number of customers who have expired contracts. These rates indicate the level of customers' loyalty and satisfaction, and disclose the staffing's need to serve the customer base. Other contract types such as daily, single, various or periodic are not incorporated in the calculation of this rate.

By monitoring these rates, Boecker® validates the predicted acceleration in its long-term growth and pertains the wellbeing of the company. Sales consultants should always follow-up on churned customers because they will potentially return to the program in the future.

Churn rate or nonrenewal rate vary across the industries. In the below section, the KPIs for the churn rates and renewal rates depends on three factors: Boecker® position in the pest control industry as a leader among competitors, high quality of

service provided, oldness and great level of expertise in the operations and customer service.

On another hand, the Early Risk Assessment report (ERA) was recently developed and added to Boecker®'s reporting system. It helps the whole company projecting the risk of having non-renewed contracts due to several reasons: lack of response, high level of complaints, skipping appointments, call backs, change of management or contact person, sighting of competition, pricing complaint, approach complaint and delay in the payments for more than 90 days.

Metrics and KPIs	**Report**	**Source**
Renewal Rate Timeline	Non-renewal	Scream
Other Contracts for Renewal		
YTD Renewal Rate by SC $		
YTD Renewal Rate by SC #		
Total Renewal Rate		
Renewal % per LOB		
Non-Renewal Reason		
ERA Trend	ERA	Scream
ERA Type		
ERA Task Owner		

3.4. Renewals Metrics

i. Renewal Rate Timeline

Close monitoring of renewal and churn rates is necessary for the continuity of the business. Therefore, a monthly rate is displayed in this chart emphasizing on the amount of money generated monthly from renewals.

ii. Other Contracts for Renewal

This metric displays the renewed amount of contracts from all contract types (except the yearly ones): daily, single, various or periodic. Even though these contracts are not included in the calculation of the renewal rate, they constitute a potential to increase revenues. Therefore, a close monitoring should be done despite the fact that they are not included in the renewals' target.

iii. YTD Renewal Rate by SC (dollar value and number of contracts)

These two KPIs disclose the year to date renewal rate of each sales consultant respectively vis-a-vis the amount of money generated and the count volume of renewed clients. These measures are both needed to assess the healthiness of the achieved renewal rates. The sales consultants are incentivized on two scales: revenue generated and retention of clients. Each consultant should reach at least 80% in order to achieve his target.

iv. Total Renewal Rate

This pie chart displays the percentage and amount of proposals, renewed, pending and non-renewed contracts. Proposals are contracts for renewed services which treatment was not done or contract is not signed yet. As for the non-renewed, they represent the churn rate of the business. This KPI can be filtered by line of business to reflect the rate of each service. For example, the target Renewal Rate for Pest Control Corporate is 80 % and Pest Control Residential Services has a target of 70 %. Since the Food Safety and Biosecurity yearly programs were recently added to Boecker®'s lines

of business, there is no targeted renewal rate. Nevertheless, observing this rate is essential to preserve customers' loyalty and increase the clients' portfolio.

v. Renewal percentage per LOB

This metric reveals the contribution of each line of business to total renewal. Percentage and generated amount are presented on the pie chart. The user will be able to spot the renewal amount generated by each line of business and hence define the strategies to be followed accordingly.

vi. Non-Renewal Reason

This indicator supports the manager with the reasons behind the high churn rate. The reasons are entered by the sales consultant on Scream when a client doesn't renew within 3 months from end of service and can be extracted from the Non-Renewal Report. Based on the historical data collected from Boecker® database, the following reasons have been identified: decision maker passed away, unreachable, travel, change mind before service, problem not solved, customer service problem, change in management, trying the competition, unpaid due payments, price issue, problem solved, client will call back, permanent shut down, moved location.

vii. ERA Trend

This measure identifies the number of tickets entered on Scream on a monthly basis and reflects the probability of not having renewed contracts. Executives are able to detect an increasing trend in risks and act preventively to assure that these clients will

renew their contracts. Preventive actions will be taken to guarantee customer satisfaction and therefore renewals.

viii. ERA by Type

The chart displays the reasons behind the risks, entered on the system. This KPI allocates a weight for each risk source and helps executives to take early corrective actions and ensure clients satisfaction. The monitoring of this indicator has led to an increase in renewal rates and decrease in customer complaints.

ix. ERA by Task Owner

The source of the reason is detected by Boecker®'s employees whether on field, over the phone or by observation. This measure recognizes the effort contributed by each employee to fill this data. Low number of data entry diverges the risk assessment.

2. Finance Dashboard

The dashboard use data from the general accounting system of Boecker®, Visual Big, (Aging Report, Collection Report) and from excel sheets filled by the manager of the department (Profit & Loss Report). Therefore, data from different sources supply the dashboard which enhance the relevance of having consolidated information in one report.

The finance dashboard will be updated on a weekly basis to have greater control of the metrics and KPIs gathered in one effective dashboard. This attributes to

the need of the manager by saving efforts and hundreds of man hours to report the requested information.

Metrics and KPIs	Report	Source
Monthly Net Profit % Trend	P&L	Excel
YTD Net Profit % Trend		
Aging Trend	Aging Report	Visual Big
Monthly DSO		
Aging by Category		
Aging by # of Outstanding Days		
Monthly Collection Achievement	Daily Collection	Visual Big
Collection by Account Handler		
Weekly Collection Trend		
Collection by Payment Method		

3.5. Finance Metrics

i. Net Profit Percentage - Monthly & YTD

There is no doubt that net profit is one of the essential KPIs to be monitored in any business. Based on historical growth and given that Boecker® is a service company, net profit target is set to be at least 20%. The elements that affect the achievement of this KPI are: expense reduction, increase market share, open new line of business and focus on renewals. This metrics shows the net profit percentage by month and as total. It is calculated as per the below:

- Revenue - Cost of Sales = Gross Margin
- Gross Margin - (General & Admin Expenses + Marketing Expenses + Personnel Expenses + Travel Expenses) = EBITA Margin
- EBITA Margin - Amortization Expense = EBIT Margin
- EBIT Margin - Financial Expenses = EBT Margin
- EBT Margin - Regional Fees – Tax on Profit = Net Profit

- Net Profit/Revenue = Net Profit Vertical Percentage

ii. Aging Trend

This measure specifies the monthly amount of Account Receivables (AR) in the market. It allows to detect the months where we have shortage in money collection and the months where the customers pay more. This will help the manager to schedule his dues based on the collection. Any upward or downward trend is sensed from this chart. The target of this KPI is to decrease aging by 10% from last year

iii. Monthly DSO

A measure of the average number of days that a branch takes to collect revenue after a sale has been made. Each branch has a different KPI for this measure depending on the payment practices of each country. For instance, Lebanon's KPI is between 80 and 100 days. DSO (Days Sales Outstanding) is calculated by the following formula: DSO = (AR/Invoicing) x number of sales days.

A low DSO value means that it takes the company fewer days to collect its accounts receivable. A high DSO number shows that the company is selling its product to customers on credit and taking longer to collect money.

iv. Aging by Category

User will be able to compare the aging status of each department and define which department has the highest AR amount. If a rising trend is detected throughout the months, manager should change collection strategies by changing contract payment terms for new clients or offering discounts on early payments for existing clients.

v. Aging by Number of Outstanding Days

This metric shows the number of outstanding days from the day of invoice issuance. This indicator designates to the manager or executive how much uncollected money is at risk of becoming bad debt. The defined categories from the lowest to the higher risk are: 30 days, 60 days, 90 days, 180 days, 360 days and more. The user will be able to drill down into more granular information visualized in different charts to see the reasons behind the uncollected amount of money.

vi. Monthly Collection Achievement

Monthly overachievement or underachieving of the collection unit is displayed in this KPI. The total amount of collected money and the percentage out of the target are shown in the graph. The target of this KPI is to reach 80% and above of the outstanding amount.

vii. Collection by Account Handler

Each officer has a monthly collection target to be reached. This KPI reflects the efforts of the account handler. 100% of the target should be achieved by account handler on a monthly basis.

viii. Weekly Collection Trend

As its name reveals, it is the collected amount of money on a weekly basis. It gives the finance manager the power to track the collection trend on weekly basis and schedule his payments accordingly.

ix. Collection by Payment Method

The user of this dashboard is able to check whether the payments are done through Bank, Card, Cash LBP, Cash USD, Check. This metric's result will differ from branch to another following the payment trends in each country. Based on this indication the manager can create incentives to encourage the payment through any payment method if this is more profitable to the company.

3. Operations Dashboard

Pest control's operations for corporate and residential categories are examined in this dashboard. The operations dashboard summarizes the available data into consumable format, helping the user in monitoring the outcome of the operations' activities at-a-glance. It identifies evolving patterns mined from past and present data across the enterprise, spots any deviations from the standard and allow fast response to avoid the emergence of an issue into a crisis. The operation's aspects covered are customer satisfaction, customer complaints, and technicians' and officers' performance. This dashboard highlights and monitors the high correlation between client satisfaction and service execution.

When customers' expectation and customers' perception converge, the service quality is successful (Parasuraman, 2004). Customers foresee a certain level of service and accordingly differentiate the level of the rendered service (Walker, 1995). The reasons behind this result are owed to the gaps of the company: overpromise and under deliver approach and deficit in the treatment efficiency and employees' behavior. Based on the expected level of service, the client elaborates a "zone of tolerance". If the service company performs within or above this zone, the customer is respectively

satisfied or extremely satisfied. If the operation did not reach this zone, the service is considered as poor (Parasuraman 2004).

The operations dashboard will be updated twice a week on Monday and Thursday in the purpose of safeguarding proper follow-up on this big operation and eliminating inefficiencies in the day to day activities to maintain high quality service. Deficiencies in several metrics or KPIs is an indicator of lack of performance or shortage in staffing. All data is filled on Scream by the operations' officers and client service team. Hence, the extracted reports to build this dashboard are Call Backs report, Audit Calls Report, Complaints report, and Quality report.

- Call Backs Report: Boecker® gives full warranty throughout the contract period for its Pest Control Clients in the corporate and residential units. Thus, when the customer spots any evidence of pests, he can call the company and ask for a free of charge treatment. Those calls are related to technical problems and are added on Scream as Call Back (CB) under the following subcategories from the lowest to the highest severity: CB0, CB1, CB2, CB3, CB4, CB5.

Call Back	**Definition**
CB 0	Evidence of pests not covered in the contract.
CB 1	Presence of dead pests; good treatment's result.
CB 2	Evidence of pest activity however, witness of Integrated Pest Management (IPM) problems such as sanitation or pest proofing.
CB 3	Due to late treatment: rescheduling either from Boecker® side or the client side.
CB 4	Evidence of Pest Activity; inefficient treatment.
CB 5	Evidence of occasional invaders.

3.6. Call Backs Definition

- Audit Calls Report: Having extremely satisfied clients is Boecker®'s motto. Therefore, on a daily basis, the client service team call all the clients that had a treatment in the previous day to fill the customer satisfaction survey. The officer asks seven questions regarding the following aspects of the operations: technicians' punctuality, technicians' courtesy, technicians' positive response to requests, solvency of pest problems, meeting expectation, officer's response to request and quality of service. Those measures are qualitative. Thus, the customer service officer translates them to quantitative measures by scoring 0 and 1 respectively to negative and positive feedbacks.
- Complaints Report: This report combines the number of incoming complaints for any aspect of the business related to the service provided in all the divisions: personnel behavior, lack of courtesy, missed treatments, treatment's inefficiency, damage after treatment, bad customer service, delay in response, neglecting the client's request … Once a complaint is received by any employee, it is transferred to the client service department to take actions, enter the information on the system and resolve the problem.
- Quality Report: The quality report is related to the corporate unit of pest control and provides data about pest control scheduling appointment from the date of contract signature. The identified KPIs from this report ensure that Boecker® is providing the highest level of services to its clients by having quick responses to their needs. In addition to that, these metrics uncover the pest control officers' performance by

following the set procedures. The operations process starts from the date of the contract signature. The operations' officer should call the client within 48 hours and enter this information on Scream. Once done, an automation line for planning appointments will pop-up on his/her schedule. The officer should follow the line in favor of not missing or delaying appointments.

Table 3.5. below includes the defined operations metrics and their source of report and related software.

Metrics and KPIs	**Report**	**Source**
Appointment Scheduling	Quality Report	Scream
Treatment Execution		
CB Trend	Callbacks	Scream
CB per Department		
CB After Type of Treatment		
CB per Severity		
CB Solvency per Severity		
Days of CB Occurrence after Last Visit		
CB Speed of Response		
CB per Crew		
Complaints Trend	Complaints	Scream
Customer Complaints Response		
Customer Satisfaction Rate		
Complaints by Industry		
Quality of Service	Audit Calls	Scream
Quality of Service by LOB		
Overall Score		

3.7. Operations Metrics

i. Appointment Scheduling

The first KPI that monitors the officer's performance is days' difference of scheduling appointment. It is calculated by deducting the day of scheduling the appointment from the contract day. Appointment scheduling for the basic treatment should take place within 48 hours from contract's signature as per Boecker® quality manual.

ii. Treatment Execution

Days difference of appointment scheduled is the period ranging from the contract signature till the implementation of the treatment. The defined target for this KPI as per Boecker®'s operations procedure is maximum of seven working days. Unreached target is a sign of a lack in operations' performance. The client will have a good first impression about the company once the officer abides by this KPI.

iii. CB Trend

This metric graphs the number of call backs engendered monthly revealing the trend over the year. A high number of call backs is predicted in the high season due to the increased number of clients and the high activity of pests during spring and summer.

If a peak is detected during a month in the low season, user should search the reasons behind the abnormal result.

iv. CB per Department

Residential call back numbers versus corporate call back number are presented to date in this metric. Typically, the percentages should be close to each other since

products, trainings and context are the same for both segments. Otherwise, an irregular situation is happening and manager should act on it.

v. CB After Type of Treatment

The yearly pest control contract includes 5 visits as per the following schedule: Basic Treatment (BT) at the beginning of the contract, Replenishment Treatment (Rep) after 15 to 21 days and on a quarterly basis a Control Treatment (C1, C2 and C3). Follow-up (FU) visits and Check-up (CU) visits are scheduled by the operation team when a problem cannot be solved in one visit and when there is a need to verify the effectiveness of the treatment done. Call backs may occur as well after different visit type not included in the contract such as Flying Insect Control Program (FICP), Fleas Treatment (FLZ), Single Treatment (ST), Monthly Treatment (MT)… It is significant to identify when the call backs are taking place. A high number of call backs incurring after a certain type of visit is an indicator that either the proposed schedule is not appropriate or this type of treatment is not executed properly.

vi. CB per Severity

The number of call backs by severity and the percentage of each type out of the total number of call backs is displayed in this pie chart. These metrics reflect the efficiency of the pest control treatments done by the technicians. The highest the severity, the fastest should be the recorded response.

vii. CB Solvency per Severity

Actions should be taken by the officer once the call back is received. Otherwise, there is no need to record these calls. This KPI highlights the number of solved call backs by type versus the unsolved ones.

viii. CB Time after Last Visit

Segregating when the call backs are incurring is key to the operations' performance. Throughout the yearly contract, different applications of the pest control treatment are executed. This measure helps the head of department monitoring the efficiency of each treatment. If the number of call backs is relatively high in the period (up to 3 weeks) following the treatment, this means that the treatment was not done properly. To know the reasons behind these results, manager should drill down his/her analysis.

ix. CB Speed of Response

The speed of response is one of the key metrics to be monitored. The client cannot afford having pest activity in his facility specially that our operations treat different critical industries such as hospitals, food and beverage companies, drugs manufacturing and nurseries. Response to a call back should be maximum within a week.

x. CB per Crew

This metric identifies which team of technician is having the highest number of call backs after treating the facility. Therefore, it can be an indicator either of improper

implementation of the treatment or of lack of knowledge thus the need of technical trainings and supervision.

xi. Complaints Trend

Complaints increase due to high season or inefficiency in the process. The number of incoming complaints per month is monitored through the tendency chart. Decision maker is able to simulate comparative and trend analyses by departments, problem resolution and customer satisfaction from this chart.

xii. Customer Complaints Response

The KPI set for the complaints' follow-up is 100 %. Customer service team should call, listen and follow-up on all the complaints received from clients. If this KPI is not met, the level of unsatisfied will surge leading to bad reputation and lost profits.

xiii. Customer Satisfaction Rate

This KPI shows the number of solved and unsolved complaints in addition to the number of satisfied and unsatisfied clients. It is also displayed as a percentage of the total number of received complaints.

xiv. Complaints by Industry

Boecker® serves pest control clients in different industries. Some industries such as food manufacturing, restaurants, bars & food services… are disposed to a higher risk of pest infestation thus more customer complaints … In addition to that, the volume of residential clients served by Boecker® is bigger than any other sector (health care

sector, construction sector, transportation services sector, professional services sector, arts, entertainment & recreation sector, education sector, government, business services sector, lodging, retail sector), therefore, a higher number of complaints may be detected in this area. Any deviation from this analysis should trigger the user to search for reasons behind the high number of complaints.

xv. Quality of Service

Good, fair or bad service is rated in this category. The chart displays the percentage of each quality of service to the total number of calls. It keeps a close-up on the implementation of the treatments and the courtesy of the employees.

xvi. Quality of Service by LOB

Emphasis on the performance of each line of business apart is essential given that the pest control operations are serves corporate and residential clients. This measure mainly allows the user to detect any inefficiencies in the management of the unit. It is read in the chart as a count of good, fair and bad services.

xvii. Overall Score

This chart summarizes the success rate of all the predefined questions of the audit call. It gives an overview on the efficiency of the treatment, the professionalism of employees, whether technicians or officers, and the expectations' achievement. The scores are displayed as count number of the positive response in comparison to the total number of clients surveyed.

4. Human Resources Dashboard

The human resources dashboard visualizes the current status of the human asset within the company, the generation of candidates and the recruitment process. It mirrors a scannable outlook of the department performance.

The data is retrieved from Excel reports filled by the HR manager on a monthly basis: Job Families and Titles Report, Generated Applicants Report and Recruitment Activity Report.

- Job Families and Titles Report: the extraction of data from this report shapes the general profile of the company. Executives and HR managers are capable of monitoring where the company stands in terms of personnel versus the set vision of the company.
- Generated Applicants Report: Applicants generation is the first step of the recruitment process. The studied metrics mined from this report highpoint the attractiveness of Boecker® as employer in the job market.
- Recruitment Activity: Recruitment Activity Report accounts for the recruitment for newly opened position and vacant existing positions. It reveals data of the recruitment process from the first interview till the admission, hold or rejection of the candidate.

The below identified metrics and KPIs delivered all together (Table 3.5) give insights about the HR processes' efficiency: screening, interviewing and hiring. The HR Dashboard will be updated on a monthly basis to ensure appropriate exposure of the year to date performance.

Metrics and KPIs	Report	Source
Workforce Status	Job Families and Titles	Excel
Workforce Breakdown by Branch		
Workforce Breakdown by Department		
Workforce Breakdown by Unit		
Workforce Breakdown by Position		
Workforce Breakdown by Gender		
Workforce Breakdown by Language Proficiency		
Workforce Breakdown by Blood Type		
Generated Applicants Trend	Generated Applicants	Excel
Generated Applicants by Source		
Generated Applicants by Branch		
Generated Applicants by Job Family		
Generated Applicants by Position		
Recruitment Trend	Recruitment Activity	Excel
Interviews by Source		
Interviews by Branch		
Interviews by Job Title		
Recruitment Success Rate		
Recruitment Time to Fill		
Recruitment Time to Hire		

3.7. HR Metrics

i. Workforce Status

This metric reveals the percentage of active and left employees to the total number of employees hired. It gives insights regarding the employees' turnover.

ii. Workforce Breakdown Measures

Boecker® employees can be grouped in three categories: department, unit and position. To have a holistic overview of the repartition of the human resources capital, the workforce breakdown is displayed by several criteria in the dashboard: branch, department, unit, position, sex, blood type and language proficiency.

iii. Generated Applicants Trend

The HR department observes the movement of monthly application's submission through this metric. Manger can monitor the peak time of applying to job opportunities and plan his recruitment process accordingly.

iv. Generated Applicants by Source

Boecker® uses different sources to generate applicants for filling the empty positions: search engines, walk-ins, third-party sources, referral, professional social networks, website, media advertising. This measure reflects the efficiency of each source by calculating the number of candidates generated by one source versus the total number of generated applicants. HR Manager has incentive to divide his/her recruitment budget based on this measure in order to fill the vacant positions the fastest.

v. Generated Applicants by Branch, Job Family, Position

These measures give information about the attractiveness of Boecker® as an employer in the job market for each position. This highlights as well the facility of having interested applicants for each position depending on the demand.

vi. Recruitment Trend

The recruitment trend graph reveals the number of interviewed applicants per month. It is an indicator of the HR department performance. The number of conducted interviews gauges the life cycle of the company whether it is growing (steep upward trend) or mature (stable or slightly increasing), besides the turnover of employees (higher number of interviewed candidates is a sign of a higher turnover rate).

vii. Interviews by Source

The recruitment by source graph shows the capability of having qualified candidates from different sources. The number of applicants interviewed from each source is the measured metric emphasizing on the effectiveness of each source and its contribution to the recruitment process. Manager has then the means to select the most appropriate source when searching for applicants in different positions.

viii. Interviews by Branch and Job title

These metrics are function of the number of interviewed candidates. The user can examine the recruitment emphasis by branch and per position once analyzing these measures. The first measure is relevant only in KSA and UAE where Boecker® has more than one branch.

ix. Recruitment Success Rate

User understands from this chart the success rate of the candidates that passed the interviews versus the ones who were rejected, transferred to the pool or unaccomplished the interview process. The metric is displayed in number of candidates and percentage of total interviewed applicants.

x. Recruitment Time to Fill

This KPI measures the time between the receiving of the CV till the offer signature of the selected candidate. It differs from a position to another since diverse backgrounds, skills and experience are required for every opened position. The

dashboard's user will have the privilege to define the targeted recruitment time to fill for each position by studying the historical data compiled in the dashboard.

xi. Recruitment Time to Hire

The time between the application of the candidate till the first day of work is defined by the KPI, recruitment time to hire. Same concepts of the measure recruitment time to fill apply to this KPI. On a later stage, HR will specify specific targets to this KPI based on detected tendencies in the dashboard.

D. Data Collection Process and Challenges

After identifying the metrics and KPIs that will constitute our dashboards through one to one meetings with the managers, a bottom-up approach was followed to build the dashboards. Internal data was fostered from the current reporting system abided by Boecker®. Collected data is either quantitative gathered from the executed activities or qualitative collected from conducted surveys with the clients.

The data relevant to our dashboards emerges from three main resources: Boecker® Customer Relation Management - Scream, Boecker® Accounting System - Visual Big and Excel Spreadsheets filled by managers. Scream and Visual Big are synchronized and technologically linked. Several reports contributed in the access to data, a list of them is mentioned in Appendix III. Boecker® is an ISO 9001: 2015 certified company, therefore, targets are retrieved from Boecker® quality management system manual that defines the objectives of each KPIs based on historical achievement and changes in the organization's internal and external environments. As a matter of fact, targets are coherent with the global vision of Boecker®.

Extracted data was cleaned and adjusted to become valuable as it is up to date, relevant, accurate and complete. The modifications were done to fit the recommended report's layout for building the dashboards in Excel. Excel dashboards require simple table format to enable the usage of pivot tables and charts. Thus, existing excel formats and Visual Big report were amended. As for Scream reports, they are obtained in the demanded setup. This step was time consuming. However, it was finalized once for all, when the dashboards were tailored, and additional new information will be added easily and promptly to the existing layout.

Available data is prone to human error given that all the data is entered manually by Boecker®'s employees. Therefore, a data-driven culture should be adopted at all levels of the organization from front officers to top management. Alignment between all the departments should be reached by conducting first reinforcement trainings on entering properly the data needed as input to our dashboards and second, monitor the abidance of the trainings' guidelines avoiding falls through the cracks.

Transparency in filling the data should be ensured and supervised by managers in all departments. Any divergence, error or inconsistency in data entry is detectable in the dashboard.

Another challenge is that data is not filled on a daily basis into the system, thus, inaccurate and erroneous dashboard's output may occur, affecting the decision making system. A schedule to update the dashboard will be created to avoid any false outcome.

CHAPTER IV

DASHBOARD IMPLEMENTATION TOOLS

A. Dashboard Design

Professor John Tukey of Princeton was the first academic to develop a study about the power of data visualization in data analysis entitled "Exploratory data analysis". Many researches have evolved around this topic throughout the years, concluding that graphical communication is paramount when presenting information extracted from data to executives. Currently, dashboard is the trendiest and most used Business Intelligence (BI) instrument to examine, display and manage data. Dashboards are rich in analytical insights which triggers the interest of decision makers. To build an effective and efficient dashboard, art and science are needed (Few, 2007). Science was defined in the previous sections whereby art is key to have appealing, easy to read and insightful representations of charts. In order to achieve the desired business intelligence application, we have chosen Excel to be the introductory tool to convert spreadsheets into dashboards. Excel Dashboards are inexpensive, easy to design, powerful, informative and interactive.

The functionality of Excel dashboard consists of three main phases: transformation of the available data sets into readable database in Excel, identification of Pivot Tables and creation of related Pivot Charts, and finally combination of all charts in the dashboard sheet and connecting them to each other's through slicers and timelines (Jelen, 2010). The first step is about having clean raw data sets combined in

one table by removing empty rows and columns. Thus, the user can add or remove data and by refreshing the data, the dashboard will be updated automatically. Afterwards, the table is identified as a Pivot table and Pivot charts for each metric formed. Charts are the adopted class of data representation in our dashboards. It groups pie charts, line charts and bar charts. In this step, calculated field are defined whenever a KPI is derived from multiple fields. The final step summarizes and consolidates the created small charts into one single dashboard on a separate spreadsheet. For more information on the building phases, refer to Appendix IV. It is important to note that there is no perfect design for a dashboard and this step relies more on subjectivity (Velcu-Laitinen and Yigitbasioglu, 2012). Thus, the position of each chart on the dashboard is decided by the developer and user of the dashboard depending on the relevance of each metric to the dashboard objective. Usually, important KPIs are placed in the upper part of the dashboard and metrics reflecting deeper analysis are positioned in the lower part. Consequently, charts are localized on the dashboard and then slicers and timelines are inserted and connected to all charts. Hence, the decision maker can interact with the visuals and then analyze thru conditional logic the displayed information; if the user changed the filter in one or many field(s), identical change will be applied to the connected charts and relevant information serving his research will be shown on the charts. “One of the most powerful techniques of visual analysis” defined by Stephen Few and used in building Boecker® dashboards is that the simultaneous presentation of several graphs displays either different views of a shared data set, or multiple subcategories of data taken from a larger data set (Few, 2007).

Colors play a major role in the attractiveness of the dashboards. The ones used in the dashboards are correlated to certain meanings. They are also standardized among

all the dashboards in order to reduce complexity of perception and facilitate the interpretation of the charts. Table 4.1 reveals the definition of each color available in the dashboards.

Category	Type	Color Display	Color Code
Sales Type	New		Color Model: RGB Red: 0 Green: 32 Blue: 96
	Renewal		Color Model: RGB Red: 191 Green: 191 Blue: 191
Line of Business	Pest Control Corporate		Color Model: RGB Red: 68 Green: 114 Blue: 196
	Pest Control Residential		Color Model: RGB Red: 189 Green: 214 Blue: 238
	Food Safety		Color Model: RGB Red: 146 Green: 208 Blue: 80
	Biosecurity Corporate		Color Model: RGB Red: 255 Green: 255 Blue: 0
	Biosecurity Residential		Color Model: RGB Red: 255 Green: 229 Blue: 153
	Trade		Color Model: RGB Red: 237 Green: 125 Blue: 49
Effectiveness	Good		Color Model: RGB Red: 0 Green: 176 Blue: 80
	Fair		Color Model: RGB Red: 255 Green: 192 Blue: 0
	Bad		Color Model: RGB Red: 204 Green: 0 Blue: 0
Target	Budgeted		Color Model: RGB Red: 31 Green: 78 Blue: 121
	Achieved		Color Model: RGB Red: 168 Green: 208 Blue: 141
Relevance	General Performance		Color Model: RGB Red: 89 Green: 89 Blue: 89
	Unfilled or Wrong Data		Color Model: RGB Red: 255 Green: 0 Blue: 0

4.1. Dashboards Color-Coding

B. Dashboards Evaluation & Future Development

Boecker® management team showed high interest in the implementation of this project after the evaluation of the first drafts. The dashboard management system value emerges from having for the first time a customized and interactive digital support for data analysis. All users granted a buy-in to the project once they felt the efficiency of accessing readily data intuitively and quickly, and the large amount of analysis that can be mined from the metrics used simultaneously. Some decision makers pointed the need to add more dashboards serving diverse purposes such as marketing, food safety, forecasting and executive dashboards...

The validation of the results was done by comparing the output of selected traditional reports prepared by managers to the values available in the dashboard. The trial period for the dashboards will be launched in a meeting, grouping all the decision makers of the organization. After the three months' trial, the dashboards will be iterated as per the concluded recommendations and then validated for implementation. Later, the dashboards will be scaled to be implemented to all Boecker® branches.

Employees become more productive and motivated to excel if their performance is monitored and public. Thus, we recommend that each dashboard should be communicated with the concerned team. This will contribute to the enhancement of efficiency, innovation, and competitiveness at all levels in the organization.

On another level, the constructed dashboards using Excel serve as a base for future BI software integration such as: Tableau, QlikView, Microsoft Power BI and many others. The added values of the former systems are stated below:

- Directly connected to the CRM; no need to extract data

- Availability of more advanced visualization, for instance, maps and diagrams
- Possibility to be directly linked to internet and digital platforms of the company.
- Adaptation of the dashboards' layout on smaller or bigger screens such as mobile phones, tablets and TVs.
- Simultaneous access on multiple devices.

The final version of dashboards built for Boecker® is attached in Appendix V. Below is a prototype of the finance dashboard.

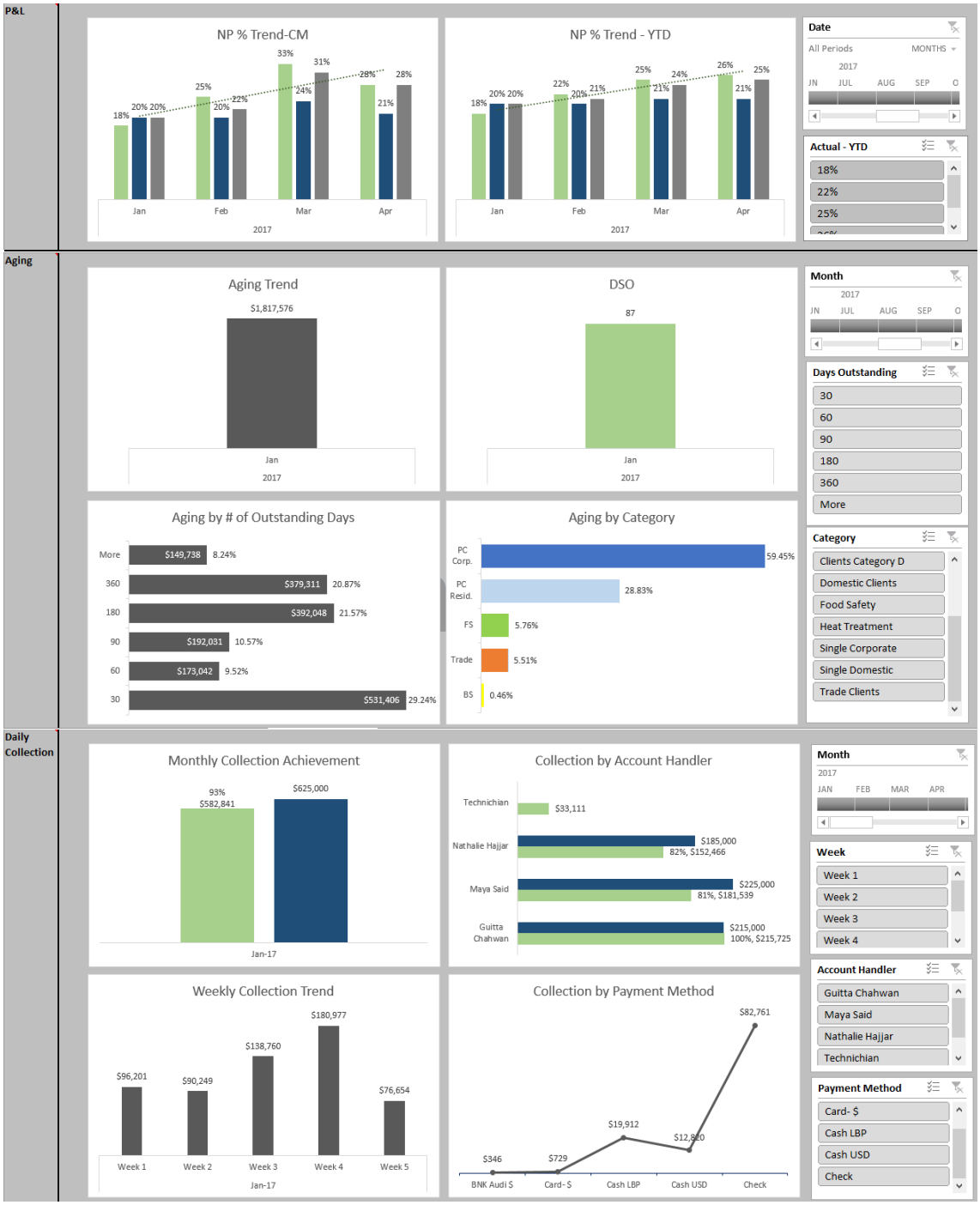


Figure 3: Snapshot of Boecker® Finance Dashboard

CHAPTER V

CONCLUSION

Boecker® is expanding exponentially locally and regionally. The more the operation is bigger, the more it generates data and the tougher is its monitoring and analysis. As such, the aim of this MBA project was to make the available data viable and provide decision makers with user-friendly, easy to read, up to date and thoughtful decision support tool. For Boecker®, this project will be the foundation for several developments in this area making executives more well-informed about the business and thus more powerful while taking decisions.

Few (2007) said: "When using the dashboards efficiently, great things can happen for the operations.", and it is just the beginning for Boecker®. The crafted dashboards were defined after meeting with executives and assessing the motive and need behind the departmental dashboard. As a result, five main dashboards were introduced under the scope of this project and they will be addressed to the manager of each department and the top management. The targeted users have an advanced profile; they are familiar with the workflow of information, are aware of the treasure behind the huge amount of data, and are analyzing data to a certain extent using traditional reporting… Each dashboard has been created to communicate the right information for the right users.

The structure of this MBA project was to outline the steps to develop the dashboards as follows:

- The context of the project was studied following SAMAS framework in order to align it with Boecker® mission, vision and strategy. In that way, outputs of the dashboard will be more relevant to the organization.
- Identification of adequate key metrics was a crucial step and was done in reference to the objective of each dashboard. Different types of key metrics were used in the dashboard: timeliness (trends), descriptive, drill-able, informative, strategic, operational, customizable. Altogether, they offer a comprehensible and complete view of the organization.
- Afterwards, data was collected, cleaned and organized accordingly and reports were extracted from Boecker® software. The hard part was to have the reports in a format that fits the excel dashboards in order to facilitate the update of the dashboard. This part was done manually and will be coded later on by the systems manager once resuming work.
- Finally, the dashboards were designed following three principles: simplicity, attractiveness and interactivity. Consequently, the user will be able to explore the data fluently.

Boecker® team will be able to experience the common benefits of dashboards once starting the implementation. The dashboards constitute a shared platform to communicate business data, pinpoint deviations and problems, track good and bad performance and determine fast changes. Other than that, this project contributed to the assessment of the current processes, the integrity, the collection and entry of data, and the reporting system.

In addition, for myself:

- I was exposed to the holistic operations of Boecker® and applied the multidisciplinary learnings of the MBA program: decision making, accounting, finance, management, human resources and leadership…
- I also realized how much data analytics is valuable to improve the decision making system and how much integrity in filling data at all levels is crucial.
- I learned on my own how to build dashboards through excel and mastered this skill. To figure out how to come up with a dashboard prototype took me around a month of intensive research and learnings. This project made me interested in acquiring Excel skills. It is, for me, the first step towards excelling in Excel.
- I experienced leadership and team work through meeting conduction, repartition and follow-up on tasks and effective communication.

Finally, Boecker® will adopt his dashboard management system and I will launch it to all country managers in October 2017.

APPENDIX I

BOECKER® ORGANIZATIONAL CHART - GROUP

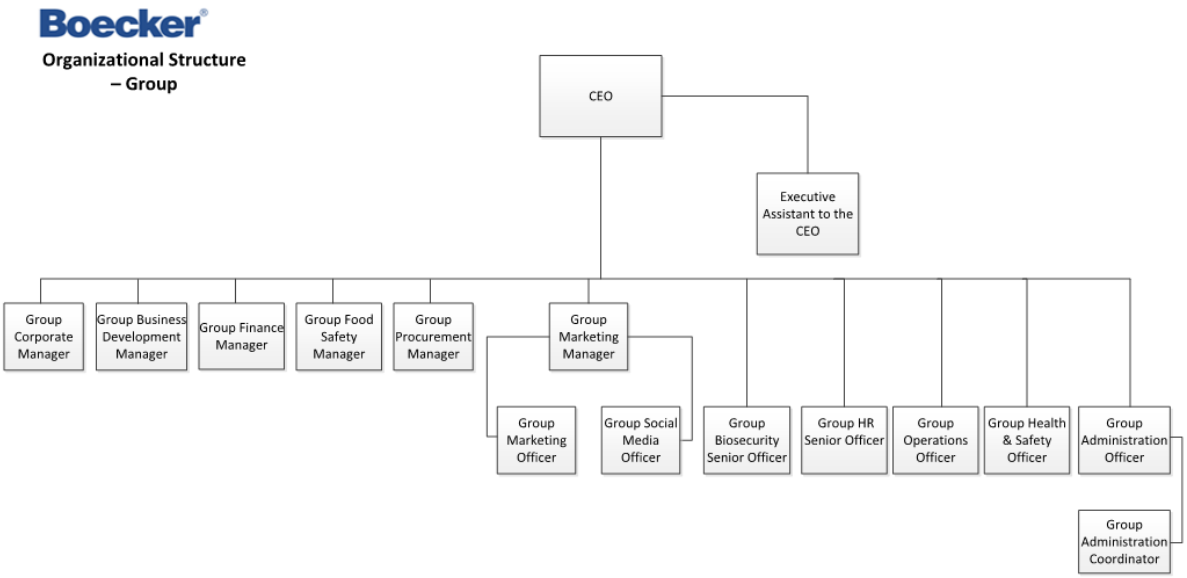


Figure 4: Boecker® Organizational Structure - Group

APPENDIX II

BOECKER® ORGANIZATIONAL CHART - BRANCH

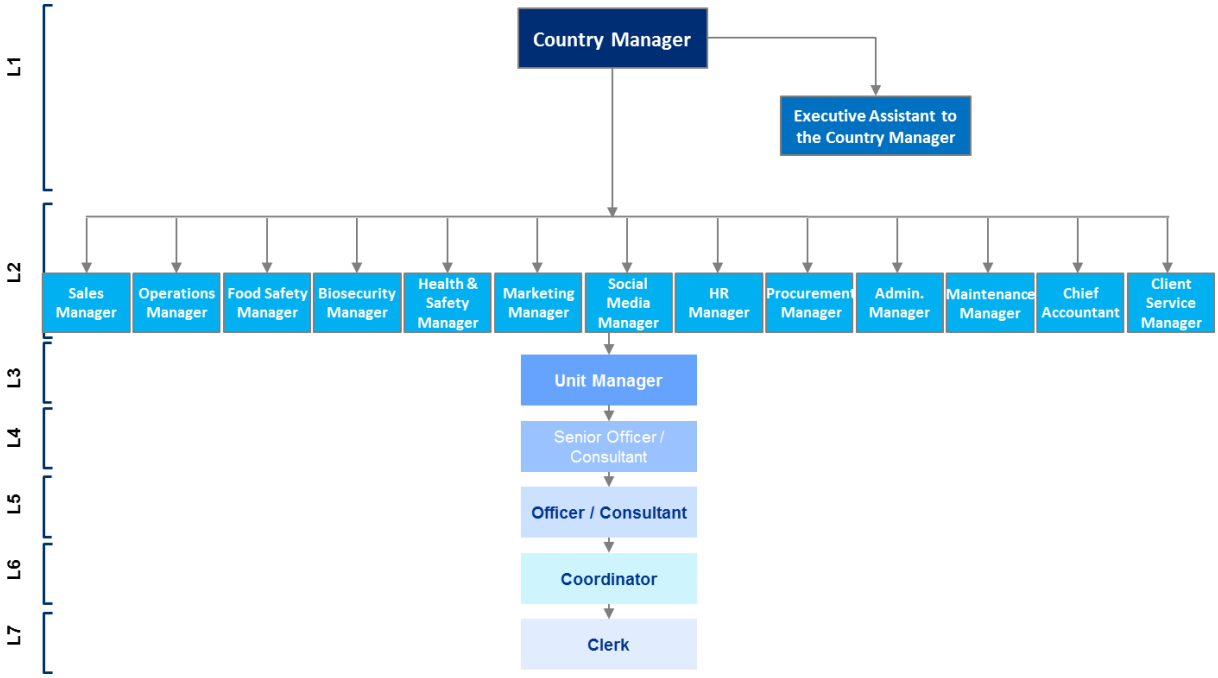


Figure 4: Boecker® Organizational Structure - Branch

APPENDIX III

MEASURES, METRICS AND KPIS

Metrics and KPIs	Report	Source	Dashboard
Monthly Sales Achievement $	P&L	Excel	Sales
YTD Sales Achievement $			
Monthly Sales Growth $			
YTD Sales Growth $			
Monthly Sales Growth %			
YTD Sales Growth %			
New VS Renewal	New & Renewal	Scream	Sales
New Sales Trend			
Renewal Sales Trend			
New Sales per Sales Consultant			
Renewal Sales per Sales Consultant			
Total Sales per LOB			
New Sales per LOB			
Renewal Sales per LOB			
New Sales per Area			
Renewal Sales per Area			
Sales Distribution by LOB & Sales Consultant			
Renewal Distribution by LOB & Sales Consultant			
Sales by Source			
Renewal by Source			
Portfolio of New Clients per Sales Consultant			
Portfolio of Renewal Clients per Consultant			
Sales Count per Invoice Amount			
Renewal Count per Invoice Amount			
Sales VS Return			
RSO per LOB			
RSO per Sales Consultant			
Renewal Rate Timeline	Non-renewal	Scream	Renewal
Other Contracts for Renewal			
YTD Renewal Rate by SC $ and #			
Total Renewal Rate			
Renewal % per LOB			
Non-Renewal Reason			
ERA Trend	ERA	Scream	Renewal
ERA Type			
ERA Task Owner			

Metrics and KPIs	Report	Source	Dashboard
Monthly Net Profit % Trend	P&L	Excel	Finance
YTD Net Profit % Trend			
Aging Trend	Aging Report	Visual Big	Finance
Monthly DSO			
Aging by Category			
Aging by # of Outstanding Days			
Monthly Collection Achievement	Daily Collection	Visual Big	Finance
Collection by Account Handler			
Weekly Collection Trend			
Collection by Payment Method			
Appointment Scheduling	Quality Report	Scream	Operations
Treatment Execution			
CB Trend	Callbacks	Scream	Operations
CB per Department			
CB After Type of Treatment			
CB per Severity			
CB Solvency per Severity			
Days of CB Occurrence after Last Visit			
CB Speed of Response			
CB per Crew			
Complaints Trend	Complaints	Scream	Operations
Customer Complaints Response			
Customer Satisfaction Rate			
Complaints by Industry			
Quality of Service	Audit Calls	Scream	Operations
Quality of Service by LOB			
Overall Score			

Metrics and KPIs	Report	Source	Dashboard
Workforce Status	Job Families and Titles	Excel	HR
Workforce Breakdown by Branch			
Workforce Breakdown by Department			
Workforce Breakdown by Unit			
Workforce Breakdown by Position			
Workforce Breakdown by Gender			
Workforce Breakdown by Language Proficiency			
Workforce Breakdown by Blood Type			
Generated Applicants Trend	Generated Applicants	Excel	HR
Generated Applicants by Source			
Generated Applicants by Branch			
Generated Applicants by Job Family			
Generated Applicants by Position			
Recruitment Trend	Recruitment Activity	Excel	HR
Interviews by Source			
Interviews by Branch			
Interviews by Job Title			
Recruitment Success Rate			
Recruitment Time to Fill			
Recruitment Time to Hire			

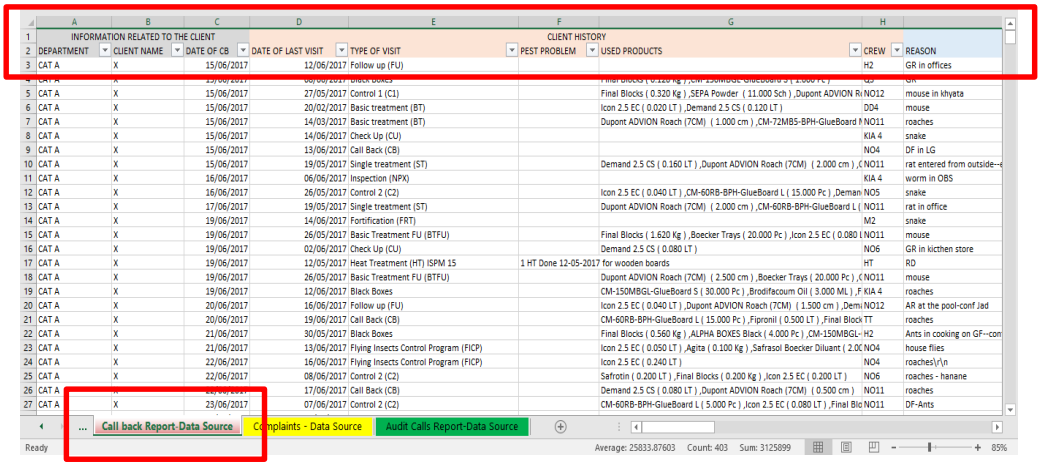
III.1. Measures, Metrics and KPIs

APPENDIX IV

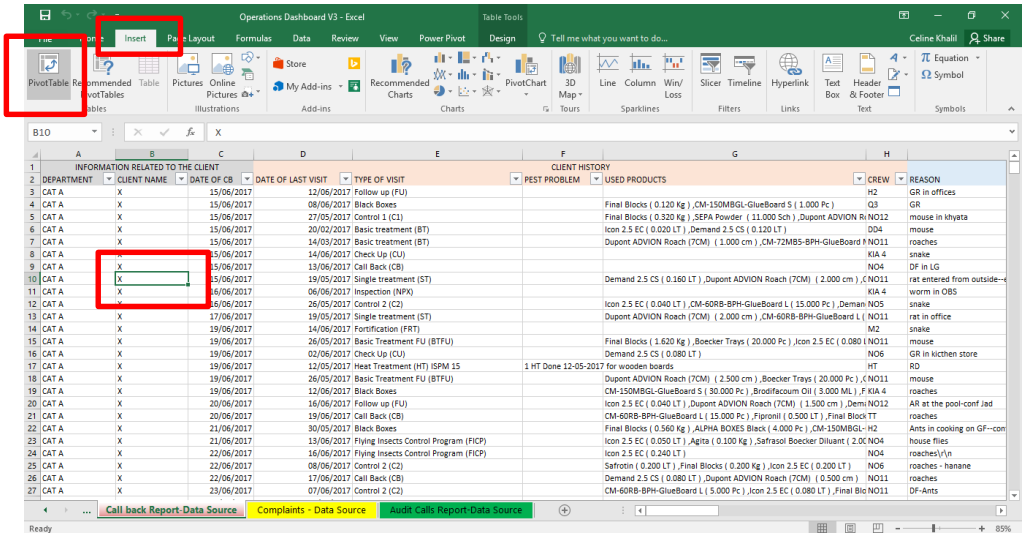
DASHBOARD BUILDING STEPS

To build Boecker Dashboard, we used the latest version of Excel, Excel 2016.

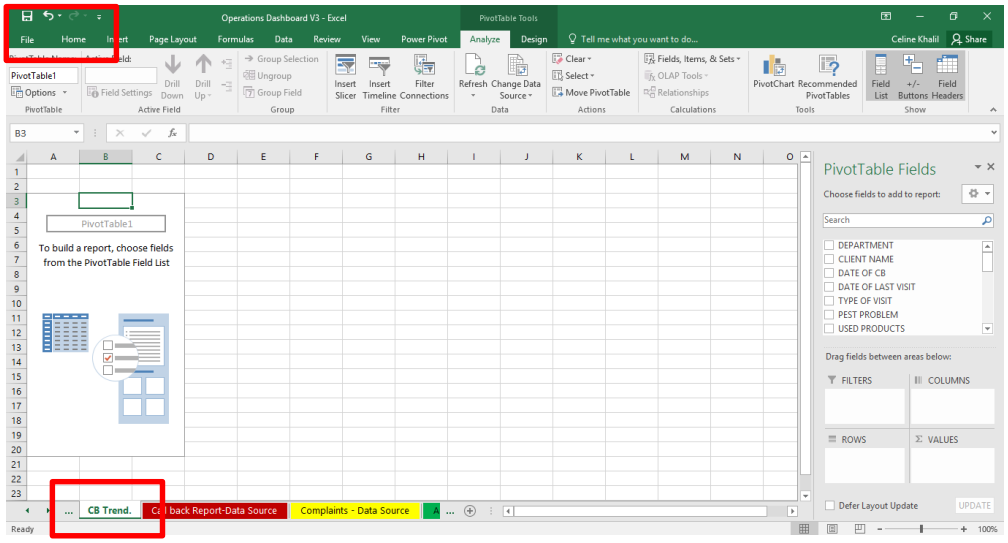
1. The first sheet to create in the workbook is the “Data Source” where the previously identified report will be inserted by doing a copy/paste action. The format of the data should be adjusted to fit into the layout of a simple table with only columns’ titles.



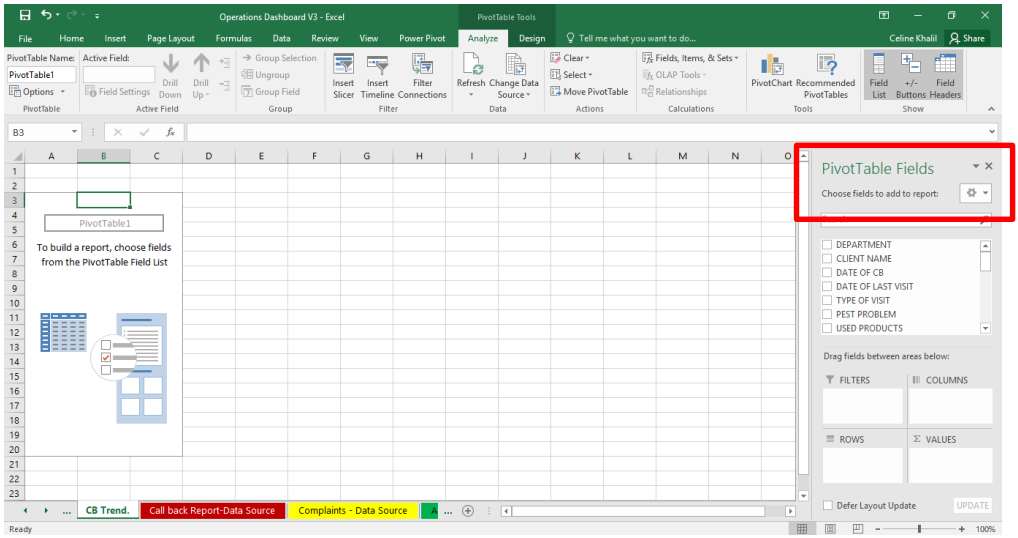
2. Step two is to format this table in a Pivot Table. To do so, first click on any cell of the table, then choose “Insert” from the ribbon on the top of the workbook and click on the “Pivot Table” icon in the left corner.



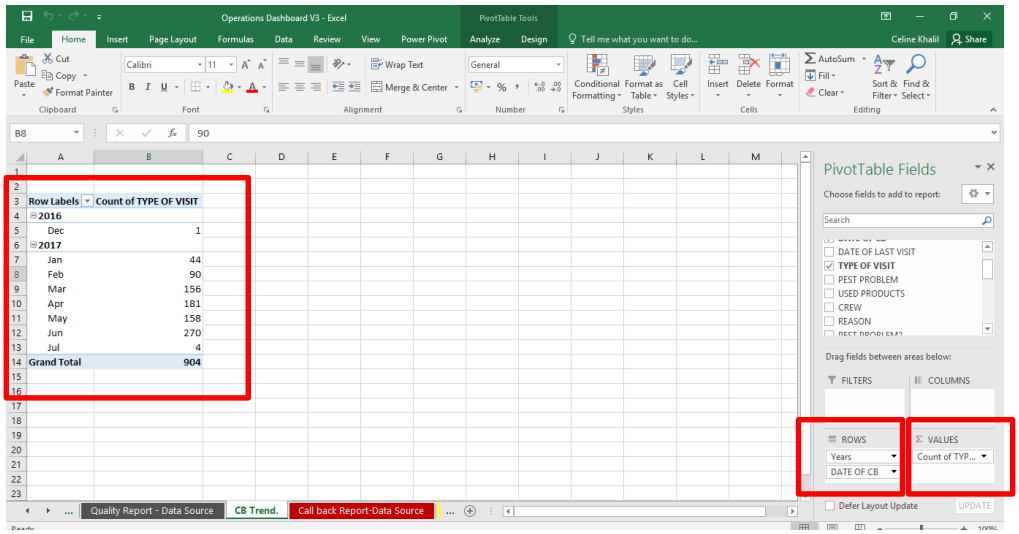
3. A new sheet will open as per the below format. The sheet will be renamed by the name of the chart to be created.



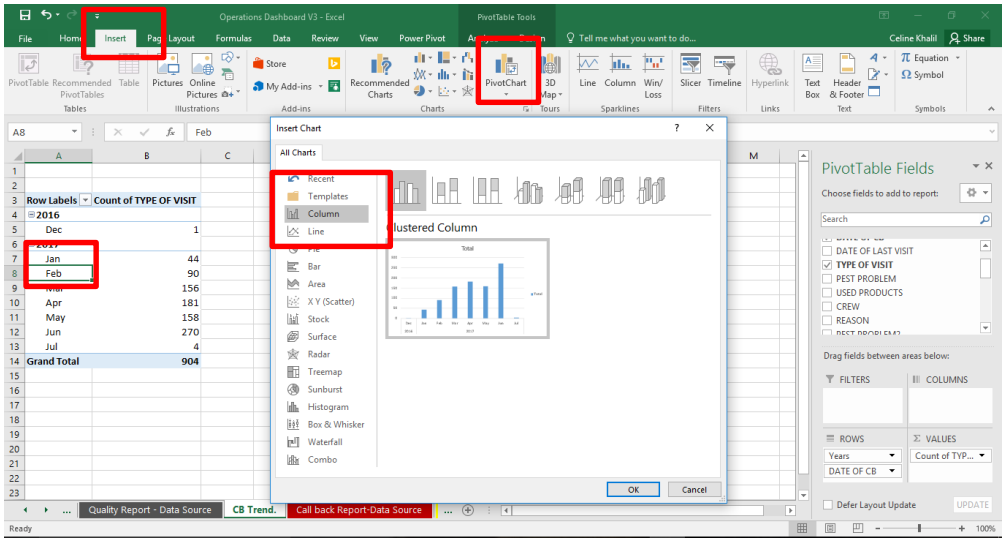
4. In the Pivot Table Fields at the right of the sheet, you will be able to choose the data needed from the Source sheet to build the metric's graph.



5. In this example, we will build the call back trend chart. Date of CB will be dragged from the Fields to the Rows area and Type of Visit will be added to the value area in order to count the total number of executed visits per date. Automatically, a table on the left of the sheet will appear including the needed information.

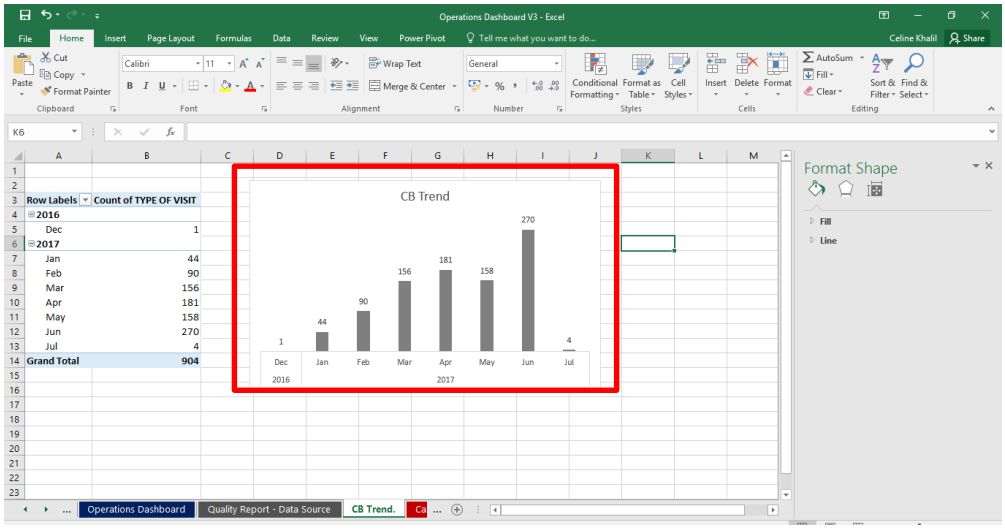


6. Then, we will add the chart of this table by first selecting a cell in the table, then choosing from the ribbon at the top of the workbook “Insert” and clicking on the “Pivot Chart” icon in the middle. Insert Chart dialogue will appear and we are able to choose the appropriate type of chart for the metric and click OK.

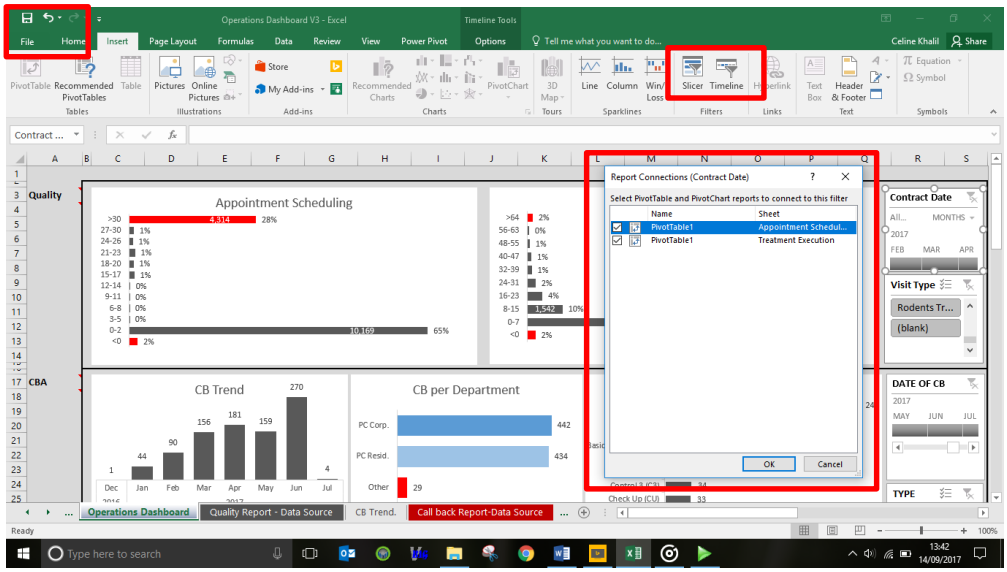


7. The chart will be displayed and we will format it as per the needed: right click on the chart and hide all value fields buttons on the chart, remove the gridline behind the bars, rename the title, remove the legend and adjust the bars width and colors as per the color coding of the dashboards used, remove

the axis values and add the value's labels on the bars.



8. Do the same for all the metrics on different sheets. Last create a new sheet. rename it "Dashboard" in order to combine the graphs on it. Format the sheet by shading all the cells in grey and creating bold borders for the area where the dashboard will be presented. To finalize the dashboard, add timeline and slicers from the "Insert" button on the ribbon and right click on each one of them, click on Report Connections and choose the charts to be connected to each slicer in order to have a dynamic model.



APPENDIX V

DASHBOARDS

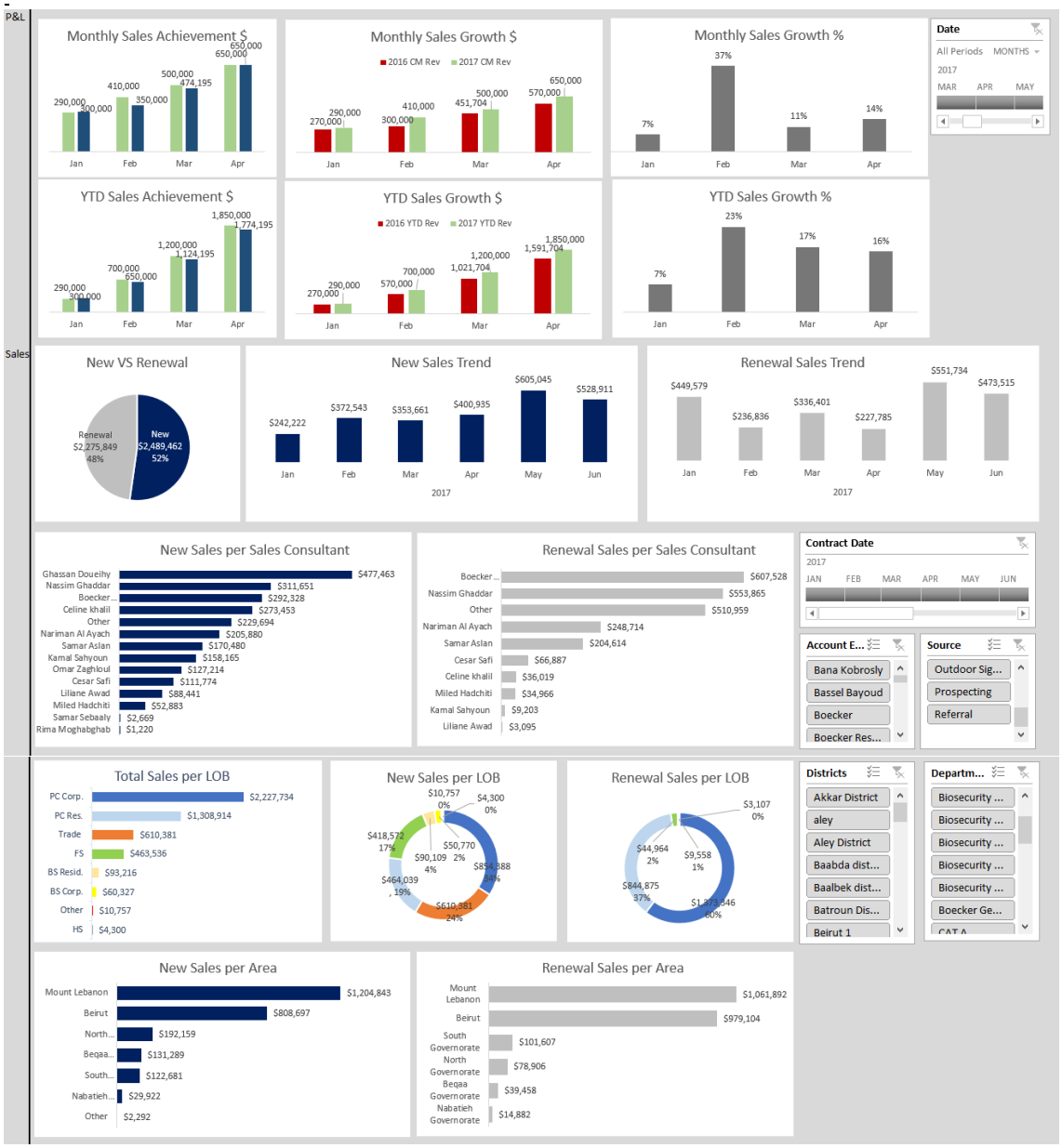


Figure 6: Sales Dashboard

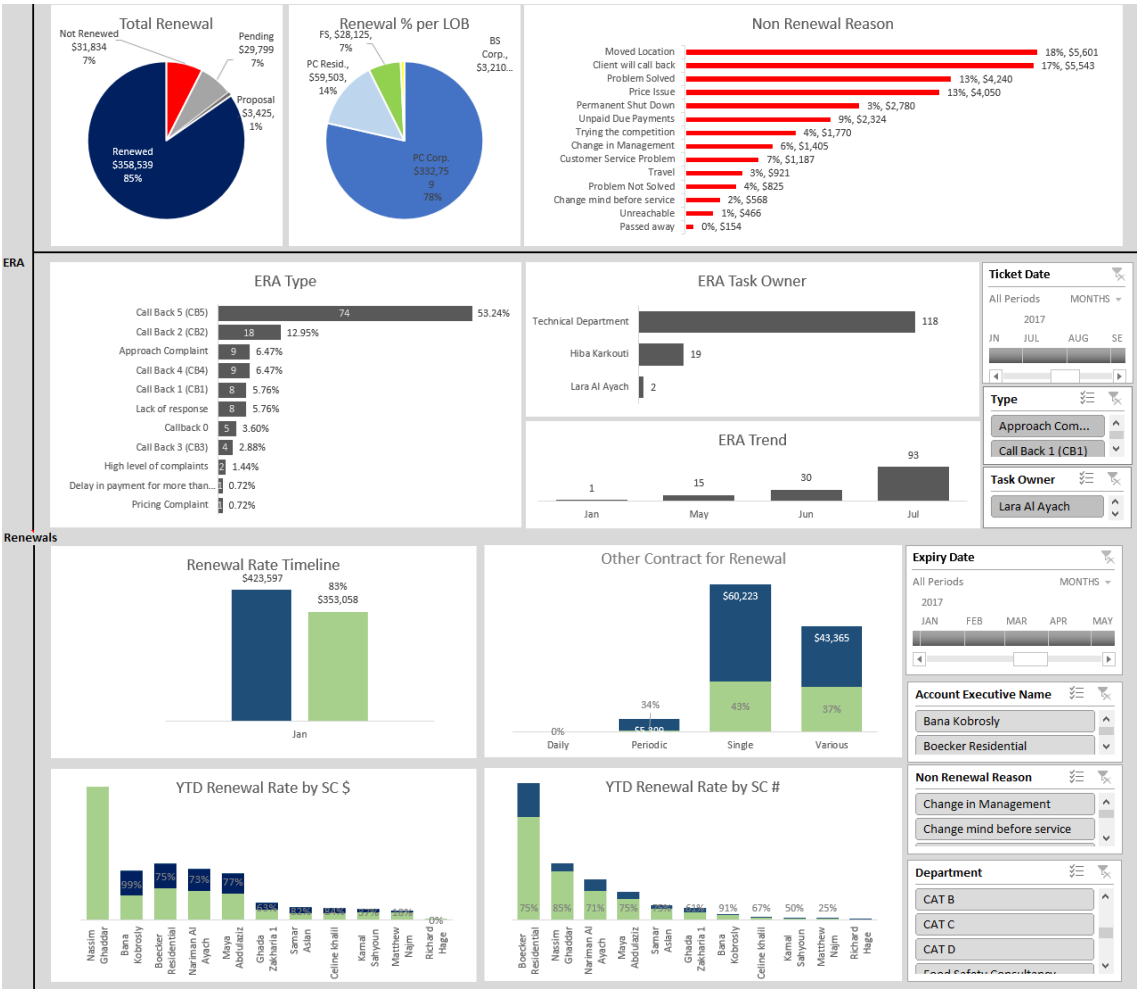


Figure 7: Renewals Dashboard

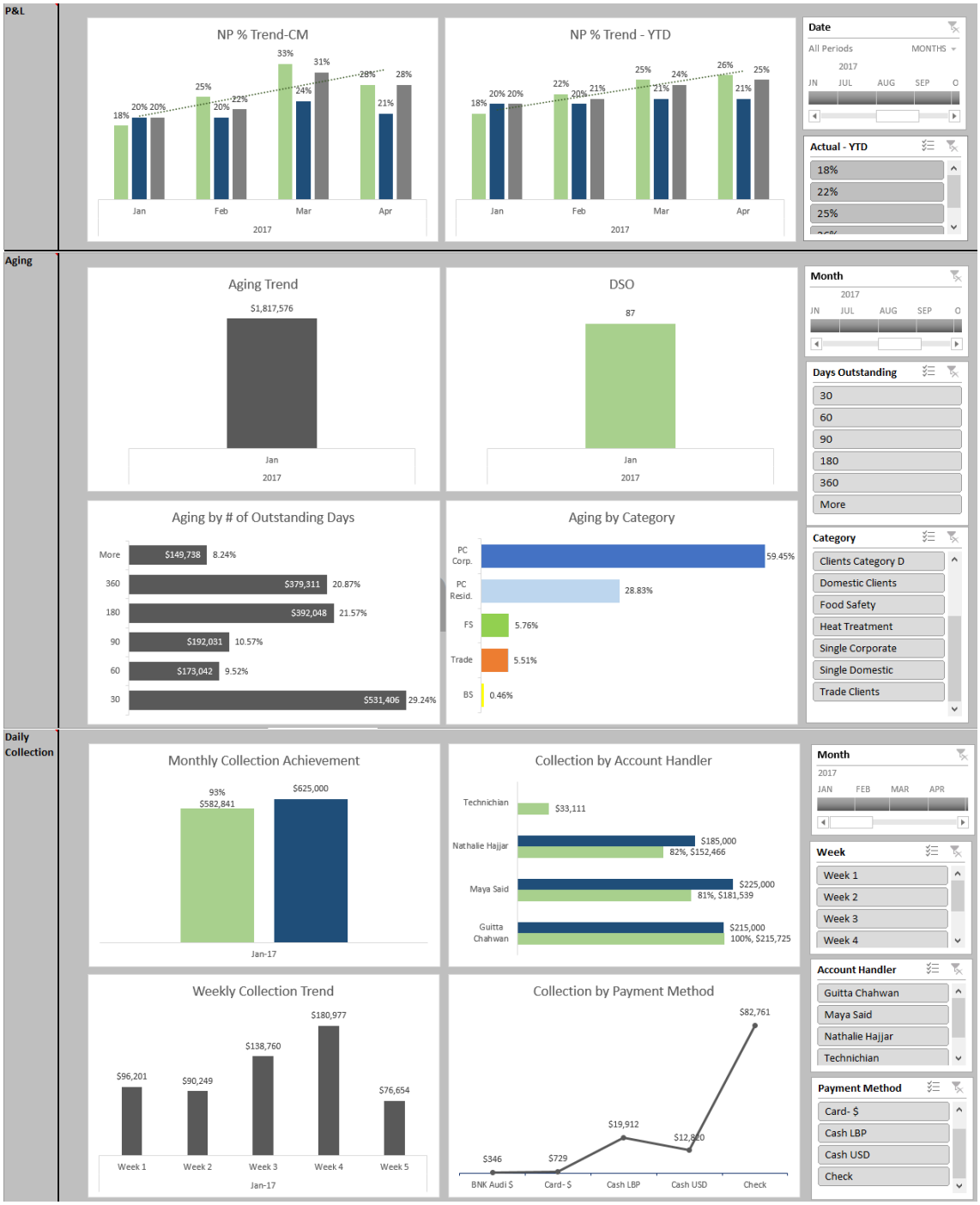


Figure 8: Finance Dashboard

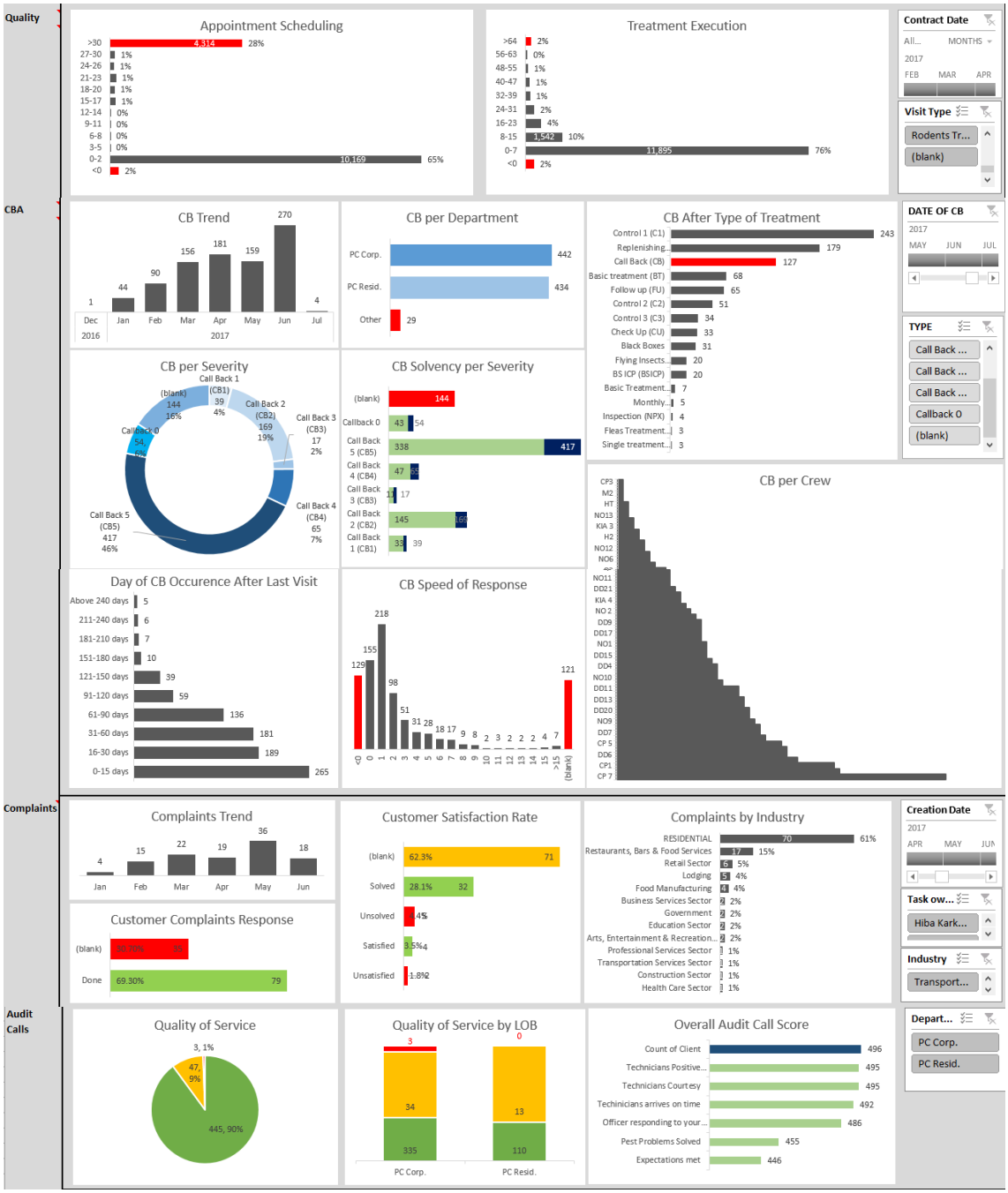


Figure 9: Operations Dashboard

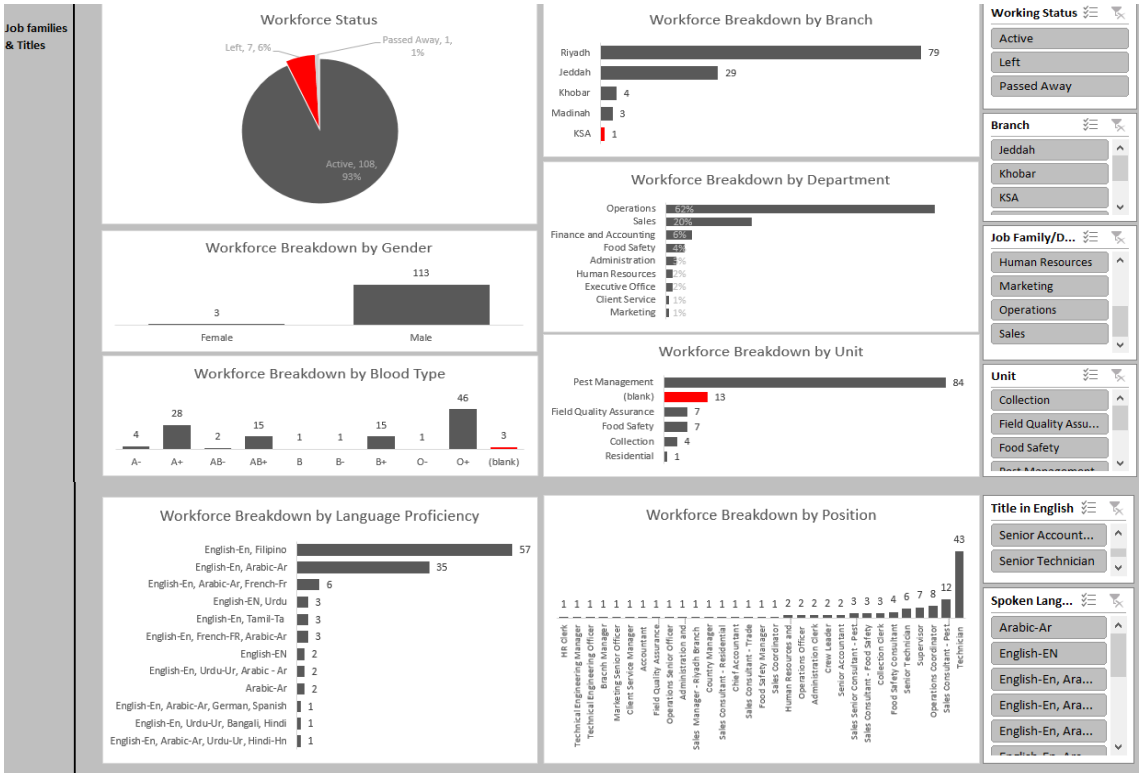

Job families & Titles
Workforce Status
Left, 7, 6%
Passed Away, 1, 1%
Active, 108, 93%
Workforce Breakdown by Branch
Riyadh 79
Jeddah 29
Khobar 4
Madinah 3
KSA 1
Working Status
Active
Left
Passed Away
Branch
Jeddah
Khobar
KSA
Workforce Breakdown by Gender
3
113
Female
Male
Workforce Breakdown by Department
Operations 52%
Sales 20%
Finance and Accounting 6%
Food Safety 4%
Administration 3%
Human Resources 2%
Executive Office 2%
Client Service 1%
Marketing 1%
Job Family/D...
Human Resources
Marketing
Operations
Sales
Workforce Breakdown by Blood Type
4 28 2 15 1 1 15 1 46 3
A- A+ AB- AB+ B B- B+ O- O+ (blank)
Workforce Breakdown by Unit
Pest Management 84
(blank) 13
Field Quality Assurance 7
Food Safety 7
Collection 4
Residential 1
Unit
Collection
Field Quality Assu...
Food Safety
Workforce Breakdown by Language Proficiency
English-En, Filipino 57
English-En, Arabic-Ar 35
English-En, Arabic-Ar, French-Fr 6
English-EN, Urdu 3
English-En, Tamil-Ta 3
English-En, French-FR, Arabic-Ar 3
English-EN 2
English-En, Urdu-Ur, Arabic - Ar 2
Arabic-Ar 2
English-En, Arabic-Ar, German, Spanish 1
English-En, Urdu-Ur, Bangali, Hindi 1
English-En, Arabic-Ar, Urdu-Ur, Hindi-Hn 1
Workforce Breakdown by Position
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 3 3 3 4 6 7 8 12 43
HR Clerk
Technical Engineering Manager
Technical Engineering Officer
Branch Manager
Marketing Senior Officer
Client Service Manager
Accountant
Field Quality Assurance...
Operations Senior Officer
Administration and...
Sales Manager - Riyadh Branch
Country Manager
Sales Consultant - Residential
Chief Accountant
Sales Consultant - Trade
Food Safety Manager
Sales Consultant
Human Resources and...
Operations Officer
Administration Clerk
Crew Leader
Senior Accountant
Sales Senior Consultant - Pest...
Sales Consultant - Food Safety
Collection Clerk
Food Safety Consultant
Senior Technician
Supervisor
Operations Coordinator
Sales Consultant - Pest...
Technician
Title in English
Senior Account...
Senior Technician
Spoken Lang...
Arabic-Ar
English-EN
English-En, Ara...
English-En, Ara...
English-En, Ara...

Figure 10: HR Dashboard

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