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Corporate Performance Management: the CCH Tagetik case

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To Giorgia. To the way she looks at me.

.

Preface

In the face of ever-increasing digitization, companies are forced to question the reliability of their performance measurement systems.

Internationalization and globalization have forced performance measurement systems to change shape and structure.

New business models have emerged that adapt to the constant digital and IT transformation that has revolutionized the tools for internal and external data analysis and performance measurement.

Digitization and increasing automation are strategic priorities for companies that want to keep up with the times.

These continuous needs must inevitably be linked to business KPIs; this means that the measurement of performance indices today requires innovative IT tools that can meet the needs of the business.

In response to these needs, Enterprise Performance Management systems such as CCH Tagetik, SAP, Oracle, OneStream, etc. were designed.

The following study aims to demonstrate how these software, specifically CCH Tagetik, improve business performance.

In this sense, the first chapter will be dedicated to the analysis of the doctrines of performance measurement and performance management. The definitions of the evaluation methodologies will be provided and the different evaluation systems will be analyzed and compared. An integration of the disciplines will then be proposed, with performance measurement at the disposal of performance management, which is functional to determine the degree of success of the company's strategies.

The second chapter will be dedicated to an analysis of information and technology systems, from the beginning to the present day. I will then analyze cases of companies operating in different sectors and geographical regions where the implementation of these systems has proved successful.

The third chapter will analyze the main Enterprise Performance Management systems. In particular, the functionalities of Oracle Hyperion, SAP S/4HANA, IBM Cognos, OneStream and CCH Tagetik will be described. The study of the "Magic Quadrant" by Gartner, which divides the different vendors of EPM software into four spheres of players (leaders, visionaries, challengers and niche players) will be reported.

The fourth chapter will present the case study under review. The company analysed will be *Mondo Convenienza*, the first group in Italy for the distribution of furniture and furnishing. The company will be described, the strategy defined and the main financial indicators reported. *Mondo Convenienza* was selected because it implemented the Tagetik software in 2016 to carry out the processes of Financial Statements, Intercompany Relations, Statutory Consolidation, Consolidated Disclosure

Management and Executive Dashboards. The process of selecting the EPM software will then be described.

The fifth chapter will be devoted to quantitative analysis. A questionnaire will be sent to *Mondo Convenienza* employees who use Tagetik daily for their operational activities and the following assumptions will be confirmed or rejected:

- Tagetik is appreciated by users;
- Tagetik simplifies business processes;
- Tagetik reduces production time;
- Tagetik improves processes.

The data will be analyzed through SPSS.

The sixth chapter will be dedicated to qualitative analysis. Giuliano Caruso, Head of the Accounting Data Processing and Administrative Services Centre of *Mondo Convenienza*, and Luigi Esposito, Senior Manager at KPMG with decades of experience at Tagetik will be interviewed. The respondents were selected as they represent respectively the user and system integrator of the Tagetik package and will therefore offer a double insight into the degree of appreciation of the package. The data will be analyzed through Sentiment Analysis and Keyword Analysis and will be compared to each other in order to critically examine similarities and disagreements.

Finally, conclusions, limitations, implications and avenues for future research will be drawn up.

Chapter 1

From Performance measurement to Performance management

In this first chapter, an in-depth analysis of the doctrines of performance measurement and management was carried out. Specifically, the general definitions of the methodologies have been reported and the main evaluation tools of both disciplines have been mentioned, analyzed and compared.

The integration of the subjects under examination was then discussed, analyzing the role of performance measurement as a key tool to support performance management.

The analysis of the integration of the two disciplines aimed to assess the performance management as the final destination of the performance measurement.

Therefore, the study of performance indicators is functional, allowing companies to determine the degree of success of the choices made up to that time and change strategy in the event of failure.

1.1.Performance Measurement: a literature review

A consistent framework of business research on performance measurements is dedicated to raising awareness of the determinants of organizational performance as well as answering some questions, such as what makes one company more profitable than another? Or do we have absolute measures in place that allow us to quantify business performance in an unavoidable way to clearly distinguish successful practices from failed ones?

All organizations have been striving with their performance measurement[1] systems in order to help internal members to focus on what really matters to manage a business. (Beretta, Bozzolan, 2013)

It is therefore essential to analyze the concept of Performance Measurement, which is extensively discussed in the literature and whose definitions can mainly be traced back to two macro-areas.

From the perspective of Professor Andy Neely, Performance Management is <<*the process of quantifying the efficiency and effectiveness of past actions*[2]>>.

[1] Beretta S., Bozzolan S. (2013), Il governo della performance dei processi di business: dai Kei Performance Indicator ai Key Risk Indicator, Management Control, Issue 2, pp. 9-37

[2] Neely, A.D., Adams, C. and Kennerley, M. (2002), The Performance Prism: The Scorecard for Measuring and Managing Stakeholder Relationships, Financial Times/Prentice Hall, London.

Neely[3] therefore decides to focus on the concepts of efficiency and effectiveness, meaning by efficiency a "*measure of how economically the firm's resources are utilized when providing a given level of customer satisfaction*" and by effectiveness the "*extent to which customer requirements are met*" (Neely at al.'s, 1995).

While this definition underlines both effectiveness and efficiency, it does not provide any indication on how managers can challenge their performance measurement systems and, broadly speaking, on what they measure, how can they use measures and why.

Max Moullin provides a different definition, stating that performance measurement is "*evaluating how well organisations are managed and the value they deliver for customers and other stakeholders*[4]" (Moullin, 2002).

According to the aforementioned definition, Moullin gives much more guidance to managers who are directly involved in performance measurement process by facilitating them "*to consider the extent to which organisations measure the value they deliver to their customers and whether it covers the main aspects of how performance is managed*[5]." (Moullin, 2007).

Moullin aims, instead, to demonstrate the relationship between performance measurement and organizational excellence as "*performance measurement provides the information needed to assess the extent to which an organisation delivers value and achieves excellence*." (Moullin, 2007).

These divergent definitions have thus generated two lines of thought, one filo-Neely - whose main defender is Bocci - supporting strictly quantifiable measurement indices and the second filo-Moullin - with spokesman Pratt - focused on the concept of evaluation.

The debate on the definition of performance measurement has been swarming and has produced numerous publications.

As Paul Folan and Jim Brown noted in 2005,

"*in the last fifteen years or so Performance Measurement (PM) has been seen to occupy the minds of academics in an ever-increasing number of fields. The mid to late nineties seem to have seen the peak of this activity. Neely estimated that between 1994 and 1996, some 3,615 articles on performance measurement were published alongside the statistic that in 1996 books on the subject appeared at a rate of one every two weeks in the USA alone*"[6]. (Folan Jim Brown,2005).

[3] Neely, A., Gregory, M., Platt, K. (1995), Performance measurement system design, a literature review and research agenda, University of Cambridge, Cambridge

[4] Moullin, M. (2002), Delivering Excellence in Health and Social Care, Open University Press, Buckingham.

[5] Moullin, M. (2007), Performance measurement definition, linking performance measurement and organizational excellence, Sheffield Hallam University, Sheffield

[6] P. Folan, J. Browne, (2005), A Review Of Performance Measurement: Towards Performance Management Computers in Industry, 56 , pp. 663-680

With a view to giving order to this intense debate in order, Ted Watts and Carol L.McNair-Connolly have summarized the most wide-ranging models of performance measurement that have been theorized over a period of more than 30 years.

From here until the end of the paragraph, the analysis will be developed by analyzing different models of performance measurement, theorized by authors such as Keegan, 1989; Lynch and Cross, 1991; Kaplan and Norton, 1992; Brown, 1996; Neely and Otley, 2002.

1.1.1. The Tableau de Bord

Watts and McNair-Connolly's analysis starts with the several "Tableaux de Bord", theorized respectively by Epstein and Manzoni in 1997, Bourguignon in 2004 and by Pezet in 2009, which, as the authors report, are not only focused on "*financial indicators, but are developed in the context of the mission and objectives of each unit. This involves translating the units vision and mission into a set of objectives from which key success factors are identified and then transformed into a series of quantitative key performance indicators*[7]" (Watts and McNair-Connolly, 2012).

In this sense, the Tableu de Bord is used to give the top management an overview of the business, to track to goals that have been set and take in corrective actions if needed.

The main goal of the Tableu is to translate the mission and the vision of the single units of company into a set of objectives. In this way, each single unit will be able to identify its Key Success Factors (KSF) and translate them into quantitative Key Performance Indicators (KPI).

The Tableau de Board cannot be universal and standardly applicable. As Epstein and Manzoni underline,

"*the Tableau de Bord cannot be a single document applying equally well to the whole firm; because each sub-unit, and in fact each manager, has different responsibilities and objectives, there should be one Tableau de Bord for each sub-unit. These "dashboards" should be integrated in a nested structure, like the one illustrated by a set of Russian dolls. In this context, the firm's overall Tableau de Bord would translate into a series of documents supporting local decision making*"[8]. (Epstein and Manzoni, 1997)

Furthermore, the authors suggest to extend the Tableu de Bord to operational indicators, and not financial only, since they are able to give more reliable information "*on the impact of "local" events and decisions, and thus on cause-effect relationships*". (Epstein and Manzoni, 1997)

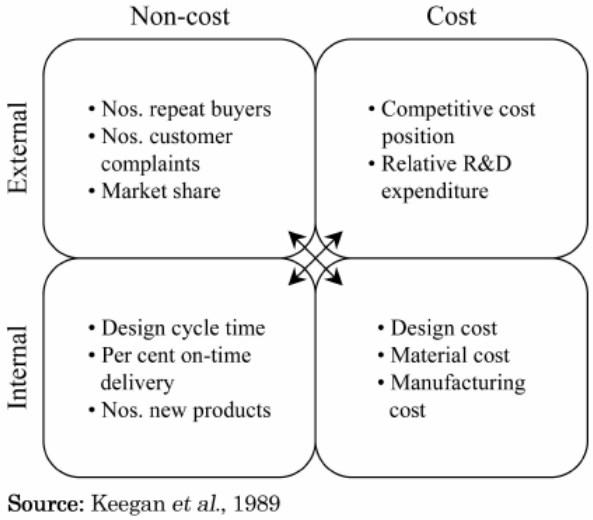
[7] Watts, T. & McNair-Connolly, C. J. (2012). New performance measurement and management control systems. Journal of Applied Accounting Research, 13 (3), 226-241.

[8] Epstein M.J. and Manzoni J.F. (1997). "The Balanced Scorecard & Tableau de Bord: A Global Perspective on Translating Strategy into Action"; INSEAD Working Paper, 97/63/AC/SM

Surely, they suggest to realize a Tableu document that is concise, reporting just a small number of indicators covering the time of the last period and adding cumulative performance since the beginning of the year.

1.1.2. The Performance Measurement Matrix

Then Watts and McNair-Connolly go on analyzing the "Performance measurement matrix", conceptualized Keegan in 1989. The matrix "*categorizes measurement as being 'cost' or 'non-cost' and 'internal' or 'external'. Key to the model is the use of the key metric approach and the 'Determine and Decompose' method. This involves decomposing departments into functional equivalents and assessing how the departments support the business*". (Watts and McNair-Connolly, 2012)



Source: Keegan *et al*, 1989

Figure 1. The performance measurement matrix

In line with this model, Fitzgerald, in 1991, proposed a second version which was called "The results and Determinants Framework", in which the matrix, "*is based on the key assumption that there are two basic types of performance measure in any organization, those that relate to results (competitiveness, financial performance), and those that focus on the determinants of the results (quality, flexibility, resource utilization and innovation)*[9]*"*. (Spickova and Striteska, 2012).

[9] Striteska, M., Marketa Spickova, M. Review and Comparison of Performance Measurement Systems (2012), IBIMA Publishing, Journal of Organizational Management Studies

Results	Financial performance
	Competitiveness
Determinants	Quality
	Flexibility
	Resource utilisation
	Innovation

Source: Fitzgerald *et al.*, 1991

Source: Fitzgerald *at al*, 1991

Figure 2. The results and Determinants Framework

1.1.3. The strategic Measurement and reporting Technique (SMART) Pyramid

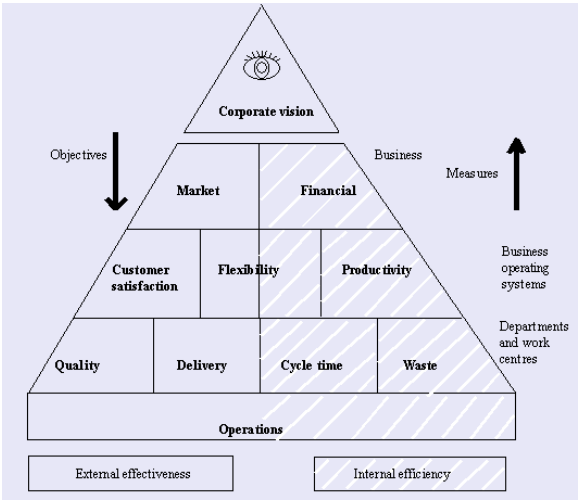
In the same year, Lynch and Cross proposed "The strategic Measurement and reporting Technique (SMART) Pyramid" in which they underlined the importance of producing measurement systems capable of reflecting "*the corporate vision as well as internal and external business objectives*". (Watts and McNair-Connolly, 2012)

The corporate vision is defined as the first level, and represents the mission of the organization and the way by which the long-term success and the competitive advantage will be achieved.

The second level focuses of market and financial success in order to achieve the corporate vision. In this sense, market and financial measures are used to reach the organization's critical success factor.

The second level is related to the third one since its goal is the achievement of the main driving forces to hit the organization's strategic objectives. To do so, customer satisfaction, flexibility and productivity must be increased.

The fourth level is composed of several indicators (quality, delivery, cycle time and waste) that monitor the third level driving forces. Quality and delivery are external-focus measures and they are characterized to be non-financial, while cycle time and waste are financial and focused on internal efficiency.



Source:Accounting & Planning, 2014

Figure 3. The strategic Measurement and reporting Technique (SMART) Pyramid

1.1.4. The Balanced Scorecard

Later in 1992, Kaplan and Norton theorized the model that was most successful in their field: the Balanced scorecard.

The authors firmly stated that, "*managers want a balanced presentation of both financial and operational measures*", and, as they underlined in the article, "*the balanced scorecard includes financial measures that tell the results of actions already taken. And it complements the financial measures with operational measures on customer satisfaction, internal processes, and the organization's innovation and improvement activities—operational measures that are the drivers of future financial performance*[10]". (Kaplan and Norton, 1992)

The balance scorecard aims to answer four questions based on customer, internal, innovation and learning, and financial perspective.

The questions are as follows (Holsapple, 2003)[11]: (43)

1. How do customers see us?

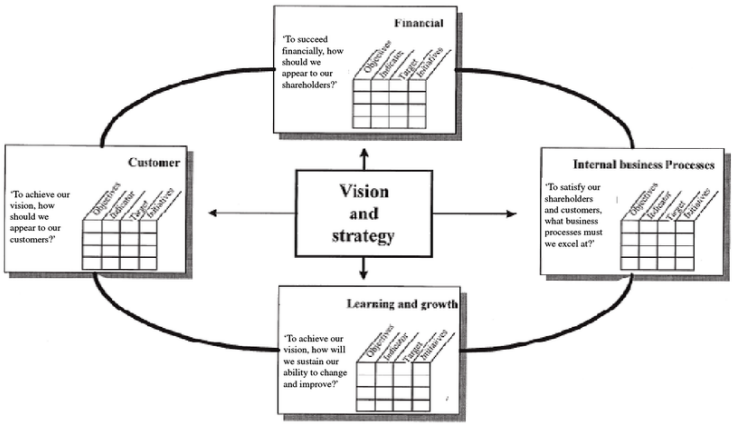
2. What must we excel at?

3. Can we continue to improve and create value?

4. How do we look to shareholders?

[10] Kaplan, Robert S., and David Norton. "The Balanced Scorecard: Measures that Drive Performance." Harvard Business Review 70, no. 1 (January–February 1992): 71–79.

[11] Clyde, W. Holsapple, Handbook of knowledge management 2, 2003 Springer



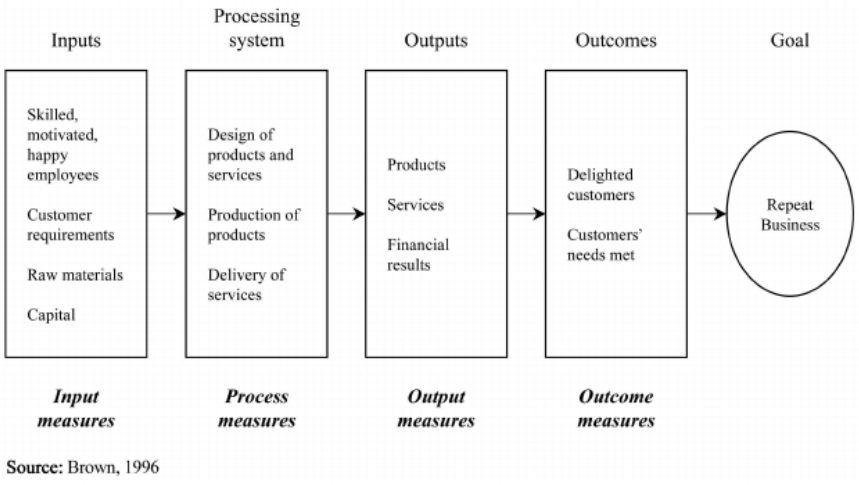
Source: Kaplan and Norton, 1996

Figure 4. Balanced Scorecard framework

1.1.5. The Input-Process-Output-Outcome Framework

Four years later, in '96, Brown proposed another model, the "Input-Process-Output-Outcome Framework" whose purpose was to create "*links between five stages in a business process and the measures of their performance. These stages are defined as inputs, processing systems, outputs, outcomes and goals*". This requirement stems from the assumption of a "*linear set of relationships between these stages, with each previous factor determining the next*". (Watts and McNair-Connolly, 2012)

Brown's goal was to link measures in a cause-effect relationship and even if it could appear as an oversimplification, the model, as Neely underlines, distinguish different categories of measures.



Source: Brown, 1996

Figure 5. The Input-Process-Output-Outcome Framework

1.1.6. The Performance Prism

Finally, Neely proposed at the beginning of the new millennium, "The performance prism" consisting of "*of five integrated facets which identify areas for organisations to address: stakeholder satisfaction, strategies, processes, capabilities and stakeholder contribution*". (Watts and McNair-Connolly, 2012)

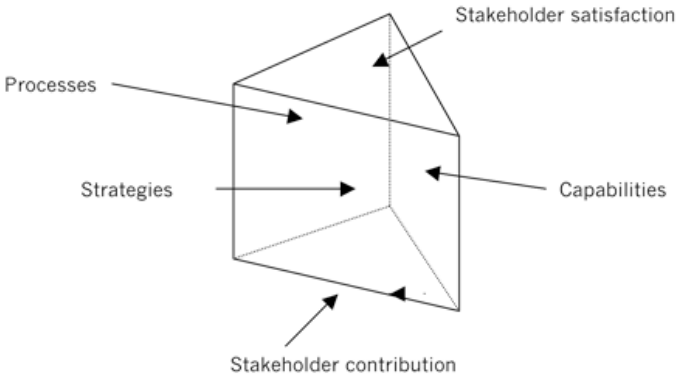
As Watts and McNair-Connolly point out, "*the critical and unique aspect of the performance prism is the reorganization of the reciprocal relationship between the stakeholder and the organization*". (Watts and McNair-Connolly, 2012)

To this effect, stakeholder's satisfaction is fundamental since the organization, according to the author, exists to deliver value to key stakeholders (suppliers, investors, customers, employees, etc). Since the group is heterogeneous, the value will be delivered differently according to each group.

Further reason that makes the stakeholder's contribution fundamental is that the organization, while delivering value to stakeholders, wants and needs benefit from them.

Doing so, the organization has to understand what stakeholders' wants and needs are, and, through successful strategies, satisfy them.

Stakeholder satisfaction will be achieved according to the process built up by the organization and through what makes the organization work, namely through the several capabilities at its disposal (such as infrastructure, people, technology, etc).



Source: ACCA

Figure 6. The Performance Prism

Neely states in his manualthat "*by its nature performance measurement is a diverse subject*[12]" (Neely, 2002), and examines the 3 perspectives of performance measurement: accounting (analysed by

[12] Neely, A., Business Performance Measurement. Theory and practice. Cambridge University Press, 2002.

Otley), marketing (analysed by Bruce Clark), operations management (analysed by Neely and Austin).

In the manual Otely lists the three main functions of financial performance measures: financial management tool; financial performance as "major objective of a business organization"; and financial measures of performance as a motivational and control mechanism within an organization.

About the first function of the financial performance measures, Otley assumes that,

"*Any organization, whether public or private, has to live within financial constraints and to deliver perceived value for money to its stakeholders. The role of the finance function is to manage the financial resources of the organization, and to ensure that the financial constraints it faces are not breached. Failure to do this will lead to financial distress, and ultimately, for many organizations, to financial failure or bankruptcy. Thus, financial planning and control is an essential part of the overall management process. Establishment of precisely what the financial constraints are and how the proposed operating plans will impact upon them are a central part of the finance function. This is generally undertaken by the development of financial plans that outline the financial outcomes that are necessary for the organization to meet its commitments. Financial control can be seen as the process by which such plans are monitored and necessary corrective action proposed where significant deviations are detected*". (Neely, 2002)

Financial plans must therefore focus on both cash flow planning to make sure that liquidity is available to meet the financial obligations of the organization (and therefore not incur technical insolvency) and on profitability and asset value (looking at the balance sheet rather than profit and loss account or cash flow statement).

So, financial management deals with the "*acquisition of financial resources on terms as favorable as possible, and on the utilization of the assets that those financial resources have been used to purchase, and on the interaction between these two activities*". (Neely, 2002)

From this perspective, Otley reports the "pyramid of ratios" to analyze the Return on investment measure that is considered an overall measure of profitability.

The ratios are broken down and the pyramid clearly shows the connection between them: hence, it represents a focused approach that aims at providing an "integrated" pyramid.

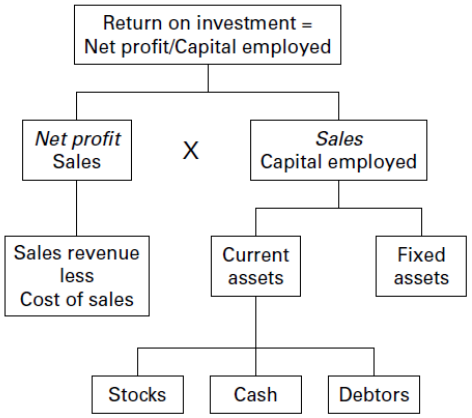


Figure 1.1. Outline pyramid of accounting ratios.

Source: Otley, 1999

Figure 7. Outline pyramid of accounting ratios

In this context, in order to have a concrete vision, performance measurement uses a series of ratios concerning cash flow and liquidity, among which the most commonly used ones, as Otley points out, are:

- *current ratio (current assets divided by current liabilities),*
- *quick ratio/acid test (current assets less inventories divided by current liabilities),*
- *inventory turnover period (inventories divided by cost of sales, with the result being expressed in terms of days or months),*
- *debtors to sales ratio and*
- *creditors to purchases ratio.*

These ratios are particularly useful for the short-term cash flow while, with long-term profitability, profit to sales and value-added ratios are calculated.

Furthermore, a set of ratios have to be estimated in considering the rising of capital, like the debt to equity capital since it indicates the risk associated with a company's equity earnings.

In conclusion, as Otley stresses, "*there is thus no definitive set of financial ratios that can be said to measure the performance of a business. Rather, a set of measures can be devised to assess different aspects of financial performance from different perspectives*". (Neely, 2002)

In addition, being the financial performance a "major objective of a business organization", Otley highlights the importance of accounting performance measures such as profit, return on investment, or EVA®, since the reference purpose is to meet the needs of external suppliers of capital, both debt and equity.

He asserts, indeed, that,

"*It is this need that external financial reporting addresses. An organization's annual report and financial accounts are primarily produced for the shareholders, although some use may be made of them by bankers and other providers of debt capital. In some ways, these external financial reports can be seen as mirroring the internal measures and ratios discussed above, in that they cover the same three main areas of cash flow (rather obliquely), operating profit, and asset values*". (Neely, 2002)

The debate has centred on the advantages or disadvantages of audited financial statements to shareholders. In this regard, Otley underlines that, in the attempt to control managers, owners (shareholders) have difficulties to do as they have less detailed information.

Several indicators for shareholders are considered. Earnings (profit) is one of them because it is "*the central performance indicator for shareholders*" (Neely, 2002). The ratios that are most commonly used are related to both the past and expected future performance of the reference company and are:

- *EPS (total annual earnings divided by the number of shares in issue). Earnings essentially represent the (cum dividend) and*
- *P/E ratio (current share price divided by the last reported earnings figure)*

Finally, managers use the financial measures of performance as a motivational and control mechanism within the company with the aim of "*increasing shareholder value*". (Neely, 2002)

Besides, Otley takes into consideration the account performance measures, both earnings and balance sheet values, emphasizing that,

"*accounting information is concerned not just with financial performance, but rather uses financial indicators to represent the underlying activities that are being managed. In an organization of any size or complexity, there is a need to be able to represent a variety of different activities in terms of a common language or unit of measurement. Accounting provides such a common language, so that the impact of very different activities can be aggregated into overall measures, such as sales revenue, costs, and profitability*". (Neely, 2002)

Then the author adds that such outcomes measures are sometimes insufficient mechanisms of control. Therefore, there is the need of measures that are "drivers" of performance: through them, activities that are necessary to achieve required results (financial and other) will be identified. From this assumption, several frameworks have been theorized, including the previously analyzed balanced scorecard.

1.2.An inevitable shift

Whatever the approach, Performance measurement can be tuned – by taking up Simons' lesson - as a set of performance measures used by companies to plan and monitor the implementation of projects and to be able to take corrective actions if necessary.

What has been described so far in relation to the different measurement criteria and the various approaches to the subject, should not be considered as a discipline in itself, but rather as a fundamental tool at the service of Performance Management (Folan,Brown, 2005).

In this regard, Amaratunga and Baldry define Performance Management as

"*the use of performance measurement information to effect positive change in organisational culture, systems and processes, by helping to set agreed-upon performance goals, allocating and prioritising resources, informing managers to either confirm or change current policy or programme directions to meet these goals, and sharing results of performance in pursuing those goals. Performance measurement and performance management follow one another in an iterative process; management both precedes and follows measurement, and in doing so creates the context for its existence*[13]". (Amaratunga and Baldry, 2002)

Precisely, performance measurement provides information regarding the company's health and the state in which it is in achieving the business objectives. In short, it helps in taking decisions in order to improve the organizational performance.

However, it is important to consider, as the authors underline, that "*results of performance measurement indicated what happened, not why it happened, or what do to about it*". (Amaratunga and Baldry, 2002)

Therefore, "*in order for an organization to make effective use of its performance measurement outcomes it must be able to make the transit from measurement to management*". (Amaratunga and Baldry, 2002)

In this respect, performance management gives the organization the possibility to improve the development activities and, most of all, provides it with specific feedbacks according to performance measurement results concerning the desired outcomes.

It means that after analyzing the performance measurement results, areas of performance improvement must be established: this is what a performance management system does. It gives facilities managers not only the knowledge about the success of the strategy they have implemented but further, in case of failure, an explanation of the reason behind it.

[13] Amaratunga, D. & Baldry, D. (2002) Moving from performance measurement to performance management. Facilities Journal, 20:5/6, pp 217-223.

Amaratunga and Baldry list the two key components necessary to move from performance measurement to performance management:

- "*The right organizational structure which facilitates the effective use of performance measurement results"; and*
- *"The ability to use performance measurement results to bring about change in the organization*" (Amaratunga and Baldry, 2002)

To do so, a performance management programme must be carried out by facilities management organizations, with the following attributes:

- "*Leadership involvement in designing and deploying effective performance measurement and management systems";*
- *"Effective and open communication between empoloyees, stakeholders, and customers in order to share assessment results and any new initiatives to improve performance";*
- *"Accountability of results which are clearly assigned and well understood";*
- *"Compensation, rewards, and recognition that are linked to performance measures";*
- *"Targets that are linked to appraisals"; and*
- *"A performance measurement system that is positive".* (Amaratunga and Baldry, 2002)

In this way, facilities managers will analyze past and present performance results to assess if their strategy is still valid or otherwise change it. They will define where they want to be in the future and embed the goals in the performance management structure.

This idea is clearly analyzed by Kaplan and Norton in the Balanced Scorecard.

As the authors highlight, the fourth perspective (Learning & Growth) "*identifies the infra-structure that the organization must build to create long-term growth and improvement*[14]". (Kaplan and Norton, 1996).

According to Kaplan and Norton, the Balanced Scorecard must be built using several financial and non-financial measures linked to the organizational objectives in a relationship in which measures and objectives are "consistent and mutually reinforcing". (Kaplan and Norton, 1996). This cause-effect relationship will then converge into a single strategy. This relationship must be valid for all the perspective expressed by the Balanced Scorecard.

For example, as the authors underline,

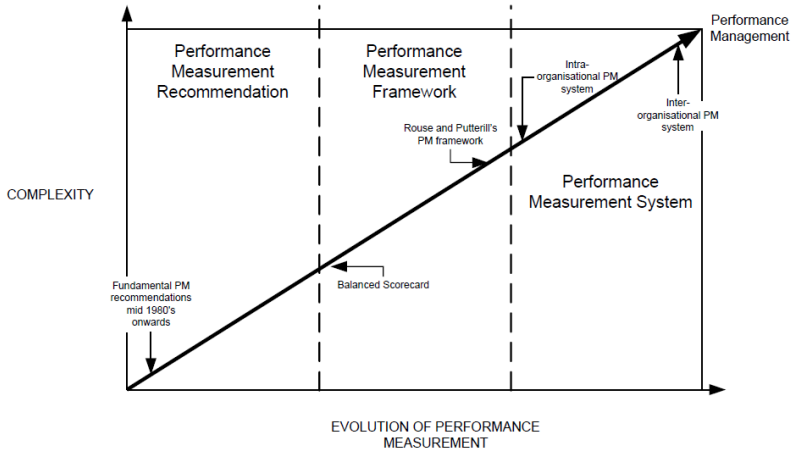
"*Return on capital employed (ROCE) may be an outcome measure in the financial perspective. The driver of this financial measure could be repeat and expanded sales from existing customers, the result of a high degree of loyalty among existing customers. So, customer loyalty gets put on the*

[14] Robert S. Kaplan, David P. Norton, (1996) "strategic learning & the balanced scorecard", Strategy & Leadership, Vol. 24 Issue: 5, pp.18-24

Scorecard (in the Customer perspective) because it is expected to have a strong influence on ROCE". (Kaplan and Norton, 1996)

This process will then be applied continuously to achieve the best performance and make the company excel at it. To do so, the Balanced Scorecard will appear as a mix of measures and performance drivers, fundamental to guide how the outcomes will be achieved.

In this regard, Forlan and Brown describe in the picture below the evolutionary process of performance measurement. It begins with the recommendation and ends in the comprehensive system of performance management. They add that today performance measurement "*has moved towards examining the organisation as a whole, and impacting, to a greater extent, upon strategy*[15]". (Folan and Brown, 2005)



Source: Folan and Brown, 2005

Figure 8. The evolutionary process of performance measurement

1.3.Performance Management: a literature review

The analysis proceeds with the comparison of the different theories concerning the discipline of performance management.

The studies of several authors have been examined, including Simons, 1995; Otley, 1999; Ferreira and Otley, 2000; Spekle, 2001; Busco, 2008; Malmi and Brown, 2008; Aguinis, 2009; Wadongo, 2014.

[15] P. Folan, J. Browne A Review Of Performance Measurement: Towards Performance Management Computers in Industry, 56 (2005), pp. 663-680

1.3.1. Aguinis

Defining Performance Management, Herman Aguinis describes it as "*a continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic goals of the organization*[16]". (Aguinis, 2009)

This process can be thought of as a constant cycle, without interruptions, in which you should never lose sight of the strategic objectives of the organization, which requires that managers ensure that everything is confluent and consistent with the common goal to gain competitive advantage.

Aguinis adds that performance management "*therefore creates a direct link between employee performance and organizational goals and makes the employees' contribution to the organization explicit*". (Aguinis, 2009)

The process that follows performance management is therefore a continuous and all-inclusive cycle, which goes far beyond the performance appraisal, limited to the annual evaluation of employees "*without an ongoing effort to provide feedback and coaching so that performance can be improved*". (Aguinis, 2009)

The two-way dialogue with employees who make the corporate objective their own goal is a fundamental element of the discipline at hand.

In this respect, Aguinis emphasizes that "*making an explicit link between an employee's performance objectives and the organizational goals also serves the purpose of establishing a shared understanding about what is to be achieved and how it is to be achieved*." (Aguinis, 2009)

Aguinis lists 16 contributions from the management performance system:

1. Increased motivation for better future performance
2. Increasing self-esteem
3. Managers boast of the opportunity to get to know their employees
4. The definition of the work and the criteria are further clarified
5. Improving the perception of one's own work and the development of it
6. Administrative actions are fairer and more appropriate
7. Business objectives clarified
8. Employees acquire more skills

[16] Aguinis, H. (2009). Performance management (2nd ed.). Upper Saddle River, NJ, US: Prentice Hall/Pearson Education

9. Employee misconduct is kept to a minimum
10. Better protection from litigation
11. Better and more tempetistic differentiation between good and bad results
12. Supervisors' opinions about performance are communicated more clearly
13. Change in the organisation is facilitated by
14. Improved motivation, commitment and intention to stay in the organization
15. The "taking voice" is encouraged
16. Employees' commitment is strengthened (Aguinis, 2009)

The adoption of a structured performance management system meets the criteria for improving the overall company. In addition to bringing benefits to business management, it is a strategic key to "*translate business strategy into business results*" (Aguinis, 2009). Aguinins - by resuming a study by Sumlin - underlines that this system influences "*financial performance, productivity, product or service quality, customer satisfaction, and employee job satisfaction*". (Aguinis, 2009)

From his study, 79% of CEOs surveyed say that the performance management systems adopted in the company drive the "*cultural strategies that maximize human assets*". (Aguinis, 2009)

As Aguinis remarks, the implementation of an integrated performance management system responds to the need for six specific purposes: strategic, administrative, informational, developmental, organizational maintenance, and documentational.

The strategic purpose makes top management reach the strategic business objectives aligning individual goals with those of the organization. Furthermore, through the "*onboarding process*" the connection between individuals and organization is increased making the employees transit from outsider to organizational insider.

Hence, "*performance management serves as a catalyst for onboarding because it allows new employees to understand the types of behaviors and results that are valued and rewarded, which, in turn, lead to an understanding of the organization's culture and its values*." (Aguinis, 2009)

The function of the administrative purpose is instead to provide all the valid information necessary to make decisions concerning employees. In this context, the reference is to "*salary adjustments, promotions, employee retention or termination, recognition of superior individual performance, identification of poor performers, layoffs, and merit increases*". (Aguinis, 2009)

The informational purpose, as its name indicates, is rather a fundamental means of communication, with the aim of informing employees about the accuracy of their activities and aligning them with the expectations of the supervisors, making them concretely aware of which objectives the administration considers most important.

The developmental purpose is another objective that relates managers to employees. Through this, the former use feedback to "*coach employees and improve performance on an ongoing basis*". (Aguinis, 2009) It is a means of identifying what the strengths and weaknesses are and what the performance deficiencies that are necessary for both managers and employees to identify their career path.

For organizational maintainance purpose, we refer to the goal of "*provide information to be used in workforce planning*" (Aguinis, 2009). This concerns with that set of systems necessary to respond to the needs that arise both inside and outside the organization, pinpointing the priorities. Finally, the documentational purpose enable the organization to get valuable information.

A good implementation of an ideal performance management system must have, according to Aguinis, several characteristics.

First of all, there have to be strategic congruence since individual and organizational goals must be aligned.

There must be congruence in the context as well: the culture of the country in which the organization is placed influences the effectiveness of the performance management system. It means that the culture of both the organization and the country must be in line.

Furthermore, the evaluation process must be extended to all the employees, managers included, covering all major job responsibilities, and the performances, considering the whole period in question. In this way, the evaluation will provide feedbacks on what is going good and what has to be improved.

The goal is to avoid time-consuming and expensive systems and create an easy-to-use one in which benefits overweight costs.

The meaningfulness is another characteristic underlined by Aguinis.

Every standard and evaluation is relevant, performance assessment must be essential only for functions controlled by employees, at regular intervals and at appropriate moments. Additionally, this system of evaluation should be ongoingly developed and the results gained used to take administrative decisions.

The author adds that this system must be specific because employees must have a clear idea of what the organization wants from them, to let them understand what an efficient performance means. The measurement system to analyze it must be reliable, free of errors and valid, not including irrelevant performance facets.

Furthermore, this system has to be considered fair and must be accepted by the participants. Otherwise, if the system is perceived as unfair, the sense of commitment will decrease and it will lead people to leave the organization.

In addition, the system must be inclusive, gathering different inputs from multiple sources. It means that the participants must be the ones who design and implement the system.

This will lead to an open system, where the feedbacks are clear and the employees informed of the quality of their performance on a regular basis. The evaluation will then be correct and objective.

Lastly, the system must be standardized: the process must be the same and repeated on a regular basis and in compliance with ethical standards, respecting the privacy of the workers.

Going through a literature review, as Chiara Demartini points out in Performance Management Systems, "*most of the literature on PMS design is grounded on the contingency approach*[17]". (Demartini, 2013) (21)

Despite having been theorized more than 30 years ago, it is still today the main reference in the context of Performance Management. It assumes that a set of variables influences both the design and implementation of the performance management system and that therefore it must be customized in order to effectively match the characteristics of these variables

It means that it does not exist a standard and universal performance management system but, on the contrary it and its effectiveness are related to contextual factors.

Ferreira and Otley agree with this approach stating that "*variables relating to external environment, strategy, culture, organizational structure, size, technology, and ownership structure have an impact on control systems design and use*[18]". (Ferreira, Otley, 2005)

Starting from this assumption, many authors found that "*similar contingent variables may lead to different, although equally effective, control packages*"(Demartini, 2013).

The effect of these contingent variables on the design of PMS was tested according to both external and internal contextual variables.

1.3.2. Wadongo

It is possible to mention, among the various contingent variables the environmental uncertainty, technology, organizational structure e strategy.

The external environment is a contingency variable that largely influences an organization since it can produce environmental uncertainty, a high degree of hostility and environmental turbulence. Environmental uncertainty surrounds the design and realisation of integrated performance management systems. Kaplan points out that it is related to the adoption of "*broad, flexible,*

[17] Demartini, C. (2013). Performance Management Systems, Design, Diagnosis and Use. Springer, Berlin

[18] Ferreira, A. and Otley, D. (2005), "The design and use of management control systems: an extended framework for analysis", Social Science Research Network

externally focused management control systems emphasising non-financial measures[19]". (Wadongo, 2014) (41)

Further, the uncertainty is widely measured due to stakeholder necessities and accountability demands.

As regard the organizational structure, Wadongo states that there is a positive relationship between performance management and organizational size.

Strategic orientation is fundamental in the adoption and realisation of performance management systems. Wadongo argues that "*strategic intentions of the NPOs influence the relative importance of and managements' preference for certain performance measures" and "strategic orientation interacts with external environment and other organisational variables, to influence performance measurement and organisational effectiveness*". (Wadongo, 2014)

Concerning technology, the author states that,

"*Technology refers to the way the organisation's work processes function to convert inputs into outputs, which include materials, machines, tools, people's tasks, software and knowledge. From the contingency perspective, the generic types of technology that influence the adoption and utilisation of PM systems include technological complexity, task uncertainty and technological interdependence*". (Wadongo, 2014)

It is important in this context to refer to the study by Nilsson, who addressed the question of whether or not two merging companies should integrate their PMS. The empirical results of his case study showed that when two merging companies have different strategies in place, measures are necessarily used to ensure that the information of both companies are in line with each other (Nilsson 2002).

1.3.3. Spekle

In addition to the contingency theory, scholars have applied other theoretical frameworks to the design of the PMS. Among them Spekle theorized the transaction cost economics, giving theoretical justifications for the use of TCE for the study of PMS, claiming that both frameworks analyze the choice of control structure and control[20].

The author describes the use of control archetypes as a connection point between transaction cost economics and management control. It is described as "*a characteristic, discrete configuration of*

[19] Wadongo, contingency theory, performance management and organisational effectiveness in the third sector: A theoretical framework. International Journal of Productivity and Performance Management

[20] Spekle, R.F., 2001, Explaining management control structure variety: a transaction cost economics perspective. Account Org Soc 26(4-5):419-441

control devices that is descriptively and theoretically representative of a significant group of observable management control structures and practices". (Spekle, 2001)

The author identifies as variables to enumerate the control archetype: certainty and uncertainty, degree of asset specificity, and intensity of post hoc information impactedness.

Certainty/uncertainty control variables refers to activities that can be programmed or not according to the knowledge the organization has of what should be performed to gain a certain outcome.

The asset specificity is related to the degree by which assets are tailored to the organizations. If the degree is low (idiosyncracy) the assets are controlled by the market pricing mechanism.

Lastly, the information impactedness refers to the quality of the contributor's performance that can be high or low.

The control archetypes that result, according to Spekle are: market control, arm's length control; machine control; exploratory control; and boundary control.

From the stakeholder theory point of view, Li and Tang proposed a stakeholder analytical framework' in order to "*identify the influencing forces behind the stated objectives and strategy and relevant critical performance variances*" of the PMS. (Demartini, 2013)

An alternative theory is the expectancy-valence theory, from Kominis and Emmanuel, of psychological study derivation, as a "*behavioural framework used by accounting researches to study individual motivation and performance in the organziation*".

The authors found out that, "*managerial motivation is affected by both extrinsic and intrinsic rewards: hence the design of the performance measurement, evaluation and reward system should promote performance-dependent and fair schemes*" (Demartini, 2013)

1.3.4. Simons

Relevant is then analyze the framework introduced by Robert Simons in the first half of 1990, to provide a *"new, comprehensive theory for controlling business strategy"* (Demartini, 2013). The theory is intended to answer the question "*How can empowerment and customization be reconciled with management controls that seek to standardized and ensure that outcomes are according to plan?"* (Demartini, 2013).

As Demartini points out, Simon's framework criticized the hierarchical model of command-and-control, where the top management defines the "one-best strategy" that has to be implemented in the organization.

Therefore, he suggested a framework consisting of four systems, known as "levers of control": belief systems, boundary systems, diagnostic control systems, and interactive control systems.

The belief systems represents the organization core values communicated by mission and vision statement.

The boundary systems are delimited by the ethic statement and define the limit of the organization.

The diagnostic control systems, traditionally used, have the goal of monitoring and adjusting the operating performance using financial and cost-accounting systems, business plans and budgets.

Lastly, interactive control systems tailor and update the strategy through the use of continuous feedbacks such as market feedback reports and competitive analysis.

Furthermore, to make the system work managers should "*balance the tension that each system provides and achieve different purposes*". (Demartini, 2013

It is possible to split the system in two micro-systems. The upper one, made of beliefs and boundary systems, comprises soft management control elements as core values and the risks that should be avoided. The a lower part, made of diagnostic and interactive control system, is characterized by a stricter management control system and is concerned with critical performance variables and strategic uncertainties.

The beliefs systems guarantees the coherence of the relation strategy-organizational value. Indeed, a good fit between strategy and corporate values is needed to achieve the organizational goals of aligning organization and employees' objectives.

Boundary systems deal with all risks that need to be avoided. In this sense, they are defined as boundaries to managerial action, delimiting the creativity with which they seek new solutions to problems.

The diagnostic control systems focus on the feedback controls, i.e. "*formal information systems that managers use to monitor organizational outcomes and correct deviations from present standards of performance*" (Simons, 1994). It refers to business plans, budgets, standard cost accounting systems and s management-by-objectives.

Lastly, the interactive control systems facilitate the innovation development since it "*stimulates search and learning, allowing new strategies to emerge as participants throughout the organization respond to perceived opportunities and threats*[21]". (Simons, 1995)

They are carried out in meetings for the testing of assumption and action plans against environmental changes.

[21] Simons, R., 1995, Levers of control: how managers use innovative control systems to drive strategic renewal. Harvard Business School Press, Boston

1.3.5. PMS as a Package

The literature offers a further and innovative concept of the PMS, PMS as a Package, introduced in the 80's, that does not study PMS as "*rational and static sets of management controls*" but as "*dynamic set of control mechanism which vary according to the changing organizational objectives and needs*". (Demartini, 2013)

Abernethy e Chua suggest that the package is influenced by the organization's institutional environment, adding that a control system operates as a package when it is internally coherent, so when it is designed to achieve similar ends.

Otley and Ferreira have created a descriptive structure for the analysis of the control package, structured in a set of questions that constitute central issues in the design of a coherent structure for performance management systems:

1. *"What are the key objectives that are central to the organization's overall future success, and how does it go about evaluating its achievement for each of these objectives?"*
2. *"What strategies and plans has the organization adopted and what are the processes and activities that it has decided will be required for it to successfully implement these? How does it assess and measure the performance of these activities?"*
3. *"What level of performance does the organization need to achieve in each of the areas defined in the above two questions) and how does it go about setting appropriate performance targets for them?"*
4. *"What rewards will managers (and other employees) gain by achieving these performance targets (or, conversely, what penalties will they suffer by failing to achieve them)?"*
5. *"What are the information flows (feedback and feed-forward loops) that are necessary to enable the organization to learn from its experience) and to adapt its current behaviour in the light of that experience?"* (Otley, 1999)

In the words of Otley, "*strategies can be seen as the means by which an organization has decided that its aims can be achieved*[22]". (Otley, 1999)

He analyzed three techniques to answer the questions he formulated: Budgeting, Economic Value, Balanced Scorecard.

Budgeting is a traditional control mechanism that is able to integrate every organizational activity into a single coherent summary.

[22] Otley, D, 1999, Performance management: a framework for management control systems research, Management Accounting Research, 1999, 10, 363-382

Budgeting assesses performance in terms of profitability as the sum of revenues and costs needs to be balanced. It is therefore estimated that a certain amount of revenues will correspond to a proportional cost.

To develop a budget, the organization needs to build a plan that shows the objectives that have to be achieved and that is the basis for the cost structure.

However, a dissatisfaction with budgeting practices has spread over time as it is time-consuming and causes control loss. It is criticized to focus only on financial results leaving out the way to achieve those results. Otley points out that although being criticized, it is one of the main means adopted by organizations. It should be improved in this respect by answering the following questions:

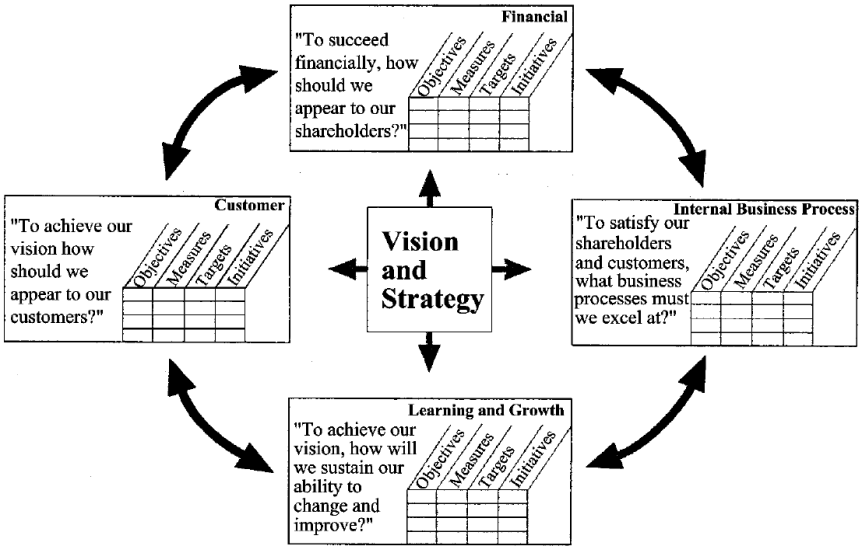
1. *"How can budgeting be better tied into the achievement of strategic goals?"*
2. *"How can resource allocation be matched to strategic imperatives?"*
3. *"How can budgeting be adapted to monitor and control the business processes along the value chain running from the extraction of raw materials through to the delivery of products to the final consumer?"*
4. *"Are there better ways of setting budgetary targets than the usual incrementalism based on historic achievement?"*
5. *"Can we avoid the distorting effects that arise when managers are given a reward for achieving budget targets?"*
6. *"Can variances be used in processes of learning and adaptation rather than in the apportionment of blame?"*
7. *"Above all, can the budget process be harnessed to add value to organizational activities rather than representing a drain on organizational and managerial resources?"* (Otley, 1999)

The second technique is the modern Economic Value Added, developed by the Stern Stewart Corportation. It is meant as an all-inclusive measure of financial performance needed for the delivery of shareholder value.

This objective is therefore intended as a primary goal for organizations, considered highly reliable as an objective measure not susceptible to managerial manipulation. However, it should be kept in mind that the EVA does not offer anticipations about earnings of future income as it is a historic income measure.

In this sense there can be an "inheritance effect" since managers can both benefit or be penalized by the history of the organization.

In any case, Otely underlines that the approach "*has been well worked through,and represents one of the most coherent performance management systems currently on offer*". (Otley, 1999). Third and last technique is the Balanced Scorecard, developed at the Harvard Business School by Kaplan and Norton since the early 1990s.



Source: Kaplan and Norton, 1996a.

Figure 9. Balanced Scorecard Framework

This is a multifaceted approach that has direct contact with the organization's strategy through the analysis of performance measurement and management. It indicates that both financial performance and processes must be measured from a general point of view and that attention must be paid to the needs of the customer.As analyzed in the previous chapter, the author defined four areas of performance (financial, customer, internal business and innovation and learning) and argued that up to four measures of performance should be analyzed in each area.

Therefore, the potential performance measures are 16 and, according to the author, they represent the critical success factor for organizational success (or, at least, survival).

Thus, there is a close link between the performance measures selected and the business unit strategy adopted. This is one of the main strengths of the Balanced Scorecard approach.

It has been suggested that the upper left-hand boxes of the picture (financial and customer) stands for the results measures and the bottom right-hand boxes (business process and innovation and learning) represents the means by which the desired outcome will be achieved.

According to Otley, however, this is true only in the "most simple-minded term". (Otley, 1999) Indeed, there's no guidance in the literature on how means and ends should be analytically related.

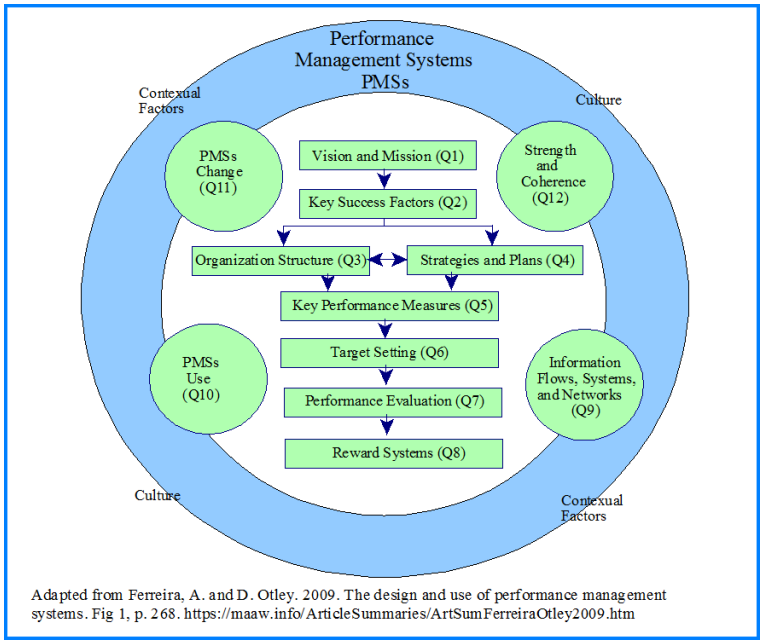
According to Otley, the Balanced Scorecard is not a standalone device, but is based on traditional measurement systems in the entire organization.

It can be considered as an illustration of Simon's interactive control systems; namely, it contains those measures that managers have decided should be highlighted for a certain period of time.
Although the Balanced Scorecard is a powerful tool through which senior managers can be persuaded to address the key issue of effectively implementing an organization's strategic focus, this should be combined with the two techniques described above to offer a more reliable and comprehensive view. Subsequently Ferreira and Otley in 2009[23] expanded the framework to include 12 questions and changed the name to "overall framework" model to solve the deficiencies that the previous framework displayed. After Simons' criticism, the focus shifted on concepts of mission and vision; the relationship between organizational structure and performance management system is here assessed. The framework is expanded with these questions:

"1. What is the vision and mission of the organization and how are the organization's purposes and objectives communicated to managers and employees?"
"2. What are the organization's key success factors and how are they communicated to managers and employees?"
"3. What is the organization structure, how does it influence the PMSs design, and how is it related to the strategic management process?"
"4. What are the organization's plans and strategies, what processes and activities are required to insure success, and how is this information communicated throughout the organization?"
"5. What are the organizations key performance measures, how are they communicated, and how are they related to performance evaluation?"
"6. What level of performance is required for each key performance measure, how challenging are these targets, and how are these targets set?"
"7. What processes are used for evaluating individual, group, and organization performance, are they objective, subjective, or mixed, and how are they related to the formal and informal controls?"
"8. What rewards (penalties) do managers and employees receive for achieving (not achieving) the performance targets?"
"9. What information flows or feedback and feed-forward systems and networks are used to support the PMSs?"
"10. How are the organization's control mechanisms used, how do they compare with those in the literature, and are they different at different levels within the organization?"

[23] Ferreira, A. and D. Otley. 2009. The design and use of performance management systems: An extended framework for analysis. Management Accounting Research (December): 263-282.

"11. How has the performance management system changed in response to the dynamics of the organization and its environment, and did this change occur in a proactive or reactive manner?"
"12. How strong and logical are the links between the performance management system components and how they are used?" (Ferreira, Otley, 2009)



Source: Ferreira and Otely, 2009

Figure 10. Framework for Performance Management Systems PMSs

1.3.6. Malmi and Brown

A further study related to the concept of control package is the one by Malmi and Brown who built a broad package of five types of control: planning, cybernetic controls, rewards and compensation, administrative controls and cultural controls. They focused mainly on pinpointing specific classes of management control components that can be combined with one of the five types of control indicated above.

Planning refers to the "long-range" planning and action planning of the goals, while cybernetic control is "*a process in which a feedback loop is presented by using standards of performance, measuring system performance, comparing that performance to standards, feeding back information about unwanted variances in the systems, and modifying the system's comportment"* (Demartini, 2013).

Reward and compensation controls motivate individual and group performance, while administrative control drive the employees' behaviors in the company. Lastly, the cultural control is used to regulate behaviors.

Weick, instead, introduced the loose coupling framework stating that the system internal elements are coordinated in the achievement of the organizational goal – since they are coupled one to another – and at the same time autonomous – since their linkages are loose because the can achieve their personal goals. Thus, the system results in a loose coupling between control systems and controlled subsystems.

The benefits that a loose coupled PMS brings are essentially efficiency and innovation purposes, developing both control and flexibility As Weick underlines, running a loosely coupled system is less expensive than using a tightly coupled one in that the cost of coordination is reduced to a minimum level. ALGharaibeh and Malkawi define in 2003 the performance management as "a means of getting better results by understanding and managing performance within an agreed framework of planned goals, standard and competency requirements". (Demartini, 2013)

They underlined that it deals with,

- *"aligning individual objectives to organizational objectives and encouraging individuals to uphold corporate core values";*
- *"enabling expectations to be defined and agreed in terms of role responsibilities and accountabilities (expected to do), skills (expected to have) and behaviours (expected to be)";*
- *"providing opportunities for individuals to identify their own goals and develop their skills and competencies";*
- *"motivating people by providing them with recognition and the opportunity to use and develop their skills and abilities".* (ALGharaibeh, Malkawi, 2003)[24]

1.3.7. Busco et al.

In conclusion, Cristiano Busco et al. (2008) analyzed the role of performance management systems in responding to the tensions present in global organizations (GOs) where local business processes and global corporate strategies must co-exist. This tension consists in the balance GOs are seeking in combining local responsiveness and flexibility with standardization and co-ordination. According to the authors, performance management systems make GOs overcome the tension and reach greater levels of integration.

[24] AL-Gharaibeh, S., Malkawi , N. (2013) The Impact of Management Information Systems on the Performance of Governmental Organizations- Study at Jordanian Ministry of Planning, International Journal of Business and Social Science Vol. 4 No. 17.

Thereby, they assert that

"*Within these processes, PMS provide managers with a common language informed by accounting and non-accounting measures and information that are spread across the different parts of the organisation. In addition, we define integration as the effective collaboration, among diverse organizational entities, which is necessary to achieve a global unity of effort, while at the same time leaving space for local adaptation, differentiation and flexibility*"[25]. (Busco, Giovannoni, Scapens, 2008)

In this way, local adaptation is preserved using co-ordination and standardization forms.

As the authors underline, the importance of the matter increased in the last decade, since market globalization connected firms of different countries and gave birth to joint ventures, cross-national agreements, alliances, partnerships, business groups.

Hence, the tensions that must be solved comprise vertical and lateral relations, convergence and differentiation, centralization and decentralization.

The first tension refers to the "*extent of the centralization vs. decentralization of decision-making authority exerted by the headquarters over the subsidiaries" and "the governance mechanisms used by headquarters to regulate transactions with (and between) subsidiaries*". (Busco, Giovannoni, Scapens, 2008)

Convergence vs differentiation deals with the need of finding common set of practices to "*facilitate communication and knowledge transfer*". (Busco, Giovannoni, Scapens, 2008)

Lastly, centralization vs decentralization tension is described as the *"extent to which decision-making authority is delegated by the centre (headquarters) to the peripheries (subsidiaries). In essence, it concerns the way in which responsibility for specific tasks is assigned to organisational roles and how order is created within the GO as a whole*". (Busco, Giovannoni, Scapens, 2008)

The authors do not consider the tensions as paradoxes that must be solved, rather they assert that they represent characteristics of the GOs that should be "*managed through appropriate integrating mechanisms*". (Busco, Giovannoni, Scapens, 2008)

In short, the importance of structured performance management models for improving business management is evident.

In a world that is constantly evolving, we must anticipate change to keep up with the times. In response to an uncontrollable automation, it is necessary to deal with the information systems and information technologies that are able to grant us a competitive advantage.

[25] Busco, C., Giovannoni, E., Scapens. R.W., (2008). Managing the tensions in integrating global organisations: The role of performance management systems, Management Accounting Research. 19, 2, p. 103-125 23 p.

More and more companies are implementing EPM (enterprise performance management) or CPM (corporate performance management) systems that offer increasingly innovative solutions.

In recent years, the digital and information technology transformation has led to the creation of new business models, new forms of digital engagement of customers and especially new methods and tools for analyzing data inside and outside companies and measuring performance. The digitalization of business processes, also through the increase of automation levels, product and service innovation, in which digital represents a core element, and the progressive opening towards multi-channel relations between companies and customers, as well as towards other actors in the supply chain, represent strategic priorities for most companies and must be linked to Business KPIs. The measurement of KPIs requires innovative and sophisticated IT tools to meet the needs mentioned above. That’s the reason why EPM systems were created.

This makes digital-based communication channels increasingly a strategic asset and monitoring their level of service and performance becomes indispensable for the brand's reputation and for achieving growth and market share objectives.

Chapter 2

IS and IT system

Technological development has increased considerably in recent decades. This has forced companies that wanted to remain competitive in the market to rethink business logic and adopt mechanisms in step with the times.

In the second chapter, the definitions of the doctrines of information system and information technolgy are reported and different IS models are examined and compared. The focus starts from the deepening of the discipline of system thinking up to modern information systems.

Finally, a successful IS implementation analysis is reported, specifically in Egypt, Jordan, USA, Italy.

2.1. Introduction to IS and IT systems

2.1.1. Definitions of IS and IT

Traditional market logic considers examples of successful companies to be those that balance costs and thus make a profit. In a constantly developing world, digitization and the speed with which information is circulating are growing at a consistent rate. This inevitably has a great impact on companies that, today, are forced to implement models of information systems and information technology to remain competitive within the market.

Since the 1970s, there has been a debate about the role of information in the logic of companies. The following two decades have represented the peak of intensity of the study in this regard and have produced multiple theories and proposed various models that aimed to explain the functioning of IS and IT. Today, in a context where business needs are always dynamic, the provision of modern and reliable information systems is considered an essential asset that companies can not help but have.

How can a company be more profitable than another? Which systems can improve performance? How can a company gain a competitive advantage over its competitors?

In an era of continuous development, a company that wants to become competitive in the marketplace cannot certainly ignore the implementation of information system and information technologies, which are increasingly becoming essential.

Techopedia[26] defines information system as "*a collection of multiple pieces of equipment involved in the dissemination of information. Hardware, software, computer system connections and information, information system users, and the system's housing are all part of an IS*". (Techopedia.com)

And adds that,

"*There are several types of information systems, including the following common types: Operations support systems, including transaction processing systems; Management information systems; Decision support systems; Executive information systems. An information system commonly refers to a basic computer system but may also describe a telephone switching or environmental controlling system. The IS involves resources for shared or processed information, as well as the people who manage the system. People are considered part of the system because without them, systems would not operate correctly. There are many types of information systems, depending on the need they are designed to fill. An operations support system, such as a transaction processing system, converts business data (financial transactions) into valuable information. Similarly, a management information system uses database information to output reports, helping users and businesses make decisions based on extracted data. In a decision support system, data is pulled from various sources and then reviewed by managers, who make determinations based on the compiled data. An executive information system is useful for examining business trends, allowing users to quickly access custom strategic information in summary form, which can be reviewed in more detail*". (Techopedia.com)

Technopedia then proposes a definition of Information Technology, assuming that it is "*a business sector that deals with computing, including hardware, software, telecommunications and generally anything involved in the transmittal of information or the systems that faciliate communication*". (Techopedia.com)

In order to clarify, it underlies that,

"*IT involves many things. Take, for instance, an IT department in a company. There are many people with many jobs and varied responsibilities. These responsibilities range from keeping systems and data secure to keeping networks up and running. There are people who input data, people who manage databases and people who do programming. There are also the decision makers, such as Chief Information Officers (CIOs), who decide how an IT department will operate and what components will be purchased. IT also includes the management of data, whether it is in the form of text, voice, image, audio or some other form. It can also involve things related to the Internet. This gives IT a whole new meaning, since the Internet is its own realm. IT involves the transfer of data, so it makes sense that the Internet would be a part of IT. IT has become a part of our everyday lives and continues to proliferate into new realms*". (Techopedia.com)

[26] https://www.techopedia.com/definition/24142/information-system-is

2.2. System thinking

IS and IT must be analysed from a systemic perspective.

Fuenmayor defines a system as "*a complex whole*[27]" of elements that form a collective unity. Whether the nature of the whole is structural, biological or an organization of ideas, any system can therefore be thought of as an assembly of components that are all part of the same whole. (Fuenmayor, 1991) (1)

Therefore, the discipline of system thinking is born from the assumption that every element present in nature can be considered in itself and not as an integral part of a whole. Reasoning this in systems, it focuses both on the single components and on the whole in general.

System thinking is a discipline which concentrates both on the single parts and on the whole in general. The most complete definition comes from Wolstenholme who defines it as the ability "*to see the whole or context of a situation and its interconnections to its environment*[28]" (Wolstenholme, 2003).

As Maria Argyropouloupoints out, initially the concept of system was identified and analysed in the biological sciences. The biologist Ludwig von Bertalanffy noticed, in 1950, that all the systems previously studied by physicists were closed systems. Therefore there were not connections with the outside. On the contrary, he focused on open systems, that is, those that receive information from the environment and interact with it.

The managerial science (Operation Research in Management Science) adopts this approach as well, which in this context is called general system theory (GST). The organization is seen as a system in which the main goal is to increase its efficiency and quality. It is around this assumption that IS/T literature revolves.

The same nomenclature makes it explicit: the information system is a system that offers information. Maria Argyropoulou, in defining IS, takes up the lesson of Symons, stating that such a system is composed of parts but the whole is greater than the sum of the parts themselves..

Assuming the lesson of Symons, Chang and King maintain that the information system is an open system composed of inputs and outputs, in which input means IS resources while output means IS capabilities.

[27] Fuenmayor, R., The Roots of Reductionism: A Counter-Ontoepistemology for a Systems Approach, Systems Practice, Vol. 4, No. 5, 1991

[28] Wolstenholme, E.F. (2003) 'A Core Set of Archetypal Structures in Systems Dynamics', Systems Dynamics Review, 19(1), pp.7-26.

Bharadwaj synthesizes resources in human, technological, and relationships, while Collins argues that capabilities are "*socially complex routines*" to determine the efficiency with which companies transform inputs into outputs. (Argyropoulou, 2013)

Chang and King thus realize the Input-Output Performance Model in which they recognize as resources-input hardware, software, human resources and integrated managerial and as capabilities-output the system and the services that it offers. The quality of input and output thus influences IS functional performance and business process effectiveness. Both of them shape organizational performance in general.

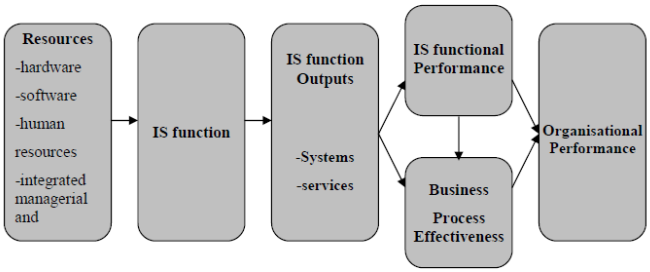


Figure 2.2 Input – Output Performance Model

Source: Chang and King 2005

Source: Chang and King, 2005

Figure 11. Input – Output Performance Model

2.3. The focus of information system

But what is the actual focus of the information system discipline?

Avgerou, in particular, analyses the object of IS studies, identifying 5 main thematic areas of information system research: "*applications of information technology to support the functioning of an organisation; the process of systems development; information systems management; the organisational value of information systems and the societal impact of information systems*[29]". (Avgerou, 2000)

The first thematic area analyses all IT systems, from database technology to computer supported co-operative work systems, proving how their presence increases company performance.

The process of system development focuses instead on all those practices that provide reliable and effective systems in a cost-efficient way.

Information system management analyzes both the evolution of information technology and "*the learning process organisations have undergone regarding the management of IT and their information resources*". (Avgerou, 2000)

[29] 8. Avgerou, C. (2000) 'Information systems: what sort of science is it?', Omega, 28, pp.567-579.

The organisational value of information systems critically examines the value that organizations get from investing in IT and telecommunication networks.

Finally, the societal impact of information systems focuses on the impact of new technologies on "*wealth creation, working life and social life more generally*". (Avgerou, 2000)

Banker and Kauffman, on the other hand, deviate from Avgerou's subdivision, recognizing as thematic areas focused by the information system: "*decision support and design science, human-computer systems interaction, value of information, IS organization and strategy, and economics of IS and IT*". (Argyropoulou, 2013)

Maria Argyropoulou, taking up the subdivision drawn up by Gunasekaran, Ngai and McGaughey in 2006, makes a historical excursus on the literature on IT/IS justification / evaluation which is divided into four categories: return on investment (ROI), the impact of IS on economic performance, cost-and-benefit analysis, information economics.

The literature therefore focused on IT/IS investments, dwelling on the recognition of the value of information technology and the relationship between this one and productivity, and between IT value and market factors.

It is essential to analyze how stakeholders perceive the benefit of IT investment (Massey et al, 2001). The various performance measures to be considered when evaluating IS projects were then detailed. The focus is on the "*impact of IT/IS strategy on tactical/operational considerations, the use of financial or non-financial measures and the tangibles/intangible benefits reaped."* (Argyropoulou, 2013)

In this sense Powell, Sarkis and Sundarraj analysed the strategic importance of IS/IT, arguing that it is "*the strategic goals that must determine why and which IS should be implemented"*. (Argyropoulou, 2013)

Finally, the literature focused on operational performance from the IS/IT perspective. It takes into consideration different areas, such as "*sales, production lead-time, inventory turnover and cost, utilisation of the available capacity, employee turnover*". (Argyropoulou, 2013)

For performance measures, as discussed in the previous chapter, the reference is to two groups: financial measures and non-financial (operational) measures.

It should be here mentioned that for financial measures both traditional measures (revenues, profits, costs, cash flow, financial margins) and more recent measures such as Economic Value Added (EVA) or Cash Flow Return on Investment (CFROI) are taken into consideration.

For non-financial measures, measures such as customer satisfaction/retention/acquisition, employee satisfaction, culture, quality, innovation, etc. are considered.

As Heneman, Ledford and Gresham emphasize, the performance measures must have the characteristics of completeness and controllability.

As already deeply analyzed, performance measures are only one of the ways to evaluate organizational performance. Effectively, it is a multidimensional construct that takes into account three dimensions: stakeholders (who directly evaluate the performance affecting the acceptability of the measures); heterogeneity (since organizations are not the same from different points of view and therefore differ in the way they measure performance); and timeframe (since performance can be attributed to a lack of random events).

Performance measurement is therefore only a part of organizational performance which, following Neely's lesson, is defined as "*process of quantifying the efficiency and effectiveness of certain business actions*[30]". (Neely et al, 1995)

However, it must be highlighted that this process of quantification contributes in achieving what are the business goals of the company. The performance measurement is carried out by means of different performance measures and allows the company to plan, monitor the implementation of plans in order to determine if it is necessary to take corrective measures.

As for the role of information systems in improving business performance, we must analyze two schools of thought: the goal-centered view and the system-resource view.

As Maria Argyropoulou points out, the first theory evaluates the "*effectiveness of the system in terms of achievement of pre-determined objectives*" while the second one conceptualizes system "*effectiveness in terms of resource viability rather than in terms of specific task objectives*". (Argyropoulou, 2013)

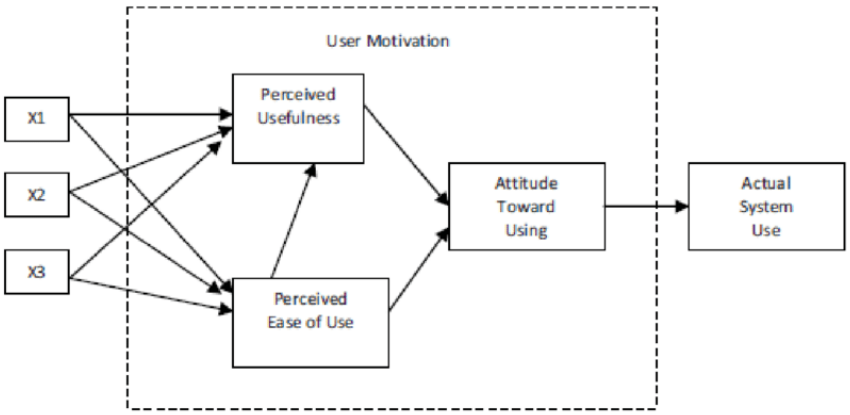
Thus, in 1992, DeLone and McLean identified more than 100 criteria/measures that had been used in some 180 studies at the time. "*The authors presented the interrelationships between six IS implementation variables that could be used as success measures*" (Argyropoulou, 2013).

2.4. IS theories

2.4.1. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was initially introduced by Fred Davis in 1986 and concerned specifically the recognition by users of information systems or technologies.

[30] 15. Neely, A. Gregory, M. and Platts, K. (1995) 'Performance measurement system design: A literature review and research agenda', International Journal of Operations and Production Management, 15(4), pp.80-116.



Source: David, 1986

Figure 12. Original Technology Acceptance Model

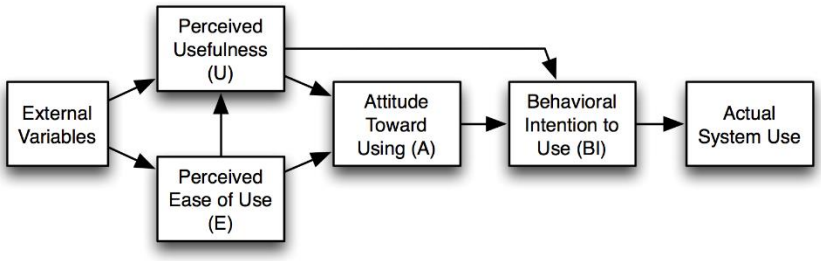
In 1989 David extended this model to explain behaviours while using computers. David's aim was to explain the general criteria for recognising computer users in order to generalise such behaviour in relation to a wide range of technologies and the population of end users. The ultimate goal of the 1989 TAM was therefore to explain why some information systems are more accepted than others.

According to the model, the fundamental factors in explaining the use of systems are Perceived Usefulness (PU) and Perceived Ease of Use (PEU).

By PU we mean "*the potential user's subjective likelihood that the use of a certain system (e.g: single platform E-payment System) will improve his/her action*" while by PEU we mean "*the degree to which the potential user expects the target system to be effortless*[31]". (Davis, 1989).

The system judgment can then be affected by other factors that the model defines as external variables.

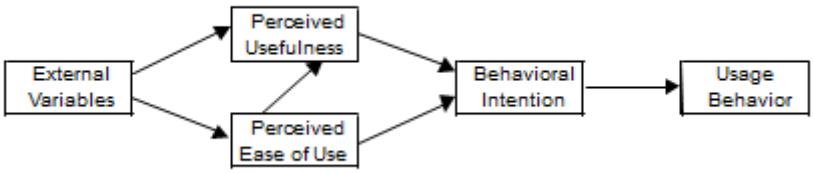
[31] 19. Davis, F.D. (1989) 'Perceived usefulness, perceived ease of use, and user acceptance of information technologies', MIS Quarterly, 13(3), pp.319–340.



Source: David, 1989

Figure 13. Technology Acceptance Model

The final version of the model was written by Venkatesh and Davis in 1996 following the discovery that Perceived Usefulness and Perceived Ease of Use directly influenced the behavior intention. In this sense, the step concerning the Attitude Toward Using (20) had to be eliminated.



Source: David, 1996

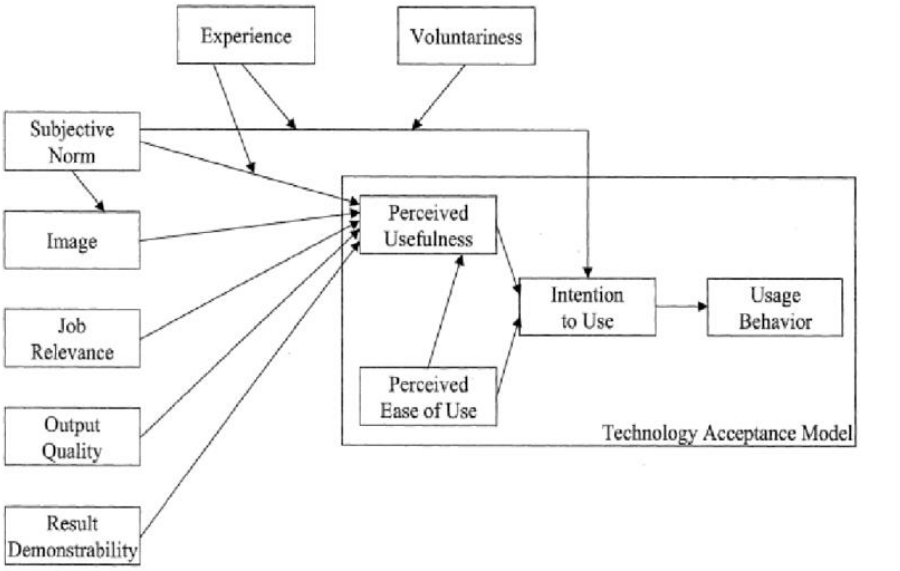
Figure 14. Technology Acceptance Model

In 2000 Venkatesh and Davis proposed a new version of the model, called TAM 2, following a more detailed study on the reasons why users consider a system useful at three different times: pre-implementation, one month post-implementation, 3 months post-implementation .

As PC Lai points out, the new model theorizes that "*users' mental assessment of the match between important goals at work and the consequences of performing job tasks using the system serves as a basis for forming perceptions regarding the usefulness of the system*[32]". (PC Lai, 2017)

The results revealed that TAM 2 performed well in both voluntary and mandatory environment.

[32] 22. PC Lai, 2017, The literature review pf technology adoption models and theories for the novelty technology, Journal of Information Systems and Technology Management

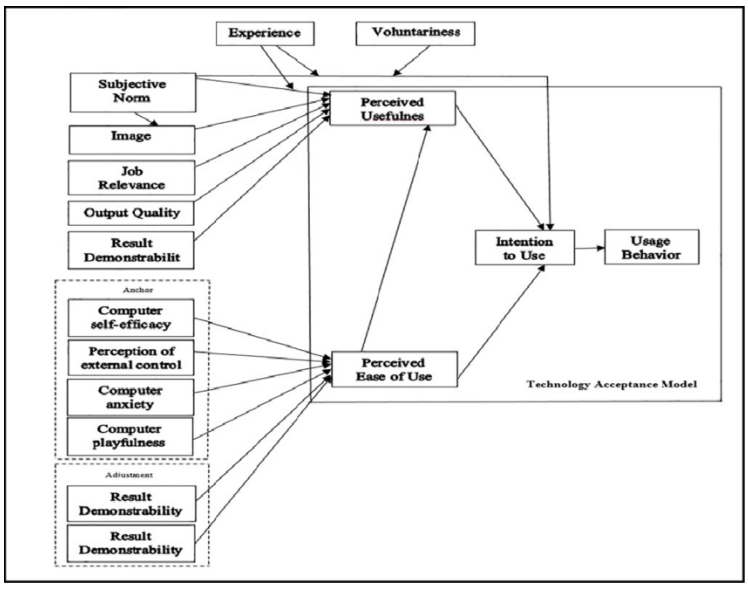


Source: PC Lai, 2017

Figure 15. Technology Acceptance Model 2

Venkatesh and Bala in 2008 propose a new version of the model called TAM 3. This new version includes four new variables: "*individual differences, system characteristics, social influence, and facilitating conditions which are determinants of perceived usefulness and perceived ease of use)*". (PC Lai, 2017)

"*In TAM3 research model, the perceived ease of use to perceived usefulness, computer anxiety to perceived ease of use and perceived ease of use to behavioral intention were moderated by experiences*", as PC Lai underlines. (PC Lai, 2017)

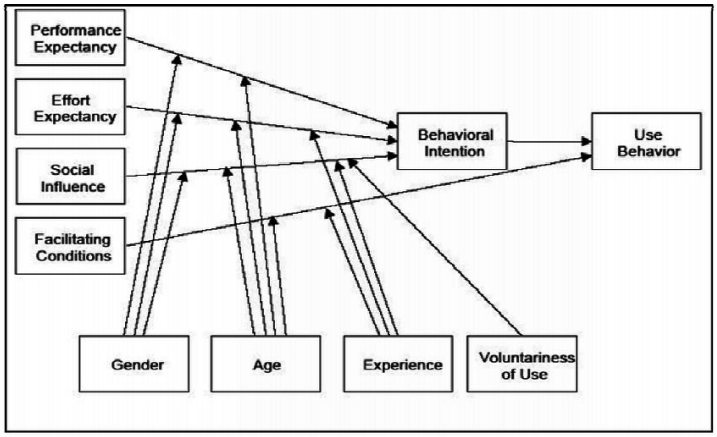


Source: PC Lai, 2017

Figure 16. Technology Acceptance Model 3

Further model, derived from the TAM, is the Unified Theory of Acceptance and Use of Technology (UTAUT) created by Venkatesh, Morris, Davis and Davis in 2003.

PC Lai points out that "*the UTAUT has four predictors of users' behavioral intention and there are performance expectancy, effort expectancy, social influence and facilitating conditions. The five similar constructs including perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations form the performance expectancy in the UTAUT model while effort expectancy captures the notions of perceived ease of use and complexity*". (PC Lai, 2017).



Source: PC Lai, 2017

Figure 17. Unified Theory of Acceptance and Use of Technology

2.4.2. DeLone and McLean model (D&M)

DeLone and McLean, looking at the literature from 1981 to 1990, identify six dimensions of IS success measurement: System Quality (technical level); Information Quality (semantic level); and Use, User Satisfaction, Individual Impact, and Organizational Impact (influence level).

Individual Success Variables are defined by DeLone e McLean as follows (D&M Model[33]):

- "*System Quality: the desirable characteristics of an information system. For example, ease of use, system flexibility, system reliability, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility, and response times".*

- *"Information Quality: the desirable characteristics of the system outputs; i.e., management reports and Web pages. For example, relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness, and usability".*

[33] DeLone, W. H. and E. R. McLean, "Information Systems Success: The Quest for theDependent Variable," Information Systems Research, 3,1 (1992), 60-95.

- *"Service Quality: the quality of the support that system users receive from the information systems organization and IT support personnel. For example, responsiveness, accuracy, reliability, technical competence, and empathy of the IT personnel staff. SERVQUAL, adapted from the field of marketing, is a popular instrument for measuring IS Service Quality[Pitt et al., 1995]".*

- *"Use: the degree and manner in which employees and customers utilize the capabilities of an information system. For example, amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use."*

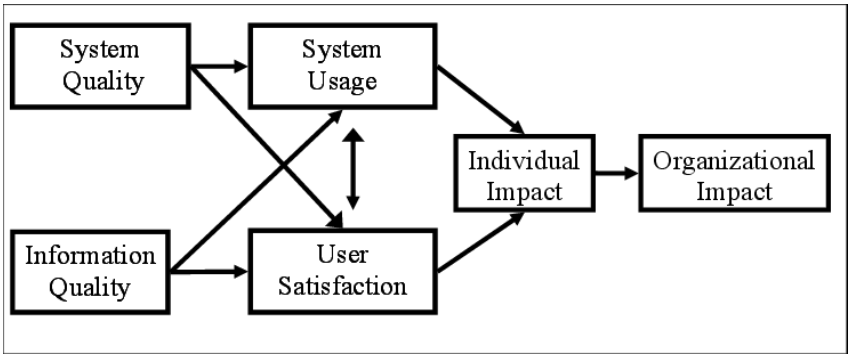
- *"User Satisfaction: users' level of satisfaction with reports, Web sites, and support services. For example, a couple of the most widely used multi-attribute instruments for measuring user information satisfaction (UIS) are Ives et al. [1983] and Doll and Torkzadeh [1988]".*

- *"Net Impacts: the extent to which information systems are contributing (or not contributing) to the success of individuals, groups, organizations, industries, and nations. For example: improved decision-making, improved productivity, increased sales, cost reduction, improved profits, market efficiency, consumer welfare, creation of jobs, and economic development. Brynjolfsson, Hitt, and Yang [2000] have used production economics to measure the impacts of IT investments on firm-level productivity"*. (Hertati, L., Zarkasyi, W., 2015)[34]

These variables are interdependent: this means that in order to measure IS success, all the six variables must be measured.

The authors underline that "*research on IS success that measures only some of these variables, and fails to measure or control for the others, has resulted in the many conflicting reports of success that are found in the IS success literature*". (DeLone and McLeane, 1992)

Based on this assumption, they published the D&M Model in 1992.



Source: DeLone and McLean, 1992

Figure 18. D&M Model

[34] Hertati, L., Zarkasyi, W., 2015. Effect of competence user information, the quality of accounting information system management and implications insatisfaction user information system (state owner in Sumatera Selatan), European Centre for Research Training and Development UK

This model is subject to numerous modifications by multiple authors.

In 1997 Seddon accused the model of being confusing both because processes and variance models were within the same framework and because the concept of "*Use*" turned out to be too ambiguous. In this sense, DeLone and McLean decided to change the name of the variable from "*Use*" to "*Intentional Use*" explaining that "*Use must precede 'User Satisfaction' in a process sense, but positive experience with 'Use' will lead to greater 'User Satisfaction'in a causal sense*[35]" (DeLone and McLean, 2003)

They thus argue that as the User Satisfaction increases, so does "*Intention to Use*", which consequently influences "*Use*".

Pitt et al. suggested in 1995 to add the variable "*Service Quality*" to the D&M Model.

Service quality should be measured with SERVQUAL, which measures the service quality of information technology organizations by measuring and comparing user expectations and their perceptions of the effectiveness of the information technology organization (D&M Model).

Instead, several researchers proposed to increase the model by adding additional types of impact: as work-group impacts, inter-organizational and industry impacts, consumer impacts, and societal impacts.

DeLone e McLean state that the reason behind the choice of analyzing just "Individual Impact" and "Organizational Impact" lays on "*the recognition that IS systems must first affect, i.e., impact, individuals and then, through them, the organization*". (DeLone and McLean, 2003)

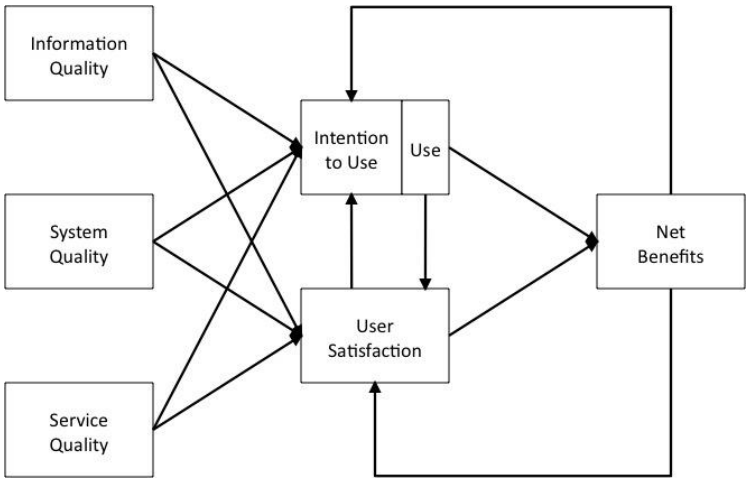
So, the authors decided not to complicate the model adding new "Impact" measures and "*group all the "Impact" measures into a single impact or benefit category called Net Benefits*." (DeLone and McLean, 2003)

The authors then decide to adopt a process perspective in the model because the information systems are dynamic. They explained that "*after the benefits, or lack of benefits, in the system are realized, there are feedback loops to "User Satisfaction" and to "Use," causing a new iteration of more (or less) "Use" and greater (or lesser) "User Satisfaction," depending upon whether the "Impacts" are positive or negative. To reflect this, we added these feedback loops into the model*[36]". (DeLone and McLean, 2016)

As a result of these changes, they published a new version of the model in 2003.

[35] 26. W. H. DeLone and E. R. McLean. The DeLone and McLean model of information systems success: A ten-year update. Journal of Management Information Systems, 19(4):9–30, 2003.

[36] W. H. DeLone and E. R. McLean. Information Systems Success Measurement. Foundations and Trends R in Information Systems, vol. 2, no. 1, pp. 1–116, 2016.



Source: DeLone and McLean, 2016

Figure 19. Updated DeLone and McLean IS Success Model (2003)

The updated model has been the subject of successive reviews by the authors who have changed the term "Net Benefit" to "Net Impact" as the word Benefit expresses positive results. On the contrary, the model can offer both positive and negative results.

In addition, another change concerns the need for additional sets of feedback loops. The authors explain that "*with increased experience in using a system, problems come to light and possible improvements are recognized, leading to requests for changes and updates to the system, what is commonly called "maintenance*." (DeLone and McLean, 2016)

These changes are the next steps in the evolving process of the life cycle of the system. To capture this graphically, feedback arrows are shown leading from "Use" and "User Satisfaction" back to "System Quality," "Information Quality," and "Service Quality."

DeLone and McLeane's model has analyzed issues that have been widely discussed in the past, systematizing the extensive literature on the subject and providing a new point of view.

For example, the concept of "System quality", which essentially refers to the performance of the system, has produced several theories about it over time.

From Kriebel in 1979 and Raviv in 1980, who measured utilization and investment utilization to test a productivity model for computer systems, to Emery in 1971 who proposed to measure the characteristics of the system, such as system accuracy, conrent of the database or response in time.

From Gallagher, who in 1974 measured relevance, informativeness, usefulness, and importance, to Ahituv who in 1980 proposed other five information characteristics (timeliness, accuracy, relevance, aggregation and formatting), to King and Epstein, who in 1983 proposed sufficiency, understandability, freedom from bias, reliability, comparability, decision relevance and quantitativeness, the literary debate was swarming.

The literature is also divided on the benefits that information systems bring.

According to Emery, "*benefits from an information system can come from a variety of sources. An important one is the reduction in operating costs of activities external to the information processing system*[37]"(38). (Emery, 1978)

Hamilton and Chervany, on the other hand, show how computer-based information systems have a positive effect on company income.

Bender, again, in 1986 was more interested in the financial impact of information processing.

So, as Ali, Bakar and Omar underline, "*using their respective measures, all of them found information quality to have a positive significant influence on organisational performance*[38]". (Ali, Bakar and Omar, 2016)

Maria Argyropoulou then recalls the studies on the informaton system effectiveness in terms of financial performance. According to many authors, the benefits of information systems can be found in contribution to company profit (Benbasat & Dexter 1985; Hamilton & Chervany 1981), return on investment (Vasarhelyi, 1981), return on assets (Cron & Sobol, 1983), stock price (Kaspar & Cerveny, 1985), overall cost reduction (Rivard & Huff, 1984) or profit for net assets (Yap & Walsham, 1986).

She then points out that Jenster (1987) has instead focused on the impact of non-financial measures (e.g. productivity, innovation, product quality).

It is worth analysing Bernroider's (2008) review of the DeLone and McLean model, which combines the six dimensions into a single ERP success measure.

Among the other authors who adopted the D&M Model, Gorla, Somers and Wong in 2010 used it to determine the impact of IS system quality, information quality and service quality on the organization. In their study, system quality and information quality are the independent variables, information quality is both dependent and independent, while organizational impact is the dependent variable (Gorla, Somers and Wong, 2010).

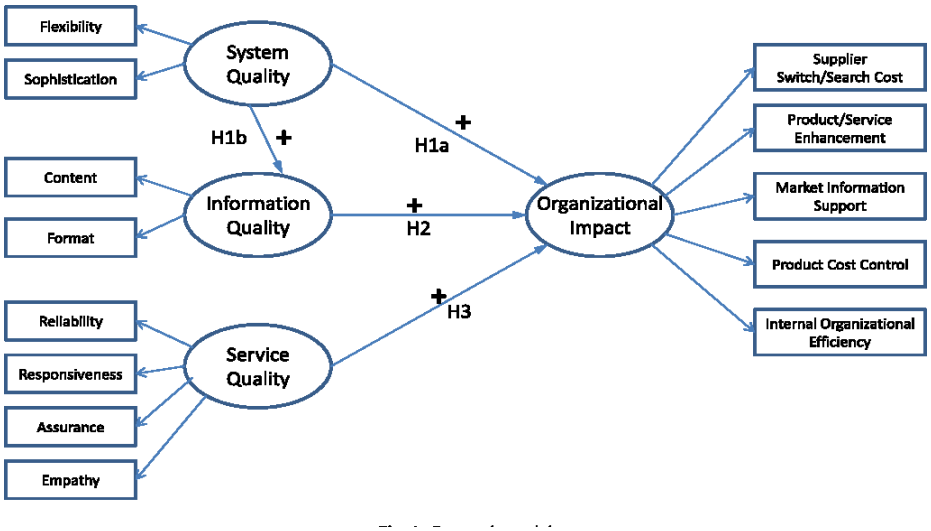
The authors thus demonstrated that there are "*links between system quality, information quality, service quality and organisational impact on the understanding that variance in organisational*

[37] Emery, J.C. (1971) 'Cost/Benefit Analysis of Information Systems', SMIS Workshop Report, (I), The Society for Management Information Systems, Chicago. IL.

[38] Basel J.A. Ali, Rosni Bakar, Wan Ahmad Wan Omar, 2016, "The critical success factors of accounting information system (AIS) and it's impact on organizational performance of Jordanian commercial banks", International Journal of Economics, Commerce and Management

impacts can be addressed through variance in IS quality[39]" in which the information quality media between system quality and organisational impact (Gorla et al., 2010).

Therefore, it can be concluded that the system, information and service quality have a significant direct or indirect impact on the organisation.



Source: Gorla et al., 2010

Figure 20. The Research Model on IS Success

It is then interesting to analyze the research of Chang and King (2005) who, starting from the model of DeLone and McLean, have developed a scorecard.

Based on the system approach and the input-output model, Chang and King assert that the information system is an open system composed of input and output.

They take up the lesson of the system approach according to which the IS resources and capabilities are the inputs to produce the output, which in turn is measured by the system, information and service providers that, according to Chang and King, are the drivers of organizational performance.

In this regard, Chang and King develop the ISFS (Information Systems Functional Scorecard) as a tool for assessing system performance, information effectiveness and service performance.

For system performance, the authors refer to the measure of evaluation of the qualitative aspect of the system (ease of use, reliability, response time, etc.) and the impact that the systems have on the work of users are taken into consideration.

With the term information effectiveness they evaluate, instead, the quality of the information about the design, value, operation and use that derives from the information itself. As in the previous case, the effect that the information has on the work of the users is estimated.

[39] 43. Gorla, N., Somers, T.M. and Wong, B. (2010), 'Organisational impact of system quality, information quality, and service quality', The Journal of Strategic Information Systems, 19(3), pp. 207-228.

Finally, through the service performance, the authors evaluate the experiences of each user with the services provided by the IS function with regard to quality and flexibility.

2.4.3. Ravichandran & Lertwongsatien Research Model

In their article, "Effect of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective", Ravichandran e Lertwongsatien propose a research model that combines four variables: firm performance, IT support for core competencies, IS capabilities, and IS resources.

Their study is based on the assumption that "*a firm's ability to create competitive advantage using IT is a function of its ability to use IT to develop and enhance its core competencies*" and "*this competence is dependent on having strong functional capabilities within the IS department, which in turn is influenced by the nature of human, technological, and relationship resources possessed by the IS department*[40]*"* (Ravichandran e Lertwongsatien, 2005).

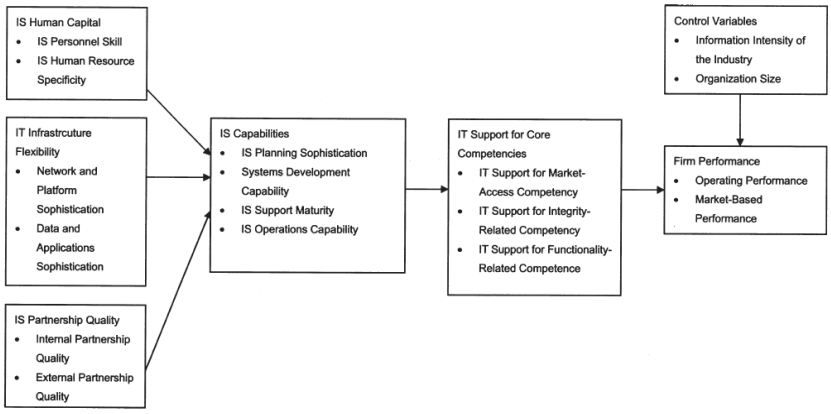


Figure 1. Research Model

Source: Ravichandran e Lertwongsatien, 2005

Figure 21. Research Model

In the course of their research, the authors develop and demonstrate different hypotheses.

The first hypothesis states that there is a positive relationship between IT support for core competencies and firm performance.

[40] Ravinchandran T. and Lertwongsatien C. (2005) 'Effect of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective', Journal of Management Information Systems, [serial online] 21(4), Spring, pp.237-276.

The authors assert that the implementation of IT systems in the core competencies of the company makes the asset of the information system non-imitable, thus offering the company an important competitive advantage over competitors. They explain that "*other things being equal, firms that target IS initiatives toward their core competencies are likely to realize greater value from their IS assets than those that are less focused in their IT deployment*". (Ravichandran e Lertwongsatien, 2005)

To demonstrate the first hypothesis, the authors study several success stories.

The first case study takes as a reference the experience of Dell, a U.S. multinational that deals with the production of personal computers and computer systems. Dell has understood the importance of IT systems in its core competencies in achieving its primary goal: delivering reliable products and services at the same time at low cost to its customers (integrity-related competency). It has therefore invested heavily in IT development to support the direct selling business model and integrate the supply chain.

Another case under consideration is that of Wal-Mart, a US multinational company that owns the chain of retail stores and is moving in the same direction.

To be competitive in the low cost and customer service market, Wal-Mart has focused on IS capabilities in order to improve procurement, logistics, inventory management and to adapt the assortment of its products to the individual needs of the stores.

In short, according to the authors, these examples clearly show how "*IT was used to enhance core competencies in research and development and allow the firms to maintain their competitive positions in industries where product development is considered a prime driver of firm performance*". (Ravichandran e Lertwongsatien, 2005)

According to Ravichandran and Lertwongsatien, IS planning is a fundamental process that companies cannot ignore because it allows them to understand what the priorities of the business are.

Therefore, companies must not limit themselves to target IT resources, but must develop and implement technological solutions to ensure effective use in order to increase core competencies. In this regard, the authors add that only a mature information system support is able to ensure that the systems are actually used by end users.

It is the information system support that determines how effectively a company uses information technology to improve its core competencies. Advanced information technology and a reliable information system are essential to support any innovative project to improve a company's core competencies.

Hence, the authors explain the second hypothesis, according to which there is a positive relationship between IS functional capabilities and IT support for core competencies.

The authors then hypothesize a direct positive relationship between IS resources and IS capabilities. As they explain, "*our research model includes IS human capital, IT infrastructure flexibility, and IS relationship quality, and posits that each of these resource will have a direct positive relationship with IS functional capabilities*". (Ravichandran e Lertwongsatien, 2005)

As far as human capital is concerned, they focus on two key indicators: skills and specificity.

By skills they mean "*the extent to which IS personnel have the requisite technical and business skills*" while by specificity they refer to "*the extent to which IS personnel have firm-specific knowledge such as an understanding of the culture and routines of the organization*". (Ravichandran e Lertwongsatien, 2005)

In general, all information system activities require special technical skills and at the same time are considered knowledge-intensive. However, the technical skills are not sufficient, in fact "*appropriate business and interpersonal skills are needed to effectively deliver IS services to end users*". (Ravichandran e Lertwongsatien, 2005)

Summarizing, the necessary skills according to the authors are technical, business and firm-specific knowledge. All the three of them are fundamental in developing functional capabilities.

From here comes the third hypothesis, according to which there is a positive relationship between IS human capital and IS functional capabilities.

They also stress the need to focus on a flexible IT infrastructure as it increases a company's ability to deliver technical solutions faster and more effectively.

They underline that

"platform readiness for new software, easy access to relevant data, and the presence of necessary networking systems enable a firm to provide faster, more cost-effective IS solutions to end users. Reusable data and application assets can speed up application delivery by reducing the need for new development and facilitating integration with legacy systems. Moreover, a flexible IT infrastructure allows easy integration of new technologies with existing platforms, thereby allowing the IS unit to deliver cuttingedge technology capabilities quickly and cost effectively". (Ravichandran e Lertwongsatien, 2005)

From here comes the fourth hypothesis according to which there is a positive relationship between IT infrastructure flexibility and IS functional capabilities.

Finally, the theory of Rockart and Short was the birthfield of the fifth and final hypothesis.

According to the authors, the ability of information system units to deliver services depends on the good partnership between IS and line managers. It is in fact necessary that these two units include the space of operation of each other. The value of the company can only be increased in this way.

Another important relation is the one between IS units, vendors and service providers.

In fact,

"*the rapid rate at which new technologies emerge makes it impossible for IS units to invest resources in developing the knowledge to assimilate and deploy these technologies effectively. Thus, technical knowledge and other resources needed to effectively deliver IS solutions might be dispersed within and outside the firm. IS firms intending to develop strong functional capabilities will have to develop effective partnerships with vendors to tap into these resources, and IS units with good vendor relationships can be expected to tap into external resources better than those that do not have effective external partnerships*". (Ravichandran e Lertwongsatien, 2005)

From here comes the fifth hyphotesis which states that there is a positive relationship between IS partnership quality and IS functional capabilities.

2.4.4 . Design Reality GAP Model

The Design Reality Gap is a model created by Heeks in 2002 that expresses the degree of adaptation between the requirements of the design of an information system and the reality of the context in which the system is implemented.

Seven dimensions are indicated in the model by the acronym of ITPOSMO. These are sufficient and necessary to understand the Design-reality Gap model and represent:

- "*Information: includes both formal and informal information, held on both IT based and other types of information system".*
- *"Technology: mainly focuses on information handling technology (particularly IT but also paper, telephones, etc.), but can cover other types of technology such as production machinery".*
- *"Processes: the activities undertaken by the relevant part of the organization – both information related processes and broader business processes".*
- *"Objectives and values: often the most important dimension since the 'objectives' component covers issues of self-interest and organizational politics, and can even be seen to incorporate formal organizational strategies; the 'values' component covers organizational culture: what stakeholders feel are the right and wrong ways to do things".*
- *"Staffing and skills: cover both the number of staff and their competencies (particularly skills, but also knowledge)".*
- *"Management systems and structures: the overall management systems required to organize plus the way in which the organization is structured, both formally and informally".*

- *"Other resources: time and money*[41]*"*. (Baraka A. et al., 2014)

The third paragraph analyses the models described above through real examples of implementation of IS/IT systems.

Hesham Baraka, Hoda Baraka and Islam EL-Gamily, studying the performance of call centers in Egypt, have shown that the main systems for evaluating technological information systems (i.e. the model of DeLone and McLean and the model of Heeks) are on the whole equivalent and lead to the same result.

Alaa Khresat instead takes a sample of 100 Jordanian companies in the world of telecommunications and demonstrates the existence of a statistical relationship between management information system and organizational performance.

Céline Bérard, L. Martin Cloutier and Luc Cassivi propose rather to demonstrate the importance of information system models and information technology during clinical trials. According to the authors, the implementation of such systems improves, above all, the accuracy of the process, ensuring more reliable outcomes, and the speed, making clinical trials more efficient.

Lastly, Thomas C. Powell and Anne Dent-Micallef selected 250 retailers in the US to analyze the linkages between technology and firm performance. The authors found out that, even thought technology has a great productivity power, it must be matched with other resources to be able to increase the overall performance of the company.

2.5. Call center case in Egypt

Hesham Baraka, Hoda Baraka and Islam EL-Gamily conducted a study on performance evaluation techniques applied to information systems using call centers as the subject of study.

In their study, the authors analyze the performance in call centers by applying the model of DeLone and McLeane and the Design Reality Gap.

To measure the degree of success, they have also used a "Performance Index".

The authors have chosen to use a multidimensional model as the only one able to allow the analysis of individual dimensions and their impact on performance in general.

The two models, respectively DeLone/McLean's and Heeks', are integrated into each other: performance is then evaluated by implementing the indicators of the model of DeLone and McLean within the seven dimensions of Heeks as well.

[41] Hesham A. Baraka, Hoda A. Baraka, Islam H. EL-Gamily, 2014, Information systems performance evaluation, introducing a two-level technique: Case study call centers, Egyptian Informatics Journal

In this context, in order to measure the Gap Index of call centers, the seven dimensions are so adapted:

- *"Information, customers in call centers should be properly authenticated; agents should address the customers with personalized, complete, relevant, easy to understand, and secure content especially in case of customers that perform financial transactions;*
- *Technology, measures the essential characteristics of call center systems including availability, reliability, intelligent routing, channels of communications, as well as the response time represented by calls abandoned, waiting time to answer, and average call-handling time (time actually on phone with customer);*
- *Processes, this dimension reflects the quality of services provided by the agents to the customers. Examples of services may include information retrieval, marketing, technical support, remote diagnosis, remote data entry as in medical transcriptions, mobile, etc;*
- *Objectives and values, measure the objectives set by the call center, these objectives may include maximizing the number of customers using the call center, the growth rate of customers using the system, as well as the rate of re-utilization of the same customer for the call center. Other targets may reflect the net profit and the return on investment for the call center;*
- *Staffing and skills, the number of agents and staff in the call center. A critical parameter to be measured for the agents' skills is the rate of the escalation of calls beyond the agent representative as the existing system failed to answer the customer query. Measuring customers' feedback of the call center system should cover the entire customer experience cycle based on the services provided from the call center;*
- *Management systems and structures, this dimension reflects the internal organization structure for the call center, the scheduling design and the degree of overstaffing and understaffing that exists as a result of the scheduling design. Also, it reflects the efficiency of utilization of available resources and the productivity of agents in the call center;*
- *Other resources, cost of service to customer, profit of call center."* (Baraka A. et al., 2014)

The two indices used are the Linear Call Center Performance Index (L-CCPI) and the Call Center Gap Index (CCGI). As the authors point out, "*the success index has been introduced with the objective of evaluating the overall performance of the call centre based on the success index for each of the dimensions of the Delone and Mclean evaluating model*". (Baraka A. et al., 2014)

They then created an evaluation tool because the system was too complex and overloaded with indicators. The Call Center Performance Evaluation Tool (CCPET) is used by call centers for "self-

assessment" and is composed of five modules: the model definition module, the performance indices module, the Input Data module, the calculation module, and the reporting module.
The authors then started from a double evaluation technique (Delone & McLean model and Design Reality Gap model) in which,

"the first level is simply not to use any modeling technique, so using the indicators for the call centers as if they are mapped to one single dimension, and you get the system to calculate your success index and the Gap Index. If the results are satisfactory then actually you do not need to get into more detailed analysis. If results are not satisfactory then you need to select one of the two models the Delone and Mclean model or Heeks' Design Reality Gap model in order to analyze the overall result obtained from the first step. This will allow identifying which dimension is impacting call center performance. So, first level means to use the tool without any model to get the overall call center performance". (Baraka A. et al., 2014).

The study therefore shows that both the use of the Delone & McLean model and the Design Reality Gap model by Heeks can be a "feasible technique to model call centers" and that the Gap Index is an even more appropriate measure of performance, especially in the presence of Benchmark values. The study therefore concludes that, in the absence of benchmark values, the two models reflect the same result.

2.6. Management information system in Jordan

The study conducted by Alaa Khresat analyzes the relationship between management information system and organizational performance in Jordan using a sample of 100 telecommunication companies in Ammam city.
The aim of the study is to confirm or reject the hypothesis that "*there is no statistical significant relationship between management information system and organizational performance in telecommunication companies in Jordan*[42]". (Alaa khresat, 2015)
The author defines the role of the management information system (MIS), taking up the words of AL-Gharaibeh & Malkawi, according to which this consists in "*manage the data, organizing, retrieving of the information which help the organization to provide services faster, and market more accurate and easier, which also affects the level of performance*". (Alaa khresat, 2015).

[42] Alaa khresat, (2015), The Effect of Management Information System on Organizational Performance: Applied Study on Jordanian Telecommunication Companies, School of Management Information system

AL-Gharaibeh and Malkawi go on analyzing the difference between information system and information technology, stating that

"*Information technology and information system are two closely terms, but they are different. Information technology (IT) refer to the products, methods, inventions, and standards that are used for the purpose of producing information, IT pertains to the hardware, software, and data components, Whereas information system (IS) is an assembly of hardware, software, data, procedures, and people that produces information*" (Alaa khresat, 2015)

The importance of information technology has grown over time, so much so that it gives a competitive advantage to those who understand its importance.
It has impacted, according to Noor et al (2003), the form and substance of information in general and accounting in particular, making it necessary for companies to implement on-line and real-time process systems.
In this IS and IT are integrated with each other and this is reflected in the figure of the MIS that provides different information in the form of reports in an innovative way.
In this reference, AL-Gharaibeh & Malkawi, in their study, report the example of sales managers that "*may use their networked computer and web browser to get instantaneous display about the sales results of their daily sales analysis report to evaluate sales made by each sales personnel*". (Alaa khresat, 2015)
The Management information system then integrates with the concept of performance, taking the lesson of Munirat et al (2014), when the determination of performance standards depends on the availability of relevant management information systems. This is where MIS is used to operate and monitor the organisation.
Having conceptually defined the concepts of performance and management information system, AL-Gharaibeh and Malkawi, ascertain from the study made on the sample Jordanian companies that:
- Workers in telecommunication companies in Jordan have a positive attitude towards software: they use managerial programs with the internet at work and agree that companies depend on managerial infromation systems and customers who purchase products via the web;
- Workers in telecommunication companies in Jordan have a positive attitude towards tools: MIS in Jordan has tools;
- Workers in telecommunication companies in Jordan have a positive attitude towards databases: MIS in Jordan has databases;

- Workers in telecommunication companies in Jordan have a positive attitude towards organizational performance: Managerial systems in Jordan influence organizational performance.

The study therefore rejects the hypothesis that "*there is no statistical significant relationship between management information system and organizational performance in telecommunication companies in Jordan*". (Alaa khresat, 2015)

The Managerial Information System must be carefully planned, installed, managed and improved in order to successfully respond to changes in demand in all the five phases of its development: planning, analysis, design, implementation, and support.

They conclude the study by stating that "*companies should match between Managerial information system and organizational performance*". (Alaa khresat, 2015)

2.7. Management information system in clinical trial

Céline Bérard, L. Martin Cloutier and Luc Cassivi conduct a study on clinical trials in pharmaceutical companies analysing the multiple steps of the process and demonstrating how this requires an integration of information systems.

The pharmaceutical sector is being considered as one of the largest manufacturing sectors in the world. In 2003, annual sales amounted to US$ 300 billion, investing heavily in R&D (Santos, 2003). At the same time, however, the authors point out that "*even though its activities are focused on the research, development and the commercialization of new drugs, time-to-market is slow (somewhere between 8 and 12 years) and expensive (about US$ 800 million per new drug), in part, due to the complexity of the process and heavy regulation*[43]". (Bérard et al., 2005)

Hence, several steps must be overcome for a new drug to circulate in the market.

These are the pre-clinical and clinical trials of the approval and release of a new drug. In turn, the clinical trials are divided into 4 phases. The first phase concerns tests on healthy voluntary patients, the second phase evaluates the results of the first phase, the third phase verifies and confirms the results of the previous phases using a larger sample and, with the fourth phase, a regulatory agancy reviews and approves the development process and the final product to be launched on the market.

In such an extensive process, the provision of an adequate information system is necessary both to ensure the correct flow of information during the trial phases and to reduce costs for R&D.

[43] Céline Bérard, L. Martin Cloutier, Luc Cassivi, (2005), Performance Evaluation of Management Information Systems in Clinical Trials: A System Dynamics Approach,

The authors explain that "*automating the clinical trial process through IS is a means for these firms to meet project performance goals, that is to keep cost, time delay, and data quality in check, notably during the more extensive clinical trial phases II, III, and IV, where many events take place for which a large quantity of data are gathered, processed, and analyzed*". (Bérard et al.,, 2005)

Céline Bérard, Martin Cloutier and Luc Cassivi also underline the importance of adopting not only advanced information systems, but the information technology systems as well. They resume the lesson of Augen (2002) who supports the process of discovery and production of medicines is closely related to IT. In fact, Rowe at al (2002) stressed that information management during clinical trials depends on the use of software, fundamental technological means during clinical trials given the strict deadlines associated with the process.

Rowe notes that the need to anticipate the pace of drug discovery and the increasingly strict regulations, which have imposed in the last 20 years to duplicate the number of patients during clinical trials (thereby increasing data management requirements) have pushed companies "*towards automating data extraction and processing with the end goal of reducing time delays, costs and information risks*". (Bérard et al.,, 2005)

2.8. Information technology as a competitive advantage in US retail industry

Thomas C. Powell and Anne Dent-Micallef analyzed the ties between information technology and firm performance examining the U.S. retail industry.

As the authors highlight, they decided to focus on such industry since it is the largest one in the U.S. considering the $500 billion annually from sales and the four million of employees. Indeed, they noted that out of the 15 American largest employers, six of them are the retailers Wal-Mart, KMart, Sears, J.C. Penney, Kroger, and Dayton-Hudson.

The retailers taken into account in the study implemented information technology systems both in-store and beyond-store and have been studied in process divided in three phases.

First of all the authors went through a deep analysis of the academic IT literature and interviewed retail executives and suppliers, store managers and industry experts.

Then they selected 250 retailers to be examined, by directing their attention to the largest ones. The selection criteria was based on firm size and sector representation. After having established the sample, the authors mailed a survey to the firm's CEOs.

Lastly, a survey was made for the administration and sent to retail store managers.

The research aimed to confirm or reject the following hypotheses:

"Hypothesis I: Human resources complementary to IT create embedded advantages that explain significant performance variance among firms.
Hypothesis 2: Business resources complementary to IT create embedded advantages that explain significant performance variance among firms.Hypothesis 3: Technology (IT) resources do not explain significant performance variance among firms[44]." (Powell, Dent-Micallef, 1997)

In order to do so, IT Performance and Financial Performance were used as dependent variables.
As the authors underline, IT Performance comprises "*five survey items designed to measure executives' perceptions about the impacts of IT on financial performance" while Financial Performance "was designed as a subjective measure of financial performance itself, consisting of questions about the firms' overall profitability and sales growth over the previous 3-year period*". (Powell, Dent-Micallef, 1997)
The findings, concerning the Overall Performance, show that there is "*a positive and significant zero-order correlation with Human resources (r = 0.45), a moderate correlation with Business resources (r = 0.23), and a negative but non-significant correlation with Technology resources (r = -0.05)".* (Powell, Dent-Micallef, 1997)
In conclusion, Thomas C. Powell and Anne Dent-Micallef concluded that "*ITs carry enormous productivity power*" but it should be combined with other resources since "*technology alone is not enough*". Furthermore, they add that "*this result suggests that conflicting perceptions of Human and IT resources negatively impact performance, and again supports the notion that complementary Human resources such as communication and consensus play a vital role in the successful implementation of IT*". (Powell, Dent-Micallef, 1997)
As Siamak Nejadhosseini Soudani recalls,
For the first time in 1966, the American Institute of Certified Public Accountants (AICPA) stated that: "Accounting actually is information system and if we be more precise, accounting is the practice of general theories of information in the field of effective economic activities and consists of a major part of the information which is presented in the quantitative form[45]". (Soudani, 2012)
The role of technological information systems is therefore to collect data and transform it into strategic information for companies. In this sense, information technology turns raw data into financial data managed by decision makers.

[44] Powell, T., Dent-Micallef, A., (1997), Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources, Strategic Management Journal, Vol. 18, No. 5 (May, 1997), 375-405.
[45] Siamak Nejadhosseini Soudani, (2012), The Usefulness of an Accounting Information System for Effective Organizational Performance, School of Accounting and Management, Islamic Azad University U.A.E. Branch

Hence, the world of IT integrates and strengthens the world of accounting.

Digitization has made it possible for companies implementing advanced systems to improve their performance, as the case studies in the previous paragraph show, and has made obsolete all those companies that have not been able to evolve.

Chapter 3

EPM SYSTEMS: A COMPARISON

3.1. What EPM is

The concept of Enterprise Performance Management is currently one of the most discussed.
In a world where artificial intelligence is gaining the upper hand over human intelligence, companies that want to keep up with the times are opening up to new horizons.
It is in this context that Enterprise Performance Management is born, proposing innovative solutions. This discipline offers greater control over the most diverse business activities and is a strategic means to improve business processes.
There are several definitions of the concept of Enterprise Performance Management. Techopedia, online technology dictionary, offers an exhaustive and comprehensive definition, reporting that (Techopedia.com)
"Enterprise Performance Management (EPM) is a type of business planning that relates to business intelligence (BI), which involves evaluating and managing performance for an enterprise to reach performance goals, enhance efficiency or maximize business processes".

The discipline is referred to in several ways: EPM (Entereprise Performance Management), CPM (Corporate Performance Management), BPM (Business Performance Management), FPM (Financial Performance Management). However, according to Technopedia, there are experts who consider the systems described above as sub-sets of BPM.
Furthermore, Technopedia informs that Enterprise Performance Management is closely linked to the concept of Enterprise Resource Planning (ERP), which consists of viewing the available resources and determining how they are used to achieve certain objectives.
The two systems can be compared because they aim at similar objectives: for example, the "*use of staffing teams, new technologies or other existing resources may improve performance in a given set of business processes*". (Techopedia.com)
What ERP and EPM differ in concerns the daily activities: if the former deals with the daily transactions of the business activity, the latter manages it, analysing, understanding and generating reports on the business activity.
In assessing the company's performance, the EPM systems consult all those metrics related to value and cost (overhead costs, ROI, etc.). Clearly, "*all of this information is used to determine how to optimize performance and create more profit or value for the enterprise*." (Techopedia.com)"

These systems are at the disposal of the entire company.

Although they are mainly used by the Chief Executive Officer and by the Finance office, they are also used by many other functions, such as Marketing, HR, IT and Sales, for everything related to operational planning, budgeting and reporting.

Oracle, one of the most popular EPM systems, explains on its website the functionalities of Enterprise Performance Management, reporting that

"*today, the EPM software is considered strategic for the management of any type of organization, as it links financial and operational metrics to insights and, essentially, favors strategies, plans and execution. Managers can use the EPM software to improve performance across the organization by monitoring financial and operational results against forecasts and objectives and relying on analytical capabilities to recognize key trends and predict results".* (Oracle.com)

These systems can be implemented in any type of companies (government entities, non-profits, educational institutions, etc.)

They manage the following processes:

- Budgeting, Planning, Forecasting and Modelling
- Consolidating results and closing the books on a periodic basis
- Reporting results to internal and external stakeholders
- Analyzing performance vs. plan, prior years, across divisions or products

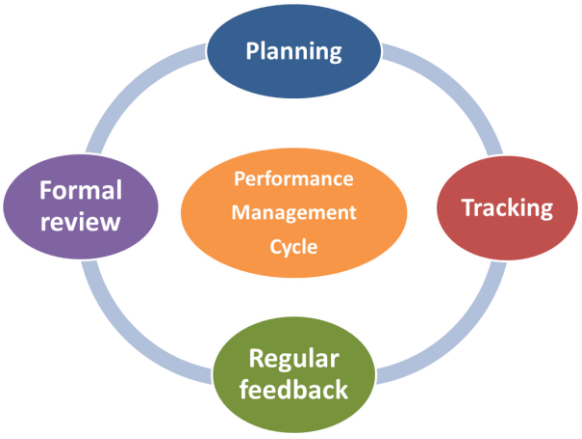


Figure 22. EPM cycle

Following the Performance Management Cycle process, the EPM acts to ensure that the organisation achieves its objectives. In this respect, it is necessary, first of all, to ensure that these strategic goals are clearly communicated to managers and explained in the budget and plan. Secondly, it must be ensured that the entire organization is in line with these short and long term objectives, and that it is able to cope with any unpredictable event.

It is therefore functional for both external stakeholders (board of directors, investors) and internal stakeholders (management team) to consult the reports.

Furthermore, EPM systems allow the monitoring and management of all those Key Performance Indicators (KPIs) that offer a cross-section of key markets and business trends on a regular basis. This functionality is necessary because, through the KPIs indicators, companies are able to respond promptly to any eventuality and thus maintain alignment with the business objectives.

Source: Oracle.com

Figure 23. EPM cycle, Oracle

Hostanalytics traces the historical evolution of EPM software.

Around the 70s accounting packages began to support the collection of budgets and financial results for reporting purposes.

In the following decade, spreadsheets such as VisiCalc and Lotus 123 were used to allow accounting and finance teams to create budgets and reports automatically, replacing manual worksheets.

In the 90s, emails facilitated the diffusion of these spreadsheets. It increased the collaboration between departments in the collection and dissemination of budgeting and reporting data.

It is however in 1980 that the first dedicated EPM software packages were born, although they were not yet named in this way. Among the first, IMRS Micro Control (which later became Hyperion Software) and Hyperion Enterprise (moving the concept from DOS to Microsoft Windows) attacked the financial consolidation and reporting process.

In the same years, the first executive information systems (EIS) were born to deliver to senior executives, via computer, graphic reports and KPIs. Subsequently, they evolved into software-based, visual dashboards and scorecards, capable of delivering KPIs and metrics to both executives and managers in the organization.

Since the 80s, therefore, EPM software platforms have moved from being mainframe systems to Windows-based client/server systems, to internet-enabled, web-browser-based applications.

Today the demand for these software - such as cloud-based software that allows finance to take control, deploy the solution quickly, and receive automatic, low-cost upgrades - is growing. These packages have proved to increase efficiency within organizations through the elimination of spreadsheets and to improve planning and reporting processes through centralized databases, workflow and process control.

Hostanalytics underlines that "*this helps drive accountability across the enterprise by aligning strategic, financial, and operational goals, broadening budgeting participants and empowering managers with more timely information*". (Hostanalytics.com)

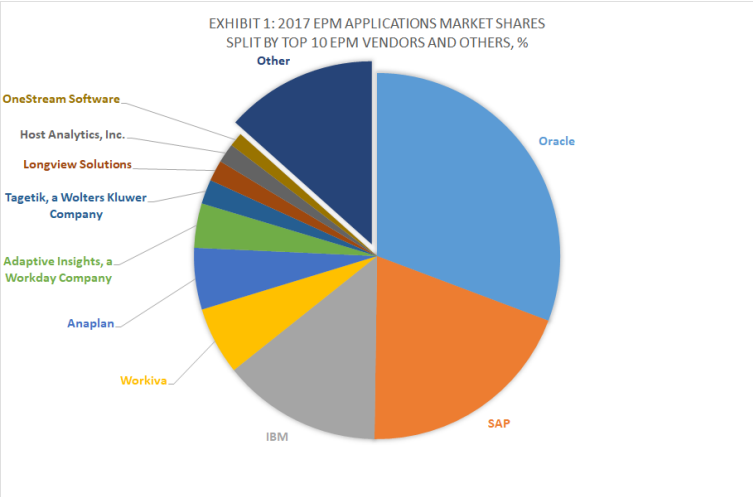
Currently EPM systems are moving in the Cloud market for "*making it easier and faster to deploy, reduces the cost of ownership, increases innovation speed, and supports enhanced collaboration across the enterprise. It helps organizations automate manual tasks, accelerate key finance processes, and drive better alignment between Finance and operations*". (Hostanalytics.com)

Albert Pang, Misho Markovski and Milena Kostadinovski conducted a study on EPM software finding that, in 2017, the top 10 EPM software vendors held 87% of a growing global market (3.8% over the previous year) worth nearly $2.4 billion, including EPM licenses, maintenance and subscription revenues. Based on this analysis, they expect the market to reach $3.1 billion by 2022, compared with $2.4 billion in 2017 at a compound annual growth rate of 5%.

They add that "*EPM is moving beyond the finance operations to tackle a full range of budgeting, forecasting and planning challenges with Cloud apps that aim to address Excel-based EPM shortcomings for sales, human resources and operational executives*[46]". (Pang, et al. 2019)

The Top 10 EPM software are: Oracle, SAP, IBM, Workiva, Anaplan, Adaptive Insights, Tagetik, Longview Solutions, Host Analytics e OneStream Software.

[46] Pang, Markovski and Kostadinovski, (2019), Apps Research and Buyer Insight



Source: Apps Research and Buyer Insight

Figure 24. Top 10 EPM software

3.2. Oracle

Headquartered in Redwood City, California, Oracle Corporation is an American multinational technology company. The company focuses on the production and commercialization of database software and technologies, cloud engineered systems and business software products. With revenue of $39.83 billion in 2018, it is the third largest producer of revenue software, after Microsoft and Alphabet.

Founded in 1977 by Larry Ellison, Bob Miner, Ed Oates, the company further develops and builds tools for database development and systems of middle-tier software, supply chain management (SCM) software, enterprise resource planning (ERP) software, and customer relationship management (CRM) software.

It builds cloud-based systems to keep up with the times: cloud platforms allow to innovate faster, producing more at lower costs and at the same time offer systems where security has increased. In this way, the company aims to increase business value and productivity.

The greatest benefit of cloud applications is given by the accessibility on company's operations at any time and from any device.

As they highlight on their website, "*Oracle is developing capabilities in AI, machine learning, augmented reality, blockchain, IoT, and human interface technologies, all of which are designed to let customers take advantage of the latest technology advances and develop their own innovative products and services*". (Oracle.com)

They add that technological advancement is a primary objective for them. So, Oracle invests heavily in R&D. In 2017, their investment amounted to US$6.2 billion.

Several customers are now using Oracle's cloud platforms, such as

- Lloyds Bank,
- DB Schenker,
- Dubai Airports,
- Hitachi,
- Kenya Airways,
- Noble Plastics,
- Profound Medical,
- Pandora,
- Craftsy,
- Mack Trucks,
- Boingo Wireless,
- MCH, Veritone,
- Marlette funding,
- Safexpress, Subaru,
- Exelon,
- Turning point,
- Murad, Allianz,
- Telesoft,
- Identitymind,
- Beeline and
- Wireflare.

In 2007, Oracle Corporation acquired Hyperion - Oracle's corporate performance management (CPM) and business intelligence systems division - to extend its capabilities and offer the most comprehensive system for enterprise performance management.

Hyperion's portfolio includes products for financial management, budgeting, planning and forecasting (BP&F), financial reporting, database management, financial consolidation, treasury management and analytics.

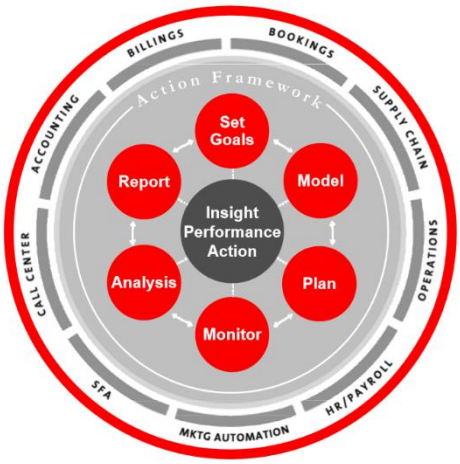
The acquisition of Hyperion in 2007 was of strategic importance to Oracle as performance management as a software segment was growing rapidly: it was estimated to reach $7.0 billion in 2009. With 11%+ of CAGR growth, it was estimated that it was a priority for executives and board of directors and that financial planning was now extended to full enterprise business planning.

Such a purchase would thus expand Oracle's position in the world of business intelligence.

At a time when performance management and business intelligence were increasingly being used together, Oracle's goal was to become a leader in that market.

It would have been the first to offer an integrated, end-to-end Enterprise Performance Management System for: planning, consolidation, operational analytic applications, BI tools, reporting, data integration. This would differentiate it from other business intelligence vendors.

During the 2007 presentation "The New, Extended Oracle BI: A System for Enterprise Performance Management", Oracle made it clear that with the acquisition of Hyperion, it would have aimed at "Better information, Better insight, Better plans, Better decisions, Better actions, Better performance, Better results".



Source: Oracle.com

Figure 25. Insight Performance action

According to the latest estimates, Oracle Corporation has the following targets:

- *"US$40 billion total GAAP revenue in FY 2018*
- *430,000 customers in 175 countries*
- *25,000 partners*
- *137,000 employees, including: 38,000 developers and engineers; 14,000 support and services specialists who speak 29 languages; 19,000 implementation consultants*
- *More than 6.3 million students supported annually in 128 countries*
- *More than 18,000 patents worldwide*
- *#19 of 100 most valuable global brands (Interbrand Best Global Brands 2018 Rankings)*
- *5 million registered members of the Oracle Developer Community*
- *484 independent user communities in 92 countries, representing more than 1 million members*

- *Industry Leadership in: banking; communications; engineering and construction; financial services; healthcare; insurance; public sector; retail; utilities"* (Oracle.com)

3.3. SAP

With its headquarters in Walldorf, SAP SE is a European multinational company that produces management software.

Founded in Germany in 1972 by five IBM employees, Claus Wellenreuther, Hans-Werner Hector, Klaus Tschira, Dietmar Hopp and Hasso Plattner, SAP SE operates in the world of ERP and enterprise computing solutions.

The acronym comes from "Systeme, Anwendungen, Produkte in der Datenverarbeitung" (Systems, Applications, Products in Data Processing).

In 1980, SAP products were written with the proprietary programming language ABAP and 10 years later the authors produced Realtime (Echtzeit-System) software through which they signed their products with the letter R.

The first customer to adopt it was Imperial Chemical Industries (ICI), a multinational chemical company.

It was in the 90s that SAP specialized itself in ERP (Enterprise Resource Planning) through SAP R/x product, in the R/1, R/2 and R/3 versions for the Mainframe platform.

In addition to producing ERP systems, SAP specializes in data warehousing (SAP BW before and SAP BI after), customer relationship management (SAP CRM) and web portals (SAP Enterprise Portal). Subsequently, with the acquisition of SAP Business One, an ERP version for small and medium enterprises, it expanded its market.

Growing year by year, in 2010 it started the development of SAP HANA High-Performance Analytic Appliance to manage high transaction rates and process complex queries on a single platform, with the acronym S/4.

Through its systems, SAP offers the following services to companies:

- Financial Planning and Analysis (FP&A): Financial and Strategic Planning, Forecasting and Budgeting, Financial Analysis and Reporting, Performance Management (EPM)
- Accounting, Financial Closure and Tax Management: Accounting and Financial Reconciliation, Accounting Closure Process, Financial Reporting and Publication, Compliance with Evolving Standards)
- Liquidity and treasury management: Corporate treasury management, Cash flow forecasting and management, Debt and investment management, Financial risk and liquidity management

- Accounts receivable and payable: credit assessment and risk management, automated management of accounts receivable and payable, electronic invoicing and invoice management, collection and dispute management
- Solutions for real estate management: Real estate management, Contract and leasing management, Property management and maintenance, Energy management and building security
- Cyber security, governance, risk and compliance: A triple line of defence, Access to governance and control, Management of international trade, Cyber security and data protection

SAP, like Oracle, offers cloud systems. As they report on their website, they believe that the cloud cross-section gives them the ability to track all interactions on any device, interact with customers in real time, manage tasks and track performance, even when working offline. They believe that the customer experience increased because it gives the opportunity to interact and get in touch with customers in a personalized and meaningful way, with instant access to back-office data and a complete view of all information about them. The version that allows you to manage ERP data in the cloud is SAP S/4HANA.

Its key functions are:

- Administration, Finance and Control (by which it consolidates financial, management and operational data into a single source and accelerates performance with real-time processes and analytics)
- Procurement (reducing manual tasks and increasing efficiency while improving contract renegotiation and compliance processes through predictive analysis)
- Portfolio and project management (which increases efficiency through accurate reporting of cost, status and timing forecasts, using SAP CoPilot as an Intelligent Project assistant)
- Sales (prepared for sales and marketing teams)
- Professional services (to achieve improved real-time financial management performance and increased efficiency through global control over end-to-end projects and operational visibility)
- Production of components (for everything related to the production and management of supply chains based on the real-time demand of customers).

Source: SAP.com

Figure 26. ERP Modules

The software that manages EPM processes is SAP BPC (Business, Planning and Consolidation). As reported on the website, it offers planning, budgeting, forecasting and financial consolidation capabilities, to easily adapt plans and forecasts, accelerate budgeting and closing cycles and ensure compliance with financial reporting standards.

SAP BPC enables to make better decisions based on what-if analysis and scenario planning, increase collaboration for accountability and planning accuracy, and increase efficiency by reducing cycle times and thus aligning more quickly with strategic objectives.

Therefore, the product enables to:

- Save time and reduce the probability of error through a single, integrated software for planning and consolidation
- Engage stakeholders through Microsoft Excel, HTML5 and mobile reporting interfaces
- Use "what-if" and "scenario planning" models to assess the suitability of the budget in real time
- Automate aggregations, allocations and other manual processes to accelerate planning cycles
- Deliver a quick and accurate closure by automating the consolidation process.
- Implement pre-packaged industrial and functional content for all types of planning
- To promote the self-sufficiency of business users by providing them with a financial tool built specifically for finance - and managed by finance

According to the latest estimates, SAP has the following targets:

- 425,000 customers in more than 180 countries
- 96,000+ employees from 140+ countries
- 18,000+ SAP partner companies globally

- 24.74b€ (Non-IFRS) in FY2018
- 186 mil. subscribers in cloud user base
- 100+ innovation and development centers

3.4. IBM Cognos

Headquartered in Armonk, New York, IBM (International Business Machines Corporation) is a U.S. company that operates in the computer industry. Specifically, its portfolio includes the manufacture and marketing of hardware, software, IT services and the provision of infrastructure, cloud computing services and hosting and consulting.

Founded by Charles Ranlett Flint in 1911 under the name of Deutsche Hollerith Maschinen Gesellschaft, it was named IBM in 1924 under the leadership of Thomas J. Watson, who made it a leader in the field of mechanographic systems.

Among its most famous inventions, are remembered the first electromechanical computer (Mark 1), the first PC with DOS operating system produced by Microsoft, the magnetic stripe card, the floppy disk, the motherboard, the relational database, the Universal Product Code (UPC - barcode), the PS/2 connectors, the Watson artificial intelligence system, the SABRE air reservation system and the DRAM.

Its main product is the Mainstream for 60 years, adopted with the advent of the electronic computer. The first was the IBM System/360, built in 1964 and in production until 1978.

After a period of crisis between the '80s and '90s, IBM dedicated its activities to value-added services and "midrange" systems (management systems and applications for small and medium enterprises not able to buy mainframe).

Today IBM operates in various sectors (servers, software, IT services and microprocessors).

Its worldwide policy is mainly based on the network of Business Partners and, since 2011, is the second largest technology company in the world listed on the stock exchange for market capitalization. It closed FY 2018 with revenues of $79.591 million. (IBM Annual report 2018)

It is a company in continuous innovation: in 2014, it created the architecture PaaS/Platform As A Service, IBM Cloud. Aiming at leadership in this sector, IBM purchased Red Hat in October 2018, a world leader in the provision of open source solutions.

To compete with SAP's BPC and Oracle's Hyperion in the EPM field, IBM offers two software solutions: IBM Planning Analytics and Cognos Controller.

IBM Planning Analytics automates planning, budgeting and forecasting, and is used in finance, sales, operations, human resources (HR), marketing and IT. It has a Microsoft Excel interface and uses

multi-dimensional models to obtain more detailed insights. Its visualization tools are self-service and easy to use and can be used in the cloud.

Cognos, on the other hand, is a Business Intelligence solution that offers queries, reporting, analysis, dashboards and scoreboards that can be extended with planning, scenario modelling, predictive analysis and much more. This solution supports the different approaches and activities of users who want to understand business performance and make important decisions with tools for interacting, researching and assembling different points of view of the business.

In particular, Cognos Controller supports the process of closing, consolidating and reporting to the cloud. As reported, it enables financial teams to automate and accelerate financial closure with minimal IT support. It also helps financial teams achieve financial results, create informative financial and management reports, and provide the Chief Financial Officer (CFO) with an overview of key financial and metric indices.

As reported on the website, Cognos Controller allows to "*reduce the time of the closure and reporting process, define and maintain rules and processes that change flexibly, without coding, scripting or complex language, automate processes, and improve audit control by monitoring the flow of data during the consolidation process and monitoring the performance of subsidiary reporting through integrated workflow and status reporting".* (IBMCognos. com)

In short, Cognos Controller:

- Supports extended financial closure, in a verifiable solution owned by the financial department
- Offers cloud deployment option, with the functionality of an on-premise solution
- Automates consolidation without IT support
- Supports IAS, IFRS, U.S. GAAP, local GAAP and other regulatory regimes

To date, IBM boasts the following achievements:

- 28,046 companies using IBM Cognos
- 350,000+ employees
- operations in more than 170 countries
- 79.59b€ in FY2018

3.5. OneStream

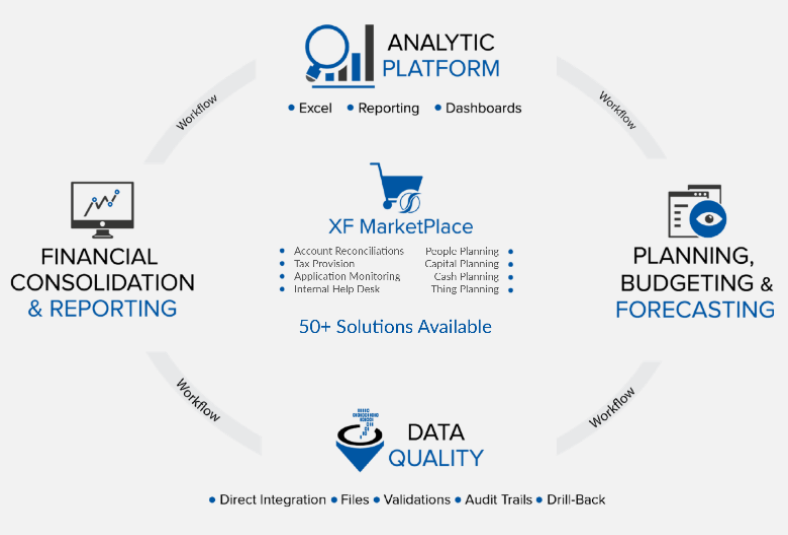
Headquartered in Rochester, Michigan, OneStream Software LLC is an independent corporate performance management (CPM) software company, founded by Craig Colby, Bob Powers, and Tom Shea in 2012.

It expanded quickly and now has offices in Atlanta (Georgia), Stratford (Connecticut), Lucerne (Switzerland), Manchester (United Kingdom), Delft (The Netherlands), and Lund (Sweden).

It is a private company that offers, on a cloud-based platform, processes of financial consolidation, planning, budgeting and forecasting, reporting and analysis and quality of financial data to enable the implementation of additional analytical solutions. This enables customers to eliminate the risk and complexity of data integration, validation and reconciliation across products, applications or modules, and reduce ownership costs and upgrades.

In its portfolio, OneStram XF's SmartCPM platform, aligned with business changes by managing key financial activities of closure and consolidation, planning, budgeting and forecasting, reporting and analysis, financial data quality, cloud or On-Premise deployment, technology leadership, Oracle Hyperion conversion to OneStream, and OneStream for SAP ERP Customers.

OneStream XF MarketPlance offers additional solutions for CPM, account reconciliations, people planning, capital planning, sales planning, cash planning, compliance solution, tax provision, task manager and close manager.



Source: OneStream.com

Figure 27. XF MarketPlace

The main benefits it offers are:

- *OneStream XF delivers corporate standards while meeting business unit and business process detail requirements in a single unified application*
- *OneStream XF combines analytical, stage, relational and source transactional reporting into one model to make it easier for users to achieve optimal performance.*

- *OneStream XF MarketPlace reduces the time to value equation and quickly delivers financial and operational solutions without IT complexity.* (OneStream,com)

3.6. Tagetik

Based in Lucca, Tagetik was founded in 1986 as a consulting firm dealing with performance management processes. In the 90s, it expanded its presence in Italy and developed the first suite of products for budgeting, consolidation, financial planning, closures and allocations.
In 2005, Tagetik brand was launched, unifying all corporate performance management processes into a single product, making itself known on a global level.
In 2008, in fact, two offices were opened in North America, obtaining a place in the Gartner "Magic Quadrant for CPM Suites".
In the following years, its development continues: in 2015, it offered unified CPM products both on-premise and in the cloud. As a result, it began to have important customers in 40 different markets.
Two years later, in 2017, it joined Wolters Kluwer, a global leader in providing software solutions, information and services to the world's legal, tax, financial and healthcare professionals. Tagetik Software thus becomes CCH® Tagetik, maintaining its focus on developing innovative solutions for the Finance area.
Today, CCH® Tagetik has approximately 1,000 customers and 75,000 users in more than 35 countries who use the Financial Performance Platform to automate business processes that affect financial results.
Tagetik has always maintained the same mission over time: provide the best Corporate Performance Management solution, today more than yesterday given the increasing needs in the Finance area and the increasingly strategic ground that covers the CFO, as reported on its website.
Its implementation accelerates the time of different financial activities, reducing the total cost of ownership (TCO): this allows clients to devote more time to strategic activities aimed at improving financial results.
Among the certifications it has, appear:
- ISO22301: maintains a business continuity management system in accordance with the international standard ISO 22301: 2012;
- ISO 27001: the implementation and operation of the Cloud services have been certified in accordance with the UNI CEI ISO/IEC 27001:2013 standard on information security management;
- OHSAS 18001: introduced and applies a management system for the protection of health and safety at work according to the BS OHSAS 18001:2007 standard;

- ISO 9001: CCH Tagetik is certified on the design, development, sale and maintenance of Performance Management software solutions and related application consulting services.

Tagetik's main clients include UniCredit, Generali, Astaldi, Leonardo, Tim and Allianz.

To date, Tagetik has a significant global presence, with 14 offices in 39 countries divided into 5 continents.

The great consensus that Tagetik has achieved in the short term is mainly due to the effectiveness with which the software manages to reduce the Total Cost of Ownership (TCO). It is achieved through the modernization of budgeting and planning processes, the reduction in the number of days needed for monthly closures and the consolidation cycle, the acceleration of all financial activities and disclosure management, as well as the simple generation of advanced management reports and analyses, as reported on its website. (Tagetik.com)

Budget data collection is simplified by 70%, the closing process is reduced by 50% and reporting activities are reduced by 40%.

The cloud in the "Administration, Finance and Control" area manages the following processes:

- Budgeting and Planning
- Modeling and Forecasting
- Financial Consolidation and Close
- Management Reporting
- Disclosure and Compliance
- Reporting and Analytics

Source: Tagetik.com

Figure 28. Tagetik cycle

In the "Budgeting and Planning" process, recalculation time is cut by 95%, retail budgeting cycle is cut by 30% and budget collection time is cut by 70%. It enables unified end-to-end planning, reduced

planning times, alignment between finance and operations, full traceability, integrated financial intelligence, and smooth transactions.

It then invests every type of planning: expenses and investments, finance, capital planning, economic and capital planning, personnel, profitability, integrated business planning, production capacity, sales and operations (S&OP); strategic.

Among the various clients who have chosen CCH Tagetik for Budgeting and Planning, figure Astaldi, Randstad, Askoll, Artemide, VorWerk and Cisalfa.

The "Modeling and Forecasting" process is facilitated as forecasting times are reduced by 50%, manual operations are cut by 50% and planning and forecasting is accelerated by 30%.

It provides faster and more in-depth information, a unified model, the financial impact of changes, modeling processes, unified multi-annual strategic plans and models, cash flow and modeled hedging.

The main companies that have implemented Tagetik for the Modeling and Forecasting process are TIM, Alpitour, Artemide, Gruppo Banca Carige, Menarini Group and Sorgenia.

The "Consolidation and Closing" process benefits from a 150-hour reduction in the Closing cycle, manual activities are limited to 5-10%, new resources in the finance area are reduced by 50%.

The benefits are a reduction in costs and time, greater reliability, rapid monthly closures, a reduction in errors, complete traceability and native financial intelligence.

The customers who in this case have adopted Tagetik for these processes are Unicredit Group, Generali, Brembo, Mediaset Group, Percassi and Faper Group.

The "Management Reporting" process, on the other hand, reduces manual data entry by 90-95%, speeds up report generation by 50% and automates +100 reports.

The benefits that follow are the production of reports from a single source, the automatic updating of all reports, integrated controls and audits, full consistency without errors, elimination of time-consuming activities and collaboration between multiple events.

The main companies that have adopted Tagetik Collaborative Office are Leonardo, Allianz, UniCredit Group, Fininvest Group, Trattori Antonio Carraro and Loacker.

As far as the "Disclosure Management" process is concerned, manual data entry is reduced by 90-95% and disclosure is automated from day to hour.

The benefits include simple and fast reports, reliable information, increased reliability, elimination of manual activities, dynamic reports and risk mitigation.

The main customers who have adopted this process are Erstes, Banca Popolare di Milano, Acea, Astaldi, Generali and Allianz.

Finally, with regard to the Analytics Reporting process, CCH Tagetik automates +100 reports, speeds up their generation by 50% and reduces monthly reporting to less than 2 days.

The benefits are more requirements and a single set of tools, maximum simplicity of reports, useful information and immediate reports, simpler and faster processes, use of existing solutions and self-service modeling.
CCH Tagetik analytics reporting has been implemented by Generali, CIR, Vorwerk, Zuegg, Sirti and Juventus.
Finally, the companies that have implemented CCH Tagetik on the Cloud are Randstad, Johnston Press PLC, Marcolin, Postevita, Renvico and Generali.
In short, with a turnover of €42.4 million, Tagetik, like all the other companies previously described that produce EPM software, is a constantly growing reality.
In conclusion, it is clear that EPM software is constantly evolving and that the various vendors invest each year in becoming more and more competitive. The following paragraph is dedicated to a comparison between the different systems based on the "Magic quadrant" of Gartner.

3.7. Gartner Magic Quadrant

Gartner is a research and advisory company founded in 1979 that provides enterprises with business insights, advice and tools they need to achieve their mission-critical priorities and build the organizations of tomorrow
As reported on Gartner website
"Gartner Magic Quadrants offer visual snapshots, in-depth analyses and actionable advice that provide insight into a market's direction, maturity and participants. Magic Quadrants compare vendors based on Gartner's standard criteria and methodology. Each report comes with a Magic Quadrant graphic that depicts a market using a two-dimensional matrix that evaluates vendors based on their Completeness of Vision and Ability to Execute". (Gartner.com)
The Magic Quadrant is updated every 1-2 years with analysis in different technological sectors. It consists of a series of market researches carried out directly by the consulting company IT Gartner.
The primary purpose of the analyses is to show the multiple features of the market, from listing participants to showing direction and maturity. These analyses are performed with a method of collecting qualitative data.
The quadrant divides the market into four areas: leaders, challengers, visionaries and nickel players.
The quadrant recognizes as leaders the ones that
"provide mature offerings that meet market demand and have demonstrated the vision necessary to sustain their market position as requirements evolve. The hallmark of Leaders is that they focus on, and invest in, their offerings to the point where they lead the market and can affect its overall

direction. As a result, Leaders can be vendors to watch as you try to understand how new market offerings might evolve. Leaders typically possess a large, satisfied customer base (relative to the size of the market) and enjoy high visibility within the market. Their size and financial strength enable them to remain viable in a challenging economy. Leaders typically respond to a wide market audience by supporting broad market requirements; however, they may fail to meet the specific needs of vertical markets or other more-specialized segments" (Gartner.com)

As challengers the ones that

"have a strong Ability to Execute, but may offer products that don't fully align with Gartner's definition of the market. Large vendors in mature markets may be positioned as Challengers because they choose to minimize risk or avoid disrupting either their customers' activities or their own. Although Challengers typically have significant size and financial resources, they may lack strong vision, innovation or an overall understanding of market needs. Challengers may offer products nearing the end of their lives that dominate a large, but shrinking, segment. Challengers can become Leaders if their vision develops. Over time, large companies may move between the Challengers and Leaders quadrants as their product cycles and the market's needs shift" (Gartner.com)

As visionaries the ones that,

"align with Gartner's view of how a market will evolve, but their ability to deliver against that vision is less proven. In growing markets, this is the typical status. In more mature markets, it may reflect a competitive strategy for a smaller vendor — such as selling an innovation ahead of mainstream demand — or a larger vendor trying to get out of a rut or differentiate itself. Visionaries fall into the higher-risk/higher-reward category. They often introduce new technology, services or business models, but may also need to build financial strength, service and support, and sales and distribution channels. Whether Visionaries become Challengers or Leaders may depend on whether customers accept new technologies or whether the vendors can develop partnerships that complement their strengths. Visionaries are sometimes attractive acquisition targets for Leaders and Challengers" (Gartner.com)

And as niche players the ones that

"do well in a segment of a market, or have a limited ability to innovate or outperform other vendors in the wider market. This may be because they focus on a particular functionality or region, or because they are new entrants. Alternatively, they may be struggling to remain relevant in a market that is moving away from them. Niche Players may have reasonably broad functionality, but limited implementation and support capabilities and relatively limited customer bases. Niche Players do not demonstrate a strong vision for their offerings. For end users, assessing Niche Players is more challenging than assessing the vendors in other quadrants. This is because some could make

progress, while others may not execute well and may lack the vision and means to keep pace with broader market demands. A Niche Player may well be perfect for your requirements. However, even if you like what a Niche Player offers, if it runs contrary to the direction of the market it may be a risky choice because its long-term viability will be threatened". (Gartner.com)

3.7.1. Magic quadrant for Cloud Financial Close

The 2018 research project on the different EPM systems that deals with financial close in cloud takes into account three types of cloud service vendors: cloud-only vendors with cloud solutions architected as cloud services; traditional on-premises vendors with new "built for the cloud" solutions; traditional on-premises vendors that have made their solutions available as a cloud services.

As the report highlights, the cloud financial close market is having a strong influence on the financial department since it allows improving the process' effectiveness, efficiency and compliance.

Indeed, "*most of the associated capabilities are "greenfield" opportunities (without the constraints of any previous work) for organizations that previously relied heavily on spreadsheets and manual processes*". (Gartner Magic Quadrant, 2018)

Nowadays the cloud represents an extremely important tool that helps CFOs in optimizing the financial close process.

By financial close solution, Gartner refers to the support to financial accounting processes needed to achieve the corporate financial close and includes financial consolidation, financial reporting, reconciliation management, close management, intercompany transactions and disclosure management.

To be included in the quadrant, vendors must support at least two areas of the six cited above.

In addition, to be included, vendors must deploy the FC solutions as a cloud service, market and sell the solution to mid/large size global organizations and actively market, sell and deploy the cloud FC solution on a stand-alone basis.

Furthermore, as the report underlies, vendors need:

- at least 25 organizations as clients,
- at least $7 million in booked subscription revenue from cloud FC in the fiscal year 2017,
- sales outside the vendor's home region in at least one of the following regions: Americas, EMEA or Asia/Pacific.

As far as it concerns cloud service attributes, vendors to be included must have the responsibility of "*managing all technology infrastructure either in its own data centers or in third-party data centers,*

and implementing upgrades as part of the cloud service, not via a third-party or managed service provider". (Gartner Magic Quadrant, 2018)

Additionally, vendors are required to license the cloud on a subscription basis, not to sell tailored contracts to specific user organizations, provide a cloud service that uses internet technologies, have scalable and elastic computing resources to support the cloud service.

Further requirements include the disposal of a single code line, of at least two upgrades annually, of self-provisioning capabilities, and of technology to deliver a service that is shared by multiple customers.

Lastly, "*to be eligible for inclusion, vendors had to be financially viable and profitable, or have a realistic path to profitability*".(Gartner Magic Quadrant, 2018)

The evaluation criteria are based on ability to execute and completeness of vision.

To evaluate the ability to execute, the quadrant looks at the product/service considering capabilities, quality, features and skills; the overall viability intended as financial health; sales execution/pricing, looking at deal management, pricing and negotiation, presales support; market responsiveness/record as the ability to be flexible and achieve competitive success; marketing execution; operations as the vendor's ability to meet goal and commitment; and customer experience looking specifically at

a) Sales experience
b) Implementation experience
c) Ease of use
d) Application flexibility
e) Performance
f) Integration
g) Analytics
h) Application governance/life cycle management
i) Ongoing maintenance effort
j) Solution's ability to meet their needs
k) Overall satisfaction with the vendor

Concerning the completeness of vision, the quadrant evaluates market understanding looking at the vendor's ability to "*understand buyers' needs and to translate those needs into products and services*"; marketing strategy; sales strategy; offering strategy; business model; vertical/industry strategy; innovation and geography strategy. (Gartner Magic Quadrant, 2018)

To gather the data, Gartner, in addition to the 400 client calls about FC market in 2017, conducted a survey of organization using FC product made of 21 questions about their experience with the solution.

The responses obtained were 462 from companies based in the following regions:

- North America, 71%
- Europe, the Middle East and Africa, 42%
- Asia/Pacific, 21%
- Latin America, 16%

Source: Gartner.com

Figure 29: Magic Quadrant for Financial Close 2018

The study shows the following results:

- Oracle, BlackLine, Workiva and Host Analtytics are market leaders;
- None of the company analyzed are recognized as challengers;
- CCH Tagetik, Trintech (Cadency), OneStream Software, BOARD International are visionaries;
- Trintech (Adra) and FloQast are niche players.

The software are evaluated by analyzing vendor' strengths and cautions, as reported in the appendix. The vendors evaluated in the report are:

- BlackLine, a pure-play cloud vendor solutions for FC functions. It is based in California and sells its solutions individually. It is considered leader in its market.

- BOARD International, a joint based in Boston (U.S.) and Chiasso (Switzerland) which sells solutions on-premises and on cloud for financial reporting, consolidation and management reporting. It is considered a visionary in its market this year, moving form a niche position, due to the ability to innovate and support complex requirements.

- CCH Tagetik, based in Lucca (Italy) and Stamford (U.S.). It supports FC processes and FP&A requirements both on-premises and on cloud. It is considered a visionary in its market supporting complex FC use cases.
- FloQast, based in Los Angeles (U.S.), covers the lower mid-market managing reconciliation management and close management EFCA solutions. It is considered by the quadrant a Niche Player.
- Host Analytics, based in Redwood City (U.S.), supports financial reporting, consolidation and FP&A functions through its platform. It is a cloud-only vendor that is considered a leader since its cloud experience is recognized as very high and its product offering strong.
- OneStream Software, based in Rochester (U.S.), supports financial reporting, reconciliation management, FP&A, and robust platform selling on-premises, SaaS, and hosted solution. It is considered a visionary showing relatively high level of customer satisfaction but just responding to the requirement for market penetration.
- Oracle, based in Redwood City (U.S.), mostly sells cloud offerings but is worldwide known for its on-premises Hyperion FP&A and FC solutions. It is Leader in the market due to its business model, product/sales/geographic strategy.
- Trintech, based in Dallas (U.S.), offers solutions on cloud and serves the lower midmarket. It is considered a Niche player and known as a product easy to implement, use and maintain.
- Workiva, based in Ames (U.S.), is a cloud-only vendor supporting FC processes, close and disclosure management. It is considered a leader in the market and is characterized by a rapid growth.

3.7.2. Magic Quadrant for Cloud Financial Planning and Analysis Solutions

This second report considers financial planning and analysis solutions that support the finance office in budgeting, forecasting and planning.

The study responds to the current shift from the on-premises solution to the cloud that is overwhelming the market in question. According to the Gartner report, the reasons behind this shift are the reduction of application support costs, the increase of application flexibility and the reduction of the evaluation time.

The cloud service vendors considered are the same as the previous research (cloud-only vendors, traditional on-premises vendors with new "built for the cloud" solutions, and traditional on-premises vendors that have made their solutions available as a cloud service).

Vendors in the market are required to support at least two of the following: financial budgeting and planning, integrated financial planning, financial forecasting and modeling, management and performance reporting.

The inclusion criteria are based on product capabilities, according to which vendors must support at least two of the components previously cited; deploy a financial planning and analysis solution as a cloud service; market and sell the solution to small/midsize/large and/or global organizations; sell and deploy the cloud solution on a stand-alone basis.

Further, to be included in the research, vendors need at least 50 organizations using their service, at least $7 million in book subscription revenues from the offering in question during the fiscal year 2017, sell and market the solution outside the vendor's home region and at least in Americas or EMEA or Asia/Pacific.

Lastly, the company vendor must be financially viable and profitable.

In addition, the evaluation criteria are the same listed in "Cloud financial close report".

As the report highlights, companies choose financial planning and analysis solutions on cloud because their on-premises solutions lack of flexibility, have poor performance and an ongoing support cost. Furthermore, past solutions show limited analytical capabilities.

As Gartner underlines, the financial planning and analysis market is rapidly evolving: *"analysis of social media conversations around the leading vendors in the FP&A space has revealed that the market direction is gradually shifting from "integration" and "consolidation" in 2016 and 2017 toward creating "user-friendly" interfaces or GUI in 2018".* (Gartner Magic Quadrant, 2018)

The demand of FP&A solutions is increasing and getting consistent

The report underlines that "*survey respondents were asked, "Which of the following technologies are you looking to deploy in the finance organization to improve the business by 2020?" Fifty percent responded predictive analytics. This was the No. 1 answer given. Fifteen percent responded data lakes. Although this is a relatively small percentage, it's representative of what Gartner has discussed with organizations that have advanced analytics initiatives".* (Gartner Magic Quadrant, 2018)

The study consisted of a survey ran from February 2018 to April 2018, made of 21 questions addressed to customers about their experience with their cloud FP&A vendor and its solutions.

The responses obtained are 462 from different regions:

- North America (71%)
- Europe, Middle East and Africa (42%)
- Asia/Pacific (21%)
- Latin America (16%)

Furthermore, social media and forum were used to track user responses, since they are considered an indicator of consumer sentiment and preference.

Source: Gartner.com

Figure 30: Magic Quadrant for Cloud Financial Planning and Analysis Solutions 2018

The study shows the following results:

- Oracle, Anaplan, IBM, Adaptive Insights and Host Analtytics are market leaders;
- Workiva and Kaufman Hall (Axiom Software) are recognized as challengers;
- CCH Tagetik, SAP, OneStream Software, BOARD International, Prophix and Longview are visionaries;
- Vena Solutions, Jeclox and Kepion are niche players.

The software are evaluated strengths and cautions of the following vendors:

- Adaptive Insights, considered Leader "*due to its scores for Completeness of Vision, reflecting its sales, marketing and product strategy, and for Ability to Execute, reflecting its product and marketing execution and high customer satisfaction ratings*". (Gartner Magic Quadrant, 2018)

- Anaplan, considered a cloud-only vendor Leader due to the number and experience of its customers.

- BOARD International, considered a Visionary having a strong vision for innovation and "*a good understanding of the market and analytics*". (Gartner Magic Quadrant, 2018)

- CCH Tagetik, classified as a Visionary thanks to the ability to support complex use cases and the continuous increasing of its ability to execute.

- Host Analytics, listed as a cloud-only vendor leader due to market understanding and customer number and experience

- IBM, headquartered in Armonk (U.S.), sells on-premises and cloud solutions. It is classified as a Leader in the quadrant thanks to the customer expansion not just in cloud but also from a geographic, sales and product strategy point of view.
- Jedox, based in Germany, sells on-premises and cloud solutions. It is considered a Niche player providing a "*cost-effective modeling solution that is highly compatible with Microsoft Excel*". (Gartner Magic Quadrant, 2018)
- Kaufman Hall (Axiom Software), based in Skokie (U.S.), sells cloud solutions supporting "*planning, budgeting, performance reporting, rolling and cash flow forecasting, cost accounting, capital and workforce planning, strategy management, and profitability modeling*". It is considered a Challenger in the market, and it is focused on a limited number of industries. (Gartner Magic Quadrant, 2018)
- Kepion, headquartered in Seattle (U.S.), offers a platform to support FP&A process and provide analytics for sales, finance, operation, marketing and HR. It supports financial and operational planning processes and is considered a Niche Player in its market.
- Longview, based in Toronto, Canada, sells a cloud-based FP&A solution for "*budgeting, forecasting, dashboards, modeling, performance reporting, analytics and collaboration support. It also offers separate solutions for tax planning and to support the financial close*". It is considered in the reference market a Visionary. (Gartner Magic Quadrant, 2018)
- OneStream Software, considered a Visionary in the market and is known for the ability to executive and the high customer satisfaction.
- Oracle, considered a Leader in this market as well, due to "*its market traction with PBCS and EPBCS, its geographic, sales and product strategy, and its business model*" (Gartner Magic Quadrant, 2018)
- Prophix, based in Toronto, Canada, offers on-premises and cloud solution that serves the midmarket. It is listed as a Visionary.
- SAP, based in Germany, offers "*SAP Analytics Cloud and SAP Digital Boardroom (built on SAP Analytics Cloud) in this space*". It is considered a Visionary by Gartner. (Gartner Magic Quadrant, 2018)
- Vena Solutions, based in Toronto (Canada), is a cloud-only solution vendor that uses Microsoft Excel within its user interface not requiring users to replace their models and spreadsheet. It is considered a Niche Player in the market.
- Workiva is a cloud-only vendor listed as a challenger due to its rapid growth.

It is therefore clear that the EPM systems are constantly improving. As Micheal Gaiss points out, "*the fundamentals for successfully implementing strategy include a sound strategy, strong management,*

and appropriate measurement system. Tying measurement to management delivers accountability across the organization, while linking measurements back to the strategy ensures that objectives are measurable[47]". (Gaiss, 1998)

EPM systems are today a necessary requirement to ensure the fluidity and accuracy of processes and at the same time to promote a safe implementation of the strategy designed.

The next chapters will be focused on the analysis of the implementation of CCH Tagetik in the Mondo Convenienza.

[47] Gaiss, M., (1998), Enterprise Performance, Management Accounting

Chapter 4

Case study: Mondo Convenienza

After the literature excursus in which the disciplines of performance measurement and management were defined, information and technology systems examined, and Enterprise Performance Management systems analysed, the following chapters turn to empirical analysis.
The case study concerned the implementation of Tagetik at Mondo Convenienza.
After describing the company, defining strategy, main financial indicators and group philosophy, Tagetik's implementation process was outlined, from the evaluation phase of the different EPM systems to the post-implementation benefits found.
A double analysis - quantitative and qualitative - was then carried out to obtain significant information about the usefulness of these systems.
A questionnaire was administered to Mondo Convenienza employees to assess their level of appreciation of Tagetik. The answers of the sample were then analysed with SPSS. Luigi Esposito, senior manager of KPMG (vendor of the Tagetik package) and Giuliano Caruso, Head of Accounting Data Processing Center and Administrative Services of the holding company Mondo Convenienza (user of the Tagetik package) were interviewed. The relationship between the two interviews, the meeting points and the dissonance points, will be described in the next chapter.

4.1. Presentation of the company

Edil Tre Costruzioni is holding of Mondo Convenienza Group.

Founded in 1985 by Giovan Battista Carosi, Mondo Convenienza is the first Italian group that distributes furniture and furnishing. Its sales network is disseminated throughout the country and today it convers several Italian regions.

The management of the core business is supported by the activities carried out by the service companies and is coordinated by the holding company.

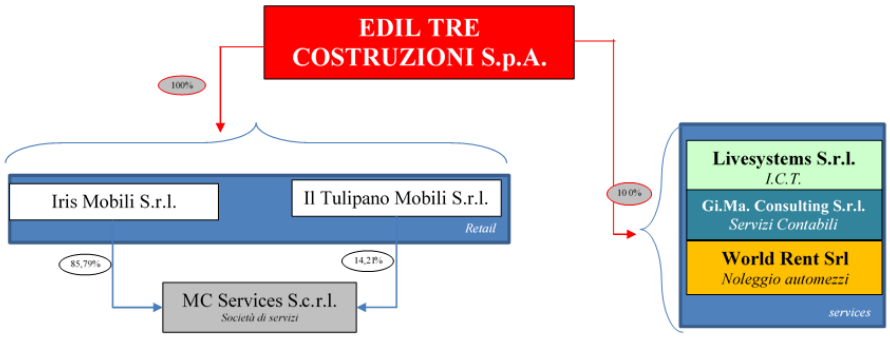


Figure 31: Mondo Convenienza Group - Corporate organizational chart

The philosophy of the group is to offer customers furniture and furnishings at the best value for money in the market.

Mondo Convenienza is an example of a sound company.

Analyzing the CAGR[48] (Compound Annual Growth Rate) from 2011 to 2018, the average annual growth rate of the volume of production value in the period considered is 8.08%.

In 2018, the value of production increased by 6.18% (+Euro/000 67,229) compared with the previous year. This demonstrates the progressive consolidation of the Group's market shares which, in 2018, exceeded 11% of the national furniture market, where there was, on average, a growth performance in the value of production of 0.8%.

[48] According to Investopedia, the "Compound annual growth rate (CAGR) is the rate of return that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each year of the investment's lifespan".

Anno	Valore della produzione	Valore della produzione CAGR
2011	670.695	670.695
2012	624.432	724.882
2013	632.096	783.447
2014	715.866	846.743
2015	868.423	915.153
2016	1.031.765	989.090
2017	1.088.139	1.069.001
2018	1.155.368	1.155.368
CAGR	8,08%	

Figure 32: Mondo Convenienza CAGR

Values expressed in Euro/000

In the period 2016-2018, this strategy enabled the Group to increase its revenues by 12.69% (from €1,009 million/Euros in 2016 to €1,137 million/Euros in 2018), with a share of the domestic furniture market, referring to the "Mondo Convenienza" brand stores, which in 2018 exceeded 11%.

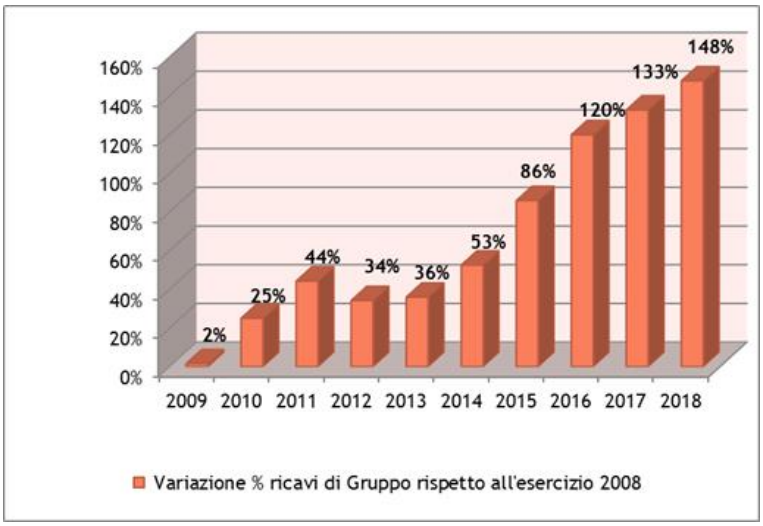


Figure 33: Variation in Mondo Convenienza group revenues

Concerning the EBITDA, which in 2018 amounted to Euro/000 49,213 (Euro/000 34,072 - 2017), after a decrease in the financial year, the value improved, rising to 4.33% of revenues, compared to 3.19% in 2017, with a growth of about 15 million, due to the significant increase in the first margin (VA) of about 23 million.

This trend is consistent with the medium/long-term objectives outlined in the Group's strategic plan, aimed at increasing sales by consolidating and acquiring new market shares and containing overheads.

The balance sheet, compared to the previous year, shows the strategic intention to develop the Group's own resources, in support of the Group and its growth process in the reference markets, in an economic phase still characterized by a limited recovery in consumption.

Among the main results achieved, Mondo Convenienza reported a turnover of 1,137 million of euros in 2018. It presents more than 38 points of sale on the national territory and more than 2.900 direct resources and 20 active Tagetik users.

4.2. The implementation of Tagetik

Aiming at improving its business processes, Mondo Convenienza implemented CCH Tagetik in 2015.

The group decided to use the CPM software for:

- Balance Sheet,
- Intercompany relations,
- Consolidation,
- Disclosure Management and
- Executive Dashboard.

The company was seeking for a management model able to simplify, rationalize, uniform and decentralize the business processes to make them reach the qualitative excellence, usability and an easy communication.

As Giuliano Caruso - Head of Accounting Data Processing Center and Administrative Services - highlighted, "*we wanted a solution that would reduce time and simplify the management of the entire budgeting process: with CCH Tagetik we reduced cycle times, cut manual tasks by more than 50%, ensure data consistency and integrity, and improve work quality*". (Tagetik.com)

The goal was a substantial restructuring of the balance sheet and consolidation processes, the drafting of the notes, the management report, the financial report, the generation of files in XBRL format, collecting data and reports in a single database, and reducing the time taken to produce the information.

Having understood the needs, the company posed as main objectives:

- redesign the budgeting process and create standards for activities and reporting;

- adapt the IT system to allow a rapid response even to regulatory changes;

- ensure the control and perfect traceability of data;

- use a single database shared by all users, to improve the quality of activities; a system capable of continuously adapting to the evolution of business

Recognizing its needs, Mondo Convenienza decided to leave ViaLibera software because it was incompatible with server access policies, and did not have satisfactory support services.

Furthermore, the software did not support optimal lead times of less than 5 months and international operations (on foreign countries).

Lastly, ViaLibera had not ensured the full functionality of the module, causing the company to risk approving its financial statements late.

Thus, Mondo Convenienza was looking for reliability, support in future phases of development of the business complexity, and reduction of the lead time under three months. So, it decided to implement an EPM software between Passepartout, Ipsoa, Tagetik and Oracle.

Passepartout and Ipsoa were excluded since they do not have products that could equalize the technical characteristics of ViaLibera – Teamsystems, concerning the consolidated financial statement.

On the contrary, Tagetik and Oracle presented products characterized by higher technical features than those of Via Libera - Teamsystems, allowing the fulfilment of the company's expectations.

The strengths recognized at both Oracle and Tagetik were:

- direct data loading from ad hoc through ETL system;

- manual adjustments imported budget;

- admin and user profiling, with customizable levels of activity and responsibility

- activity and process tracking;

- possibility of drawing the process and allocating activity levels based on it

- budget schemes and XBRL with dedicated module (but in phase of implementation):

- customizable a note templates and management report;

- function of the whole program in multi-language;

- automatic table compilation, budget data tagging system, with automatic refresh in case of update

- possibility to import transactional DB and manage IC reports with creation of elision rules;

- historicisation of consolidated data (e.g. margin elision);

- manages the consignment in the CCIAA

Furthermore, Tagetik had an additional benefit: the XBRL module was already completed and was working on the possibility of managing leasing, according to IAS 17 PCs, with a dedicated application.

It was considered an important strength by Mondo Convenienza since the XBRL module made problems with ViaLibera.

The weaknesses recognized to Oracle are:

- the installation and configuration of the hardware and networking environments are the responsibility of Mondo Convenienza (MC);

- in the case of service/bug and software release, the management of the service vs. oracle is the responsibility of MC;

- the development of the ETL is the responsibility of MC;

- a development environment must be made available to ABIC-Oracle within the timeframe defined in the contract;

- only intercompany balances will be imported from the transaction, and assisted construction of data entry forms in Excel is recommended for movements during the year;

- definition and transcoding of the consolidated accounts plan for MC;

- XBRL taxonomy and association with MC's accounts/balance sheet items

In Tagetik, no such critical issues have been identified, so it was decided to implement the latter.

As Mondo Convenienza reports on the implementation case study, "*the flexibility of the CCH Tagetik software and the constant commitment, in keeping up with technological developments and regulatory changes, have enabled Mondo Convenienza to effectively manage the evolution of the business in recent years*".

Mondo Convenienza has decided to adopt parameters and structures common to the whole group. This has brought significant improvements to all 'intercompany' processes. These parameterizations were all carried out in the first phase of the project.

The implementation period ended in December 2015 and already in April 2016 the system was integrated.

The transition to the new CCH Tagetik management system allowed the multiple applications used by the administrative function to be brought together in a single unified software solution.

Through the implementation of Tagetik, all companies use a unified and automated civil reporting tool.

A special company structure is responsible for the maintenance of the software and processes (and no longer individual users).

Mondo Convenienza underlines that "the main benefits obtained are, in addition to the development of economic and financial information, also a significant saving of time for the entire process".

Through Tagetik, the Mondo Convenienza group has a centralized database, with high quality data and fully traceable within civil processes. In addition, it benefits from an "extremely flexible and efficient information system that allows a 'drill-down' with the highest level of detail up to the single writing of rectification of consolidated".

In addition, Tagetik has made it possible to manage statutory consolidation, and to generate consistent, high-quality reporting, in line with the needs of stakeholders.

Among the most important results are:

- A reduction of more than 50% in manual activities,

- Rationalisation of consolidation entries,

- Peripheral data loading by means of a system of 'customized' ETLs and,

- Reconciliation of intercompany through a web-based dashboard that allows to maintain supervision and control over the data entered by peripheral users.

Giuliano Caruso, commented the benefits received from Tagetik, stating that “"the CCH Tagetik solution has proved to be highly customizable, allowing effective responses to the continuous changes in the organizational perimeter of the Group that, since 2012, has embarked on a path of profound reorganization”.

In conclusion, the numbers reported demonstrate the success of the implementation of Tagetik in Mondo Convenienza. The next chapter is dedicated to the quantitative research. A questionnaire was administered to Mondo Convenienza employees to assess their appreciation of Tagetik. The results were processed with SPSS, Statistical Package for Social Science.

Chapter 5

Quantitative research

5.1 Methodology and questionnaire design

Before designing the questionnaire the initial driver for its design has to be the research question, previously elaborated. After establishing the issue to be addressed in this research, an early decision was to choose the methods that survey was administered by.

There are generally two underlying methods for conducting a survey: self-administered and interviewer administered. I used both methods in order to have much consistent findings.

The first method (a self-administered survey) consisted of a paper questionnaire conducted electronically on the internet by using Google forms. Self-administered surveys aim at reducing the chance of bias in the face-to-face interview with a person but at the expense of having the interviewer available to explain the questions. Results on this method have been inserted and analyzed in SPSS Software package, originally launched in 1968 by SPSS Inc. and later acquired by IBM in 2009, commonly used by various researches in statistical data analysis (Bryman & Cramer, 2002; Lawal & Lawal, 2003; Meyers et al., 2013; Verma, 2012). The choice to used SPSS as a statistical software was due to its straightforward and English-like command language. Furthermore, SPSS enables to get statistics ranging from simple descriptive numbers to complex analyses of multivariate matrices. It allows to plot the data in histograms, scatterplots, and other ways by combining files, modifying existing variables and creating new ones. According to Arkkelin (2014), SPSS allows anything a researcher would ever want with a set of data using a software package. The questionnaire is below reported and the analysis will be explained in the following paragraphs.

The second method of interviewer administered has been done in person with Luigi Esposito and over the phone with Giuliano Caruso, recording results directly in the computer. The interviewees are related to the software since the former is its implementator while the latter is one of the users. Luigi Esposito is Senior Manager at KPMG of the Tagetik group. He has decades of experience with the software and his interview was studied through a Key words analysis. Giuliano Caruso is the Head of the accounting data processing center and Administrative Services of the Mondo Convenienza. A sentiment analysis of his interview was carried out. The purpose of the two interviews was to discover the perceptions that Tagetik vendors and users respectively have. In this way, assonances and dissonances between the two experiences were analysed.

5.2. Data Analysis

The Questionnaire items are written in the form of questions using:

a) 5-point Likert-type scale ranging as follows

- (1) Very satisfied; (2) Somewhat satisfied; (3) Neither satisfied nor dissatisfied; (4) Somewhat dissatisfied; (5) Very dissatisfied
- (1) Very semplified; (2) Somewhat semplified; (3) Neither semplified nor complicated; (4) Somewhat complicated; (5) Very complicated
- (1) Very much; (2) Somewhat; (3) Undecided; (4) Not really; (5) Not at all

b) graphic rating scale from 0 (minimum) to 10 (maximum)

c) dichotomous scale for Yes and No

d) an open question

The questionnaire was distributed to 15 employees of Mondo Convenienza who use Tagetik for daily operations. The questionnaire was sent via link to Giuliano Caruso, Head of the accounting data processing centre and administrative services of the holding company,who submitted it to the employees. 15 responses were received.

As shown in the table below, the 15 respondents were asked if Tagetik was the first EPM software they used.

93,3% of them replied in the affirmative and 6,7% in the negative.

Is Tagetik the first EPM software you use?

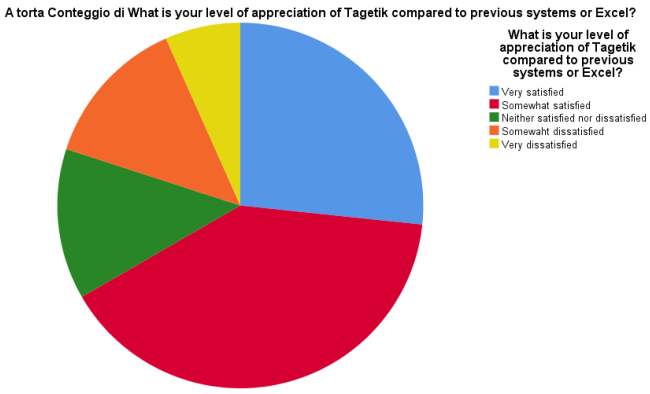
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	93,3	93,3	93,3
	No	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

5.3. Descriptive statistics

Five points Likert scale and graphic rating scale has been encoded to enter data into the SPSS software to achieve the study's goal. To obtain the overall results of the study, the frequency and percentage of the different responses to the statements were calculated using the Statistical Package for Social Sciences (SPSS). Below is reported the descriptive analysis for each question.

Q_1 What is your level of appreciation of Tagetik compared to previous systems or Excel?

The tables below reveal a positive attitude toward the question related to the appreciation of Tagetik compared to systems previously used (i.e. other EPM software or Excel).
Five points Likert scale (from Very satisfied to Very dissatisfied) was coded to get the result.
The maximum score, 5, is given to Very satisfied, score 4 is given to Somewhat satisfied, score 3 is attributed to Neither satisfied nor dissatisfied, score 2 to Somewhat dissatisfied and score 1 to Very dissatisfied. The findings show that 66,7% of the sample have a general positive attitude, 13,3% proved to be undecided while 20% of the population have a general negative attitude. The positive attitude toward the question is confirmed by the mean value (3,73) which is greater than the standard mean (1,234).



What is your level of appreciation of Tagetik compared to previous systems or Excel?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very satisfied	4	26,7	26,7	26,7
	Somewhat satisfied	6	40,0	40,0	66,7
	Neither satisfied nor dissatisfied	2	13,3	13,3	80,0
	Somewaht dissatisfied	2	13,3	13,3	93,3
	Very dissatisfied	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

Descriptive statistics

	N	Mean	St. Deviation
What is your level of appreciation of Tagetik compared to previous systems or Excel?	15	3,73	1,234
Number of valid cases (listwise)	15		

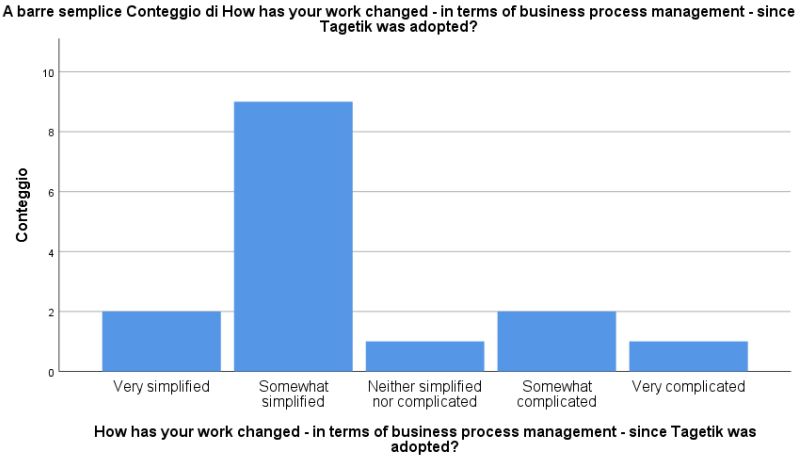
Q_2 How has your work changed - in terms of business process management - since Tagetik was adopted?

The tables below reveal that, since tagetik was adopted, the work, from the point of view of business process management, is simplified. Five points Likert scale (from Very semplified to Very complicated) was coded to get the result.

The maximum score, 5, is given to Very satisfied, score 4 is given to Somewhat satisfied, score 3 is attributed to Neither satisfied nor dissatisfied, score 2 to Somewhat dissatisfied and score 1 to Very dissatisfied.

The findings show that 73,3% of the sample have a general positive attitude, 6,7% proved to be undecided while 20% of the population have a general negative attitude.

The positive attitude toward the question is confirmed by the mean value (3,6) which is greater than the standard mean (1,121).



How has your work changed - in terms of business process management - since Tagetik was adopted?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very simplified	2	13,3	13,3	13,3
	Somewhat simplified	9	60,0	60,0	73,3
	Neither simplified nor complicated	1	6,7	6,7	80,0
	Somewhat complicated	2	13,3	13,3	93,3
	Very complicated	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

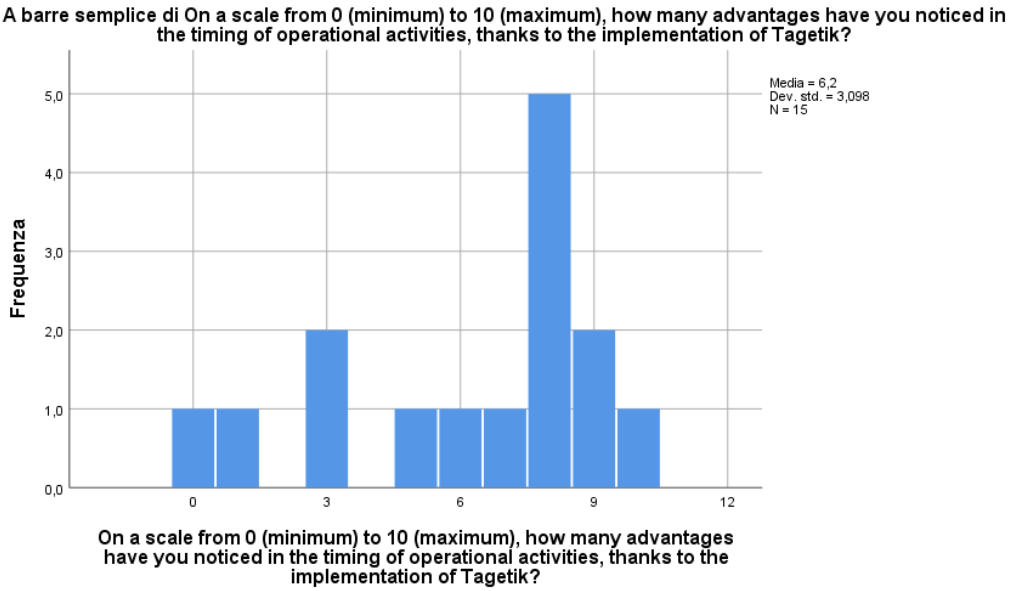
Descriptive statistics

	N	Mean	St. Deviation
How has your work changed - in terms of business process management - since Tagetik was adopted?	15	3,6	1,121
Number of valid cases (listwise)	15		

Q_3 On a scale from 0 (minimum) to 10 (maximum), how many advantages have you noticed in the timing of operational activities, thanks to the implementation of Tagetik?

The tables below reveal a positive attitude toward the question related to the advantages noted in the time of operational activities since Tagetik was implemented. Graphic rating scale from 0 (minimum) to 10 (maximum) was coded to get the result. The findings show that 66,7% of the sample have a general positive attitude, 6,7% declared to be neutral while 26,7% of the population have a general negative attitude.

The positive attitude toward the question is confirmed by the mean value (6,20) which is greater than the standard mean (3,098).



On a scale from 0 (minimum) to 10 (maximum), how many advantages have you noticed in the timing of operational activities, thanks to the implementation of Tagetik?

			Frequency	Percent	Valid Percent
Valid	0	1	6,7	6,7	6,7
	1	1	6,7	6,7	13,3
	3	2	13,3	13,3	26,7
	5	1	6,7	6,7	33,3
	6	1	6,7	6,7	40,0
	7	1	6,7	6,7	46,7
	8	5	33,3	33,3	80,0
	9	2	13,3	13,3	93,3
	10	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

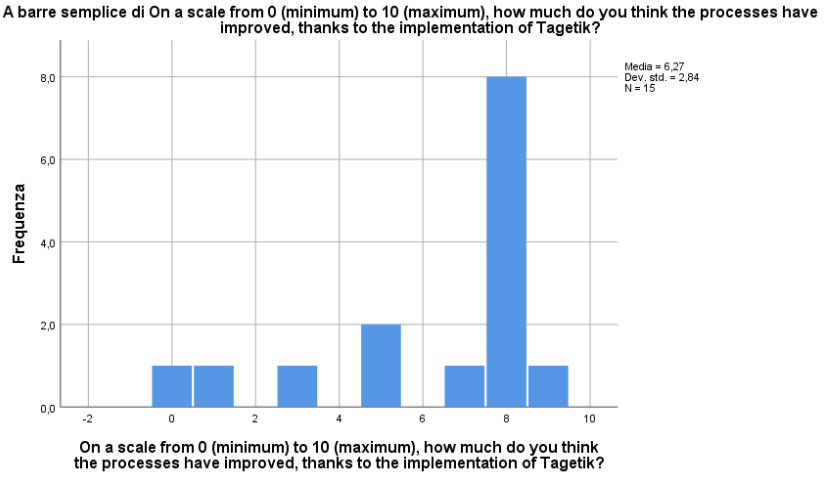
Descriptive statistics

	N	Mean	St. Deviation

On a scale from 0 (minimum) to 10 (maximum), how many advantages have you noticed in the timing of operational activities, thanks to the implementation of Tagetik?	15	6,20	3,098
Number of valid cases (listwise)	15		

Q_4 On a scale from 0 (minimum) to 10 (maximum), how much do you think the processes have improved, thanks to the implementation of Tagetik?

The tables below reveal a positive attitude toward the question related to the improvement of the processes since Tagetik was implemented. Graphic rating scale from 0 (minimum) to 10 (maximum) was coded to get the result. The findings show that 66,7% of the sample have a general positive attitude, 13,3% declared to be neutral while 20,1% of the population have a general negative attitude. The positive attitude toward the question is confirmed by the mean value (6,27) which is greater than the standard mean (2,840).



On a scale from 0 (minimum) to 10 (maximum), how much do you think the processes have improved, thanks to the implementation of Tagetik?

			Frequency	Percent	Valid Percent
Valid	0	1	6,7	6,7	6,7
	1	1	6,7	6,7	13,3
	3	1	6,7	6,7	20,0
	5	2	13,3	13,3	33,3
	7	1	6,7	6,7	40,0
	8	8	53,3	53,3	93,3
	9	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

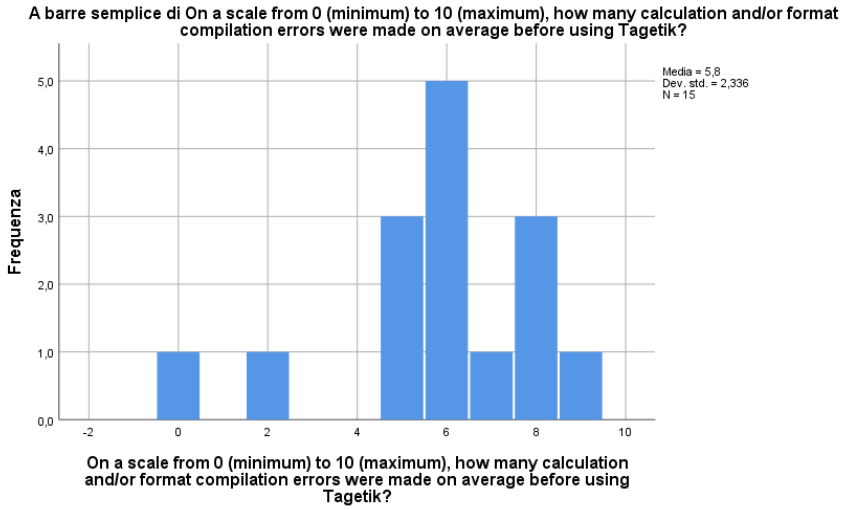
Descriptive statistics

	N	Mean	St. Deviation
On a scale from 0 (minimum) to 10 (maximum), how much do you think the processes have improved, thanks to the implementation of Tagetik?	15	6,27	2,840
Numner of valid cases (listwise)	15		

Q_5 On a scale from 0 (minimum) to 10 (maximum), how many calculation and/or format compilation errors were made on average before using Tagetik?

The tables below reveal a negative attitude towards the reliability of the process before Tagetik was adopeted. Graphic rating scale from 0 (minimum) to 10 (maximum) was coded to get the result. The findings show that 13,4% of the sample have a general positive attitude, 20% declared to be undecided while 66,7% of the population have a general negative attitude.

The negative attitude towards the reliability of the process before Tagetik was implemented is confirmed by the mean value (5,80) which is greater than the standard mean (2,336).



On a scale from 0 (minimum) to 10 (maximum), how many calculation and/or format compilation errors were made on average before using Tagetik?

			Frequency	Percent	Valid Percent
Valid	0	1	6,7	6,7	6,7
	2	1	6,7	6,7	13,3
	5	3	20,0	20,0	33,3
	6	5	33,3	33,3	66,7
	7	1	6,7	6,7	73,3
	8	3	20,0	20,0	93,3
	9	1	6,7	6,7	100,0
	Total	15	100,0	100,0	

Descriptive statistics

	N	Mean	St. Deviation

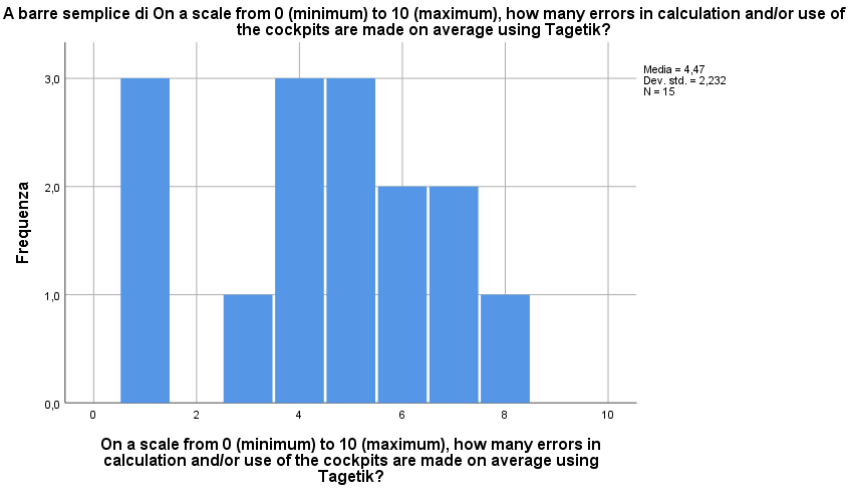
On a scale from 0 (minimum) to 10 (maximum), how many calculation and/or format compilation errors were made on average before using Tagetik?	15	5,80	2,336
Number of valid cases (listwise)	15		

Q_6 On a scale from 0 (minimum) to 10 (maximum), how many errors in calculation and/or use of the cockpits are made on average using Tagetik?

The tables below reveal a a general positive attitude towards the reliability of the process after Tagetik was adopeted. Graphic rating scale from 0 (minimum) to 10 (maximum) was coded to get the result. The findings show that 46,7% of the sample have a general positive attitude, 20% declared to be undecided while 33,3% of the population have a general negative attitude.
The positive attitude towards the reliability of the process after Tagetik was implemented is confirmed by the mean value (4,47) which is greater than the standard mean (2,232).

On a scale from 0 (minimum) to 10 (maximum), how many errors in calculation and/or use of the cockpits are made on average using Tagetik?

			Frequency	Percent	Valid Percent
Valid	1	3	20,0	20,0	20,0
	3	1	6,7	6,7	26,7
	4	3	20,0	20,0	46,7
	5	3	20,0	20,0	66,7
	6	2	13,3	13,3	80,0
	7	2	13,3	13,3	93,3
	8	1	6,7	6,7	100,0
	Total	15	100,0	100,0	



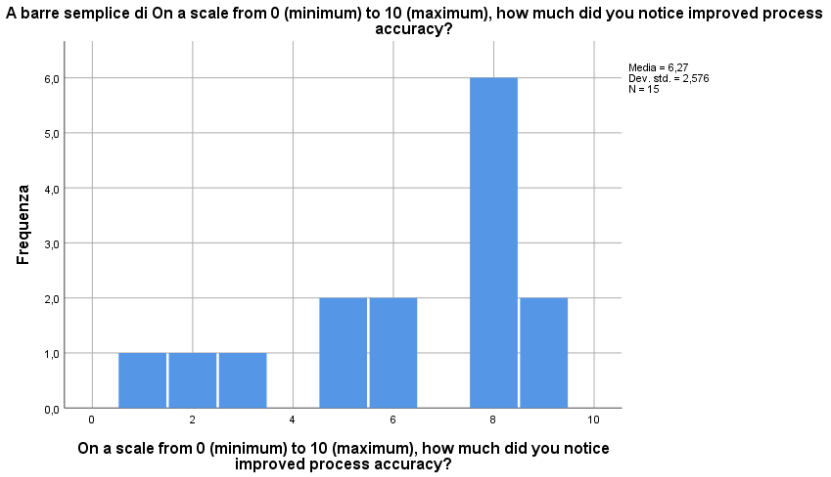
Descriptive statistics

	N	Mean	St. Deviation
On a scale from 0 (minimum) to 10 (maximum), how many errors in calculation and/or use of the cockpits are made on average using Tagetik?	15	4,47	2,232
Number of valid cases (listwise)	15		

Q_7 On a scale from 0 (minimum) to 10 (maximum), how much did you notice improved process accuracy?

The tables below reveal a positive attitude toward the question related to the improvement of the process accuracy since Tagetik was implemented. Graphic rating scale from 0 (minimum) to 10 (maximum) was coded to get the result. The findings show that 66,6% of the sample have a general positive attitude, 13,3% declared to be undecided while 20,1% of the population have a general negative attitude.

The positive attitude toward the question is confirmed by the mean value (6,27) which is greater than the standard mean (2,576).



On a scale from 0 (minimum) to 10 (maximum), how much did you notice improved process accuracy?

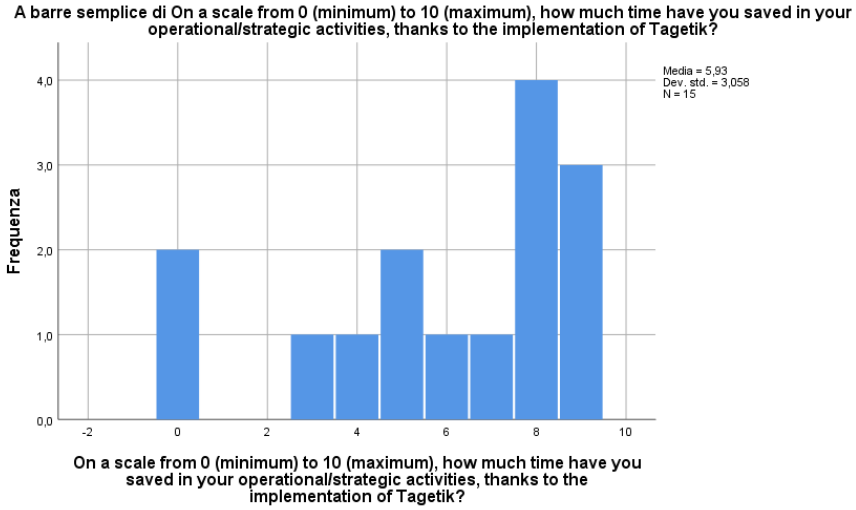
			Frequency	Percent	Valid Percent
Valid	1	1	6,7	6,7	6,7
	2	1	6,7	6,7	13,3
	3	1	6,7	6,7	20,0
	5	2	13,3	13,3	33,3
	6	2	13,3	13,3	46,7
	8	6	40,0	40,0	86,7
	9	2	13,3	13,3	100,0
	Total	15	100,0	100,0	

Descriptive statistics

	N	Mean	St. Deviation
On a scale from 0 (minimum) to 10 (maximum), how much did you notice improved process accuracy?	15	6,27	2,576
Number of valid cases (listwise)	15		

Q_8 On a scale from 0 (minimum) to 10 (maximum), how much time have you saved in your operational/strategic activities, thanks to the implementation of Tagetik?

The tables below reveal a positive attitude toward the question related to the more time available to devote to operational and strategic activities since Tagetik was adopted Graphic rating scale from 0 (minimum) to 10 (maximum) was coded to get the result. The findings show that 60,1% of the sample have a general positive attitude, 13,3% declared to be undecided while 26,7% of the population have a general negative attitude. The positive attitude toward the question is confirmed by the mean value (5,93) which is greater than the standard mean (3,058).



On a scale from 0 (minimum) to 10 (maximum), how much time have you saved in your operational/strategic activities, thanks to the implementation of Tagetik?

			Frequency	Percent	Valid Percent
Valid	0	2	13,3	13,3	13,3
	3	1	6,7	6,7	20,0
	4	1	6,7	6,7	26,7
	5	2	13,3	13,3	40,0
	6	1	6,7	6,7	46,7
	7	1	6,7	6,7	53,3
	8	4	26,7	26,7	80,0

	9	3	20,0	20,0	100,0
	Total	15	100,0	100,0	

Descriptive statistics

	N	Mean	St. Deviation
On a scale from 0 (minimum) to 10 (maximum), how much time have you saved in your operational/strategic activities, thanks to the implementation of Tagetik?	15	5,93	3,058
Number of valid cases (listwise)	15		

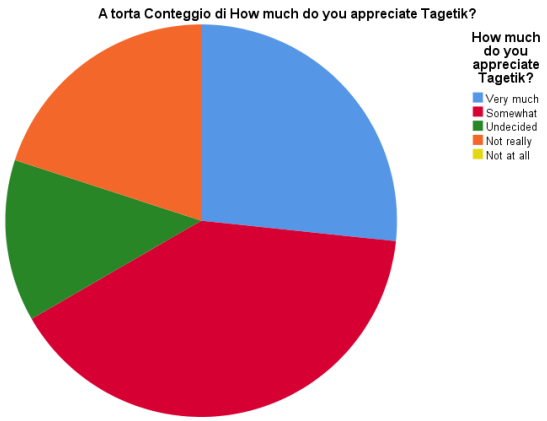
Q_9 How much do you appreciate Tagetik?

The tables below reveal a positive attitude toward the question related to the appreciation of Tagetik. Five points Likert scale (from Very much to Not at all) was coded to get the result.

The maximum score, 5, is given to Very much, score 4 is given to Somewhat, score 3 is attributed to Undecided, score 2 to Not really and score 1 to Not at all.

The findings show that 66,7% of the sample have a general positive attitude, 13,3% proved to be undecided while 20% of the population have a general negative attitude.

The positive attitude toward the question is confirmed by the mean value (3,73) which is greater than the standard mean (1,100).



How much do you appreciate Tagetik?

			Frequency	Percent	Valid Percent
Valid	Very much	4	26,7	26,7	26,7
	Somewhat	6	40,0	40,0	66,7
	Undecided	2	13,3	13,3	80,0
	Not really	3	20,0	20,0	100,0
	Total	15	100,0	100,0	

Descriptive statistics

	N	Mean	St. Deviation
How much do you appreciate Tagetik?	15	3,73	1,100
Number of valid cases (listwise)	15		

5.4. General findings of descriptive statistics

The questionnaire was designed to answer the following hypotheses:

- Tagetik is appreciated by users;
- Tagetik simplifies business processes;
- Tagetik reduces production time;
- Tagetik improves processes.

As the above results show, the first hypothesis is confirmed by questions 1 and 10. The second hypothesis is confirmed by question 2. The third hypothesis is confirmed by questions 3 and 9. Finally, the last hypothesis is confirmed by questions 4, 5, 6 and 7.

66.7% of respondents appreciate Tagetik compared to the systems previously used and Tagetik in general.

73.3% of respondents believe that Tagetik simplifies business process management.

66.7% believe that Tagetik reduces time spent on business activities and 60.1% believe that it gives more time to operational and strategic activities.

66.7% of respondents believe that Tagetik has improved processes by reducing errors, and 66.6% believe that Tagetik has increased process accuracy.

5.5. Open question

The open question was written in the form of statement asking to the respondents to indicate 2 strengths of Tagetik and 2 improvement points.

Seven answers have been received, as reported below:

A_1 Strengths: Speed - Flexibility
Improvements: Powerpoint Presentations

A_2 Strengths: Speed – Reliability
Improvements: None

A_3 Strengths: Accuracy - precision of the data processed
Improvements: the speed of execution of the calculations - the simplification of the search criteria for links

A_4 Strengths: Simplification of reporting package activities - Simplification of pre-consolidated processes
Improvements: Document management in XBRL

A_5 Strengths: fast retrieval of budget changes to documents, fast processing of the consolidated
Improvements: adaptation of tables and corrections in the Notes to the Financial Statements

A_6 Strengths: ETL speed of loading – speed of reloading the balance sheet without the loss of any changes already made to the reports
Improvements: layout of the tables (since sometimes the amounts are outside the printing area) in the drafting of the document – the squaring with the values reported in the data entry – in the validation of the XBRL there should be highlighted alerts related to the paragraphs or

tables that do not belong to printing area without having to download the version in PDF – drill down in the pre-consolidated reports that do not report the company counterpart

A_7 Strengths: updating of certain processes on the basis of data entry - ease of visualisation of processes

Improvements: slowness in processing processes - undefined data extraction

5.6. Findings of quantitative research

The analysis of the open question is qualitative and has been carried out by extraction of key words. The highlighted words related to Tagetik's strengths were found to be:

- Speed
- Flexibility
- Reliability
- Accuracy
- Precision
- Simplification
- Fast
- Ease

The highlighted words related to Tagetik's improvement points were found to be:

- Presentation
- Speed of execution
- Simplification criteria
- Document management
- Adaptation
- Layout
- Slowness

The quantitative analysis shows the general appreciation of Tagetik by the users of Mondo Convenienza. The following chapter will be dedicated to the qualitative analysis of the interviews made directly to a Tagetik vendor and a user.

Chapter 6

Qualitative Research

The qualitative research was carried out on interviews. The interviewees were Giuliano Caruso, Head of the Accounting Data Processing and Administrative Services Centre of Mondo Convenienza, and Luigi Esposito, Senior Manager at KPMG with decades of experience at Tagetik.
Specifically, Giuliano Caruso described the process of the implementation of Tagetik in Mondo Convenienza, highlighting the main benefits that it has offered the company and suggesting possible improvements.
Luigi Esposito shared his experience with Tagetik and indicated what the future development of EPM systems would be like on his opinion.
Respondents were selected as they represent Tagetik system integrators and package users.

6.1. Interview with package user

Giuliano Caruso is Head of the Accounting Data Processing and Administrative Services Centre of the Holding Company.
Among the main activities for which he is in charge, he must ensure the performance and proper execution of all administrative services related to the economic activities of the companies managed by the structure, the proper keeping of accounting records and the proposal of the final version of the financial statements and consolidated financial statements.
He also supports tax regularity in compliance with current legislation, ensuring the coordination of services provided and pursuing the homogeneity of the process of building financial statements for group companies.
Furthermore, he must then ensure, in line with its area of responsibility, the correct functioning of the internal control system.
The interview with Giuliano Caruso was composed of three questions concerning the use of Tagetik in Mondo Convenienza and covered three time axes. The interviewee answered questions related to the pre-implementation phase, the current use, and possible future steps.
The Sentiment Analysis revealed Giuliano Caruso's satisfaction with Tagetik.
Here is reported the full interview:

Q_1: Why did you decide to implement Tagetik?

A_1: First of all because the process we used was too long and complex. We had, indeed, a transaction for accounting, we transferred the balance sheet data (balances) on an Excel spreadsheet developed in-house, which contained automatisms for the calculation of operating taxes.
Subsequently, the balances were imported on the Teamsystem (ex SOLE24ORE) Via Libera software, which was necessary for the processing of diagrams, explanatory notes and management reports.
In a nutshell, in the Excel spreadsheet we did detailed work with respect to the transactional (general accounting), while in the VIALIBERA software there to all the activity of wording, tables, indices and balance sheet analysis. Once the activities for the approval of the financial statements were completed, the accounts were filed with the Chamber of Commerce.
The consolidation process was also extremely long. For intercompany relations, a native module of the accounting transaction (Zucchetti) was used, with many customizations, for the calculation of intercompany margins and the application of OIC17 (IAS17 - Leasing), dedicated EXCEL files were used.
The resulting chaos is easily deduced, especially if you think that we have come to manage up to 40 companies. So we decided to implement Tagetik because:
- It's a single platform;
- We wanted to eliminate all the residues and formalisations of the various processing steps (e.g. for inter-company data we did the data extraction, processing and integration with data saving for all the data of each step);
- We wanted to eliminate as much as possible the non-formalized exchange between resources, in order to standardize the formats of communication and information sharing;
- We wanted to manage the consolidated second level (shareholdings, capital gains, leasing, etc..) in a different way and no longer use Excel sheets.
In short, we needed a single package that could offer us everything we needed. We needed a single platform that would manage all processes, right through to the budget documents, and that would be mappable and scalable.
We thought Tagetik was the best solution and we did. Consider that before its implementation, our activities as a consolidated IC lasted more than 10 days, while today at most 3.
If before the use of Tagetik the process of annual consolidation (i.e. from the financial statements of the individual legal entities until the approval of the consolidated financial statements) closed around the end of June (5 months of full activity), with Tagetik the process was closed gradually earlier (this year mid-May) allowing us, too, to dedicate ourselves to other activities.

The trend is positive, particularly if we take into account that this improvement is part of a phase in which we also found ourselves managing extraordinary operations (corporate mergers).
Now, instead, we can opt for the automatic balancing of the IC posts directly in the system, or define a threshold of significance of the relationships to be squared. Moreover, from the 3rd quarter of 2018, we have introduced the preparation of the quarterly consolidated financial statements, which provide (for the periods 3 and 9) for lighter processes and rules of different significance compared to the half-yearly and annual consolidated financial statements. In short, today we can close a consolidated situation in three days, yesterday it would have been impossible.
Moreover, as of this year, we managed the preview of the consolidated operating result as early as the end of February, significantly bringing the preview performances closer to those of listed companies and/or IAS Adopters. The result was particularly appreciated by internal and external stakeholders: the former quickly received fundamental information for strategic planning, the latter for the economic-financial evaluation of the business partner.
In both cases, the speed with which information with high added value was provided increased the perception and evaluation of reliability.

Q_2: What are the benefits since Tagetik was implemented?
A_2: Now we can monitor the performance of users, everything is mapped, traced and so we save time and paper. In addition, the native audit reports allow us to critically analyze the processes as a whole, and in the detail stages, measure them and think about possible points for improvement. For this last point, we have opened an Issue with the e-support of tagetik, to develop some details of analysis of the Audit reports that, we hope, will be put online with the next version updates.
Tagetik provides the possibility of parameterization and scalability: we can also give partial access to carry out activities. The greatest benefit, however, has been to revisit the entire process. Tagetik offered us an opportunity to rethink and remodel our activities. We have built up a specific manual, evaluating how and when to carry out certain activities. In short, it was a way of analysing the working processes and modifying what was no longer appropriate.

Q_3: What improvements would you recommend at Tagetik?
A_3: I would recommend improving the development of the XBRL module, and the system part. The CPM software, in fact, uses an open source application (first Jboss now Wild Fly), a program that manages the services and operation of web programs (such as Tagetik). Fortunately we have, in House, system builders who quickly managed to configure the best application server.
It would be useful if Tagetik developed a tool for updating and annual taxonomies, as the XBRL system is very complex. To fix bugs it is recommended to set up an autosetting.

In any case, our experience with Tagetik is very positive. We even developed a tax model in-house. We therefore have maximum customization. We now use Tagetik really for everything and have not seen any significant bugs. I want to underline again the customization benefit we benefit from because it is really important. Given this positive experience, the next step would be to manage the Budget and Forecast processes as well on Tagetik.

6.1.2. Text analysis and Findings

Sentiment analysis has been chosen because it is the most reliable tool to analyze the sentiment (positive, negative or neutral) of the users of a product.

It is performed by means of algorithms able to calculate the degree of appreciation of a product and provides explanatory visual charts. Starting from the natural language, the analysis identifies and extracts significant terms used by the interlocutor.

The sentiment analysis was performed using the NVivo 12, a qualitative data analysis software.

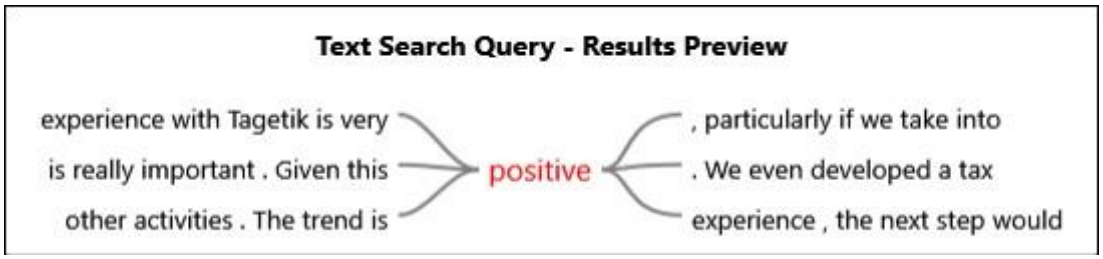
The text was initially auto-coded in the wizard to divide the interview into structured paragraphs.

Subsequently a word frequency query was run to analyze frequency used words and phrases across the data. A second query was made to gather synonyms and get more accurate data.

Then a word cloud has been created to have a clear view of the most used words. As can be noted below, the larger the words, the more frequently they are repeated by the respondent.

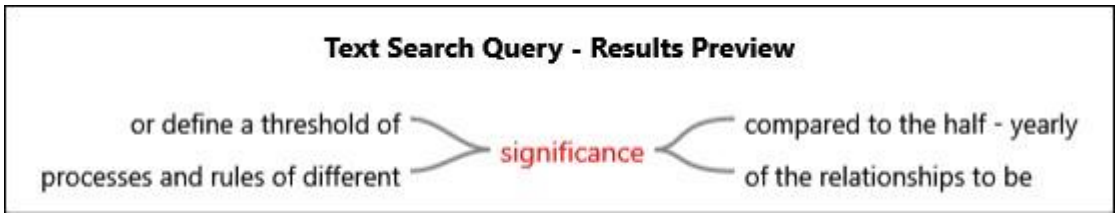
Then a text search query has been run, specifically to each word significant in the text.

The first text search query was made to analyze the word "Positive". A group tree has been created to visualize the words that are used before and after the term Positive.

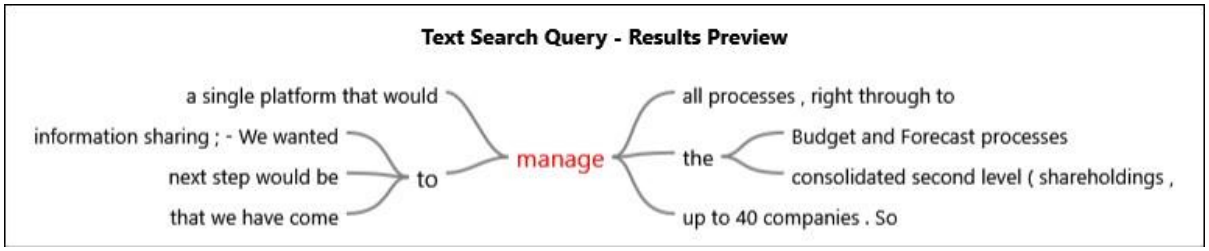


From the query the term positive is associated with the term "experience". So I run a text search query for the phrase “Positive experience” and re-run a query on positive experience based on a narrow context. The first query shows the positive attitude of the interlocutor towards Tagetik.

The same procedure was applied to the term "Significance" and, from the query carried out, was linked to the term "Relationship". The query shows again the positive attitude of the interlocutor towards Tagetik.

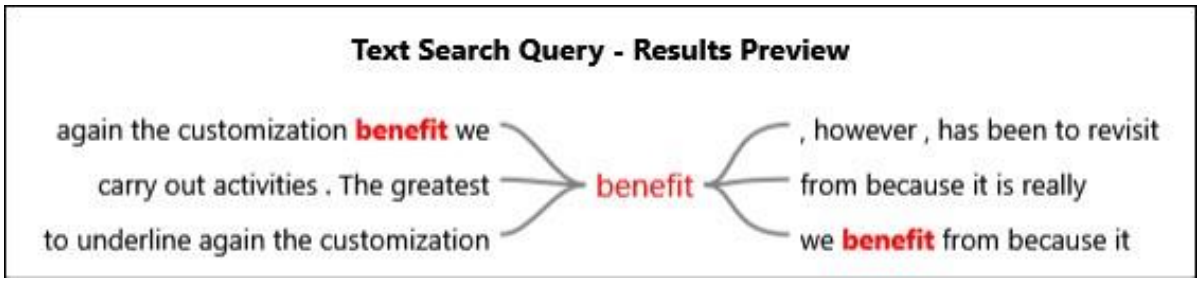


The term "Manage" was aggregated with the term "Process" and in particular the interlocutor expressed a positive opinion on Tagetik's ability to manage business processes.



A subsequent query identified the term "Improvement". It was linked to the negative sentiment of the interlocutor towards the package and the consequent suggestion of software improvements.

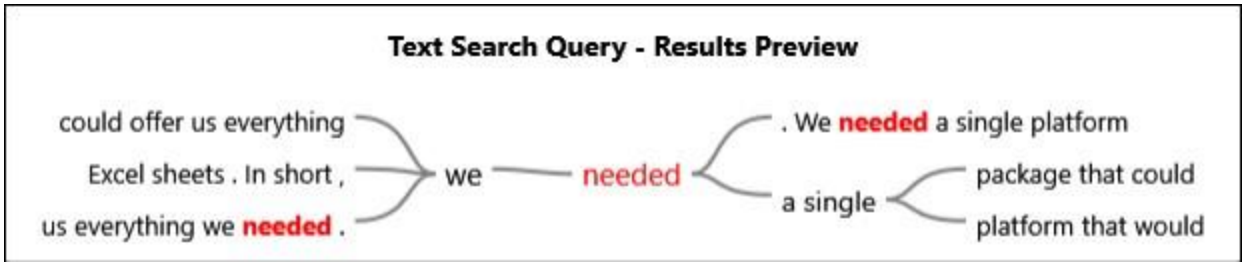
The term "Customization" is associated with the term "Benefit". This indicates the positive attitude of Giuliano Caruso and explains the customization benefits offered by Tagetik.



The word "Appreciation" showed the positive attitude of the interlocutor and the query reported the level of appreciation of internal and external stakeholders.

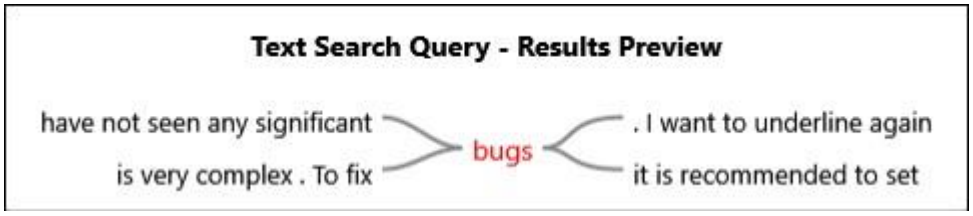
The analysis of the term "Recommend" has instead suggested a negative attitude. In this case, the interlocutor has again highlighted possible points of improvement of the software.

The term "Need", on the other hand, has been linked to the needs of the company satisfied by the Tagetik package and has therefore highlighted the positive attitude of the interlocutor.

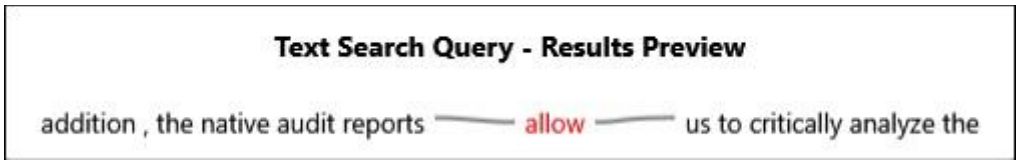


The analysis of the term "Best" also showed positive sentiment. The query linked this term with the word "Result".

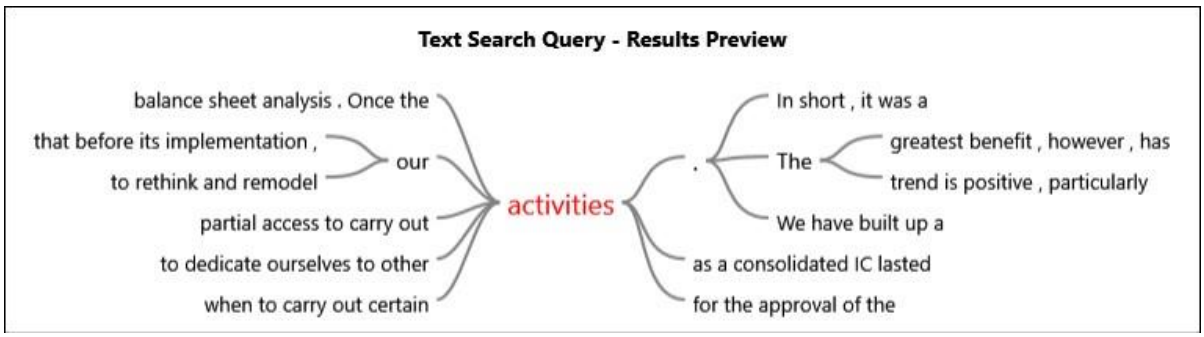
The term "Bug" instead showed the respondent's negative attitude. Problems with the system were highlighted here.

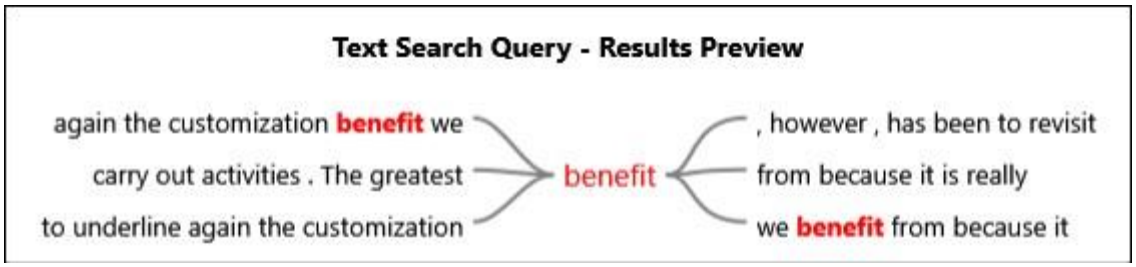


The term "Allow" made explicit what Tagetik allows Mondo Convenienza to do and therefore showed the positive attitude of the interlocutor.

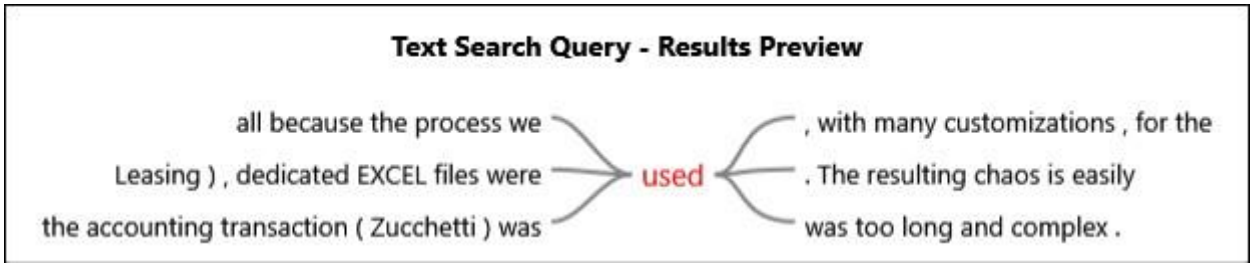


A query was then made about the term "Activity" and this was linked again with the term "Benefit". The positive attitude is then highlighted again.



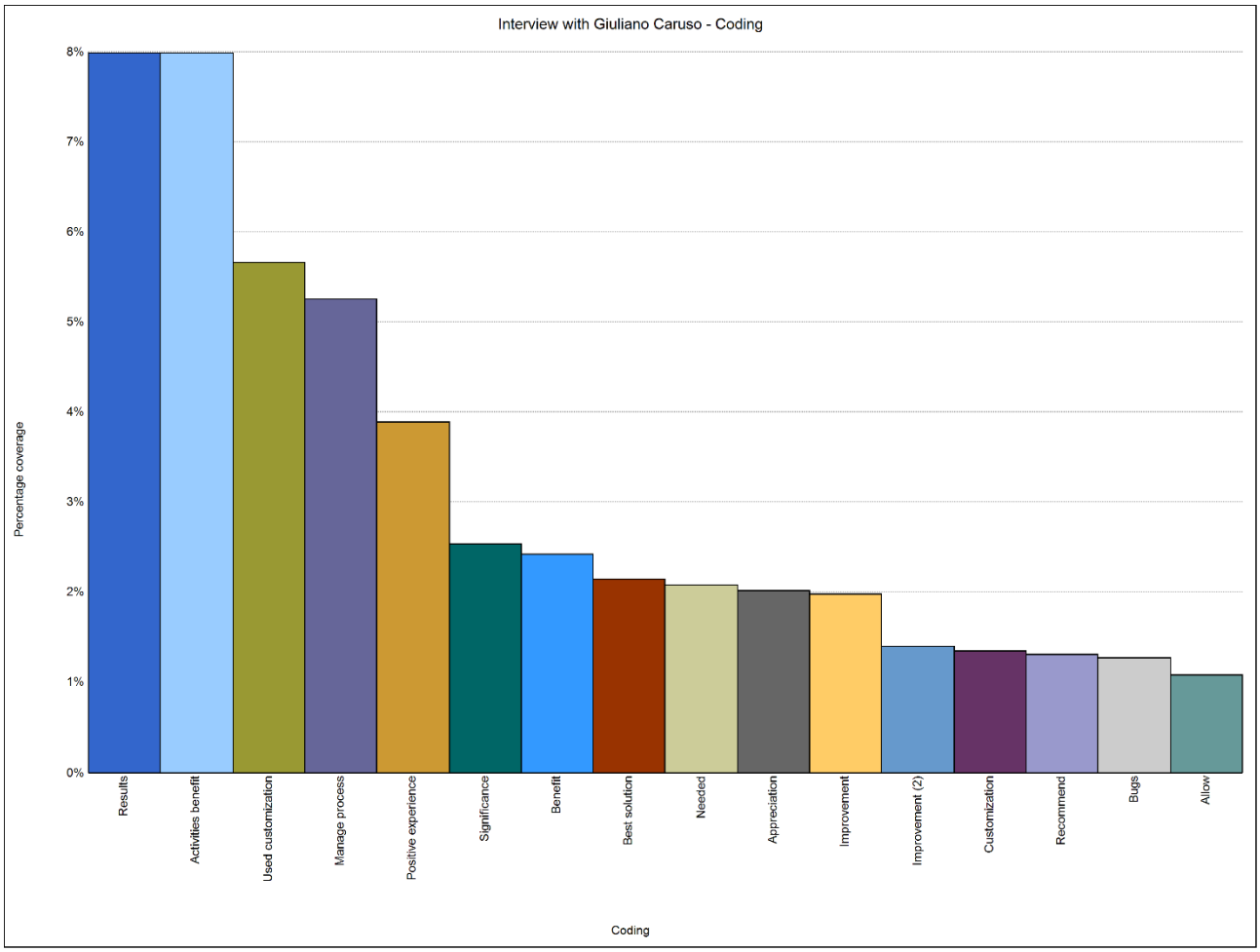


Finally, a query was made on the term "Use" which was linked to "Customization" and showed the positive sentiment of the respondent.



6.1.3. Conclusions

The results of the sentiment analysis were included in a visual chart that included all the terms revealing the interviewee's attitude towards Tagetik divided into percentage coverage.



As the graph shows, the hypothesis that Mondo Convenienza had a positive experience with Tagetik is confirmed.

6.2. Interview with system integrator

Luigi Esposito is Senior Manager of the Tagetik Group at KPMG. He has decades of experience with Tagetik software and has witnessed the expansion of the package throughout his career, from its beginnings to its entry into the Gartner Magic Quadrant.

He was interviewed as a software system integrator and his interview was analyzed through key word analysis.

Here is reported the full interview:

Q_1: How many years have you been working with Tagetik?

A_1: I've been working with Tagetik since 2005. I was hired for an internship at Telecom where Tagetik, then known as Gruppo Servizi with Easy finance as software, was used for regulatory

accounting. At the time, it was a small, growing business. Telecom was probably the most important project they had in their hands, so much so that the vice president worked directly on it.

Q_2: How has Tagetik improved over the years and at what rate?

A_2: Tagetik's take-off coincides with the moment when it began to gain more and more customers, both Italian and international. The owners decided to change the name from Gruppo Servizi to Tagetik in order to have a more international identity. The first software that the company has developed, Tagetik 2, has had the dual innovation of name and position in the market.

The owners of the brand have been very dynamic. Their strength compared to others was precisely to focus on a more niche core business. While other vendors were more interested in other areas (SAP and Oracle focused on ERP), Tagetik made EPM their core business and, by increasing the number of customers, they were good at taking their needs (customers and partners) and making them system standards. They then based their standards on roadmaps and the needs of customers and partners.

I joined KPMG because I knew Tagetik. As the number of customers interested in Tagetik grew, KPMG was one of the first companies to decide to do projects with Tagetik. Since 2007, Tagetik has grown internationally and entered the Gartner quadrant in 2008.

There has been a significant improvement from version 3 to version 4 but the real leap in quality has been made by Tagetik 5. We witnessed a disruptive innovation because, if with the other versions we aimed to improve the functionality of the system, with Tagetik 5 we moved to a userfriendly interface.

The company has grown a lot over the years so much so that it was purchased by the Dutch multinational Wolters Kluwer, in 2017.

The multinational company has paid 300 million euros for 100% of Tagetik.

For Wolter Kluwer it was attractive, presenting the software house in Lucca 39.6 million euros in revenue 2015 (+8%), a gross operating margin of 4.13 million and a net profit of 2.2 million.

It was a historic purchase, equal to 50 times the ebitda.

Q_3: What are Tagetik's strengths and weaknesses?

A_3: The integration of processes in a single environment and the extreme flexibility. Although it was purchased by Wolter Kluwer, Tagetik still lives by the logic of a small Italian company. Every problem customers encounter is handled extremely quickly.

In terms of weaknesses, Tagetik has to make improvements to its dashboards and presentations.

Q_4: How do you think Tagetik will evolve in the future?

A_4: Tagetik and all EPM systems in general face a great challenge. The IT world is changing. When I started working 15 years ago, the data to be managed was quantitatively smaller than it is now. Our main task was organizational.

With more and more data available to the company, Tagetik has to focus on both structured and unstructured data.

It must therefore be able to perform predictive analysis. Today, companies need to be quick to intercept future movements in order to stay alive in the market and be more and more competitive. This is what Tagetik must aim for.

In any case, Tagetik is operating. It has now created an analytical information hub to collect and process a large amount of data.

Q_5: How can Tagetik remain competitive in an evolving world?

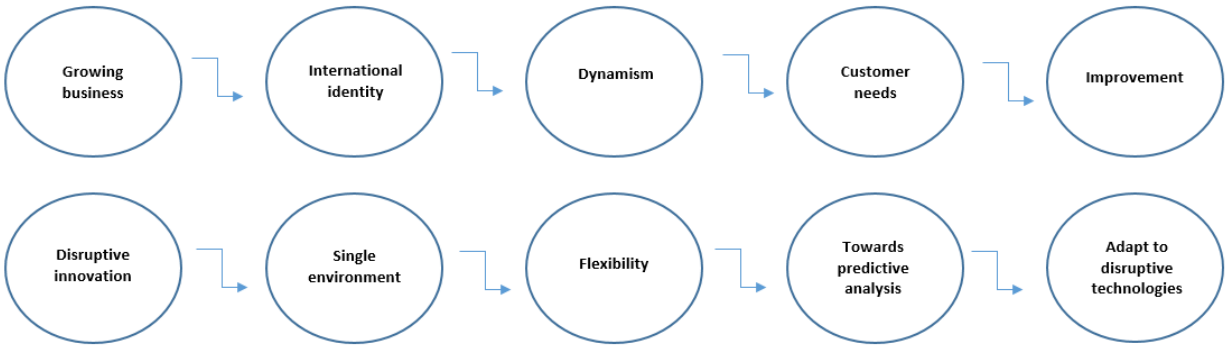
A_5: Tagetik will remain competitive if it is able to maintain what is its distinctive character, namely being a company close to the user and the customer. At the same time, it must keep up with the disruptive technologies, and especially Big Data, Machine Learning, Artificial Intelligence.

6.2.1. Text analysis and Findings

The interview with Luigi Esposito was analyzed through key words analysis. The key words used by the interlocutor were listed highlighting total count and percentage (keywords density).

General text statistics were then created to have a clear view of what are the focal themes of Tagetik, according to the respondent's opinion.

With a total word count of 775, the highlighted keywords are summarized in the roadmap shown below.



Luigi Eposito, in addition to describing the main features of the software, listing the strengths and weaknesses, has outlined the development that Tagetik has had over the years.
He provided a cross-section that shows a rapidly expanding company that has grown dynamically over the last decade and that today, to remain competitive, must be able not only to meet the needs of the market but also to predict future demands.
If in the first phase Tagetik has focused on growing its business, offering flexible solutions in a single environment, responding to the needs of its customers both domestic and international, today it must be able to evolve even more to remain competitive in the market.
Luigi Esposito believes that, with increasingly dynamic businesses, Tagetik must offer the possibility of carrying out predictive analyses of future movements.
To do so, it must adapt to the disruptive technologies, such as Big Data, Machine Learning and Artificial Intelligence, that today are indispensable presence.

6.3. Results of qualitative research

Both interviews show a positive perception of Tagetik.
Giuliano Caruso and Luigi Esposito agree on the benefits that the software brings to business management.
They expain that Tagetik is a single platform that allows to monitor the performance of users and in which everything is mapped. It gives the possibility to analyze the process as a whole and think about point of improvements. It is extremely flexible and close to the customer.
The points of improvement are the XBRL module, as highlighted by Giuliano Caruso, and dashboard and presentation, as reported by Luigi Esposito.
In general terms, the results of qualitative and quantitative research coincide. Tagetik is appreciated for the different reasons mentioned above.
The study confirmed all the assumptions made in the pre-research phase.

Chapter 7

Conclusions

The present work aims to offer a close-up view of Enterprise Performance Management systems, business management tools that are increasingly used in most medium and large enterprises.

The investigation of the success of Tagetik as a software for measuring performance is a complicated effort. A single thesis can only shed a light on a limited bunch of aspects. The key goal is to provide a conceptual theory and an exploration into broad empirical categories as well as into the basic mechanisms for technology support. The theoretical investigation in the beginning focused on literature from the field of performance measurement and management together with the information system and technology.

The focus of the critical review of literature strongly supports the needs for describing the phenomenom of study. Furthermore, the focus in the empirical study is on a network of researchers and it's been able to discover potential indications for the propositions made.

With globalization and digitization more and more accelerating, companies are forced to revisit the models of performance measurement in the evaluation of internal and external dynamics of the business. EPM systems in general, and Tagetik in the specific, offer a possible solution.

The work has demonstrated this assumption by means of a double analysis, quantitative and qualitative. The questionnaire has been submitted to Mondo Convenienza employees, which implemented Tagetik in 2016 to manage the processes of Financial Statements, Intercompany Relations, Statutory Consolidation, Consolidated Disclosure Management and Executive Dashboards. The results have been analysed through SPSS and have shown how Tagetik is appreciated by users, how it simplifies business processes, how it reduces work time, thus allowing employees to focus more on strategic activities and how it improves overall processes.

At the same time, qualitative research confirmed the results of the quantitative analysis. Two interviews were carried out, one with a Tagetik user analyzed by Sentiment Analysis and the other with a Tagetik vendor analyzed by Keywords analysis. The result obtained is an appreciation by both of the product's functionalities, which in addition to streamlining daily business processes, is a fundamental tool for revisiting KPIs and business strategy.

To have a clearer view, it was therefore necessary to list, analyze and describe the multiple models of performance measurement and performance management and indicate how the research should be oriented to an integration of the disciplines mentioned above. The work therefore proposed the significant use of performance indicators in the elaboration of performance management systems.

The rapid digitization requires not only a review of the concept of KPIs and performance management, but is also clearly linked to the fields of information system and information technology, from which it derives directly. These systems must be implemented efficiently by companies as they are the basis for converting raw information into financial data managed by decision makers. The study first reviewed the IS and IT disciplines at a literary level and then reported business cases of companies operating in different sectors and countries where the implementation of these systems was vital.

Having demonstrated this, it was essential to describe the main EPM systems on the market today, examining the features that characterize them and comparing them based on the study of the Magic Quadrant by Gartner.

The last part of the research was dedicated to the empirical analysis, as initially explained, which confirmed the hypothesis that Tagetik, and therefore EPM systems, improve business performance.

It is therefore clear that EPM systems are a reality in continuous expansion today. However, it is essential that they evolve further, orienting their focus on the creation of predictive analyses that are functional for companies to anticipate future business movements that are increasingly changing.

Implications

The study has some practical implications for managers seeking to improve and strengthen the performance processes and the organization as a whole. The cases study analysis shows how managerial and organizational mechanisms should work in the implementation of Tagetik in the Italian context. The aim of the study was to offer a new perspective that had so far been little discussed at the literary level. The research can be used primarily for scientific purposes, as it offers perspectives on the combination of performance systems and digital systems, having thoroughly analyzed the points of convergence between the disciplines. It can also be subject to practical evaluation by Chief Executive Officers who want to adopt systems to improve business performance. The novel findings of this work mainly concerns the space for CPM software that is a matter of priority. In the light of the above analyses, the implementation of technological tools assessing firms' performances such as Tagetik requires the need to specify a detail program design and all the technical and engineering requirements to produce the software.

Limitations

Although findings cannot be generalized since they are built only on one case, the study, showing patterns of knowledge of Tagetik development underlining that when Tagetik is implemented at a strategic level and with a systemic approach, all the tools and activities, are potentially adopted in the attempt to measure performance in companies, and adapted to the emerging digitalization context. It would therefore be appropriate to confirm the hypothesis on a larger sample of companies both nationally and internationally since, as previously said, this work focuses only on one case. Moreover, the sample to which the questionnaire subject of the quantitative research was administered is numerically low (15 people). The reason for this is that the questionnaire is specific to people who use Tagetik on a daily basis. As far as qualitative research is concerned, a single vendor and a single user were interviewed to evaluate the degree of appreciation of the software under examination. However, next to the methodological limitations (cases and questionnaires) a set of areas with open questions have remained and need to be addressed. While some scholars may state that a thesis generally shows more questions than it answers is something worth achieving, others may find the results unfocused. For this reason, a brief overview on the main directions for further research might be provided as follows.

Avenues for future research

Further research is needed to understand which ways, context and organizational and managerial mechanisms can facilitate the implementation of this software. This study can be a starting point for future research. These can be directed at analyzing a larger sample of companies, operating in different sectors and geographical regions. In addition, the sample under examination in the quantitative research can be expanded to obtain even more reliable results. Qualitative research can also be broadened by interviewing more vendors and users. Finally, it would be interesting to evaluate the improvements made to business performance not only by Tagetik software but also by other EPM systems to find out whether other software are appreciated in the same way and whether they provide the same benefits.

Appendix

Below are the results of the report "Magic Quadrant for Cloud Financial Close Solutions" by analysts John Van Decker and Christopher Iervolino on the strengths and cautions of the EPM software vendors placed in the Gartner quadrant.

Source: https://www.gartner.com/en/documents/3884004/magic-quadrant-for-cloud-financial-close-solutions

1. BlackLine

Strengths

- *BlackLine is a well-recognized brand in the finance industry and we see many finance personnel taking the product with them as they migrate to new companies. Brand recognition has increased since BlackLine went public in 2016. It has also been successful in establishing relationships with leading financial management service providers, as part of its Finance Transformation practices.*
- *BlackLine's products are sold exclusively using a cloud-based subscription model. Pricing is segmented for midsize and large organizations, based on the number of end users during a typical three-year contract.*
- *BlackLine received above-average scores for execution from its reference customers, its highest score being for customer experience. BlackLine provides 24/365 live global support via email, phone and an online support portal. Its support team is based in its U.S. corporate headquarters and in its London, U.K., office. As in prior years, BlackLine's reference customers gave it high scores for customer satisfaction. However, reference customers also reported that the interface looks old, and those that did not have a good third-party implementer did not get the value they needed.*

Cautions

- *BlackLine's prices have been steadily increasing, year over year, since going public, and its pricing is considered "premium" when compared with that of other vendors offering similar products. However, BlackLine can be very competitive when pitched against multiple vendors. Its international capability is still emerging, so prospective customers should check that it offers local support where they need it.*
- *BlackLine's midmarket pricing appears high, when compared with FC vendors that target the lower midmarket. This has created opportunities for new offerings from other vendors targeting this market segment.*
- *BlackLine's transaction matching for reconciliations is often a concern for companies during contract negotiation, according to Gartner client inquiries. We have encountered many cases where organizations chose to limit the amount of reconciliation matching, which can lower the value of the implementation.*

2. BOARD International

Strengths

- *BOARD's financial reporting capability is strong due to its global perspective and knowledge of international requirements, when compared with some North American vendors. BOARD provides a good alternative for global customers that have EMEA-based and International Financial Reporting Standards (IFRS) reporting requirements. One of BOARD's strengths is the analytics leveraged in FC use cases.*

- *BOARD supports both midsize and large organizations as well as enterprisewide use. Its reference customers were fairly evenly split between those that generate less than $1 billion in annual revenue and those that generate more. It's worth noting that a few of BOARD's reference customers had more than $10 billion in annual revenue, and that the average number of users per customer was 1,230. This average is more than twice as large as any other vendor in the Magic Quadrant.*
- *Reference customers for BOARD reported that their top-three product selection criteria were ease of use, analytics and solution flexibility. BOARD's reference customers also reported that other criteria were functional capability and product capability. It has expanded these capabilities to allow predictive forecasting and information visualizations to be used more extensively.*

Cautions

- *A notable number of BOARD reference customers reported taking six months or more to upgrade to new versions, with some reporting that they didn't accept any version updates in 2017. The ability to quickly and seamlessly upgrade allows new product capabilities to be leveraged sooner. This finding compares unfavorably with the other vendors in this study, most notably when compared with the cloud-only vendors.*
- *BOARD's financial reporting capability is strong, due to its global perspective and knowledge of international requirements, when compared with some North American vendors. However, most customers have developed much of the consolidation on top of the BOARD platform themselves, or through the vendor's professional services or a third party.*
- *BOARD offers fewer process- and business-domain-focused prepackaged applications than other vendors in this Magic Quadrant, including those for financial consolidation. However, reference customers reported that its FC capabilities were relatively easy to configure. They did, however, also cite a pushy sales experience and the lack of a clear product roadmap.*

3. CCH Tagetik

Strengths

- *CCH Tagetik has consistently demonstrated its ability to satisfy the needs of large, complex organizations for financial consolidation, intercompany reconciliation, disclosure management, and reporting. It has received higher scores for larger customers in the reference study, and this is consistent with client inquiry. Reference customers for CCH Tagetik reported that their top-three product selection criteria were compatibility with Microsoft Excel, ease of use and solution flexibility.*
- *This vendor has enhanced its user experience with an updated UI, simplifying navigation, extending workflow and mobile support, and by enhancing its analytics dashboards. It has increased its penetration in cloud financial reporting and consolidation. CCH Tagetik has enhanced its support of key regulatory requirements.*
- *Since mid-2017, CCH Tagetik has been a part of the more than $1 billion Wolters Kluwer Tax & Accounting division. While integration into this division is still in progress, it will improve the ability of, and funding for, CCH Tagetik to accelerate its digitalization of the FC process and increase its global penetration.*

Cautions

- *Reference customers scored CCH Tagetik below the average in 10 of the 11 key areas evaluated for customer satisfaction. However, all of CCH Tagetik's survey respondents would still recommend it.*

- *Nearly half of CCH Tagetik's reference customers reported that their deployment took nine months or more. This is fairly typical of some types of financial consolidation implementation, due to the complexity involved in the integration of multiple core financial management solutions in large enterprises, or customers implementing both FP&A and FC solutions.*
- *Reference customer scores for CCH Tagetik placed it in the bottom quartile for support and vendor satisfaction, ease of maintenance and ease of integration. Some reference customers cite the need to maintain a strong technical proficiency in-house with CCH Tagetik.*

4. FloQast

FloQast, based in Los Angeles (U.S.), covers the lower mid-market managing reconciliation management and close management EFCA solutions. It is considered by the quadrant a Niche Player.

Strengths

- *FloQast has a focused FC management solution targeted at the lower midmarket, which is also applicable for the business units of larger organizations. While not complex in capability, it can be implemented fairly rapidly and provides a quick time to value for the right client with more-basic close management requirements. Reference customers cite ease of use and integration into accounting teams' existing processes as strengths, specifically in allowing them to continue to use Excel and their own checklists.*
- *FloQast provides an excellent price point for the lower midmarket and is often 30% to 50% less costly than the more-high-level FC products. Many of its customers have found that they do not need to pay for the additional complex functionality (such as matching) found in larger-enterprise-targeted solutions.*
- *Given the high levels of customer satisfaction with FloQast, organizations have found that they can position this SaaS solution to provide near-term value without the need of complete financial transformation initiatives; focusing on their near-term tactical requirements.*

Cautions

- *FloQast does not have transaction-matching capability at present, and may not be an appropriate choice for an organization attempting to automate more of its reconciliation initiatives and having more upper-market requirements.*
- *FloQast is developing partnerships with core financial management and FP&A/FC vendors at present; however, these partnerships are mostly at arm's length and focus on technology integrations.*
- *FloQast is still immature in its ability to market its products globally, and beyond its target market. This will need to be a focus as it builds the business. Most of its international penetration is through North America-based multinational companies, but it does have channels outside North America.*

5. Host Analytics

Host Analytics, based in Redwood City (U.S.), supports financial reporting, consolidation and FP&A functions through its platform. It is a cloud-only vendor that is considered a leader since its cloud experience is recognized as very high and its product offering strong.

Strengths

- *All of Host Analytics' reference customers reported upgrading to new versions as soon as the version was available. Its scores here are the highest of any vendor in this study, and are an indication of a reliable cloud architecture and a well-honed version release process. Host Analytics' reference customers also scored it well for their not needing a third party for upgrades; illustrating, once again, the strength of its cloud platform.*
- *Reference customers for Host Analytics scored it above average in seven of the 11 key areas evaluated. These were: sales experience, ease of implementation, ease of maintenance, application governance/life cycle management, overall experience, meeting the customer's needs and meeting overall needs versus money spent (value for money). All of its reference customers would recommend Host Analytics to others, a few with minor qualifications.*
- *Host Analytics is viewed as having a comparatively mature cloud solution for FC, and its product is able to support the more complex use cases. Its offering is seen as being a more stable and proven platform that can support large and complex organizations.*

Cautions

- *Host Analytics' reference customers scored it in the bottom quartile for analytics; however, it did launch dashboards in late 2017. In addition, performance was the vendor's next-lowest score. These were the issues most often cited under "recommend the vendor but with minor qualifications." For instance, some reference customers cited issues with performance for very large datasets and with data visualization capabilities for more complex analytics needs.*
- *Most of Host Analytics' software sales, consulting and support capabilities are in North America. All of its reference customers' deployments took place there, though they showed activity in other regions. Prospective customers outside North America should therefore appraise Host Analytics' local consulting and support capabilities. Its global capability is good; however, it does not have a strong global presence in all major markets. We see this vendor approaching globalization more conservatively and investing where there is a strong market opportunity.*
- *Host Analytics has released significant new features to its modeling offering, including a new user interface that can be used as an alternative to Microsoft Excel; however, additional improvements are required to match the top modeling offerings in this market.*

6. OneStream Software

OneStream Software, based in Rochester (U.S.) supports financial reporting, reconciliation management, FP&A, and robust platform selling on-premises, SaaS, and hosted solution. It is considered a visionary showing relatively high level of customer satisfaction but just responding to the requirement for market penetration.

Strengths

- *Reference customers scored OneStream in the top quartile of the vendors in this Magic Quadrant in the key non-product-functionality areas evaluated, and reported that their top-three criteria when selecting OneStream were functional capabilities, solution flexibility and ease of use. In addition, all of its reference customers would recommend OneStream to others, without qualification. OneStream tends to be used by large organizations for complex, enterprisewide financial consolidation applications. OneStream has a functionally robust solution for reconciliation management. It competes effectively against much larger vendors in this area, and its solution has been successfully implemented by large enterprises.*

- *OneStream Software is growing rapidly and has a strong mind share among finance professionals. It is also good at targeting large organizations that are struggling with complex legacy on-premises financial consolidation implementations. We are beginning to see OneStream Software compete well against leading best-of-breed reconciliation management vendors.*

Cautions

- *OneStream Software focuses on North America and EMEA, and has limited exposure elsewhere. It needs to further develop partnerships with midsize and large SIs to extend its reach around the world by, for example, accessing more support for local languages and local regulations.*
- *Approximately one-fifth of OneStream's reference customers reported that their deployments took nine months or more; a few reported 12 months or more. Although this is due, in part, to the size and complexity of the applications this vendor often undertakes, suitable attention should be paid to this during project scoping.*
- *One-third of reference customers reported they needed ongoing support from OneStream, or a consultant. This may be due, in part, to OneStream's customers having more complex FC needs than the average enterprise, but should be considered when evaluating OneStream. This score for implementation was below average for this Magic Quadrant and underlines the complexity that many large FC implementations are faced with.*

7. Oracle

Oracle, based in Redwood City (U.S.), mostly sells cloud offerings but is worldwide known its on-premises Hyperion FP&A and FC solutions. It is Leader in the market due to its business model, product/sales/geographic strategy.

Strengths

- *Oracle has many large customers, a global reach, a large implementation partner ecosystem and a large service organization, with broad business domain and industry coverage. Oracle is able to exploit these attributes to increase the market penetration of its cloud financial close products.*
- *Oracle has a large base of Oracle HFM customers that are anxious to move to Oracle FCCS; this will further expand the pervasiveness of this solution. During the past year, Oracle has become a significant competitor in the reconciliation management market and competes well against leading best-of-breed products.*
- *Oracle supports both midsize and large organizations as well as having enterprisewide use. This has been demonstrated by the reference study used as part of this research.*

Cautions

- *Reference customers for Oracle scored it as below average in all of the 11 key areas evaluated. Bottom-quartile scores were reported for sales experience, overall experience with this vendor and overall satisfaction with the vendor.*
- *Approximately one-third of Oracle's reference customers reported that they would recommend Oracle, but would do so with minor qualifications. More than one-third of reference customers stated that they needed ongoing support for maintenance and upgrades from a third-party vendor. This was a below-average score and points to the complexity of many large enterprise financial consolidation implementations.*

- *Many of the SIs that implement Oracle products do not keep up to speed with all of its product releases, which occur several times each year. As a result, we have seen SIs not implementing newly released functionality that would bring the product functionally more on a par with Oracle HFM.*

8. Trintech (Adra)

Trintech, based in Dallas (U.S.), offers solutions on cloud and serves the lower midmarket. It is considered a Niche player and known as a product easy to implement, use and maintain.

Strengths

- *Adra is one of the few lower-midmarket-focused solutions in the market that has transaction-matching capability built into its solution. This can provide the lower midsize organization with an opportunity to automate more of its reconciliation management requirements.*
- *Adra has good penetration in Scandinavian countries, where it was a proven reconciliation management solution for more than a decade. Its workflow/routing/approval capabilities, once a weakness, have been significantly improved.*
- *Adra is focused on the lower midsize market, where there is a significant opportunity to address the needs of organizations that have been largely ignored — through a focused solution with corresponding lower midsize pricing.*

Cautions

- *Companies need to determine whether Adra will meet their requirements, or if they need a more robust product — particularly if they have complex needs. While reference customers report that this product is easy to implement, use and maintain, they also consider response time and a need for APIs to be issues.*
- *Support for Adra implementations will largely be supplied by Trintech, because there are few lower midmarket SI partnerships for this product. This may limit the ability of prospective clients to use this product as a basis for a financial transformation initiative.*
- *The Adra product has limited presence outside Europe. While it has a minor presence in Asia/Pacific, South America, the U.K. and the U.S., prospects need to fully understand the level of support that will be available to them as Trintech expands these teams.*

9. Trintech (Cadency)

Trintech, based in Dallas (U.S.), sells cloud-only products and is considered a visionary "due to its strength as an integrated suite of FC functions that draws on a common business process platform that excels in comparison with its competitors".

Strengths

- *Trintech Cadency has strong reconciliation management capabilities that are suitable for large organizations with complex needs. Its product suite addresses many areas of EFCA and is a good choice for organizations that want to address multiple areas of FC as customers start, or expand, their implementation.*
- *Trintech's integrated Cadency suite offers organizations the opportunity to extend their FC solution footprint without having to acquire separate products on a piecemeal basis. As new functions are enabled, organizations can use the same platform to acquire the additional SaaS seats they require to bring applications to new users.*

- *Trintech is a digitalization visionary in the FC market, and with robotic process automation (RPA) it is ahead of its competitors — releasing RPA capabilities in 2017 that were designed to drive RPA based on customers' configured risk profiles. Examples include automatically approving close workflow items and enabling the integration of third-party systems into their close workflow.*

Cautions

- *Trintech does not have the same marketing visibility as its main competitors in this market. As a result, it may be less visible than others and has yet to achieve its desired level of brand recognition and market awareness.*
- *Trintech's Cadency suite's positioning and pricing deter organizations that just want one capability, such as reconciliation. Furthermore, at times Trintech's per-seat SaaS prices are higher than those of its midmarket competitors. On the other hand, if the customer uses multiple Cadency functions, this could result in a lower total cost of ownership. (Trintech also brings the Adra product to market, which is focused on the small and midsize business [SMB] market whereas Cadency is focused on upper-midsize and enterprise customers.)*
- *Cadency's reference customer scores placed it in the bottom quartile for customer satisfaction, ease of use, ease of maintenance and ease of integration. Reference customers for Cadence reported that it takes a long time to get problems resolved when trouble tickets are issued. We have, however, seen Trintech make significant improvements to its product and strategy during the past year.*

10. Workiva

Workiva, based in Ames (U.S.) is a cloud-only vendor supporting FC processes, close and disclosure management. It is considered a leader in the market and is characterized by a rapid growth.

Strengths

- *Reference customers scored Workiva as above average in 10 of the 11 key areas surveyed, with top quartile scores in five of the 11: ease of implementation, ease of use, ease of maintenance, performance and overall experience with vendor. In addition, all of Workiva's reference customers would recommend it to others; a few with minor qualifications. Reference customers for Workiva reported that their top-three product selection criteria were ease of use, functional capability and performance. Workiva also continues to achieve high customer satisfaction scores from its references.*
- *Workiva supports both midsize and large organizations. The tendency for large companies to use Wdesk reflects their more complex financial disclosure and performance reporting requirements.*
- *Workiva offers popular additional FC capabilities. For example, we estimate Workiva has more than 50% of the U.S. market for Securities and Exchange Commission (SEC) XBRL cloud services. Also, many of its customers are acquiring more Wdesk seats in order to use the product in other areas of financial closure.*

Cautions

- *Most of Workiva's customers are in North America, and its customers outside of the U.S. are part of large North America-based multinationals. Most of Workiva's software sales, consulting and support capabilities are in North America (all of its reference customers' deployments took place in this region, though some also had activity in other regions). Prospective customers outside of the U.S. should evaluate relevant customer references for their region and appraise the local consulting and support capabilities.*

- *Although Workiva is used by both midsize and large organizations, and has customers with hundreds of users, its solutions tend to be used tactically within business units and departments (reference customers reported having 54 users, on average).*
- *Wdesk is used more often for financial disclosure than for other functions within financial closure. As a result, Workiva has fewer large FC deployments. As part of your evaluation process, be sure to speak with references with FC deployments as large as those you are planning.*

Below are the results of the report " Magic Quadrant for Cloud Financial Planning and Analysis Solutions" by analysts John Van Decker and Christopher Iervolino on the strengths and cautions of the EPM software vendors placed in the Gartner quadrant.

Source: https://www.gartner.com/en/documents/3883865/magic-quadrant-for-cloud-financial-planning-and-analysis

1. Adaptive Insights

Adaptive Insights is considered Leader "due to its scores for Completeness of Vision, reflecting its sales, marketing and product strategy, and for Ability to Execute, reflecting its product and marketing execution and high customer satisfaction ratings".

Strengths

- *Survey respondents rated Adaptive Insights above average in all 11 key areas surveyed, with top-quartile scores in nine: ease of implementation, use and maintenance, solution flexibility, performance, application governance/life cycle management, overall experience with vendor, meeting needs, and meeting overall needs vs. money spent. Almost all references said they would recommend Adaptive Insights without reservation.*
- *Almost all Adaptive Insights reference customers reported having upgraded to new versions within a week, mostly as soon as the version was available. These scores are in the top quartile and are an indication of a reliable cloud architecture and version release process.*
- *Adaptive Insights has increased scalability and performance capabilities in support of larger and more-complex implementations by large organizations. Survey respondents reported an above-average number of users for planning and integrated financial planning. A quarter of respondents reported having over 250 users, and a third had over $1 billion in annual revenue.*

Cautions

- *Prospective customers requiring high degrees of customization, such as those needing governance between many linked models, should conduct proofs of concept. Evaluate those capabilities that Adaptive Insights has released more recently.*
- *A very small percentage of Adaptive Insights reference customers cited the need for minor Microsoft Excel integration improvements.*
- *Most Adaptive Insights business is done in the U.S. — 89% of its reference customers reported that their deployments were in North America. Prospects outside North America should appraise the vendor's local capabilities, although it is expanding globally (over 20% of its customers are international companies).*

2. Anaplan

Anaplan is considered a cloud-only vendor Leader due to the number and experience of its customers.

Strengths

- *Survey respondents rated Anaplan above average in eight of the 11 key areas surveyed, with top-quartile scores in six: sales experience, ease of use, solution flexibility, performance and overall experience with vendor, and meeting overall needs. All customers surveyed would recommend Anaplan without qualification.*
- *All Anaplan customers surveyed reported upgrading to new versions within a week, with the vast majority upgrading as soon as the version was available. The vendor's top-quartile scores here indicate a reliable cloud architecture and version release process.*
- *Anaplan tends to be used by large organizations for complex, enterprisewide applications (56% of its survey respondents had over $1 billion in annual revenue, and 22% had more than $10 billion — this latter percentage is a top-quartile result). In addition, Anaplan reference customers reported having an above-average number of users — 11% of them had over 1,000 users (another top-quartile result).*

Cautions

- *Anaplan survey respondents gave slightly below-average scores for ease of implementation, ease of maintenance and meeting needs vs. money spent, although none of these ratings was especially weak. Prospects should consider these scores alongside the above-average number of users and complex models in the Anaplan customer base.*
- *Anaplan may not be an appropriate vendor for small organizations with straightforward planning needs, such as those without complex integrated financial planning or modeling requirements. This is due to a higher product cost and higher internal application governance requirements.*
- *Some Anaplan reference customers reported performance slowdown when many users are in the same model. Organizations with complex models and large numbers of concurrent users should pay particular attention to model design optimization.*

3. BOARD International

BOARD International is considered a Visionary having a strong vision for innovation and "a good understanding of the market and analytics".

Strengths

- *Survey respondents rated BOARD above average in seven of the 11 key areas surveyed: ease of use and maintenance, solution flexibility, performance, analytics, application governance/life cycle management, and meeting overall needs. The vast majority of its customers surveyed would recommend BOARD without reservation.*
- *BOARD supports both midsize and large organizations as well as enterprisewide use. Half of its survey respondents had less than $1 billion in annual revenue; half had more. Eleven percent had more than $10 billion in annual revenue, and the average number of users per customer was 1,230 — over double that of any other vendor in this Magic Quadrant. This high number is partially due to*

the inclusion of some customers with integrated planning and modeling use cases across very large numbers of users.

- *BOARD has focused on its strength in analytics, expanding these capabilities to allow predictive forecasting and information visualizations to be used more extensively.*

Cautions

- *A notable number of BOARD reference customers reported taking six months or more to upgrade to new versions, with some reporting that they didn't accept any version updates in 2017. The ability to quickly and seamlessly upgrade allows new product capabilities to be leveraged sooner. This finding compares unfavorably to the other vendors in this study — most notably against the cloud-only vendors.*
- *A notable number of BOARD reference customers reported that their deployment took nine months or more. Although part of this reason is the size and complexity of applications the vendor often undertakes, related attention should be given during project scoping accordingly.*
- *BOARD offers fewer process- and business-domain-focused prepackaged applications than other vendors in this Magic Quadrant.*

4. CCH Tagetik

CCH Tagetik is classified as a Visionary thanks to the ability to support complex use cases and the continuous increasing of its ability to execute.

Strengths

- *CCH Tagetik has consistently demonstrated its ability to satisfy the needs of large, complex organizations. For example, 32% of its customers surveyed had over $1 billion in annual revenue, and 18% had over $10 billion — the latter being a top-quartile score.*
- *CCH Tagetik has enhanced its user experience by simplifying navigation and adding an Analytical Workspace to its planning and profitability modules. This is for governing the large data volumes and dimensionality required for complex financial and operational planning and profitability analysis.*
- *CCH Tagetik has been effective in replacing on-premises planning solutions in large or complex enterprisewide FP&A opportunities.*

Cautions

- *Survey respondents rated CCH Tagetik below average in 10 of the 11 key areas surveyed, although few individual ratings were especially weak. Bottom-quartile scores were reported for ease of implementation and analytics, although most reference customers would still recommend the vendor without reservation.*
- *Almost half of CCH Tagetik's customers surveyed reported that their deployment took nine months or more. Although part of this reason is the broader FP&A and financial close implementation scope the vendor often undertakes, related attention should be given during project scoping accordingly.*
- *Half of CCH Tagetik's reference customers said they needed ongoing support for upgrades related to maintenance or updates, which places the vendor in the bottom quartile in this area. This is partially attributable to the size and complexity of applications the vendor often undertakes. When scoping related initiatives, prospects should consider the potential need for ongoing support.*

5. Host Analytics

Host Analytics is listed as a cloud-only vendor leader due to market understanding and customer number and experience

Strengths

- *Survey respondents rated Host Analytics above average in seven of the 11 key areas surveyed: sales experience, ease of implementation and maintenance, application governance/life cycle management, overall experience, meeting needs, and meeting overall needs vs. money spent. Most reference customers would recommend the vendor without qualification.*
- *All Host Analytics reference customers reported upgrading to new versions as soon as the version was available. The highest score of any vendor in this Magic Quadrant, this result indicates a reliable cloud architecture and well-honed version release process.*
- *Host Analytics is in the top quartile for reference customer needing ongoing support for upgrades related to maintenance or updates, with few requiring it.*

Cautions

- *Host Analytics reference customers scored it in the bottom quartile for analytics. Some survey respondents cited issues with performance for very large datasets and data visualization capabilities for more-complex analytics needs.*
- *Most Host Analytics software sales as well as consulting and support capabilities are in North America (all reference customer deployments took place in this region, although 10% of these had APAC activity, 14% had EMEA and 5% Latin America). Prospects outside North America should appraise its local consulting and support capabilities*
- *Host Analytics has released significant new features for its modeling offering, including a new user interface that can be used as an alternative to Microsoft Excel. However, additional improvements are required to match the top modeling offerings in this market.*

6. IBM

IBM headquartered in Armonk (U.S.), sells on-premises and cloud solutions.

It is classified as a Leader in the quadrant thanks to the customer expansion not just in cloud but also from a geographic, sales and product strategy point of view.

Strengths

- *IBM has many large customers, a global reach, a large implementation partner ecosystem and an extensive service organization, with broad business domain and industry expertise.*
- *IBM Planning Analytics is based on TM1, and has had many improvements to enhance functionality, usability and flexibility. IBM's reference customer scores for solution flexibility were above average.*
- *IBM has a diversified customer base. The vendor tends to be used by large organizations for complex, enterprisewide applications — 58% of reference clients had over $1 billion in annual revenue, and 17% more than $10 billion. At the other end, 25% of reference clients had less than $1 billion in revenue.*

Cautions

- *Survey respondents rated IBM below average in 10 of the 11 key areas surveyed, although few individual ratings were especially weak. It had bottom-quartile scores for ease of implementation*

and maintenance, application governance/life cycle management, overall experience with vendor, and meeting needs vs. money spent.

- *IBM is in this Magic Quadrant's bottom quartile for reference customers needing ongoing support for upgrades related to maintenance or updates, with almost half requiring it.*
- *A clear majority of IBM customers surveyed would recommend the vendor without reservation; however, a material number would do so with minor qualifications. These qualifications generally reflected some dissatisfaction with support responsiveness.*

7. Jedox

Jedox, based in Germany, sells on-premises and cloud solutions. It is considered a Niche player providing a "cost-effective modeling solution that is highly compatible with Microsoft Excel".

Strengths

- *Jedox provides a flexible FP&A modeling solution, with reference customers scoring it highest for solution flexibility, performance and analytics. The vast majority of its customers surveyed would recommend the vendor without reservation.*
- *Jedox can support a range of customer sizes (30% of its survey respondents had more than $1 billion in annual revenue, and 15% more than $10 billion). However, in large organizations its solutions tend to be used by business units and departments, as opposed to enterprisewide (Jedox survey respondents reported having, on average, 55 users versus the all-vendor average of 259).*
- *Jedox has released new capabilities allowing for predictive forecasting, and can leverage GPUs for larger, more-complex models.*

Cautions

- *Half of Jedox's reference customers cited needing ongoing support for upgrades related to maintenance or updates, placing the vendor in the bottom quartile in this regard.*
- *Most Jedox reference customer satisfaction scores were average. This isn't an indication of any problem since no individual score was weak; however, some respondents reported minor implementation issues due to a suboptimal third-party consulting team.*
- *A material number of Jedox reference customers reported that they didn't accept any version updates in 2017. Updates allow new product capabilities to be leveraged. This finding compares unfavorably to the other vendors in this study — most notably against the cloud-only vendors.*

8. Kaufman Hall (Axiom Software)

Kaufman Hall, based in Skokie (U.S.), sells cloud solutions supporting "planning, budgeting, performance reporting, rolling and cash flow forecasting, cost accounting, capital and workforce planning, strategy management, and profitability modeling".

It is considered a Challenger in the market, and it is focused on a limited number of industries.

Strengths

- *Survey respondents rated Kaufman Hall above average in all 11 key areas surveyed, with top-quartile scores in 10: sales experience, use and maintenance, solution flexibility, performance, application governance/life cycle management, overall experience with vendor, meeting needs, and meeting overall needs vs. money spent. The vast majority of reference customers would recommend Kaufman Hall without reservation.*
- *Axiom Software tends to be used by large organizations for complex, enterprisewide applications (71% of Kaufman Hall survey respondents had over $1 billion in annual revenue, and 29% had*

more than $10 billion — this latter percentage is in the top-quartile for vendors in this Magic Quadrant). In addition, survey respondents reported having a top-quartile average of 480 users.
- *Kaufman Hall's industry-specific knowledge within the healthcare, financial services and higher education sectors enables Axiom Software customers to use its embedded industry and process-specific capabilities.*

Cautions

- *Most Kaufman Hall reference customers said they needed ongoing support for upgrades related to maintenance or updates. This compares unfavorably to the other vendors in this study.*
- *Almost half of Kaufman Hall's reference customers reported taking six months or more to upgrade to new versions, a quarter of whom didn't accept any version updates in 2017. The ability to quickly and seamlessly upgrade allows new product capabilities to be leveraged sooner. This finding compares unfavorably to the other vendors in this study — most notably against the cloud-only vendors.*
- *A material number of Kaufman Hall reference customers reported that their deployment took 12 months or more. Although partially due to the size and complexity of their applications, related attention should be given during project scoping accordingly.*

9. Kepion

Kepion headquartered in Seattle (U.S.), offers a platform to support FP&A process and provide analytics for sales, finance, operation, marketing and HR. It supports financial and operational planning processes and is considered a Niche Player in its market.

Strengths

- *When asked what they liked most about the solution, Kepion survey respondents most often cited solution flexibility.*
- *That Kepion is Microsoft-based makes it a more attractive option for organizations standardizing on Microsoft solutions.*
- *Kepion has increased its market exposure through its partner and OEM relationships in 2017.*

Cautions

- *Survey respondents rated Kepion below average in all 11 key areas surveyed, although few individual ratings were especially weak. Bottom-quartile scores were reported for sales experience, analytics, application governance/life cycle management and meeting overall needs.*
- *Over half of Kepion's reference customers cited needing ongoing support for upgrades related to maintenance or updates, placing the vendor in the bottom quartile in this regard.*
- *Most Kepion sales, consulting and support capabilities are in EMEA (69% of its reference customer deployments took place in this region, although 13% of these had APAC activity, 13% had Latin America and 6% North America). Prospects outside EMEA regions should appraise its local consulting and support capabilities.*

10. Longview

Longview, based in Toronto, Canada, sells a cloud-based FP&A solution for "budgeting, forecasting, dashboards, modeling, performance reporting, analytics and collaboration support. It also offers separate solutions for tax planning and to support the financial close".

It is considered in the reference market a Visionary.

Strengths

- *Longview received top-quartile scores for the speed of version updates. Almost all its reference customers reported upgrading to new versions within a week, with many upgrading as soon as the version was available — an indication of a reliable cloud architecture and version release process.*
- *Longview can support a range of customer sizes — 38% of its survey respondents had more than $1 billion in annual revenue, and 13% more than $10 billion.*
- *Longview leverages a number of innovative features, such as its approach to analyzing detailed data across multiple hierarchies, and its "storylines" to combine financial, operational and unstructured data within business narratives.*

Cautions

- *Survey respondents rated Longview below average in all 11 key areas surveyed. Bottom-quartile scores were reported for ease of implementation, analytics, application governance/life cycle management and meeting needs.*
- *Reference customer feedback reflected some dissatisfaction with reporting capabilities and project implementation. Although Longview reference customers would all recommend the vendor, a material number said they would do so with minor qualifications such as these. Longview has subsequently released reporting and analytics improvements.*
- *A quarter of Longview reference customers reported that their deployment took nine months or more. Although part of this reason is the size and complexity of applications the vendor often undertakes, related attention should be given during project scoping accordingly.*

11. OneStream

OneStream Software is considered a Visionary in the market and is known for the ability to executive and the high customer satisfaction.

Strengths

- *Survey respondents rated OneStream in the top quartile in all 11 key areas surveyed. All of its customers surveyed would recommend the vendor with no qualifications.*
- *OneStream was awarded a perfect score by reference customers for sales experience (no vendor has ever achieved that rating in this study).*
- *OneStream tends to be used by large organizations for complex, enterprisewide applications (59% of its survey respondents had over $1 billion in annual revenue — a top-quartile amount in this Magic Quadrant — and 4% had more than $10 billion).*

Cautions

- *A notable number of OneStream reference customers reported that their deployment took nine months or more. Although part of this reason is the size and complexity of applications the vendor often undertakes, related attention should be given during project scoping accordingly.*
- *OneStream received a below-average score for the number of reference customers citing a need for ongoing support for upgrades related to maintenance or updates.*
- *OneStream's solutions tend to be used exclusively by the office of finance as opposed to enterprisewide (survey respondents reported having a materially below-average number of users). However, the vendor can support a range of customer sizes and larger numbers of end users.*

12. Oracle

Oracle is considered a Leader in this market as well, due to "its market traction with PBCS and EPBCS, its geographic, sales and product strategy, and its business model"

Strengths

- *Oracle has many large customers, a global reach, a large implementation partner ecosystem and a large service organization, with broad business domain and industry coverage. It has a high degree of name recognition in this space — a 2017 Gartner social media analysis indicated that Oracle led all other vendors in number of social media conversations and the increase in its share of social media conversations.*
- *Since switching to a primary sales focus for its cloud-based enterprise performance management offerings in 2016, Oracle has achieved a high rate of customer adoption for PBCS and EPBCS. Its customer adoption rate compares favorably with those of most other vendors in this Magic Quadrant.*
- *Oracle supports both midsize and large organizations as well as enterprisewide use. Its survey respondents were mostly large organizations (57%), with 15% having more than $10 billion in annual revenue. They also reported a top-quartile average number of users.*

Cautions

- *Survey respondents rated Oracle below average in all 11 key areas surveyed, although few individual scores were especially weak. Bottom-quartile scores were reported for sales experience and overall experience with this vendor, but these two scores were significantly higher than those attained in past years for Oracle's on-premises FP&A solutions.*
- *A material number of Oracle reference customers said they would recommend the vendor with minor qualifications, generally reflecting some dissatisfaction with support responsiveness and the speed of bug fixes.*
- *Oracle received a below-average score for the number of reference customers citing a need for ongoing support for upgrades related to maintenance or updates.*

13. Prophix

Prophix, based in Toronto, Canada, offers on-premises and cloud solution that serves the midmarket. It is listed as a Visionary.

Strengths

- *Survey respondents rated Prophix above average or average in nine of the 11 key areas surveyed, with top-quartile scores for analytics and meeting overall needs. The vast majority of respondents would recommend the vendor without qualification.*
- *Prophix targets SMBs and the midmarket, as shown by its high number of reference customers with less than $1 billion in annual revenue and below-average number of users. The vendor's larger customers tend to use its applications on a business unit or departmental basis.*
- *Prophix has seen strong levels of cloud growth in the past year and has expanded its number of worldwide ERP partnerships, such as with SYSPRO, Viewpoint, TOTVS, QAD and Sage.*

Cautions

- *Most of Prophix's software's cloud sales, consulting and support capabilities are in North America, although it has channel partner support worldwide. Almost all of its reference customer deployments took place in North America, and only a few of these had EMEA activity. Most respondents worked with Prophix for application design and implementation. As a result, prospects outside North America should appraise its local consulting and support capabilities.*
- *Prophix is in the bottom quartile for the time taken to upgrade to new versions, with a material number of reference customers citing six months or more, including some that they didn't accept any version updates in 2017. Updates allow new product capabilities to be leveraged. This finding compares unfavorably to the other vendors in this study — most notably against the cloud-only vendors.*
- *Some Prophix reference customers referred to the need for improvements with cloud application maintenance and implementation planning, and noted some performance slowdown with large applications and/or high-volume data load tasks.*

14. SAP

SAP, based in Germany, offers "SAP Analytics Cloud and SAP Digital Boardroom (built on SAP Analytics Cloud) in this space". It is considered a Visionary by Gartner.

Strengths

- *SAP has many large customers, a global reach, a large implementation partner ecosystem and an extensive service organization, with broad business domain and industry expertise.*
- *Survey respondents gave SAP top-quartile scores for analytics and overall experience with the vendor, the latter rating representing much improvement over previous versions of this survey. The vast majority of their customers surveyed would recommend SAP without reservation.*
- *Deployment speed survey results show marked improvement over previous years' results, with a good majority of SAP reference customers citing deployment within six months.*

Cautions

- *A clear majority of SAP reference customers would recommend the vendor without qualification; but a small percentage would do so with minor qualifications. For example, some respondents reported slight performance issues related to large applications. Prospects with such use cases should pay particular attention to application design.*
- *SAP reference customers tend to choose to rely on ERP for a larger percentage of financial planning and forecasting needs than those of the other vendors in this Magic Quadrant. This is likely related to a desire to combine transactions, planning and analysis. Associated implementation project emphasis should be given to process and application design in order to optimize potential advantages.*
- *SAP reference customers reported having a higher degree of technical expertise than those of the other vendors in this Magic Quadrant. They estimated that the balance of financial application support responsibility rested more outside finance — with either IT, an external vendor or consulting support — than inside.*
-

15. Vena Solutions

Vena Solutions, based in Toronto (Canada), is a cloud-only solution vendor that uses Microsoft Excel within its user interface not requiring users to replace their models and spreadsheet. It is considered a Niche Player in the market.

Strengths

- *Survey respondents rated Vena above average in 10 of the 11 key areas surveyed, with top-quartile scores in seven: sales experience, ease of implementation and use, application governance/life cycle management, overall experience with vendor, meeting overall needs, and meeting needs vs. money spent. The vast majority of their customers surveyed would recommend Vena without qualification.*
- *Vena is in the top quartile for the fewest number of reference customers citing a need for ongoing support for upgrades related to maintenance or updates.*
- *Vena can support a range of customer sizes (32% of its survey respondents had more than $1 billion in annual revenue, and 5% more than $10 billion). However, in large organizations, its solutions tend to be used by individual business units and departments as opposed to enterprisewide (reference customers reported having a far-below-average number of users).*

Cautions

- *Most of Vena's software sales, consulting and support capabilities are in North America (91% of its reference customer deployments took place in this region, although 27% of these had EMEA activity, 9% had APAC and 5% Latin America). Prospects outside North America should appraise its local consulting and support capabilities.*
- *Some Vena survey respondents cited some issues with performance for very large datasets. Overall performance satisfaction scores were slightly below average.*
- *Vena lacks brand awareness relative to other vendors in this Magic Quadrant.*

16. Workiva

Workiva is a cloud-only vendor listed as a challenger due to its rapid growth.

Strengths

- *Survey respondents rated Workiva above average in 10 of the 11 key areas surveyed, with top-quartile scores in six: ease of implementation, use and maintenance, performance, and overall experience with vendor. The vast majority would recommend Workiva to others without qualification.*
- *Workiva is a public company with $208 million of revenue in 2017 and a rate of growth that compares favorably with most other vendors in this market.*
- *Workiva supports both midsize and large organizations, with most of its reference customers having over $1 billion in annual revenue and a material number having over $10 billion. The tendency for large companies to use Wdesk reflects their more-complex financial disclosure and performance reporting requirements.*

Cautions

- *Workiva's FP&A capabilities satisfy some budgeting requirements where Excel is used as the main tool, but Wdesk lacks many basic capabilities, such as for scenario comparison and allocation. It does not offer the same level of analytics as other vendors in this Magic Quadrant, with reference customers rating the vendor below average in this area.*

- *Most of Workiva's software sales, consulting and support capabilities are in North America (all reference customer deployments took place in this region, although 10% of these had APAC activity, 10% had EMEA and 10% Latin America). Prospects outside North America should appraise its local consulting and support capabilities.*
- *Wdesk is used more often for financial disclosure than for FP&A. This is reflected in Workiva reference customers reporting an average number of users far below the Magic Quadrant average.*

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Executive Summary

In the face of ever-increasing digitization, companies are obliged to question the reliability of their performance measurement systems.

Internationalization and globalization have forced performance measurement systems to change shape and structure.

New business models have emerged that adapt to the constant digital and IT transformation that has revolutionized the tools for internal and external data analysis and performance measurement.

Digitization and increasing automation are strategic priorities for companies that want to keep up with the times.

These continuous needs must inevitably be linked to business KPIs; this means that the measurement of performance indices today requires innovative IT tools that can meet the needs of the business.

In response to these needs, Enterprise Performance Management systems such as CCH Tagetik, SAP, Oracle, OneStream, etc. were designed.

The purpose of the study was to demonstrate how these software, specifically CCH Tagetik, improve business performance.

In order to demonstrate or reject this hypothesis, according to which Tagetik improves the company's performance, it is inevitable to review the literature of performance measurement.

If it is assumed that modern digitization will dictate the methods of assessing financial and non-financial performance adopted so far, a deep knowledge of them is required.

In this sense, the research reports the main definitions, those of Neely (2002) and Moullin (2002), and analyses the main recognized models.

The Tableu de Bord aims to translate the mission and the vision of the single units of company into a set of objectives. In this way, it allows each single unit to identify its Key Success Factors (KSF) and translate them into quantitative Key Performance Indicators (KPI). (Epstein and Manzoni, 1997)

The Performance Measurement Matrix instead divides the measurements in “cost” and non-cost” and “internal” and “external” and aims at establishing how the departments sustain business activity. (Keegan, 1989)

The strategic Measurement and reporting Technique (SMART) Pyramid establishes types of measures to point out the corporate vision and the internal and external business goals.(Lynch and Cross, 1991)

Additionally, the Balanced Scorecard, theorized by Kaplan and Norton in 1992, is the most successful model in its field. It sights at answering the following questions:

- How do customers see us?
- What must we excel at?
- Can we continue to improve and create value?
- How to we look to shareholders? (Kaplan and Norton, 1992)

The Input-Process-Output-Outcome Framework, proposed by Brown in ’96, divides the business process in 5 stages and set relationship between them. (Brown, 1996)

Lastly, the Performance Prism creates five areas on which the organization should focus. (Neely, 2001)

Today, more than ever, performance measurement must be incorporated into performance management. The first is in fact a fundamental tool for evaluating the efficiency of the strategies adopted and an incomparable alert system to change them in case of failure.

Performance management gives the organization the possibility to improve the development activities and, most of all, provides it with specific feedbacks according to performance measurement results concerning the desired outcomes.

It means that after analyzing the performance measurement results, areas of performance improvement must be established: this is what a performance management system does. It gives facilities managers not only the knowledge about the success of the strategy they have implemented but further, in case of failure, an explanation of the reason behind it.

In order to provide a real knowledge of the different models of performance management, the theories of the main authors on the subject have been analyzed, from Otley (1999) to Spekle (2001), from Simons (1995) to Busco (2008), from Aguinis (2009) to Wadongo (2014).

Clearly, the importance of structured performance measurement and management models for improving business management is evident.

In a world that is constantly evolving, change must be anticipated to keep up with the times.

In response to an uncontrollable automation, it is necessary to deal with the information systems and information technologies that are able to grant the competitive advantage.

More and more companies are implementing EPM (enterprise performance management) or CPM (corporate performance management) systems that offer increasingly innovative solutions.

In recent years, the digital and information technology transformation has led to the creation of new business models, new forms of digital engagement of customers and especially new methods and tools for analyzing data inside and outside companies and measuring performance. The digitalization of business processes, also through the increase of automation levels, product and service innovation, in which digital represents a core element, and the progressive opening towards multi-channel relations between companies and customers, as well as towards other actors in the supply chain, represent strategic priorities for most companies and must be linked to Business KPIs. The measurement of KPIs requires innovative and sophisticated IT tools to meet the needs mentioned above. That is the reason why EPM systems were created.

This makes digital-based communication channels increasingly a strategic asset and monitoring their level of service and performance becomes indispensable for the brand reputation and for achieving growth and market share objectives.

If traditional market logic considers examples of successful companies to be those that balance costs and thus make a profit, today, in a constantly developing world, digitization and the speed with which information is circulating are growing at a consistent rate. This inevitably has a great impact on companies that, today, are forced to implement models of information systems and information technology to remain competitive within the market.

Since the 1970s, there has been a debate about the role of information in the logic of companies. The following two decades have represented the peak of intensity of the study in this regard and

have produced multiple theories and proposed various models that aimed to explain the functioning of IS and IT.

Today, in a context where business needs are always dynamic, the provision of modern and reliable information systems is considered an essential asset that companies cannot help but have.

It is therefore natural to wonder how one company can be more profitable than another. Which systems can improve performance? How can a company gain a competitive advantage over its competitors?

In an era of continuous development, a company that wants to become competitive in the marketplace cannot certainly ignore the implementation of information system and information technologies, which are increasingly becoming essential.

To understand these new dynamics it is necessary to know in depth the information systems and information technology, first of all, studying the logic of system thinking from which they were born and determining what are their specific fields of action. Among the main models to explain the functioning of information systems, the most famous are the Technology Acceptance Model (Davis, 1986), introduced by Davis in 1986 and integrated over the years, the DeLone and McLean model (DeLone and McLean, 1992), which defined the six dimensions of the IS, the Ravichandran & Lertwongsatien Research Model (Ravichandran e Lertwongsatien, 2005) and the Design Reality GAP Model (Heeks, 2002).

The success of the implementation of IS and IT systems is demonstrated by the real cases of companies operating in different sectors and geographical regions that have benefited from them.

Hesham Baraka, Hoda Baraka and Islam EL-Gamily, studying the performance of call centers in Egypt, have shown that the main systems for evaluating technological information systems (i.e. the model of DeLone and McLean and the model of Heeks) are on the whole equivalent and lead to the same result. (Baraka A. et al., 2014)

Alaa Khresat instead takes a sample of 100 Jordanian companies in the world of telecommunications and demonstrates the existence of a statistical relationship between management information system and organizational performance. (Alaa khresat, 2015)

Céline Bérard, L. Martin Cloutier and Luc Cassivi propose rather to demonstrate the importance of information system models and information technology during clinical trials. According to the authors, the implementation of such systems improves, above all, the accuracy of the process,

ensuring more reliable outcomes, and the speed, making clinical trials more efficient. (Bérard et al., 2005)

Lastly, Thomas C. Powell and Anne Dent-Micallef selected 250 retailers in the US to analyze the linkages between technology and firm performance. The authors found out that, even though technology has a great productivity power, it must be matched with other resources to be able to increase the overall performance of the company. (Powell and Dent-Micallef, 1997)

Nowadays, the role of technological information systems is to collect data and transform it into strategic information for companies. In this sense, information technology turns raw data into financial data managed by decision makers.

Hence, the world of IT integrates and strengthens the world of accounting.

Digitization has made it possible for companies implementing advanced systems to improve their performance and has made obsolete all those companies that have not been able to evolve.

In reaction to this changing world, the concept of Enterprise Performance Management is currently one of the most discussed.

In a world where artificial intelligence is gaining the upper hand over human intelligence, companies that want to keep up with the times are opening up to new horizons.

It is in this context that Enterprise Performance Management is born, proposing innovative solutions. This discipline offers greater control over the most diverse business activities and is a strategic means to improve business processes.

EPM systems are a growing reality and cannot be overlooked. They can handle the most diverse processes, from budgeting, planning, forecasting and modelling to consolidating results and closing on a periodic basis, from reporting results to internal and external stakeholders to analyzing performance vs. plan, prior years, across divisions or products.

Today, the main EPM software are Oracle Hyperion, SAP S/4HANA, IBM Cognos, OneStream and CCH Tagetik.

To get an overview, each year Gartner - research and advisory company that provides enterprises with business insights, advice and tools they need - publishes the "Magic Quadrant" in which it divides the EPM vendors market into 4 areas (leaders, visionaries, challengers and niche players).

The research provides the last two reports published by Gartner in 2018, “Magic Quadrant for Cloud Financial Close” and “Magic Quadrant for Cloud Financial Planning and Analysis Solutions”.

According to the “Magic Quadrant for Cloud Financial Close”,

- Oracle, BlackLine, Workiva and Host Analtytics are market leaders;
- None of the company analyzed are recognized as challengers;
- CCH Tagetik, Trintech (Cadency), OneStream Software, BOARD International are visionaries;
- Trintech (Adra) and FloQast are niche players.

And according to the “Magic Quadrant for Cloud Financial Planning and Analysis Solutions”,

- Oracle, Anaplan, IBM, Adaptive Insights and Host Analtytics are market leaders;
- Workiva and Kaufman Hall (Axiom Software) are recognized as challengers;
- CCH Tagetik, SAP, OneStream Software, BOARD International, Prophix and Longview are visionaries;
- Vena Solutions, Jeclox and Kepion are niche players.

It is therefore clear that EPM systems are today a necessary requirement to ensure the fluidity and accuracy of processes and at the same time to promote a safe implementation of the strategy designed.

Having assessed the evolution of EPM systems from a literary point of view, critically studying the derivation basis and tracing the current fields of operation, it is necessary to find confirmation of the hypothesis through empirical analysis.

The case study selected concerned the implementation of CCH Tagetik at Mondo Convenienza, the first Italian group that distributes furniture and furnishing.

Mondo Convenienza was selected after evaluating the company overall, the strategy, the main financial indicators and the group philosophy.

Aiming at improving its business processes, Mondo Convenienza implemented CCH Tagetik in 2016.

The group decided to use the CPM software for:

- Balance Sheet,
- Intercompany relations,
- Consolidation,
- Disclosure Management and
- Executive Dashboard.

Tagetik's implementation process is outlined in the research, from the evaluation phase of the different EPM systems to the post-implementation benefits found.

Among the most important results are:

- A reduction of more than 50% in manual activities,
- Rationalization of consolidation entries,
- Peripheral data loading by means of a system of 'customized' ETLs and,
- Reconciliation of intercompany through a web-based dashboard that allows to maintain supervision and control over the data entered by peripheral users.

Having introduced the company, a double analysis - quantitative and qualitative - is then carried out to obtain significant information about the usefulness of EPM systems, and in particular of Tagetik.

With regard to quantitative analysis, a questionnaire was administered to Mondo Convenienza employees to assess their level of appreciation of Tagetik. Five points Likert scale and graphic rating scale has been encoded to enter data into the SPSS software to achieve the study's goal. To obtain the overall results of the study, the frequency and percentage of the different responses to the statements were calculated using the Statistical Package for Social Sciences (SPSS).

The study confirms the following four hypotheses:

- Tagetik is appreciated by users;
- Tagetik simplifies business processes;
- Tagetik reduces production time;
- Tagetik improves processes.

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In fact, the resuts obtained show that:

- 66.7% of respondents appreciate Tagetik compared to the systems previously used and Tagetik in general.
- 73.3% of respondents believe that Tagetik simplifies business process management.
- 66.7% believe that Tagetik reduces time spent on business activities and 60.1% believe that it gives more time to operational and strategic activities.
- 66.7% of respondents believe that Tagetik has improved processes by reducing errors, and 66.6% believe that Tagetik has increased process accuracy.

The questionnaire includes an open question, examined through Keyword Analysis.

Regarding the qualitative analysis, the Head of the Accounting Data Processing and Administrative Services Centre of *Mondo Convenienza*, and the Senior Manager of the Tagetik group at KPMG with decades of experience with the package, have been interviewed.

Specifically, the former described the process of the implementation of Tagetik in Mondo Convenienza, highlighting the main benefits that it has offered the company and suggesting possible improvements. The latter, shared his experience with Tagetik and indicated what the future development of EPM systems would be like on his opinion.

The respondents were selected as they represent respectively the user and system integrator of the Tagetik package and therefore offer a double insight into the degree of appreciation of the package.

The findings have been analyzed through Sentiment Analysis and Keyword Analysis and have been compared to each other in order to critically examine similarities and disagreements.

Sentiment analysis has been chosen because it is the most reliable tool to analyze the sentiment (positive, negative or neutral) of the users of a product.

It is performed by means of algorithms able to calculate the degree of appreciation of a product and provides explanatory visual charts. Starting from the natural language, the analysis identifies and extracts significant terms used by the interlocutor.

The sentiment analysis was performed using the NVivo 12, a qualitative data analysis software.

The Keywords Analysis has instead been structured listing the key words used by the interlocutor in order to high total count and percentage (keywords density).

General text statistics were then created and summarized in a roadmap to have a clear view of what the focal themes of Tagetik, are, according to the respondent's opinion.

The roadmap reports a cross-section that shows the rapid expansion of Tagetik and the current need of remaining competitive, meeting the market needs and predicting the future demands.

Indeed, with increasingly dynamic businesses, Tagetik must offer the possibility of carrying out predictive analyses of future movements.

To do so, it must adapt to the disruptive technologies, such as Big Data, Machine Learning and Artificial Intelligence, that today are indispensable presence.

Comparing the two interviews, they both show a positive perception of Tagetik.

The respondents agree on the benefits that the software brings to business management.

They explain that Tagetik is a single platform that allows to monitor the performance of users and in which everything is mapped. It gives the possibility to analyze the process as a whole and think about point of improvements. It is extremely flexible and close to the customer.

In general terms, the results of qualitative and quantitative research match. Tagetik is appreciated for the different reasons initially hypothesized.

Therefore, the study confirmed all the assumptions made in the pre-research phase.

The study has some practical implications for managers seeking to improve and strengthen the performance processes and the organization as a whole. The cases study analysis shows how managerial and organizational mechanisms should work in the implementation of Tagetik in the Italian context. The aim of the study was to offer a new perspective that had so far been little discussed at the literary level. The research can be used primarily for scientific purposes, as it offers perspectives on the combination of performance systems and digital systems, having thoroughly analyzed the points of convergence between the disciplines. It can also be subject to practical evaluation by Chief Executive Officers who want to adopt systems to improve business performance. The novel findings of this work mainly concerns the space for CPM software that is a matter of priority. In the light of the above analyses, the implementation of technological tools assessing firms' performances such as Tagetik requires the need to specify a detail program design and all the technical and engineering requirements to produce the software.

Looking ahead, further research is needed to understand which ways, context and organizational and managerial mechanisms can facilitate the implementation of this software. This study can be a starting point for future research. These can be directed at analyzing a larger sample of companies, operating in different sectors and geographical regions. In addition, the sample under examination in the quantitative research can be expanded to obtain even more reliable results. Qualitative research can also be broadened by interviewing more vendors and users. Finally, it would be interesting to evaluate the improvements made to business performance not only by Tagetik software but also by other EPM systems to find out whether other software are appreciated in the same way and whether they provide the same benefits.