Building Effective SMA Systems Taking Advantage of Information Technology

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Abstract Strategic management accounting (SMA) is a set of valuable tools to manage a company at its best. However, it is expensive and complex to implement. After a first part of theoretical introduction about the SMA framework, this paper will attempt to assess the possible contribution from the information technologies (IT) in this field both theoretically and empirically. The second part describes a medium-size company and its experiences in implementing a SMA system. We will describe the Nespoli Group, which comprehends 45 medium-size firms localized all-over Europe and the issues linked to the management of such a differentiated multinational ensemble of entities. In the third part, we will propose a new approach to the use of information technology in SMA systems. For this purpose we will evaluate in depth a particular indicator, the service level agreement (SLA), to understand how IT can effectively improve SMA systems. Several final considerations conclude the paper.

Keywords Accounting information systems • Strategic management accounting • Business intelligence • ERP systems • Simulation • Modelling

1 Introduction

Most textbooks of management accounting define the discipline in terms of its decision-making role. It is generally stated that since managerial functions involve using information for better planning and control, management accounting principles are very important for effective and successful management at all levels. In this paper, we will review the role of strategic management accounting (SMA) that claims to be the future of management accounting discipline.

The purpose of the paper is to analyse the definition and the use of the SMA in a medium-sized company: the Nespoli Group Spa. The Nespoli Group is a worldwide

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family-owned Italian company, mainly operating in the "Tools for painting" market.

The Nespoli Group's established position on domestic and international markets increases the interest on the analysis of the company's performance measurement models. In particular, the Nespoli Group started a pilot project regarding service level agreement. We have found some interesting aspects in this project, in particular a relevant contribution from information technologies.

Moreover, we will explore new approaches for the use of information technology. In particular, we would like to propose some thoughts on increased exploitation of the potential of information systems.

2 Mutual Relations Between Accounting Information Systems and Strategic Management Accounting

2.1 Accounting Information Systems and Strategic Management Accounting: Some Definitions

The definition of accounting information system (AIS) depends on the definition of accounting itself. It is possible to distinguish between the two kinds of accounting: financial accounting and management accounting. Financial accounting is defined as:

> The art of recording, classifying, and summarizing in a significant manner and in terms of money, transactions and events which are, in part at least, of financial character, and interpreting the results thereof [1],

Likewise, management accounting is defined as:

> The process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information used by management to plan, evaluate and control within an entity and to assure appropriate use of and accountability for its resources. Management accounting also comprises the preparation of financial reports for non-management groups such as shareholders, creditors, regulatory agencies and tax authorities [2].

The aim of financial accounting (FA) is to gather and summarize financial data to prepare financial reports, such as a balance sheet and income statement, for the organization's management, investors, lenders, suppliers, tax authorities and other stakeholders. FA main recipients are external users, and financial reports must follow precise layouts and rules. In fact, FA must accomplish national and international principles, such as the generally accepted accounting principles (GAAP) or their equivalent in each different country. The focus of FA is to exhaustively represent all the events that occurred by means of reports produced every month, quarter and year.

The theories and the reference models adopted by FA have been defined from a long time and will not change in the future. Hence, FA systems are stable and do not

evolve, particularly when comparing this field with other management topics. Once the organization has introduced and implemented a system, FA can run for several years with very little or no changes at all, unless there is a change in external requirements such as new rules, principles or laws.

While FA is oriented towards the request of external users, management accounting (MA) focuses on the needs of managers. In literature, it is possible to find several conceptual models that may be useful in providing information to managers.

These well-known and well-defined models are designed for planning activities and, after the execution of the activities themselves, to control the obtained results and to report discrepancies, if any. Garrison et al. present this non-exhaustive list of reference models [3]:

- Cost classification
- Job-order costing
- Process costing
- Cost behaviour
- Cost-volume-profit relationship
- Variable costing
- Activity-based costing
- Profit planning (budgeting)
- Capital budgeting
- Advanced reporting

In the mid-1980s major complaints versus MA emerged in the literature [4]. In fact, although MA is considered essential for informed management activity, MA itself seems to have some flaws, particularly arising from its roots in cost accounting, as it is possible to observe in the above-reported list. As a matter of fact, traditional MA approach considers cost classification and analysis, cost-volume-profit models, profit planning (budgeting), capital budgeting and advanced reporting.

Researchers [5, 6] argued that:

1. MA had not evolved over the past decades.
2. MA is too focused on costs.
3. MA is not very useful for managers, because it is not focused on strategy and on market opportunities.

Manager risks to undertake incorrect decisions based on inadequate and obsolete management accounting data. The lack of attention to clients, competition and performance, together with a poor or even non-existing strategic approach, could lead to incapacity to cope with the new highly competitive environment [7].

Strategic management accounting (SMA hereafter) is a promising and well-acquainted evolution of management accounting [8]. SMA tries to address all the above-mentioned criticisms levelled against management accounting. SMA was initially proposed by Simmonds at the beginning of the 1980s [9], and it was not taken seriously until the late 1980s. Simmonds argues that SMA greatly differs

Table 1 Traditional management accounting versus strategic management accounting

	Traditional MA	Strategic MA
1	Historical	Prospective
2	Single entity	Relative
3	Introspective	Outward looking
4	Manufacturing focus	Competitive focus
5	Existing activities	Possibilities
6	Reactive	Proactive
7	Programmed	Un-programmed
8	Data oriented	Information oriented
9	Based on existing systems	Unconstrained by existing systems
10	Built on conventions	Ignores conventions

from MA because of its focus on the comparison of the business with its competitors. Langfield-Smith affirms that there is no agreed definition of SMA in literature [7]. However, Wilson declares that MA differs from SMA in several aspects (see Table 1) [10].

An interesting definition of SMA has been proposed by Bromwich [11], who argues that SMA is:

> The provision and analysis of financial information on the firm's product markets and competitors' costs and cost structures and the monitoring of the enterprise's strategies and those of its competitors in these markets over a number of periods.

Ma and Tayles argue that SMA finally bridged the gap that existed between MA and strategic management [12]. SMA moved MA from monetary issues to a more multidimensional approach. It is not simply a new orientation, which is aimed towards strategy; it is a radically different way of rethinking MA around strategic concepts [8]. In fact, according to Lord [13], the functions commonly associated with SMA are:

1. To collect information related to competitors
2. To use accounting for strategic decisions
3. To cut costs on the basis of strategic decisions
4. And to gain competitive advantage through it

2.2 Strategic Management Accounting: An Empirical Perspective

A straightforward characteristic of the SMA literature is the paucity of empirical research [14]. Actually, most of the literatures regarding SMA were at conceptual level and with a prominent academic emphasis. The main concern is that SMA adoption cannot be measured directly: it is in fact necessary to investigate the

adoption of those techniques that can be reconnected to the SMA concept. This is an alternative way to define SMA.

While researching the link between SMA and strategy, Cinquini and Tenucci [15] proposed to define the ensemble of techniques that companies really implement instead of trying to measure the implementation of SMA itself. Cinquini and Tenucci measured the adoption of one or more of the following techniques:

1. Activity-based costing/management (ABC/M)
2. Attribute costing
3. Benchmarking
4. Competitive position monitoring
5. Competitor cost assessment
6. Competitor performance appraisal on public financial statements
7. Customer accounting
8. Integrated performance management systems
9. Life cycle costing
10. Quality costing
11. Strategic costing
12. Strategic pricing
13. Target costing
14. Value chain costing

Actually, organizations hardly understand the meaning of SMA concept; hence, it is easier to ask them if they currently implement some of the above-mentioned techniques and then evaluate if they are de facto applying a SMA approach. Several researchers followed this course: Guilding et al. [16] created a report based on the survey of 12 SMA practices in different countries and concluded that the extent of diffusion was not uniform in New Zealand, the UK and the USA. Fowzia [14] measured the implementation of 14 SMA techniques and in this way measured business strategy and strategic effectiveness of manufacturing organizations in Bangladesh.

2.3 Strategic Management Accounting and Information Technology

The mentioned literature has essentially academic roots and does not consider actual implementations of the SMA systems. This means that on the one hand the researchers did not consider the implementation aspects and, on the other hand, they do not assess the potential related to information technology.

As regards the first aspect, we must note that to implement SMA systems is extremely expensive. In fact, it is not sufficient to adopt an online transaction processing (OLTP) system, but you also need to implement an online analytical

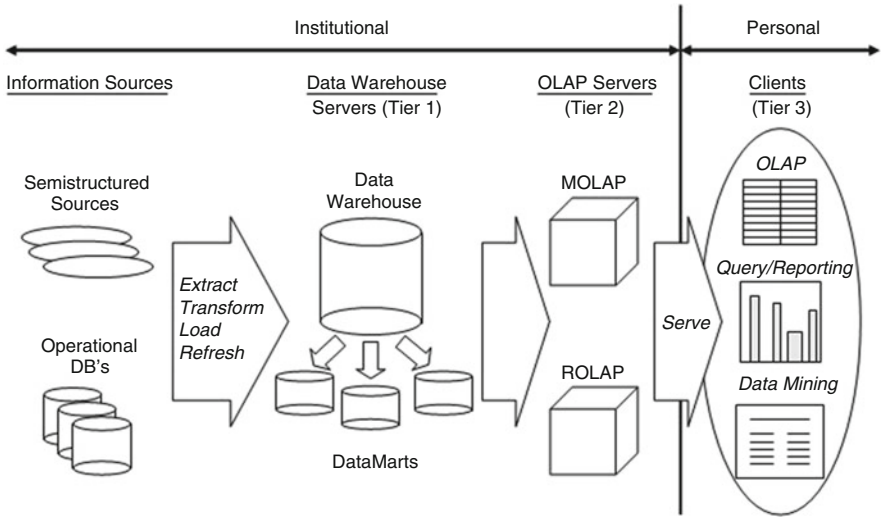

Fig. 1 Strategic management accounting: traditional architecture

processing (OLAP) system. Traditional SMA architecture is based on a three-layer structure (see Fig. 1).

The first tier is a database server that is a relational database system, and it is devoted to data warehouse (DW) support. The second tier is an OLAP server that is typically implemented using either (1) a relational OLAP (ROLAP) model, that is, an extended relational DBMS that maps operations on multidimensional data to standard relational operations, or (2) a multidimensional OLAP (MOLAP) model [17]. The third tier is a front-end client layer, which contains query and reporting tools, analysis tools and/or data mining tools to support the end users.

This architecture has been developed in the last years and is quite functional, but it is heavy and expensive. The major drawbacks are related not only to the sophistication of the scheme itself but also to complexity and cost of the required equipment, both hardware and software. Even relatively small projects, such as pilot projects, may often result to be difficult to implement, expensive and prone to failures. However, it should be stressed that a robust IT architecture is the only one capable to collect and process information necessary for the implementation of an SMA. In fact, neither an OLTP system nor an OLAP system can support by themselves the needs of a SMA system.

Recent studies suggest that it is possible to delete a level, i.e. you can use three-tier architecture taking advantage of IMT (in-memory technology)-based software [18] (Fig. 2).

IMT boosts the software of the end users and thus enables them to create their own hypercubes directly in seconds with intuitive and easy-to-use tools. In this way, IT professionals can focus on pure data issues, and end users can "play" alone with the cleaned and corrected data sets following their thoughts and intuitions.

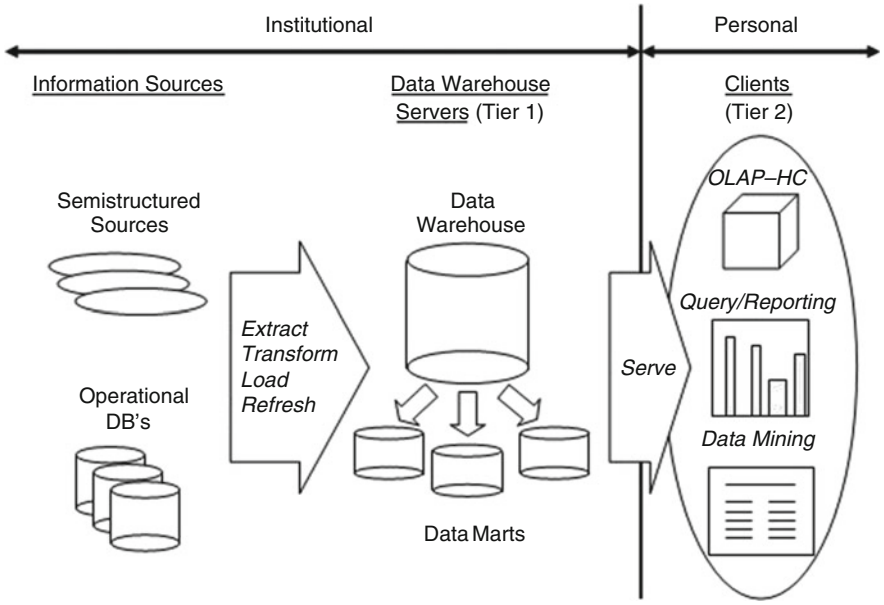

Fig. 2 Strategic management accounting: IMT-based architecture

The second aspect is even more intriguing: is it possible to envisage new perspectives in SMA systems arising from the potential offered by current computer technology? SMA theory is based on the evaluation of static indexes. Computers are used as calculators even if employed in complex models. Instead, in many cases it would be useful to adopt models that describe a process, rather than a static situation. In this case we can take full advantage of both the calculation power of the computers and their ability to handle large volumes of data.

We will present a case to prove this assertion, that is, a case in which it was built a model that describes a process. This system is then employed to perform simulations.

3 Methodology

The methodology used is the case study research approach, following the methods recommended in the literature. The decision to analyse a single case study [19] may be useful for giving a detailed outline of the grounds and distinctive features of the development and subsequent implementation of the internal reporting model represented by the SMA.

The case study approach [20] is interesting since it may offer the option of constructing theories and generalizations based on the study of a single operational

case [21–23]. In the case examined, the benefits of such an approach can be seen in the ability to illustrate the factors that drove the company to adopt a SMA system and the consequences within the planning and control function.

We were searching for an empirical case to deeply investigate the implementation of a SMA system. The selected company was interested in developing a SMA system; hence, we followed systematically the implementation of the new system.

The research carried out feature aspects of a qualitative and quantitative nature: the data examined are based on interviews and the company's economic and financial documentation made available to the public on the company's website and on internal reporting documents. The period analysed concerns the period from 2011 to 2014. The interviews were conducted with the headquarter CFO and those responsible for management control: the questions were designed to explain the various stages of the SMA's implementation to illustrate the progress achieved and the benefits in terms of company results achieved.

The interview as opposed to the questionnaire approach offers greater flexibility even if the results were characterized by a certain degree of subjectivity due to the difficulties of interpreting the answers. However, this was useful for understanding the competitive context in which the company operates and the particular features of the sector to which it belongs.

The contribution of the paper to the literature is motivated by the lack of surveys about the SMA implementation. The major limitation of this research is that results are related to the analysis of a single case study. This study cannot lead to general conclusions, and it will be necessary to conduct a comparative study between the observed company and other companies. Thus, this study represents a starting point for further research in the application of SMA concepts.

4 Strategic Management Accounting in Action: The Nespoli Group Case

4.1 Presentation of the Nespoli Group

The Nespoli Group was founded in North Italy right after the Second World War. At the end of the 1940s, Oreste and Bruno Nespoli started what was called "Pennellificio Nespoli" (the Nespoli Brush factory). Initially the company was made of a few artisans working with clear and simple rules: serious work and customer satisfaction.

The company grew steadily, and at the end of the 1970s, it passed from being a small business to becoming an industrial-sized complex. At the end of the 1990s, Nespoli Group started a series of acquisitions in the Paint Tools sector throughout Europe (see Table 2).

The first strategic acquisitions have been made in Spain, France and Germany. Together with the acquisition of Franpin Group, it acquired ZFI (Zhongshan

Table 2 Nespoli Group acquisition history

Year	Country	Company
1996	Spain	Rulo Pluma s.a.
1999	France	Roulor s.a., Monitor s.a., Le Herisson s.a.
2001	Germany	Schabert GmbH
2004	France	Franpin Group
2005	Germany	Friess GmbH
2006	France	Milbox s.a.
2008	France	Mancret
	Italy	Gubra s.r.l.
	Germany	Techno
	Italy	Gaia s.r.l.
	Italy	Italideal—Cia s.r.l.
2009	Italy	Grand Chic s.rl.
2010	Spain	Castor
	Italy	Pippo brand
	Italy	Eurostile
2011	Germany	Noelle Group

Franpin Industries) its China-based factory. Later on, Nespoli Group decided to diversify its offer and made further acquisitions in the sector of Aerosol Paint Spray with the acquisition of Italideal and CIA in Torino (Italy).

In addition, Metal Tools become part of Nespoli Group business with the acquisition of Milbox in France in 2006 and of Techno in Germany in 2008. Nespoli Group entered in the business of Wood and Leather Treatment through the acquisition of Gubra and Grand Chic (Italy).

In 2010, it was added as another business unit for Cleaning Tools, driven by the acquisition in Italy of the well-known Pippo and Eurostile brands. Today the Nespoli Group, led by Luigi and Alessandro Nespoli, is the first European group in the market segment of "Tools for painting", in terms of sales figures, production volumes and market size. Entering in UK, Poland, China, Russia and Turkey markets, the Group had a turnover approaching 350 million euros with over 2000 employees. The Nespoli Group owns several renowned brands such as Nespoli, Roulor, Franpin, Rulo Pluma, Friess, Techno, Pippo and Coronet, and it manufactures tools for several "private labels".

4.2 The Implementation of Nespoli Group's SMA System: Architectural and Theoretical Aspects

In recent years, Nespoli Group started a relevant project with the aim to provide top management and business analysts with reporting information and key indicators

that are common across the entire group and that could be analysed in a consistent way with various levels of details.

Dr. Bosisio, the Nespoli Group Chief Information Manager (CIO), declared that DataManager is the powerful and flexible tool utilized for getting deeper into business information, empowering business analysts with OLAP technology. As we said earlier, SMA should be fed by various sources of data; however, the principal source remains a sound and well-running ERP system. Here a problem arises, because the various companies that compose the Nespoli Group are actually running diverse ERP systems, such as legacy systems (IBM AS400), SAP, Oracle and MS Dynamics. Therefore, (1) in the long term, the Group has to choose a single ERP system, and all the companies have to gradually switch to it; (2) in the short term, it is necessary to create a system that can receive data from several sources, clean it and consolidate it.

The Common Nespoli Group's ERP

Dr. Bosisio stated that several considerations forced top management to progressively adopt a unique ERP system throughout the Group:

1. To unify processes and data of all the legal entities
2. To cope with the obsolescence of hardware and connectivity
3. To deal with the increasing number of malfunctions and difficulties in finding spare parts
4. To replace non-updateable software
5. To fight decreasing performance
6. To counteract decreasing security

During 2012, the Group has started a major project for an ERP common to all the companies of the Group itself. A "steering committee" expressly created for this task (1) has defined the specific characteristics that the new software should possess, (2) has performed a software selection and (3) has chosen the hardware architecture and the related organizational aspects.

The steering committee has stated that all the companies of the Nespoli Group have to move towards the implementation of Microsoft Dynamics NAV ERP system in external data centres. This system will unify the bookkeeping and the fiscal accounting of each legal entity composing the Group. Moreover, the steering committee decided to perform a "pilot" implementation in Noelle Group, Nespoli Deutschland and Coronet Germany, treating them as "model company" and considering from the beginning the needs of all the Group's companies. The project started in September 2012 for Noelle Group, in January 2014 for Nespoli Deutschland and in June 2014 for Coronet Germany.

The Nespoli Group's SMA System

Waiting to have a unique ERP system in all the Group's companies that will ease the data gathering phase, it was necessary to predispose a sound SMA system to support top management's activities. For this purpose, it has been developed a proprietary system called DataManager, basically a data warehouse. This system gathers fiscal and managerial data from every company's transactional system.

DataManager extracts final data by means of appropriate interfaces from those transactional systems. Utilizing listed processes and documented rules, it consolidates the gathered data, and it arranges data sets that can be analysed from final users. This final data allows managers to prepare budgets and forecasts regarding sales, purchases, stock and manufacturing.

The outcome of the Nespoli Group's SMA system consists in several managerial reports regarding cost classification, job-order costing, process costing, activity-based costing, profit planning and budgeting and advanced reporting. In particular, managers can access SMA via an Excel interface and directly analyse information. In fact, it is possible to modify reports and dynamically choose legal entities, time periods, etc. freely picking the desired dimensions of analysis. A non-exhaustive list comprehends:

- Business unit analysis
- Market channel analysis
- Customer chain analysis
- Trend analysis
- Stock analysis—expiring/obsolete product, consumption spread, ABC analysis, Stock Health Evaluation

4.3 The Implementation of Nespoli Group's SMA System: The Service Level Agreement Pilot Project

In the last 10 years, the Nespoli Group is grown exponentially through acquisitions in Italy and abroad. In a first step, the model of development has been to acquire new companies, leaving the dedicated local management of the acquired companies. The dual advantage was to maintain business continuity and to have a simplification of the chain of command; the disadvantage was the maintenance of an identity of the acquired companies that was not merged into the "Nespoli vision", as stated by Dr. Ripamonti (Group Planning & Control).

In recent years, the size and complexity of the Group have become such as to require a change in the Group's vision; hence, it was created a headquarter structure with the goal to:

- Steer the group as a single entity.
- Act as a chain of transmission between strategies identified by the ownership and Group companies.
- Develop the business unit that represents the main product lines (Paint Tools, Metal Tools, etc.) by focusing on the needs of customers.

The Group's strategy continues to be a growth strategy, walking in two directions:

(a) *Markets*: strength in markets already served and further geographic expansion into new high-growth markets such as Turkey, Russia and China
(b) *Business*: diversification in products for household cleaning, spray paints, in specific products for the construction industry (Metal Tools) and in products dedicated to the care of the wood and leather

Dr. Scribani, the Nespoli Group Chief Value Officer (CVO), explained the growth path for products: firstly, these are complementary products; secondly, they are often purchased from the same "buyer"; and thirdly, they fall into the Nespoli Group "mission". Similarly, the growth path in the new markets is aimed:

1. To exploit the competitive advantages already acquired in the markets currently occupied. It is possible to adopt a "copy and paste" strategy.
2. To exploit the high rates of growth in emerging countries.
3. To follow Nespoli Group main customers in their international expansion.

In order to develop this vision, the Group has started to implement IT tools that allow setting up basic information on the subject of strategic planning and control. Furthermore, the Group has chosen to implement a "pilot project" to test the real potential of the system itself. This project consists in a system capable to evaluate the "service level agreement".

The Service Level Agreement Concept

A service level agreement (SLA) is a document describing the level of service expected by a customer from a supplier, laying out the metrics by which that service is measured, and the remedies or penalties, if any, should the agreed-upon levels not be achieved.

In the field of organized large-scale retail trade (OLSRT), there is a high level of attention to the quality and the level of service. In particular, customers (i.e. large retail stores or large retail groups) require that the rate of delivery on time of ordered products is greater than percentages of 95 %.

Delays and bad deliveries create revenue loss to the customer itself, which charges substantial penalties to its suppliers for this reason. Usually these penalties are planned in the supply agreement, and therefore both the supplier and the customer are aware of them.

The problem arises at the time of accounting. In fact, while the penalty is born in a certain period, the related accounting can take place several months away. Not only it is often impossible to trace the events that led to the penalty, but also it is very difficult to account the penalty itself. In other words, an accounting period, which ended positively, could later prove to be a negative period.

To avoid this problem, it is necessary to monitor continuously orders and shipments. The daily collection of information for each order, for each shipment and for each customer, indicating the level of service and the causes that have led to any stock-outs (delays by suppliers or production), allows a better control of the supply chain.

Nespoli Deutschland	Jan-May 2014	Navision Transactional System		
	SLA % on Amount	Amount Ordered	Lost Turnover	Outstanding Amount
January 2014	97,0%	1.566.647	47.348	-
Complete	100,0%	47.401	-	-
Partial	99,2%	188.482	1.546	-
Partial and Close	96,6%	1.330.764	45.802	-
February 2014	97,4%	4.300.646	109.077	2.196
Complete	100,0%	6.847	-	-
Partial	99,3%	1.013.400	4.879	2.196
Partial and Close	96,8%	3.280.399	104.198	-
March 2014	97,1%	6.825.555	196.597	1.665
Complete	100,0%	75.676	-	-
Partial	98,7%	2.823.248	35.650	1.665
Partial and Close	95,9%	3.926.632	160.947	-
April 2014	96,1%	6.481.729	253.691	1.597
Complete	99,8%	38.766	64	-
Partial	99,7%	1.923.253	3.234	1.597
Partial and Close	94,5%	4.519.711	250.393	-
May 2014	94,1%	7.485.149	364.816	77.597
Complete	100,0%	36.830	-	-
Partial	95,3%	3.384.737	81.930	77.597
Partial and Close	93,0%	4.063.582	282.886	-
Grand Total	96,0%	26.659.726	971.529	83.055

Fig. 3 The SLA report

Service level agreement (SLA) key measures are integrated into a supply chain scorecard (see Fig. 3) that is consistently measured across the organization allowing benchmarking inside the Group. The main KPI analysed in SLA report are:

- Forecast accuracy
- Stock levels
- Internal/external supplier delivery performance
- Transport provider measurements
- Warehouse operation measurements
- Order fill rate
- Product availability or stock-out rate
- Days sales outstanding
- Customer delivery transport measurements
- Customer order outstanding analysis

In addition to the above-mentioned tactical aspects, the model developed to measure SMA allows several strategic thoughts. As a matter of fact, it is possible to

evaluate the convenience to operate on a particular market. After loading all the information related to logistics and production, you can simulate the production levels achievable and then decide whether it is possible or not to meet the demands of a potential market.

It is important to underline the complexity of the model: in fact it requires (1) a thorough understanding of the processes, (2) the availability of information related to logistics and production and (3) the availability of adequate computer facilities and databases.

5 Evaluation of the Nespoli Group's SMA System and Conclusions

Several considerations can be done about the Nespoli Group's experience. However, it is important to stress that what we described is only the initial part of a long and challenging process. The final goal is to implement a rich set of procedures not only aimed to support the management, but that will also evaluate the Group's performance.

The Nespoli Group is a multinational, multilingual ensemble of companies, formed over a quite long time. The definition of a common SMA is the first effort to implement a common management background. A relevant aspect has been the definition of a common timing for data collection and subsequent elaboration of reports and documents. The SMA system homogenizes the data, the process to create reports and reports themselves. Moreover, the system acts as communication media within the Group, and it replaces all other means of communication.

Even if the SMA system was born according to the needs of the Group's headquarter, the implementation of the system in all the companies eased dramatically the management of each company of the Group itself. While preserving the autonomy of each legal entity, the adoption of SMA eases the coordination within the Group. The SMA facilitates the vertical integration between legal entities' management and Nespoli Group's management. In this way, it is ensured an effective coordination, and both local entities' and Group's strategies can be reached.

In this respect, the Nespoli Group's experience is highly positive. Against a relevant investment in terms of structures and management empowerment, the Group has acquired an invaluable tool that turned to be irreplaceable to manage each legal entity composing the Group and the Group itself.

Finally, this model allows Nespoli Group's management to keep checking whether it is possible or not to meet the demands of a particular market and then decide whether to continue or to leave the market itself.

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