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Management Accounting and Control Practices: Qualitative Research of Swiss Industries Using Enterprise Resources and Planning Systems

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Abstract

Based on qualitative research that was conducted on enterprises from the industrial sector, we acquired new knowledge on the use and the needs of management accounting and control practices. The focus of the study was small and middle industries based in the French-speaking part of Switzerland using an ERP (Enterprise Resources Planning) system. The research aims to highlight the best practices in management accounting and control, as well as underlining missing information and tools. The collected data will be used in further research to design a simplified framework of management accounting and controlling that will be useful in identifying and developing the necessary ERP system functionalities.

Keywords: management accounting and control, cost accounting, manufacturing costs, costing, key performance indicators, KPI, budget, inventory management, ERP system, Swiss SMIs, discrete manufacturing

Management Accounting and Control Practices: Qualitative Research of Swiss Industries Using Enterprise Resources and Planning Systems

The main aim and outcome of implementing an ERP (Enterprise Resources Planning) system is to enhance the quality and the quantity of information that is available to manage the firm's performance (Davenport, 1998; Equey & Fragnière, 2008). However, researchers have also highlighted the lack of information that is provided by ERP systems to support decision-making processes (Jean-Baptiste, 2009; Vakalfotis, Ballantine, & Wall, 2011).

Furthermore, the lack of information on management accounting and control activities in very small entreprises was also emphasized in the literature (Perren & Grant, 2000; Günther & Breiter, 2007). Based on these assertions, we decided to carry out a research project to simplify management accounting and control for the small and middle industries (SMIs), which may enable better management information and performance improvement.

The results of the research presented in this paper are part of a larger research project that has been funded by the Swiss Confederation's Commission for Technology and Innovation and the Swiss ERP system editor of ProConcept, SolvAxis SA. The whole research project aims to design a management accounting and control model for SMIs, which will be the foundation for the development of a new simplified and integrated system (ERP system) for management accounting in SMIs, which could provide the missing information.

The first step in our research was to conduct semistructured interviews with 12 customers of our industrial partner to better understand the use and needs of Swiss SMIs regarding controlling and management accounting. The analysis of the interviews enables the understanding of the current management accounting and control practices, highlighting missing information and tools. The collected information will be used to achieve the aim of designing a simplified management accounting and control model for SMIs. This paper focuses only on the interviews' answers

analysis of Swiss SMIs working in the discrete manufacturing sector and presents the results that we will use to acheive our global project objective.

Literature Review

Before examining management accounting practices, we decided to refer to the definition given by the corresponding professional association of management accountants to better understand their mission.

According to the Institute of Management Accountants (2008), "Management accounting is a profession that involves partnering in management decision making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization's strategy" (p. 1). This definition points out that the roles of management accountants are mainly to measure and analyze firms' performance to control and make strategic decisions but do not detail the elements or the reporting that is necessary to manage and control a firm.

Kalkhouran, Rasid, Sofian, and Nedaei (2015) assert that management accounting practices, especially strategic management accounting for SMEs, are not studied enough by researchers. These authors also highlight that management accounting principles may be affected by "perceived environmental uncertainty, advanced manufacturing technology, and CEO characteristics" (p. 51) and that further studies are needed to test these hypotheses.

Another piece of research (Armitage, Webb, & Glynn, 2015) also suggests focusing the study on manufacturing SMEs. Our research examined management accounting and control practices for small and medium manufacturing firms.

Armitage et al. (2015) point out that "manufacturing companies … are more likely to use a broader set of [management accounting] techniques" (p. 31). Surprisingly, a few studies offer a concrete definition of management accounting techniques. Armitage et al.'s (2015) research results

describe these techniques used by SMEs: “MA [management accounting] techniques refer to various types of MA information (e.g., budgets, performance measures), systems (e.g., costing systems), and analytical approaches (e.g., variance analysis) organizations use for planning and control purposes” (p. 32). Furthermore, “forecasting (cash flows, revenues and expenses)” (p. 64) is also quoted as a useful management accounting technique for SMEs. Finally, they also note that manufacturing firms use a wide range of management accounting techniques in a broad manner, which confirms our choice to focus on manufacturing SMEs in order to select (and therefore limite) the techniques used.

To continue with our literature review, we looked for management accounting characteristics described by the literature to determine how to study management accounting uses and needs in firms. Messner (2015) asserts, “there is an infinite number of context characteristics that could be identified in any study of accounting” (p. 2). He points out that previous literature has examined management accounting practices by considering contexts such as firm size, cultural influences, public organizations, and time frame (historical periods). In contrast, he highlights that “the industry (or sector)” (p. 2) and its influence on management accounting practices is less studied. The orientation taken by the research presented in this paper contributes to better understanding of management accounting and control practices in one industry: the discrete manufacturing sector. However, our approach “produce(s) findings which are tightly linked to the particular industry context studied,” as proposed by Messner (2015, p. 4), but does not highlight differences of industry contexts.

The next phase in reviewing the existing literature was to examine the influence of ERP systems on management accounting and control; we found that findings and opinions differ.

For some authors, ERP systems benefit traditional management accounting and control activities but not new methods and techniques (Spraakman, 2005; Granlund, 2007).

For other authors, as ERP systems' editors have developed management accounting and control modules based on their clients' practices, the implementation and use of an ERP system has led to no change in management accounting practices (Scapens & Jazayeris, 2003; Rom & Rohde, 2006).

One point of agreement among authors is the enhancement of information obtention in terms of quality, quantity, and rapidity (Davenport, 1998; Kumar, Maheshwari, & Kumar, 2002; Scapens & Jazayeri, 2003; Botta-Genoulaz & Millet, 2006; Equey & Fragnière, 2008). This improvement benefits decision-making. The literature review made by Sánchez-Rodríguez and Spraakman (2012) states that the use of an ERP system did not provide "accuracy and timeliness of management accounting performance measures" (p. 401). However, the results of their research clearly point out that there is a benefit of ERP system implementation on performance measurement. They mainly note that the use of an ERP system obliges the firm to use a unified chart of accounts across the company and to standardize the transactions. Therefore, the data used for performance measurement are "… far more extensive, timely and accurate than that which had existed" (Sánchez-Rodríguez & Spraakman, 2012, p. 407). The authors also examine the changes that have occurred in key performance indicators (KPIs), and they bring to light a second important result: ERP systems usage allow the obtention of non-financial KPIs based on financial information and transactions. In the same study, they confirm that internal control is improved by ERP system use.

The impacts of the IT tool used in management accounting and control are confirmed, but the management accounting and control methods, techniques, and reporting are not described by the literature. To our knowledge, no management accounting and control model is described by academic authors. The results of the qualitative survey presented in this article will be used in further research to design a management accounting model for SMIs.

Finally, and in accordance with Stefanou and Athanasaki (2012), further studies have to be conducted in Business Intelligence and Risk Management when using an ERP system. Firm size must also be considered by researchers. Business Intelligence and Risk Management are part of management accounting but are not taken into account in our research to limite the scope of our research.

The main objective in our research is to provide a better understanding of the use of management accounting and controlling by SMIs that work in the discrete manufacturing sector and use an ERP system. We have described their current use of management accounting and controlling practices through the following types of firm activities: supply chain, logistics, production, sales, and finance.

Research Methodology

General Objective of the Research Project

The final objective of the research was to enhance the management of the SMEs to improve their performance. This research aimed to make a model of a simplified industrial managemement accounting and control system for SMIs that produce goods and distinct components (discrete manufacturing). Based on this modeling, new cross functionalities were developed in a new module of the ERP ProConcept (ProConcept is the name of the ERP system developed by our economic partner SolvAxis SA). In order to present the model to future users and to favor the understanding of all the actors of an implementation project for a module, the design of a gamified guide were proposed through a Serious Game.

The developed tools are presented in Figure 1.

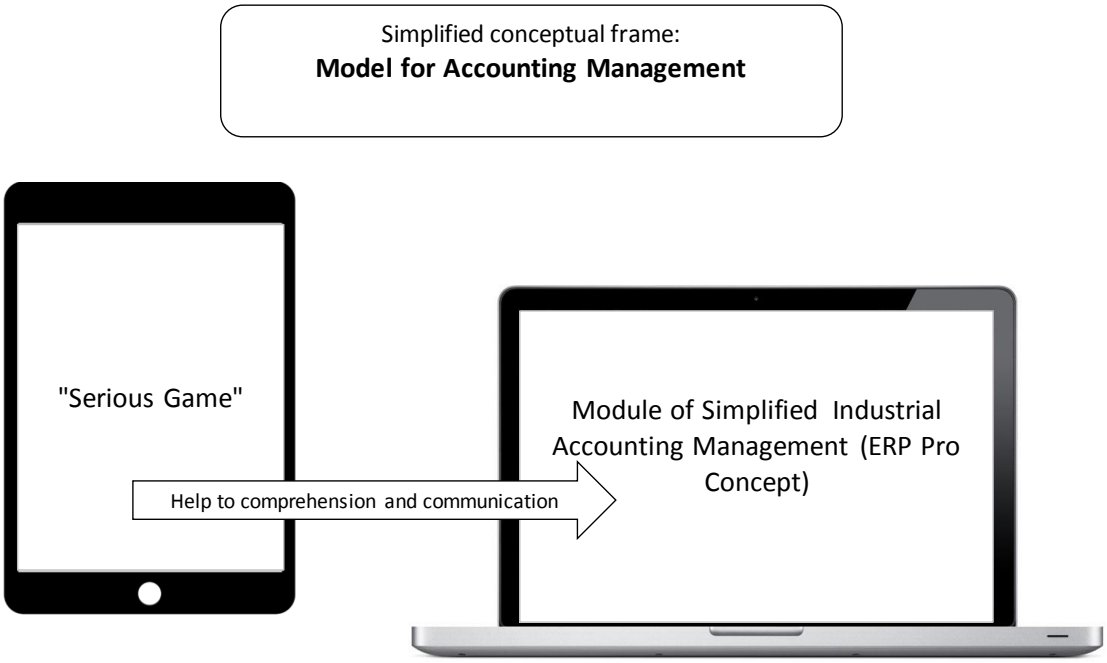

Figure 1. Three tools developed in the context of the global project.

To reach the objectives listed above, we adopted a general methodology that was split into workpackages (WP). The qualitative survey presented in this report therefore fits into a global project and represents the workpackage 2 (WP2). The WP2 was carried out between the spring of 2014 and the middle of 2015. It served to develop the conceptual simplified framework (see Figure 2).

All the steps (WP) of the global project are described in Figure 2.

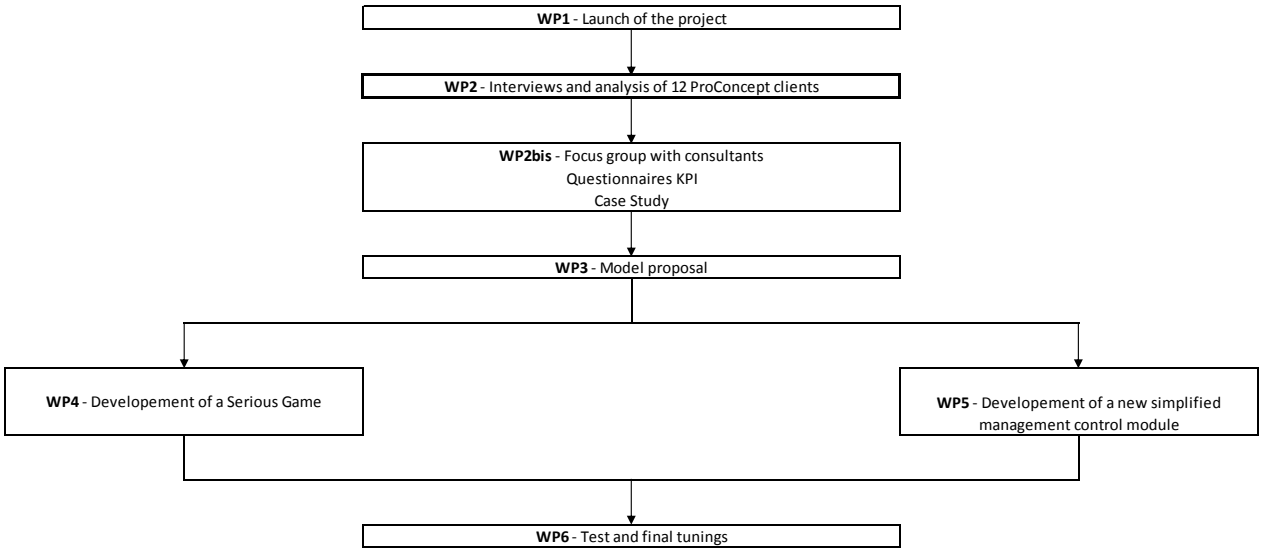

Figure 2. Workpackages of the global project.

Objectives and Methodology of the Qualitative Survey (Workpackage 2, Interviews)

To be able to design a management accounting and control model for SMIs, the following research question had to be answered: "What are the best practices in management accounting and control and what information is missing from SMIs that are active in the discrete manufacturing sector?" In order to answer our research question, we conducted semi-structured interviews of 12 clients who were representative of our ERP editor partner. The main objectives of the qualitative survey were:

- collecting specific information about the implementation and the use of the ERP ProConcept,
- analyzing management accounting and control best practices in addition to job expertise of Swiss SMIs that are active in the production of goods and distinct components (discrete manufacturing), and
- defining the needs of the SMEs regarding management accounting and control.

To carry out our interviews, we selected SMIs (clients using ProConcept ERP System) based on the following criteria:

- sector,
- group membership,
- mastering of the functionality of manufacturing accounting, and
- successful implementation of the industrial accounting functionalities.

The clients who were selected for interviews were mainly in the discrete manufacturing sector. In order to fine-tune our selection criteria, we retained the microtech activity domain, which includes the following sectors: machine tools, watch making, metal industry, cutting tools, and med tech (medical technologies). With the majority of ERP ProConcept clients being active in these domains, the obtained results will be representative and the proposed model will be applicable to a large number of the companies that have adopted ProConcept as ERP. However, in order to compare the results, we also retained a company in the pharmaceutical domain and another one close to metal construction.

The enterprises that belong to a group generally have high reporting requirements, which force them to have advanced management accounting and control tools. Thus, the indicators used by that type of enterprise can appear to be minimally applicable to other firms. It was therefore essential that our sample of interviewed enterprises contained at least one enterprise that was a branch of a group. Finally, the fact that the interviewed enterprises used the current manufacturing accounting module is essential, since it ensured the contact people's interest in an important aspect of our research.

The interviewed companies are presented in Table 1.

Table 1

Description of companies interviewed

Companies	**DM[1]**	**Sector**	**Branch of a group**	**Mastering of the functionality of the production costing module**	**Successful installment of the manuf. accounting**
Affolter SA	Yes	Watchmaking Machine tool	No	Yes	No
CAPSA Camille Piquerez SA	Yes	Watchmaking	No	Yes	No
Ceramaret SA	Yes	Med tech	Yes (Kowema)	Yes	No
Dixi Polytool SA	Yes	Cutting device	No	Yes	No
EMS SA	Yes	Med tech	No (headquarters)	Yes	No
Frewitt SA	Yes	Machine tool	No	Yes	No
Hevron SA	Yes	Metallic construction	No	Yes	No
Journe SA	Yes	Watchmaking	No (headquarters)	Yes	Yes, but not used
Lamineries Matthey SA	Yes	Metal industry	No	Yes	No
Symbios SA	Yes	Med tech	No	Yes	No
TRB Chemedica SA	No	Pharmaceutical	Yes	Yes	No
Zenith SA	Yes	Watchmaking	Yes (LVMH)	Yes	No

[1]Discrete Manufacturing

Setting the Questionnaire

After selecting the firms to be interviewed, a questionnaire listing all the elements that can influence the functioning and proper usage of the management accounting and control functionalities by the clients of SolvAxis SA who use the ERP system ProConcept was designed.

The main objectives of the questionnaire were the following:

- understanding the business and the production procedure of the enterprise,
- understanding how the interviewed enterprises use management accounting and control,
- obtaining information regarding the installment of the ERP system project (especially the functionalities of the management accounting and control),

- defining the difficulties (failure causes) in connection with the implementation of the ERP system, and
- defining the key factors for success related to the establishment of the ERP system and satisfaction level in connection with ERP system.

This questionnaire was tested with three financial directors (not clients of our partner ERP system editor) before its use with the 12 interviewed clients.

The questionnaire contained 15 parts:

- description of ProConcept (modules implemented) and the other ERPs or software used;
- description of the organization of the ERP project implementation;
- analysis of expectations and satisfaction related to the current ERP;
- information about the enterprise, its products, its activity, and its structural organization;
- information about the production procedures, logistics, and distribution;
- description of the existing cost accounting structure;
- information about the effective use of the functionalities of management accounting and control;
- missing managerial information (e.g., key figures or reporting);
- description of the needs regarding management accounting and control;
- description of the information flow between financial and management accounting and production;
- description of the parallel tools used;

- description of the implementation project organization of the management accounting and control functionalities;
- analysis of the expectations related to the control functionalities of current management;
- information as far as the ergonomics of ProConcept are concerned; and
- satisfaction analysis related to of management accounting and control functionalities.

Each question was assigned to the categories of people that we wanted to interview (see next section). The first four interviews of the SolvAxis SA clients were achieved with Frewitt SA, TRB Chemedica SA, Symbios SA, and Ceramaret SA for testing purposes. Subsequent to these first interviews, we noticed that the questionnaire was too cumbersome and too detailed. Therefore, we decided to shorten it. However, we were already able to define some recurring problems with these four clients:

- definition and cost calculation methods,
- inventory management methodology,
- relevance and definition of indicators,
- use of parallel tools (mainly Excel) instead of the ERP system,
- lack of reconciliation among the various modules (finance, production, etc.), and
- comprehension (e.g., terminology used between the financial department and the other departments).

We therefore decided to focus on the basic elements mentioned above during subsequent interviews.

Interview Modalities

The 12 enterprises presented in the Objectives and Methodology of the Qualitative Survey section (Table 1) were willing to answer our questions between April 2014 and May 2015.

We contacted the financial director via phone to briefly explain the survey's objectives and to make an appointment. Immediately after the first phone contact, an e-mail with a link to answer the questions online was sent to the various people concerned. The answers obtained through this method and the documents provided by the ERP system's consultants allowed us to prepare the interviews.

For the interviews, we decided to meet the CEO, the financial director, the person responsible for financial accounting, the person responsible for cost accounting or for management accounting and control, the head of the production, the head for the implementation of the ERP project, and the consultants involved in the project. However, we were not able to get answers from all the anticipated people because, often in SMEs, the same person is in charge of various functions (e.g., the financial director is also in charge of management and financial accounting). It was also difficult to meet all the CEOs who were not consistently available.

The clients and the consultants were interviewed by a professor who was accompanied by a scientific assistant.

Data Processing of the Collected Information

The interviews were reported on tables that summarized the questions and the main elements for the project, which were previously prepared by categories of interviewed people (i.e., CEO, financial director, head of financial accounting, head of cost accounting or management accounting and control, head of the implementation of the ERP project, ERP consultant). This process allowed a comparative basis common to all the enterprises that we met.

The data obtained over the course of the interviews and used in this report were validated by those interviewed in June 2015.

Results

Interview Analysis and Synthesis

Description of the sample

Our sample was made up of small and medium-sized enterprises within the manufacturing sector. If we take into account only the employees who are active in Switzerland, we interviewed 11 small firms (fewer than 250 employees) and one medium-sized enterprise (between 250 and 500 employees). However, if we add the employees abroad, our sample was made up of eight small enterprises and four medium-sized enterprises.

In order to describe our sample more precisely, we made a synthesis (see Table 2) of the general information that was collected during the interviews with our selected enterprises.

Table 2

Description of the sample

Companies	Number of workers in Switzerland	Number of workers abroad	Entities number	Number of production sites	Annual turnover in CHF	Type of products
Affolter SA	170	4	5	1	Confidential	Pinions and machines
CAPSA Camille Piquerez SA	189	0	3	3	Confidential	External parts Watchmaking movement Medical devices[1]
Ceramaret SA	170	0	2	1	Confidential	Components in ceramic technology, sapphire and ruby
Dixi Polytool SA	199	58	6	2	Between 21 and 50 million CHF	Precision instruments, standard and specific in solid carbide
EMS SA	200	200	6	2	Confidential	Dental and medical devices
Frewitt SA	74	25	2	2	Between 21 and 50 million CHF	Machines Industrial fitting ups (pharmaceuticals, chemicals, food)
Hevron SA	300	0	1	2	Confidential	Customized metallic constructions
Journe SA	100	50	16	4	Confidential	Luxury watches
Lamineries Matthey SA	65	0	2	2	Confidential	Laminated strips[2] Bars, tubes and beryllium copper wiring[3]
Symbios SA	82	38	5	1	Between 21 and 50 million CHF	Implants and prosthesis
TRB Chemedica SA	70	More than 600	17	2	30.3 million CHF	Pharmaceutical products and medical device
Zenith SA	225	0	1	1	Confidential	Production and sales of watches

[1]Almost all the products are custom made (specific); one third of the production is made from standard barrettes.

[2]Customized products or those ordered regularly (no standard products).

[3]Third-party products.

After collecting some general information on each interviewed enterprise, we sought some information about the use of ERP systems (Table 3) and the general level of satisfaction linked to the ERP system (Table 4).

The functional covering of the interviewed enterprises was excellent, as all of them used the Finance and Logistics modules. Specifically, 11 enterprises in 12 used the Human Resources module, ten out of 12 turned to the module Production, and nine of them used the Customer Relationship Management module. The module Make to order was used by only five enterprises, which is not surprising because this type of module is not fit for all types of production.

Before the implementation of their ERP, three enterprises wrote down specifications and six launched a call for tender. In three cases, the ERP system was imposed by the group or the management.

Finally, we noticed that between 20 and 200 employees worked with the ERP system. It should be noted that more employees had access to the ERP but only with limited access (i.e., without modification possibilities). Some other software or other ERPs were also used.

Data analysis

The data analysis showed a general use of the ERP system (e.g., functional coverage, number of users) to be correct and in conformity with best practice. However, we noticed that a lot of computing tools were used in addition to ERP. This is not astonishing as far as software in specific businesses is concerned (e.g., drawing of finished products). The use of other ERP systems or data analysis tools was, however, more surprising and must undergo some improvement.

Table 3 gives information concerning ERP system and IT tools used.

Table 3

Use of ERP

Companies	ERP selection criteria	Modules/Functionalities Acquired						Number of Users	Other ERPs / Software Used
		Finance	Logistics	Production	Make to Order	HR	CRM		
Affolter SA	Specifications	x	x			x	x	60	Ortems, Timeas, Quickcontrol, Kardex, Gildas, Excel
CAPSA Camille Piquerez SA	Call for tenders	x	x	x	x	x	x	50	MES machine sector, Timeas, Cartouche, Quality ratio, Quickcontrol, Solidworks
Ceramaret SA	Call for tenders	x	x	x		x	x	60	Salesforce, Ortems, Mobatime, Quickcontrol, Gildas, Excel
Dixi Polytool SA	Decision of the responsible for ERP	x	x	x		x	x	40	Ortems, Alfa3i, Solidworks, Quickcontrol, Cognos, Microsoft Office
EMS SA	Call for tenders	x	x	x		x		200	Qlikview, Excel
Frewitt SA	Specifications	x	x	x	x	x	x	80	Excel
Hevron SA	Decision of the management	x	x (in progress)		x	x	x	20	AutoCAD, Athena, Excel
Journe SA	Call for tenders	x	x	x	x	x	x	50	Excel
Lamineries Matthey SA	Call for tenders	x	x	x			x	30	Access, Excel
Symbios SA	Specifications	x	x	x	x	x	x	40	Symbios Connect (web platform connected to ProConcept), Excel, Patient manager
TRB Chemedica SA	Contacts and call for tenders	x	x	x		x		45	Customized tool, Excel,

							CRM Online prof. Microsoft ETQ, Infor, Inventor, Knowllence
Zenith SA	Decision of the management	x	x	x	x	72	Mobatime, Excel, CAO DAO, Qualigest, BI Oracle Cyrus

Finally, we noticed a good level of satisfaction generated by the use of the ERP system ProConcept and no interviewed enterprise was unsatisfied.

Table 4

Level of Satisfaction

Companies	**ERP satisfaction level**
Affolter SA	Satisfied
CAPSA Camille Piquerez SA	Absolutely satisfied
Ceramaret SA	Satisfied
Dixi Polytool SA	Satisfied
EMS SA	Satisfied
Frewitt SA	Satisfied
Hevron SA	Satisfied
Journe SA	Slightly satisfied
Lamineries Matthey SA	Satisfied
Symbios SA	Slightly satisfied
TRB Chemedica SA	Satisfied
Zenith SA	Absolutely satisfied

Management Accounting and Control Practices Analysis

Indicators, budgets, and reports

With our sample of interviewed firms, we were able to put together, in three big categories, the decisions taken by CEOs, which were based on management accounting and control information.

The categories were defined as follows: (a) Forecast / Budget: all decisions linked to the establishment and follow-up of the budget; (b) Personnel: all decisions linked to the size of the teams and to the decisions of hiring additional employees; and (c) Strategic: all decisions linked to

the behavior to adopt on the market, to the setting of sale price, to get rid of a product, or to the decision of investing.

The results of our interviews (Table 5) showed that a vast majority of enterprises (ten out of 12) used the management accounting and control information to make strategic decisions. Six enterprises referred to information taken out of the management accounting and control data for budget purposes, and four of them used the information to make decisions linked to the management of employees. Three firms used the management accounting and control data to make the three categories of decisions, which is small. Our findings comply with literature that have pointed out a lack of information and control in SMEs (Perren & Grant, 2000; Günther & Breiter, 2007).

Table 5

Use of Management Accounting and Control Information to Make Decisions

Companies	Forecast / Budget	Personnel	Strategic	No answer
Affolter SA			X	
CAPSA Camille Piquerez SA	X (for incomes)		X	
Ceramaret SA	X	X	X	
Dixi Polytool SA[1]				
EMS SA	X		X	
Frewitt SA	X	X	X	
Hevron SA		X	X	
Journe SA	X		X	
Lamineries Matthey SA			X	
Symbios SA				X
TRB Chemedica SA	X	X	X	
Zenith SA	X		X	

[1] As of now, no decision has been taken based on management accounting and control information.

Our interviews also allowed us to determine which management information leaders missed in order to be able to make decisions (Table 6).

Table 6

Missing Management Accounting and Control Information

Companies	Indicators in graphics	Precise indicators	Budget and variances	Cost calculation	Reports extracts
Affolter SA	X	X	X	X	X
CAPSA Camille Piquerez SA	X	X	X (for the cost element)	X	X
Ceramaret SA	X	X			X
Dixi Polytool SA	X	X		X	X
EMS SA			X	X	X
Frewitt SA	X		X		
Hevron SA					X
Journe SA	X	X			X
Lamineries Matthey SA	X	X	X		X (under mastering process)
Symbios SA		X	X		X
TRB Chemedica SA				X (calculated with Excel)	
Zenith SA	X				X

We also noticed that all the interviewed firms reenter (often even manually) the data from the ERP system in Excel or another tool to proceed with analysis. This element, according to us, has not been previously mentioned by academic authors. It appeared that the new functionalities of management control would have to put forward information that is directly accessible, without the need for extraction and analysis using another software.

Respondents complained about the way that indicators were presented and also about the substance of the information. Interviewed people mainly missed indicators, budget data, costs calculation, and variance analysis.

These elements were important results of our survey. We noticed that ERP users do not work with standard reporting but prefer using their own Excel spreadsheet. The proposal of a set of new functionalities of standard management accounting and control (our global project aim) that would propose, particularly, the setting of a scoreboard, the cost calculation, the identification of

variances, and the creation of a global and detailed budget for each product (or group of products) would allow for the standardization and efficiency of management accounting and control.

Cost allocation methods

The manufacturing costs calculation method was an important aspect of our analysis that was taken into account during our interviews.

Six enterprises told us that they used the standard costing method exclusively; four others exclusively used the full costing (or absorption costing) method, and two out of the group resorted to the direct costing method. One enterprise used the full and standard costing methods simultaneously. No enterprise used the activity-based costing method.

Half of the interviewed firms confirmed having used the ERP system to systematically calculate their manufacturing costs. The reasons for not always using the ERP system have yet to be determined, but the complexities of the processes in industrial accounting (e.g., hour capture, stock management, etc.) seemed to be an explanatory element. The analysis of the results confirmed that the entire process must be better explained internaly and methodologically defined, but also that the implementation of a management accounting and control system cannot be completed without accepting the necessary and important investment for the acquisition of the data.

Table 7

Cost Allocation Methods Used

Companies	**Cost allocation methods**					**Calculated with the ERP?**
	ABC	Full costing (Absorption Costing)	Direct Costing	Standard Costing	Other	
Affolter SA			X			No
CAPSA Camille Piquerez SA					X[1]	No
Ceramaret SA				X		Yes
Dixi Polytool SA		X (finished product)		X (on going)		No
EMS SA				X		
Frewitt SA			X			Yes
Hevron SA[2]		X				Yes
Journe SA				X		Yes, but punctually
Lamineries Matthey SA		X				Yes
Symbios SA				X		Yes, but still not routinely
TRB Chemedica SA		X				No
Zenith SA				X		Yes

[1] CAPSA Camille Piquerez SA calculates manufacturing costs by including the following elements: material cost, cost for the machine (hourly rate multiplied by the numbers of working hours), and the cost per man for the makeready (hourly rate multiplied by the number of machine maintenance hours).

[2] Hevron SA uses job-order costing to manage its projects.

Inventory management methodology

We asked the enterprises how they managed their stock. Six out of 12 enterprises managed their stocks with the weighted-average method, using the logistics module. One single enterprise used the first in, first out method. It is worth noting that international accounting standards recommend both methods in financial accounting. Two firms used a fix price, which corresponds to a standard price. One enterprise used the first expired, first out method. According to what we

noticed and allowing for exceptions, it is not always easy to reconcile logistical stocks and their appraisal in finance, whereas the ERP system offered a direct link between both modules through the activation of a permanent inventory. The link between the stock variation and the calculation of a manufacturing price seemed to be based on a appraisal of the stocks at a standard price and not at a real purchase price, (the standard price corresponds to fix price in the terminology used by ProConcept). These elements still need to be more thoroughly investigated, but a first element for an answer could be given by the fact that several enterprises did not fully understand the advantage of working with a permanent inventory or that the complexity of stock management with a permanent inventory is not adapted for a SME.

Table 8

Inventory Management Methods Used

Companies	**Inventory Management Methods**		
	WAP[1]	FIFO[2]	Other
Affolter SA	X		
CAPSA Camille Piquerez SA			Precious material stock is the only stock monitored (the most important), but the monthly fluctuation of the stock is processed manually in ProConcept, based on Excel reporting. Indeed, the link between financial accounting and logistics is not always activated. For the other materials, stocks are managed once a year in the logistic module (no inventory for the remaining period).
Ceramaret SA	X		
Dixi Polytool SA			Inventory management with the latest purchase price.
EMS SA			Inventory management at a fixed manufacturing cost.
Frewitt SA	X		
Hevron SA[3]			*Not applicable*
Journe SA	X		
Lamineries Matthey SA	X		WAP[1] is used for the purchased products. Wastes are appraised at a fix price when they are reused as components.
Symbios SA		X	
TRB Chemedica SA			FEFO (first expired, first out).
Zenith SA	X		

[1] WAP = weighted-average price.

[2] FIFO = first in, first out.

[3] Hevron SA does not hold any stock.

Use of Standard Costing

Finally, we wanted to know whether the ERP system's manufacturing cost accounting functions were used or not. Only one enterprise told us of having carried out a pre- and post-calculation and having analyzed the variances. However, none of our interviewed clients used all the functionalities of industrial accounting. On the other hand, some clients used post-calculation

functionalities and the identification of variances through manufacturing order in the production module. Ten enterprises out of 12 used pre-calculation. Pre-calculation necessitated, on the one hand, the costs defined according to hourly rates per production department and the operating ranges, and, on the other hand, the bill of material. Hourly rates could be calculated with the help of cost accounting by taking into account either budgets or effective costs (namely those of the previous financial year).

Once again, as for the indicators, we noticed that some companies carried out their post-calculation outside the ERP. On a number of occasions, respondents underlined the fact that the biggest difficulty in post-calculation is the actual data entry. This input seems too heavy and too complicated for a SME. Even if eight enterprises insisted that they needed to calculate variances, this approach makes sense only if the effective costs and the standard costs are reliable. Even though manufacturing accounting (post-calculation, pre-calculation, and analysis of the variances) is undoubtedly an efficient management tool, how should one evaluate pre-calculations that are disconnected from accounting and post-calculations for which real data is missing? These points will be considered again in the follow-up of our work.

Table 9

Manufacturing Costs Functionalities Used

Companies	Pre-calculation used?	Post-calculation used?	Variance analysis used?	Need for variance analysis?	Comment
Affolter SA	Yes	No	No	Yes	Pre-calculation is made through the ProConcept Production module.
CAPSA Camille Piquerez SA	Yes	Yes	Yes, for some articles	Yes, for all articles	Data and all calculations are made on Excel.
Ceramaret SA	Yes	No	No	Yes	Post-calculation is currently not possible because of the lack of input in real time. A software time sheet is being installed.
Dixi Polytool SA	Yes	No (rarely)	No	Yes	Pre-calculation is made on ProConcept.
EMS SA	Yes	No	No	No	Too much data to enter to obtain a relevant post-calculation.
Frewitt SA	Yes	Yes	Yes	Yes	
Hevron SA	Yes	Yes	No	No	Calculations are made globaly by project.
Journe SA	Yes (rarely)	Yes (rarely)	No	No	Calculations are made punctually, for new products for example. The analysis for variances is useless.
Lamineries Matthey SA	No	Yes	No	Yes	Intention to use pre-calculation but an improvement in forecasting production time is necessary and is presently being made. Post-calculation is extracted from ProConcept but currently not accurate because of nondistribution of the scraps. A solution is being developed.
Symbios SA	No	No	No	No reply	
TRB Chemedica SA	Yes	Yes	No	Yes	
Zenith SA	Yes	No	No	Yes	Pre-calculation is made on ProConcept.

Conclusions and Limitations

Level of Satisfaction

SolvAxis SA clients are generally satisfied with the tool and pointed out that ProConcept is a flexible ERP system that enables them to meet their needs.

The question of suitability of the ERP to the needs of the clients was raised many times during the interviews, and the answers were very different.

Some respondents stated that the ERP must be flexible and adaptable to the needs of the various enterprises to respect the SMEs' core business and, above all, their specific characteristics that give them a competitive advantage on the market. "… the business processes of the SMEs are sometimes a key success factor for the companies and the standardization of the processes is not always possible. We encounter the most cases of customization in production/logistic" (Consultant TRB, personal communication, April 24, 2014). "The ability to customize with ProConcept is an advantage when compared to other ERPs" (Computing officer, Dixi, personal communication, March 26, 2015).

In contrast, quite a few consultants noticed that the customizations caused problems because the modified ERP system becomes particularly complex and difficult to manage. "The more the enterprise adjusts itself to the standards of the ERP, the easier the implementation and the better the use of the tool will be" (Consultant TRB, personal communication, April 24, 2014). "To modify the business process to match ProConcept is the most efficient way" (Financial officer, Affolter, personal communication, November 10, 2014). "The ERP has been implemented in a single year, CAPSA adapted itself to ProConcept to avoid the customization!" (Financial officer, CAPSA, personal communication, February 26, 2015).

In fact, this dichotomy could be explained further by the type of ERP module implemented. Just as production must be adaptable to the needs of the firms, finance can remain standardized. Management accounting and control must rely on the existing best practices. The added value seems negligible when one adapts management accounting and control to the specificities of the SME's core business.

Generally speaking, the ERP system under review is thus considered to be well suited to SMEs in the discrete manufacturing sector and allows the management of activities on several production sites, including the site outside Switzerland. This flexibility of the ERP corresponded to an essential expectation of the enterprises that implemented an ERP, and it made up one of the most positive conclusions in our study.

However, clients complained about the complexity of the system. "There are many steps to go through before completing an entry" (Financial controller, EMS, personal communication, November 17, 2014). Complexity is a recurring criticism made by the users of all ERP systems (Equey, Tuberosa, Maradan, & Zufferey, 2006).

The starting point of our research project, which highlighted the need to simplify the management accounting and control for SMEs, is confirmed by the results of our interviews. Thus, the use of preparametered and simplified functionalities, which will be the final result of our project, will allow the SMIs to focus on their core business and more easily obtain management information (e.g., indicators, cost calculation, budgets, and variances).

Elements for the Design of a Simplified Management Accounting and Control Model

We have noticed that the indicators are developed by the SMEs in very different ways and with questionable relevance. Accounting departments need considerable time to obtain them, and their reliability is not guaranteed. Most respondents use Excel to get the necessary information for the management of their enterprise, and they pointed out that a scoreboard is necessary. "Some

indicators are missing" (Financial officer, Journe, personal communication, February 19, 2015). Currently, there is a portal within ProConcept that allows one to personalize a scoreboard by function, but some firms are not aware of it. The tool allows for the development and the follow-up of indicators, but during our interviews, we did not learn whether firms used it. We pointed out a problem regarding communication and training. The next step of our research project foresees the development of a Serious Game that will improve the comprehension and dialogue between clients and consultants.

All the functionalities of the manufacturing accounting are not used systematically, in particular the variances are not calculated, as the information related to post-calculation (real time, for example) is not methodically entered.

Respondents confirmed the importance of a relevant manufacturing cost for each product family. "Missing information on the database of management control? To know which product family yields profit and which generates losses!" (Managing director, Dixi, personal communication, March 26, 2015).

Another important element to remember is that stock management was difficult and did not always comply with accounting standards. "In some cases stocks are not in the ERP." (Financial Director, TRB, personal communication, May 20, 2014). "Precious metal stock is managed on Excel" (Management Controller, Zénith, personal communication, May 19, 2015).

Based on the results of the interviews, we have retained the following main elements for the development of a simplified management accounting and control system:

- the calculation of a full and variable cost for a product or for a group of products. The financial information comes from the Finance module (financial and cost accounting) and the quantitative data is extracted from the Logistics and Production modules. We

also propose the possibility of grouping some raw or secondary materials and some operations that are considered less "strategic" and handle them in a simplified manner.

- we will also use key indicators for standard performances in the form of a scoreboard that will be completed according to the clients' business needs;
- a cost accounting budget and a global cost accounting loss and profit account;
- a cost accounting budget for each product or group of products; and
- a structured list of the main variances.

The development of this model, however, requires some supplementary information that we could not collect through our interviews, and our study will have to be completed as described under the section Further Research.

Further Research

Facing the diversity of results that were obtained during the interviews, a quantitative survey on a larger scale and two more targeted and detailed qualitative approaches have proven to be necessary. We have then decided to add three steps to our initial research project methodology (alredy included in Figure 2).

The first, entitled "KPI survey," has as objective to highlight some best practices for KPIs. Our qualitative survey was thus completed with a quantitative survey, and, to do so, we sent a questionnaire to some 2,600 clients, prospects, or partners of SolvAxis SA, asking them to indicate what the currently used indicators are. The results of this survey are detailed in a separate article.

During our interviews, we also noticed that clear understanding of concepts and the functionalities of the current manufacturing cost module are necessary steps for the complete diagnosis in order to propose improvements, clarification, and simplification. We have then added two steps that consist of a case study and a focus group with consultants from SolvAxis SA.

The case study consists of an adapted representative practical case of eyeglasses manufacturing, carrying out all the parameterization and the implementation of the functionalities linked to management accounting and control, including reporting and scoreboards. Moreover, this case study will serve as the basis for the design of a standard management accounting and control model.

Finally, focus groups with industrial and academic partners were added to the initial project in order to:

- identify and describe the main strength and weakness of the current functionalities of management control,
- clarify the concepts and terminologies, and
- identify some improvement and simplification measures in the functionalities of management accounting and control and to achive a consensus among the project team regarding the various aforementioned points.

At the end of these three additional steps, the design of the new management accounting and control model and module will then start. The results of the next phase will be dealt with in a future article.

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