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THEORETICAL DIALOGUES THROUGH FIELD EXPERIMENTS:
SOME NOTES ON ACTIVE RESEARCH IN MANAGEMENT ACCOUNTING

ALBERTO ASQUER

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Abstract

This paper investigates the process of management accounting system implementation through a field experiment of introducing an activity-based costing and management system into a small-medium sized firm. This research constitutes an example of “clinical” or “active” research in management accounting, because of the direct and deep involvement of the researcher in the phenomena under investigation. Data are analysed from two different theoretical perspectives, namely the process stage model of activity-based costing system implementation of Anderson (1995) and the organisational process of knowledge generation of Nonaka and Takeuchi (1995). Finally, this paper highlights that the insights suggested from active research might contribute to improve implementation tactics in order to accomplish success in implementation efforts, and that the contrast and comparison between different theoretical perspectives might contribute to theory development in the field of management accounting system implementation.

1. Introduction.

This paper intends to contribute to scholarly inquiry on management accounting systems by addressing the issue of how the implementation of management accounting systems works. Recent research¹ argues that management accounting systems are increasingly adopted in companies, because, among other reasons, they provide both an advanced cost computation technique and an effective management practice. Anecdotal experience, on the other hand, witnesses that the process of introducing novel management accounting systems is not plain and trouble-free. Many management accounting system implementation projects, for example, are ill-fated because of counterproductive and unintended reactions from the organisational participants involved in the process. Indeed implementing new management accounting systems typically goes together with dramatic changes in the patterns of organisational behaviour, for example in such dimensions as managers' and employees' perceptions of the business environment, their understanding of the organisational business processes, and the criteria and the processes of decision-making. A better understanding of how the process of implementing management accounting systems works would most probably bring some benefit to the effectiveness and efficiency of those companies undertaking these projects.

An extensive literature² addresses the issue of how the introduction of innovative management accounting systems actually translates into novel patterns of behaviour. Yet our understanding of the ways in which the process of implementing management accounting systems unfolds still is far from exhaustiveness. Remarkable contributions

¹ See, for instance, Kaplan R. S., and R. Cooper, *Cost and Effect: Using Integrated Systems to Drive Profitability and Performance* (HBS Press, 1998); Innes J., F. Mitchell, and D. Sinclair, "Activity Based Costing in the UK's Largest Companies: A Comparison of 1994 and 1999 Survey Results" (*Management Accounting Research*, 2000, 11: 349-62); Tayles M., and C. Drury, "Autopsy of a Stalling ABC System: A Case Study of Activity-Based Cost Management and Performance Improvement" (Paper presented at the XXIV Annual Congress of the European Accounting Association, Athens, 2001).

² See in particular Kleinsorge I. K., and R. D. Tanner, "Activity-Based Costing: Eight Questions to Answer before You Implement" (*Journal of Cost Management*, 1998, Fall: 84-88); Bhimani A., and D. Pigott, "Implementing ABC: A Case Study of Organisational and Behavioural Consequence" (*Management Accounting Research*, 3: 119-32, 1992); Cooper R., R. S. Kaplan, L. Maisel, E. Morrissey and R. Oehm, *Activity Based Cost Management: Moving from Analysis to Action* (Montavle, NJ: Institute of Management Accountants, 1992); Shields M., "An Empirical Analysis of Firms' Implementation Experiences with Activity Based Costing" (*Journal of Management Accounting Research*, 7: 1-28, 1995); Anderson S.W., "A Framework for Assessing Cost Management System Changes: The Case of Activity-Based Costing Implementation at General Motors, 1986-1993" (*Journal of Management Accounting Research*, Fall, pp. 1-51, 1995); Foster G., and D. W. Svenson, "Measuring the Success of Activity-Based Cost Management and its Determinants" (*Journal of Management Accounting Research*, 9: 109-42, 1997); McGowan A. S., and T. P. Klammer, "Satisfaction with Activity-Based Cost Management Implementation" (*Journal of Management Accounting Research*, 9: 217-238, 1997); Granlund M., and K. Lukka, "It's a Small World of Management Accounting Practices" (*Journal of Management Accounting Research*, 10: 153-79, 1998); Anderson S. W., and S. M. Young, "The Impact of Contextual and Process Factors on the Evaluation of Activity-Based Costing Systems" (*Accounting, Organisations and Society*, 24: 525-59, 1999); Malmi T., "Activity-Based Costing Diffusion across Organisations: An Exploratory Empirical Analysis of Finnish Firms" (*Accounting, Organisations and Society*, 24: 649-72, 1999).

have been made, for example, in the identification of the determinants of management accounting systems implementation success (e.g., Shields, 1995)³, as well as in the formulation of stage models (e.g. Anderson, 1995)⁴ of the implementation process, nevertheless a fine-grained understanding of the involvement of the organisational participants in the implementation process still is missing. Sensitivity to this gap inspired the research reported in this paper, which intends to show how alternative theoretical lenses from the literature on management accounting and the one on organisational behaviour can be fruitfully applied to the understanding of management accounting systems implementation.

The research was conducted as a field experiment of introducing a new management accounting system into a small-medium sized organisation located in Sardinia (Italy) from June 2001 to March 2002⁵. The researcher undertook an active role in initiating and promoting the field experiment, as well as in trying to involve the organisational participants in the experiment. The field experiment aimed to develop a tailored-made management accounting system and to explore the willingness of the organisational participants for its inclusion into the repertoire of the organisational practices. The fieldwork activities generated some patterns of social interaction and allowed to closely gather data on the attitudes and actions of the organisational participants as they were involved in the process.

The analysis of the data was conducted through the coding of the observed attitudes and actions of the organisational participants into categories drawn from two theoretical frameworks, namely the stage process model of ABC implementation from Anderson (1995) and the knowledge conversion model from Nonaka and Takeuchi (1995)⁶. Depending on which of the two theoretical frameworks is considered, the results from the analysis exhibit very different explanations for the process activated by the field experiment experience, and the results derived from the knowledge conversion model seem to provide a richer account of the social dynamics observed. This paper concludes that the theoretical perspectives from organisational behaviour and organisational learning have only been moderately employed in the inquiry on management accounting systems implementation so far, but this research suggests that there could be fresh and stimulating insights from engaging in cross-fertilisation among various fields of management studies.

2. Methodological Issues.

This research⁷ was conducted as a field experiment in which the researcher actively elicited the process of introducing a new management accounting system in a small-medium sized

³ Shields M., "An Empirical Analysis of Firms' Implementation Experiences with Activity Based Costing" (*Journal of Management Accounting Research*, 7: 1-28, 1995).

⁴ Anderson S.W., "A Framework for Assessing Cost Management System Changes: The Case of Activity-Based Costing Implementation at General Motors, 1986-1993" (*Journal of Management Accounting Research*, Fall, pp. 1-51, 1995)

⁵ Additional references on this research can be found in Asquer and Spano (2002) and Asquer (2003).

⁶ Nonaka I., and H. Takeuchi (1995), *The Knowledge-Creating Company*. New York, NY: Oxford University Press.

⁷ See also Asquer A., and A. Spano, "Innovation in Management Accounting Knowledge: Evidence from a Field Experiment of ABCM Implementation" (Paper presented at the XV Annual Congress of the European Accounting Association, Copenhagen, 2002) and Asquer A., "Implementing Innovation: Lessons in Introducing Modern Systems from an Italian Food Manufacturer" (*Financial Management*, March issue, 28-29. London: CIMA Publisher, 2003). The research was funded by the CIMA, London.

organisation located in Sardinia (Italy) and operating in the food manufacturing sector. The researcher intended to call the organisational participants into a process of developing a tailored-made management accounting system and of introducing it into the repertoire of the organisational practices, and had the expectation of activating some social dynamics related to the early steps of management accounting systems implementation. During the course of the field experiment, the researcher took part in various organisational processes (e.g. meetings for discussion of the production planning, inspections of the manufacturing equipment, meetings for discussion of the yearly budget), and, on the other hand, he involved the organisational participants in individual interviews, in group discussions, and in the assessments of the management accounting system under development. On the whole, the interest and the participation of the organisational participants towards the introduction of the new management accounting system was more than satisfactory during all the field experiment, which was conducted between June 2001 and March 2002.

The field experiment initiated when the researcher proposed to the main owner and to the production manager of the firm to undertake an exploratory assessment of the potentials of a new management accounting system intended to increase the efficiency and effectiveness of the firm. The proposal was accepted, and they agreed to devote some resources (e.g. time and effort of some organisational participants, but no financial support) to the initiative. Even though the research objectives of the field experiment had been clarified, the organisational participants might have to some extent considered the researcher in a “quasi-consultant” role, also because of previous work linkages of the researcher with the consultant team of the firm. Maybe leveraging on this perception, the researcher actively participated in the formulation of the proposals for courses of action, in the interaction among the organisational participants, and in the development of the management accounting techniques to employ. On the other hand, the researcher could not exercise any authority in decision-making over organisational processes, nor he was charged of any responsibilities. On the whole, however, the process activated by the researcher gained enough credibility and attention during the course of the field experiment, and, in this respect, a good amount of the empirical evidence was an organisational response to the intervention rather than a purposive artefact of the same researcher.

These limitations of the field experiment design are brought to the surface as the researcher gets actively involved in the fieldwork setting. In the field of management accounting, Kaplan (1986)⁸ highlighted the absence of fieldwork research, pointing at the excessive concern of the discipline with normative approaches of developing theoretically derived accounting models rather than with the observation of what practitioners actually do. His call for more extensive “clinical” management accounting research focused on the case study design specifically and confined them to the description and classification of management accounting constructs, since proper explanations could only rely on measurement and statistical analysis. Later Scapens (1990)⁹ pointed out that the use of case studies could indeed serve two very different research agendas, either of descriptive-explorative or of descriptive-interpretative style. In the first line of inquiry case studies “tend to be used more for hypothesis generation than for hypothesis testing”¹⁰. In the other one, case studies allow to understand management accounting as a social practice

⁸ Kaplan R. S., “The Role for Empirical Research in Management Accounting” (*Accounting, Organisations and Society*, 11: 429-52, 1986).

⁹ Scapens R. W., “Researching Management Accounting Practice: The Role of Case Study Methods” (*British Accounting Review*, 22: 259-85, 1990).

¹⁰ Kaplan R. S., “The Role for Empirical Research in Management Accounting” (*Accounting, Organisations and Society*, 11: p. 442, 1986).

conveying a structure of meaning, a system of relevance, a way to legitimise activities and a source of social power¹¹. Whenever “it is necessary to locate practice in its historical, as well as its economic, social and organisational context ... [c]ase studies are particularly suitable for this type of research. They allow the researcher to adopt a holistic orientation and to study accounting as part of a unified social system”¹². The research presented in this paper follows the first line of inquiry, even if with at least the two distinctive traits of performing a field experiment rather than a case study, and of contributing to theory development by employing alternative theoretical frameworks to explain one experience of management accounting system implementation rather than explicitly engaging in hypothesis generation.

The limitations of the field experiment design are not insurmountable obstacles to its legitimacy however. In the field of management accounting, many authors¹³ extended to both case study and field experiment designs the merits of contributing developing and refining theories by picking up ideas from the accounting practice. More recently, Kaplan (1998)¹⁴ called for a more interventionist approach to management accounting research, even if the so-called "innovation action research" (IAR) still rarely progressed much further than descriptive and interpretative steps. On the side of active interventionism in the fieldwork, the approach labelled "constructive research approach" (CRA)¹⁵ even takes the extreme position of advocating for researchers to actively engage in solving problems which are practically relevant for managers. The subjective involvement of the researcher is an essential trait of this research style, because of the contribution he or she performs to generating novel knowledge - such as constructs, models, diagrams, plans, etc. - that solve emergent problems in running business organisations¹⁶. With respect to the minimal interference in case study settings, or the tenuous presence in action research, in the CRA the researcher plays a key role in eliciting and sustaining organisational change processes. IAR and CRA exhibit some interesting potentials for the process of theory development, because of the opportunity to purposively manipulate the empirical setting and actively searching for the limitations of a given theory with respect to the account of the evidence. The instance of management accounting research presented in this paper was indeed designed in a constructive research fashion, since the researcher was actively engaged in eliciting the organisational change process and, to some extent, in sustaining it.

¹¹ Roberts L., and R. W. Scapens, “Accounting Systems and Systems of Accountability – Understanding Accounting Practices in Their Organizational Contexts” (*Accounting, Organizations and Society*, 10: 4: 443-56, 1985).

¹² Scapens R. W., “Researching Management Accounting Practice: The Role of Case Study Methods” (*British Accounting Review*, 22: p. 268, 1990).

¹³ See in particular Hopwood A.G., "Editorial: Accounting Research and the World of Action" (*Accounting, Organizations and Society*, 3: 2: 93-95, 1978); Hopwood A. G., “On Trying to Study Accounting in the Context in which it Operates” (*Accounting, Organizations and Society*, 8: 287-305, 1983); Kaplan R. S., “Measuring Manufacturing Performance: A New Challenge for Managerial Accounting Research” (*Accounting Review*, 58: 686-705, 1983); Kaplan R. S., “The Evolution of Management Accounting” (*The Accounting Review*, July: 390-418, 1984).

¹⁴ Kaplan R.S., "Innovation Action Research: Creating New Management Theory and Practice" (*Journal of Management Accounting Research*, 10: 89-118, 1998).

¹⁵ Kasanen E., Lukka K., and Siitonen A., "The Constructive Approach in Management Accounting Research" (*Journal of Management Accounting Research*, 5: 243-264, 1993).

¹⁶ Lukka K., "The Key issues of Applying the Constructive Approach to Field Research". In T. Reponen (ed.), *Management Expertise for the New Millennium: In Commemoration of the 50th Anniversary of the Turku School of Economics and Business Administration* (Publications of Turku School of Economics and Business Administration, Series A-1:2000: 113-128, 2000).

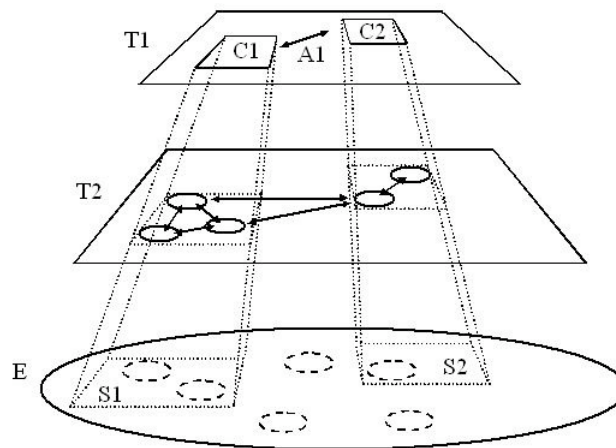
The choice of the organisational setting was informed by three main criteria. First, the organisation had to activate relatively slow learning cycles as a response to the introduction of new management accounting knowledge. The learning cycle is the cyclical process linking the action, the perception of the action consequences, the understanding of the cause-effect relationship, and the reformulation of novel plans for subsequent action as these evolve in people's minds. The speed of the learning cycle can be conceived, for example, as the time elapsed between one action and the subsequent action informed by the updated plans. Relatively slow learning cycles have various consequences. First, slow learning cycles allow the organisational participants enough time to gain a deeper understanding and reflection on the action experience, and facilitate the conceptualisation of abstract knowledge and the externalisation of the experience. Moreover, slow learning cycles allow longer time to elapse between the iteration of the experience, and reduce the prompt testing of novel plans for action. In the research fieldwork, the main concern was to gather some evidence of the attitudes and actions of the organisational participants, and of the process through which knowledge of management accounting systems evolves. Because of that, the selection was oriented towards organisational sites with relatively long learning cycles. The second criterion was to select an organisation of a relatively small size. This criterion was justified by the need for gathering detailed evidence on the involvement of organisational participants, and by the assumption that data collection might be facilitated in a smaller organisation rather than in a big one. The third criterion was to select an organisation with some pressures for motivating and sustaining the initiative. There is little need for justifying the relevance of substantial interests in the undertaking of management accounting innovations, since previous research highlighted that this is one of the determinants of effective implementation of management accounting systems. A poor record of financial performance in the past helped to identify potential organisational sites. According to these guidelines, the choice of the organisational site fell on a small-sized organisation operating in the food manufacturing industry, and located in the island of Sardinia in Italy. The firm produced canned peeled tomatoes and concentrated tomato juices, and had a steady annual turnover of about 10 million Euro. The production was seasonal, since it concentrated within about forty days between the end of July and the beginning of September, while for the rest of the year the production was suspended and only ordinary equipment maintenance took place. Organisational routines were timely scheduled in accordance to the production "campaign". For example, the budgeting routines took place between June and July, while the reporting on the production season was produced in September. The organisation constantly employed about forty people over the whole year, and about four hundred short-term employees joined in during the production season. The organisational structure was a relatively flat hierarchy with a few functionally specialised groups. The two main organisational roles were those of the general manager and the production manager. The former dealt with the overall organisational management, since he supervised the procurement, sales, human resource management, and administrative processes of the firm. The production manager only focused on the factory environment, even if he also sometimes interfered with some other organisational processes - for example, when providing indications on the fruit quality and the inbound schedule to the procurement activities. De facto, when closer to the production season, the general and the production managers worked in team, and agreed on many decisions in concert, mainly because of the relevance of the opinion and expertise of the production manager for arranging contractual relations with suppliers and for

organising the workforce. Other relevant positions in the firm were three rotating factory team managers, the equipment maintenance manager, the marketing manager, and two accountants. Partly because of the relatively small organisational size, the main owner (a local entrepreneur) also played a relevant role in directly taking or affecting organisational decisions. Additionally, the external accounting and management consultants exerted a significant influence in advising organisational choices and in facilitating internal communication. During recent years, the firm persistently incurred in operational losses, and the firm's owner had repeatedly stressed the need for increased efficiency and economy in the recent past. The pressure to improve the financial performance reasonably provided a satisfactory rationale for supporting the exploratory assessment of the proposed management accounting system (even though there was obviously no direct linkage between the outcome of the research initiative and the individual payoff of the participants).

Data were the oral accounts of the perceptions, understanding, and beliefs of the organisational participants, the documents about production and financial budgets and about production and financial reports, and the management accounting software developed. Oral accounts were collected during individual interviews, small work groups, and organisational meetings. Interviews were conducted with the general manager, the production manager, the factory team managers, the marketing manager, the equipment maintenance manager, with one of the two accountants, and some members of the consulting team. Some of the interviews were taped and transcribed, while most of them were informal talks in the organisational setting, and notes were later taken on the content and context. Indeed the most informative oral accounts happened close or during the production season, when little time could actually be scheduled for exclusive interviews. Oral accounts also were collected during participant observation of the organisational meetings about the budgeting of the production campaign and the computation of the standard product costs, and also during spontaneous discussion groups about the manufacturing processes. Documentary sources included the budget drafts, the final budget versions, the cost accounting forms and the computation models already in use in the organisation. Finally, data gathering also included the active generation of a management accounting software which could provide a structure for the production activities, for production data collection, and for information reporting on the efficiency and effectiveness of the production process. More precisely, the management accounting software modelled an activity-based costing and management system (ABCM) using an object-oriented software for business simulation and activity-based product costing. The development of the management accounting software, which was personally conducted by the researcher, involved the mapping of the production activities and of the job assignment, the translation of the work flows of the manufacturing process into the software language, and the construction of a computational model for generating information on the product average costs and productivity ratios.

Analysis was conducted through the coding of the data according to the main constructs derived from two alternative theoretical perspectives, the stage process model of ABC implementation from Anderson (1995) and the knowledge conversion model from Nonaka and Takeuchi (1995). The former conceives the implementation process as composed of six stages, namely initiation, adoption, adaptation, acceptance, routinisation, and infusion. Also, each of these stages is characterised by process stage factors, which affect the process progression, and stage process outcomes. The identification of stage process factors and outcomes was based on the perceived attitudes and actions of the organisational

participants recorded in the fieldwork. The analysis, however, encountered some difficulties because sometimes the same attitudes and actions could be alternatively mapped over different process stages, and because the timing of the activities performed in the fieldwork setting did not exactly correspond to the sequence of the stages in the Anderson (1995) model. The model from Nonaka and Takeuchi (1995), instead, conceives organisational change as a process of knowledge generation through a virtuous cycle of conversions from internalised to socialised, to externalised, and to systematised knowledge modes. The identification of the knowledge modes in the experience studied was based on the characterisation of knowledge (expressed in the participants' attitudes and actions) along two dimensions, namely the individual or shared nature of the knowledge, and the formal or informal expression of the knowledge. For example, individual understanding of properties of the production process, only expressed in informal oral account under request, was mapped as internalised knowledge. At the opposite, shared beliefs on properties of the production process, formally conveyed in process charts, would score as systematised knowledge.



Picture 1¹⁷

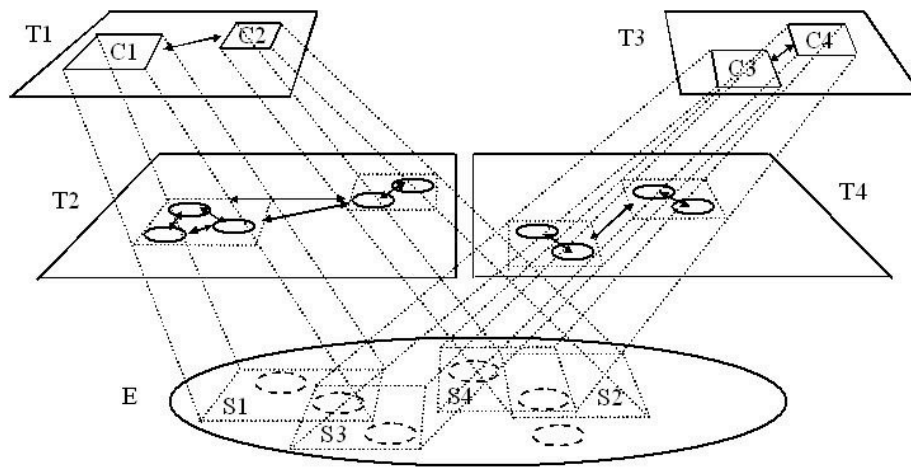
The use of alternative theoretical frameworks intends to contribute to the theory development about the implementation of management accounting systems. On the one hand, the contrast and comparison between the understanding of the experience from two different theoretical perspectives could contribute identifying and overcoming the limitations of the theoretical frameworks. The early steps of theory development¹⁸ would then move from the awareness of the gaps to fill and the aspiration to gain a better understanding of the experience studied. On the other hand, the exposure to various theoretical perspectives could bring some fresh insights and elicit some cross-fertilisation among various disciplinary fields. By referring to one theoretical framework only, in fact,

¹⁷ T1 represents a simple theoretical structure, composed of two constructs (C1 and C2) and a proposition linking them (the arrow A1). T2 represents the detailing of T1's structure into variables, which either characterise the inner structure of each construct (the various ellipses shadowed by the same construct) or formulate a detailed hypothesis among variables relating to different constructs. Finally, E represents the empirical evidence, whose components may be brought to theoretical relevance if they are "shadowed" (S1 and S2) by the constructs adopted.

¹⁸ Eisenhardt K. M., "Building Theories from Case Study Research" (*Academy of Management Review*, 14: 4: 532-50, 1989).

perception and understanding necessarily is constrained by the set of constructs and propositions (or, if more detailed, of variables and hypothesis) which embody the theoretical knowledge of a certain discipline¹⁹. In other words, all that is not “shadowed” by the theoretical structure of constructs and propositions is not brought to bear to the researcher’s consideration. Picture 1 exhibits these ideas in graphical style.

As additional theoretical perspectives are employed, the researcher can address her or his attention to novel structure components and/or process dynamics within the empirical evidence observed. Picture 2 illustrates how two theories could contribute conceiving different characteristics of the empirical evidence in alternative perspectives.



Picture 2²⁰

Alternating different theoretical perspectives could open up additional descriptive and explanatory capability, even though a collage of theoretical frameworks generally does not add up to a new theory. The combination of different theories, for example, could be hampered by incompatibility of theoretical assumptions endorsed by the various theoretical perspectives. Alternatively, the theories could not be easily combined because of the very different theoretical issues that inform the respective disciplinary perspectives and traditions. Nevertheless switching theoretical perspectives could fruitfully help identifying and overcoming the limitations of a given theory, by explicitly pointing at what a theory cannot shadow and suggesting plausible directions for enrichment. Additionally, if not substantially achieving any advancement in theory development, the cross-fertilisation among various theories could suggest ways to relate the theoretical perspectives to each other insofar they refer to different levels of analysis of the empirical evidence. To some extent, it is the case of the research presented in this paper, insofar the Anderson (1995) model refers to social processes and social mechanisms within the management accounting system implementation, while the Nonaka and Takeuchi (1995)

¹⁹ Barcharach S. B., "Organizational Theories: Some Criteria for Evaluation" (*Academy of Management Review*, 14: 4: 496-515, 1989).

²⁰ As the researcher looks at the evidence from the perspective of theory T1 or T3 alternatively, either constructs C1 and C2, or constructs C3 and C4 are cognitively employed, and consequently either portions S1 and S2 of the evidence, or those labelled S3 and S4, are observed.

model rather addresses the cognitive and social-psychological processes through which organisational knowledge develops.

3. The Experience Studied.

Before the beginning of the field experiment, two main events had taken place in the firm where the fieldwork took place. These previous events were the privatisation of the firm, which happened in 1999, and the early process of changing management accounting and budgeting practices, which had been conducted between 1999 and 2000. A brief account of these events would help better understanding the setting where the field experiment was conducted.

The fieldwork firm had been under public ownership for some decades. Since the beginning of the nineties, the regional politicians and the directors of the regional holding company (which was the legal owner of the firm) considered selling the firm to private owners. Persistently the food manufacturing firm had achieved negative financial performance in the past, but it could reasonably attract the interest from potential bidders. It was the biggest of three only competitors in the regional industry, and had a well-established regional reputation and brand image. The owner of a local retailing group was interested in the offer, and he decided to apply for the sale. His retailing group had been highly successful in the past, and the interest towards the food manufacturing firm was justified by the potential advantages from vertical integration of the food manufacturing and food retailing industries and the personal motivation towards achievement and growth. His offer was the most appealing to the regional holding company, and the sale of the organisation happened at the beginning of 1999.

During the first months, little change if any was brought into the organisational life. The new owner and his management team lacked a deep understanding of the manufacturing environment for undertaking well-informed decisions and actions. The sale of the firm came shortly before the summer production season, and the incumbent management team had the main influence in the management of the 1999 production campaign. The financial performance of the year, however, still was negative, and the new owner decided to undertake a programme of organisational restructuring and investments in additional capacity. The restructuring plan addressed the problems of overmanning and loose management control, and the investment plan intended to increase the production capacity of the manufacturing lines. In the meanwhile, the incumbent general manager retired, and a new one was appointed from the internal hierarchy of the same food-manufacturing firm. The choice of appointing the new general manager from the internal organisational ranks mainly was justified by the need for maintaining open communication channels with the workforce, apart from the lack of suitable candidates for the position from the same retailing group. Close to the end of 1999, an external consultant was appointed as the new production manager. His job was to assist in the development of the investment plan, to design the job assignment and the management control system in the factory, and to manage the 2000 and 2001 production seasons. He had a lifelong experience in the area of food manufacturing, having taken managerial roles in the factories of the main world and national companies in the food manufacturing industry.

The new production manager had a significant impact in the 2000 production campaign. His decisions affected the investments in manufacturing equipment, the layout of the workstations and the design of the workflow. He trained the factory team managers, the

equipment maintenance manager, the accountants and the manager of the short-term workers to novel shop-floor practices and management control systems. Despite these efforts, the yearly financial performance still was negative, even if achieving some improvements. After the production season, the general manager retired, and the position was assigned to a manager coming from the ranks of the retailing group. The new general manager had some work experiences in various industries, and, apart from retaining a close concert and agreement with the owner in many decisions, he introduced novel ideas on the relevance of quality improvements and the cultivation of human resources.

With the support from the new general manager, the production manager took an active role in changing management accounting and budgeting practices. He introduced the idea of allocating costs to products according to standard productivity parameters rather than flattening the overall cost lines over the quantities produced. This idea was conveyed via cost computation forms, which exhibited the calculation of end-item product costs based on the standard amount of resource consumption and the resource unit costs. He chaired a number of meetings with the other organisational participants, and in these occasions he presented the computation technique and explained that the identification of standard production ratios could allow to daily monitor the productivity by tracking the quantities produced. His ideas gained relatively rapid understanding and acceptance. In spring 2000, the new cost accounting technique was applied to product costing and budgeting. In the past years, the previous general manager and the previous production manager used to decide the budget of the production seasons in an incremental fashion - the budget lines substantially carrying forward the previous year's figures with little amendments mainly due to expected variation in the production quantities. In the 2000 budgeting round, the production manager imposed the use of the cost computation forms in order to forecast the quantities produced, the resources consumed and the product costs. The budgeting process asked for quite a number of meetings, attended by the production manager, the factory team managers, the short-term workers manager, the equipment maintenance manager, and the accountants. Occasionally, also the general manager and some of the consultants took part. These meetings intended to discuss and achieve an agreement on the standard productivity ratios, the amount of resources to assign to the various production routes and the production schedule and output. Many of the participants were actively involved in the discussion and showed to enjoy the novelty of the approach and the sharing of the work experience of the production manager. At the same time, some difficulties persisted in reproducing the participants' knowledge of the production process into the management accounting and budgeting techniques. Many organisational participants felt the inadequacy of the cost computation forms to fully represent the perceived complexities of the manufacturing environment. From the close understanding of the organisational setting, however, arising in the researcher's perspective after the prolonged presence in the field, also the persistent feeling of distrust from the incumbent employees towards the new owner and the new general manager could have played a role. For example, since the early meetings after the privatisation took place, the new owner had repeatedly addressed the issues of overmanning and inefficient work practices, and he had pointed at layoff and work reassignment as plausible solutions.

The new cost computation technique was again applied in the 2001 budgeting round. The production manager chaired the meetings on the budgeting of the production season, and in these occasions a very few explanations only on the use of the new management accounting practices were needed. Occasionally the production manager also recalled some experiences from the previous production season, when the use of the cost

computation forms allowed the detection of production problems and provided relevant information for the corrective intervention. On their side, the other participants at the meetings were willing to propose and discuss alternative viewpoints, which could, in their opinion, better account for the characteristics of the manufacturing environment. However, there were some signs of the limited impact of the new management accounting techniques on the budgeting practices and the modest use of management accounting information. During one of the budgeting meetings for the 2001 production season, for example, the production manager and the other organisational participants explicitly agreed that the productivity parameter ratios they were using in the cost computation did not actually represent their understanding of the production process. They justified their choice of the budget figures to the researcher by pointing at the well-established practice of retaining some slack resources for the purpose of reducing some risk in case of subsequent scrutiny of the production record. To some extent, the budgeting procedure had to accomplish both the mutual agreement of expectations between the production people on the production season, and the display of an accountable programme to the general manager, the owner, and the consulting team. For the rest of that meeting, the participants alternatively referred to two types of figures, the ones exhibited in the cost computation and the budget documents, and those that were not included but tacitly understood as more closely relating to the production processes.

In June 2001, the researcher identified the potential for substantial improvements in the management accounting practices in place in the organisational setting. From the benefit of the previous experience in the consulting team, the researcher started working on the idea of introducing a novel activity-based costing and management system in the organisation, and to try and implement it via an object-oriented business simulation programme. Activity-based techniques had never been used in the product cost computation in the organisation before. The researcher first approached the production manager to illustrate the project and asked for his support to the initiative. In the course of those preliminary conversations, the manager acknowledged that there was the potential for increasing the reliability of product cost information by means of other accounting systems but the one already in place. He examined the modelling samples of the ABCM system with interest, and agreed to support the implementation effort. In the same month, also the consulting team was invited to join the initiative. Since the event of the implementation of the previous cost computation techniques, the consultants highlighted that the management accounting innovations brought a remarkable change in management accounting and budgeting practices, but they also pointed at the shortcomings of the substantial lack of reliability of the cost information obtained. Also the organisation's accountants and the marketing manager shared this concern. The latter, for example, reported that his pricing decisions were mainly affected by the overall market trends and competitors' moves while little reliance he could place on the product costing information provided by the management accounting system. Some months earlier, on the occasion of one of the consulting meetings, also the general manager had endorsed the viewpoint that the lack of credible cost information prevented from taking informed interventions on the production process for the purpose of cost reduction. The proposal to undertake an exploratory project of implementation of a new ABCM system gained attention as one plausible solution for the lack of reliable cost information provided by the existing management accounting practices. Two other alternatives also were considered for a short period of time. One of the two was to refine, improve and develop the existing management accounting technique. The factory team managers, in particular, had been

working on the cost computation software for some years, and had contributed to the refinement of the easy of use and of the quality of the reports generated by the system. The consulting team, however, had highlighted that the structure of the cost computation technique could not allow to reproduce the manufacturing complexities with reasonable precision, and discarded this route. The other alternative was to introduce in the firm the same cost accounting system that was to be implemented in the other organisations of the controlling retailing group. The same owner and the general manager, and also other members of the retailing group management team, however, dismissed this alternative. They were probably unwilling to make additional relatively high investments in the food manufacturing firm, and they seemed to perceive that other cost accounting system as inadequate to provide timely information for production management purposes. The initiative proposed by the researcher, instead, asked for the commitment of fewer resources only, at least because of its exploratory scope.

By the end of June 2001, the proposal had been presented to the general manager, the production manager, and the consulting team. The consulting team arranged for a presentation of the initiative to the various organisational participants, that was held at the offices of the controlling retailing company at the beginning of July. The general manager, the production manager, the accounting staff, some members of the consulting team and some managers of the controlling retailing company attended. The researcher, together with another researcher from the local University, provided an overview of activity-based techniques, illustrated the proposal of implementing the ABCM system at the food manufacturing firm, and provided some examples of the management accounting software to employ. At the end of the presentation, an open discussion revealed the various viewpoints about the management accounting problems in the organisation. The general manager strengthened his concern with the issues of quality control and process management. He highlighted the potential for activity-based approaches to support the ideas of total quality management and continuous improving, apart from also remarking the need for clarity in organisational strategies and for adequate training and recognition for the workforce. The accounting staff highlighted the practical difficulties incurred in allocating resource costs to end-item products because of the perceived complexities of the production process and the limited information available from the factory people. Finally, the production manager declared to support the initiative of exploratory ABCM implementation, and invited the researcher to attend the organisational meetings on the cost computation techniques and the budgeting procedure. At the end of the meeting, the initiative of conducting the exploratory ABCM implementation was formally endorsed.

In the following months, the researcher called for the cooperation of various organisational participants in order to develop the management accounting model and the ABCM software. The software intended to represent the production process in considerable detail. The development process went through the identification of the activities performed in the production processes; the sequencing of the activities along the workflow; the identification of the activity drivers; the identification of the drivers of the consumption of the resources to perform the activities; the representation of each activity or set of activities into the software modules for the simulation of the production process; the design of the software modules according to the workflow; and the refining the parameters of the software modules to the production process standard values. The model was based on the definition of equations representing the processing of raw materials according to production parameters and variables. For example, one of the equations stated that the average time for downloading the raw materials carried by a lorry depended on the number

of bins it carried and the number of forklifts available. Another equation stated that the quantity of tomato waste in the fruit selection depended on the number of people working on it and the speed of the rolling conveyor tape. In principle, it was possible to better and better refine the model equations up to very thin details; in practice, the process ended with satisfactory model equations when the same organisational participants perceived that they provided a fair representation of the production process. Apart from a practical criterion for terminating the equation modelling, this approach also had some behavioural implications on the ABCM implementation, because of the call for constant participation of the organisational participants in the assessment of the model and of the progressive buy-in of the outcome of the modelling process.

The production records derived from the previous costing system were one main source of data on the manufacturing processes. The previous costing system was based on the spreading of indirect costs over the total amount of products (the firm produced about 30 different types of end-item products). The costing system related each product item to the amount quantity of input raw materials needed for the production. The core information in this costing system was the estimated productivity rate for each production routing from the raw material supply to the product end-items. The main intended use for the costing system, however, was to control the actual production workflow with respect to the production budget, rather than to determine the unit cost of each product end-item. The same organisational participants acknowledged the inadequacy of the costing system to provide reliable information on the product unit costs. Indeed they negotiated and agreed on the productivity ratios, rather than engaging any reliable attempt to measure them from the actual production processes. Despite these limitations, the reports derived from the previous costing system provided some relevant and well-codified information on the manufacturing process. Some of these records exhibited the detailing of the work roles in the production environment, with specific information on the number of people employed, the shift schedule, and the tasks assignment.

For the modelling of the manufacturing process, the production workflow was divided into phases. Each “phase” was conceived as a “set of activities” which were performed at a certain stage of the production process. Each phase typically was circumscribed within a given physical location and characterised by strong operational linkages, and all the activities of each phase were bond together my means of tight coordination mechanisms. Indeed the linkages among activities within each phase relied on a broader array of coordination devices than the linkages among activities happening in different phases. Most of the times the activities happening within one phase were coordinated by means of mutual adjustment, while the coordination of activities happening in different phases generally was based on the formal production schedule or the intervention of a supervising authority. The grouping of activities within each phase also was based on the extent to which tacit (as opposed to explicit) knowledge was employed in the coordination effort. For example, in the phase of receiving the raw tomatoes from trucks entering the factory area, the drivers checked in at the factory entrance, drove along the courtyard, and stopped on the weight platform. These activities clearly required some degree of tacit knowledge and coordination, and their performance was not strongly affected by any interaction with other activities carried on in other phases. This set of activities formed a phase.

The workflow broadly was sequential in nature. Even if there was one dominant verse (the inputs were processed in sequence towards the output), there were at some points multiple directions, where the workflow split into two or more alternative courses of activities. For example, after the tomato selection the production process could take two

alternative routes, the one leading to the production of peeled tomatoes, and the other leading to the production of tomato juices and concentrated tomato juices. Further linkages existed between phases placed in different routes. For example, some concentrated tomato juice was used to fill the cans in the peeled tomato production route. Such cases of cross-route linkages were one main source of complexity for tracking product costs. In particular, the redirecting of a work-in-progress to another process routing implied to keep track of the production costs up to the linkage connecting the two routings, the one providing the part and the other consuming it. Because of these complexities, the development of the production process required gathering a considerable amount of information. Some of the parameters and variables, for example the average time duration, the waste ratios, and the usage of other consumables had never been quantified before. However, the production people generally held a shared and informal understanding of these parameters and variables, and they could most of the time easily perceive “how production was going on” even without any formal quantification. They acknowledged, for example, that the productivity ratios could vary according to a number of parameters (for example, the quality of the tomatoes and the temperature in the machinery), even if there wasn’t any form of codified knowledge available on this topic (i.e. productivity records).

After the early development of the ABCM model, the researcher showed the first drafts to various organisational participants on the occasions of some meetings. They fed back some useful comments about how to refine and improve the model, and provided additional information in order to detail the simulation of the work processes. In turn, the model structure suggested them the need for better tracking and measuring many work activities. Some of the participants admitted that the visual representation of the work processes and the clear focus of attention on specific production variables and parameters facilitated the expression of their knowledge of the production process. Additionally, the explicit link between the factors influencing the work activities and the simulated process outcome made them accept the relevance of trustful information for the purpose of obtaining meaningful and reliable figures.

The general manager was particularly willing to take part in the development of the ABCM model. During one meeting in December 2001, he commented on some model drafts:

“This ABCM model strongly resembles me the one which has recently been implemented at [another regional food-manufacturing company], for the costing and management of the bottling of milk. Their concern there strictly is operational, they need to activate some alarms whenever any parameter is not properly set. For each phase of their production process a number of control parameters have been identified. When any of them is not appropriate, the alarm activates and calls for immediate intervention, either from the same organisational work teams, or in the case from the on-line remote assistance from Milan or from Sweden.”

In the rest of the same session, he reviewed the amount of information needed for the development of the ABCM model, and how the product cost figures were computed. He pointed out that the activity-based approach seemed able to account for the complexities of the manufacturing processes, and that the use and maintenance of the system necessarily called for more accurate measurement and record-keeping practices than those already in place. He observed:

“In this perspective, it would have been very useful to monitor and carefully track [the production process] during the previous production campaign. For example, we could have measured the average time it takes for weighting the lorries carrying the tomatoes at the entrance of the factory. (...) At the moment I cannot say that we have got the required data instead, we don't have data but feelings.”

He also acknowledged the possibility for detailing the cost computation into deeper details. For example, he added:

“We cannot claim that it takes twenty minutes to weight a lorry, since it's not the same to deal with one carrying ten bins, or another with forty. Not to say that the second one takes four times the effort, but it takes more. Additionally, the weighting platform is consumed in different ways according to the frequency or the intensity of use.”

The general manager also expressed some perplexities about the fact that the same logic of linking activities to workstations couldn't work for some job tasks. He exemplified this point by saying:

“The manager of the inbound logistics operates in the courtyard outside the factory building. He provides shared services to the external part of the production process. He contributes to the well performing of the manufacturing process, and he's needed to co-ordinate and 'lubricate' the management of the inbound logistics, but how to quantify its contribution to the production process?”

Notably the labour cost of the same manager of the inbound logistics had come out once in one of the meetings for the budgeting of the production campaign the year before. Because of the very different cost allocation technique however, it was not an issue at that time, since the labour cost of this manager simply was spread among the whole range of end item products according to standard unit parameters. In this respect, the discussion around the new management accounting system brought into the light new issues that had been previously ignored.

As the development of the ABCM model progressed, the organisational participants seemed to increase their awareness of the potentials for reliable and transparent management accounting systems. During another meeting held in January 2002, for example, the general manager commented:

“I'd not discount the ABCM model at a first glance, but we need to deeply investigate the parameters, to see how the cost is formed in any part of the production simulation. If we're able to get some trustworthy information, that's very interesting. (...) I need a tool for comparison basically. We can easily produce a budget for the next production season: most of the information comes from last year's experience. But what I strongly need is to compare this year's actual production with the benchmark, in a meaningful way.”

He also refined the formulation of his information needs in these terms:

“I’d like to have something that, once completed, could tell me if I’m safe within the budget line or if I’m overspending – or in the case if I’m over-performing. Once I realise that I have a problem, and I can identify what type of problem is – a heavy bottleneck or something affecting the workflow, etc. – I can quickly intervene and go back into the budget line. At the moment that’s not possible, it’s always a matter of subjective interpretations. I have to guess that a given workstation is under-performing, or that a given phase is under-manned, etc.”

He also came back to the point that the reliability of the management accounting information depended on the credibility and completeness of the data provided by the production people (in particular, the factory team workers, the equipment maintenance manager, and the short-term workers manager). He recalled:

“At the time of the first production season, a few years ago, I wandered around with a paper block, and I gathered information from many sources. I needed to understand what I was going to manage, otherwise I incurred the risk of losing credibility and being attacked of incompetence. I needed to master the process first. I even tried myself to perform some low-skilled tasks, like the manual selection of the fruits, to realise of my same productivity.”

In this sense, he could see some contributions from the proposed management accounting system in the elicitation and representation of the complexities of the production process as perceived by the other organisational participants. His also commented:

“When the model structure and simulation parameters are set up, we’ll have to take for granted all the data we’ll be told from the production people, but we’ll also have the possibility to assess their reliability. Once this [ABCM] system is put into place, we’ll realise whether the actual data do match the budget, but additionally if the divergence between the two figures is too large, that’s the signal that someone didn’t tell the right story.”

The research did not progress beyond the point of exploring the attitudes and actions of the organisational participants during these early steps of the exploratory ABCM implementation. The exploratory project extinguished for a number of reasons. First, the field experiment was not related to any sort of consulting, and the push of the ABCM implementation towards deeper integration with the organisational practices would have called for an extensive involvement of the researcher, who couldn't exert this role. Secondly, the researcher also got the feeling of reaching the "frontier" of what was feasible for the individual effort from an organisational outsider in leading the implementation process. Any further progression in the implementation of the ABCM model most probably needed for wider organisational interventions (i.e. re-designing some work practices, updating the accounting software in place, training key personnel, etc.) than those an outsider alone could provoke. Undoubtedly other key organisational actors (e.g., the owner or the general manager) might have taken steps in this direction, but their actions after April 2002 do not pertain to the field experiment reported here. On the whole, however, the tracking of these early steps of the exploratory implementation process provided enough evidence in order to improve our understanding of the process of

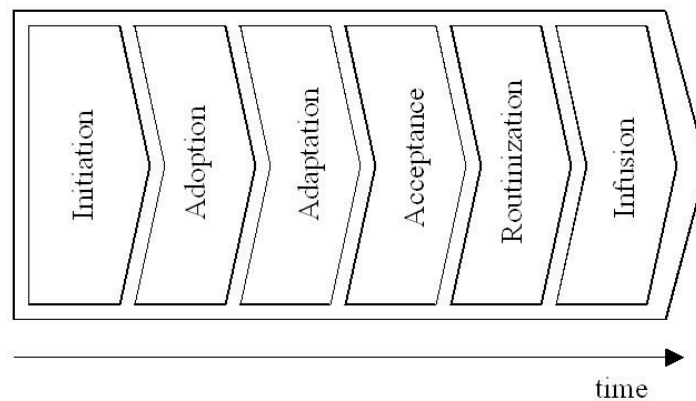
innovating management accounting systems and activating and sustaining the organisational learning process.

4. Analysis of the experience studied.

The analysis of the experience studied is conducted with the aim of achieving a better understanding of the component factors and stages of the process of management accounting system implementation. The identification of the factors and stages of the implementation process has been traditionally pursued along two alternative lines of inquiry. The first one tends to identify and test a range of factors which relate to the degree of management accounting system implementation success. One notable example is Shields and Young (1989)²¹, who presented the so-called “7C model” relating the success of activity-based costing system implementation to seven organisation factors, namely the type of culture, the form of control, the compensation scheme, the organisational commitment, the degree of continuous education, the championing from supportive leaders, and the management of the change process. Another is Shields (1995)²², who highlighted the importance of five classes of implementation factors positively relating to the degree of implementation success, namely the support and credibility of the initiative, the adequacy of training in the use of the activity-based costing models, the linkage to performance evaluation and compensation, the coordination with quality initiatives, and the adequacy of resources. The second line of inquiry tends to deconstruct the implementation process into stages and to argue that the implementation outcome depends on how the various stages are performed. In this light, the historical pattern, the sequencing and the interrelating of organisational factors in the course of the implementation event, rather than the presence/absence or degree of intensity of organisational variables, account for the success or failure of the process outcome. One exemplar case is Anderson (1995), who modelled the implementation process as composed of six stages, namely the initiation (when the pressure to change arises from internal needs or external competitive threats and a search for solution begins), the adoption (which encompasses the selection of a proposed solution and the decision to invest resources to facilitate change), the adaptation (when unforeseen needs or system shortcomings are identified), the acceptance (when establishing a minimal level of use and maintenance that the new technology requires to be sustained), the routinisation (when there is the complete replacement of old work practices by the new system), and the infusion (when the application is used, often in unanticipated ways, to improve work effectiveness and is seamlessly integrated with other organisational systems). Picture 4 illustrates the stage model of Anderson (1995), in which the six stages are ordered in sequence.

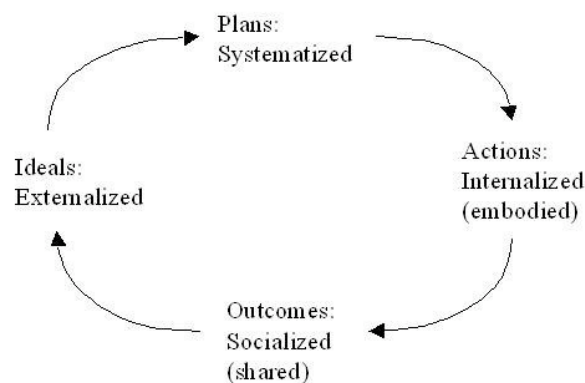
²¹ Shields, M. D., and S. M. Young, “A Behavioural Model for Implementing Cost Management Systems” (*Journal of Cost Management*, Winter: 17-27, 1989).

²² Shields M., “An Empirical Analysis of Firms’ Implementation Experiences with Activity Based Costing” (*Journal of Management Accounting Research*, 7: 1-28, 1995).



Picture 4

Because of its completeness and detail, the Anderson (1995) model provides the first theoretical perspective applied to the analysis of the experience studied. The second one is drawn from the literature on organisational behaviour, in particular from recent developments in the areas of organisational change and organisational learning. Following a well-established tradition of research on the organisational learning cycle²³, Nonaka and Takeuchi (1995) developed a process model of knowledge generation within the organisations. This model states that knowledge is created inside an organisation whenever a cyclic process of conversions among different forms of knowledge takes place. More specifically, organisational knowledge flows through four modes, namely the internalised (embodied), socialised (shared), externalised, and systematised ones. These modes differ because organisational knowledge is converted from tacit to explicit forms, and across different ontological levels (i.e. at different levels of abstraction). For example, agents' actions typically embody subjective and tacit knowledge, which is acquired through internalisation.



Picture 5

When the outcomes of actions are socially shared, they inform the generation of tacit and collective knowledge. Through the externalisation mode the ideals become explicit and

²³ See in particular Argyris C., "Single Loop Learning and Double-Loop Models in Research on Decision Making" (*Administrative Science Quarterly*, 21: 363-75, 1976); Argyris C., and D. Schon, *Organizational Learning* (Reading, MA: Addison-Wesley, 1978); Levitt B., and J. G. March, "Organizational Learning" (*American Review of Sociology*, 14: 319-40, 1988).

communicated through metaphors, analogy, and models. Finally, plans for subsequent action are formulated as systematised knowledge, and they are explicit and shared. Picture 5 summarises the flow of organisational knowledge through the four forms. In the research area of change in organisational processes, the theoretical perspective suggested by Nonaka and Takeuchi (1995) found an exemplar application in Feldman (2000)²⁴. Feldman addressed the issue of what allows organisational routines to change over time. Routines, defined as “an executable capability for repeated performance in some context that has been learned by an organisation in response to selective pressures”²⁵, typically provide an explanation for the organisational inertia and stability, since they are “repeated patterns of behaviour that are bound by rules and customs and that do not change very much from one iteration to another”²⁶. By pointing at some empirical evidence of change in organisational routines, however, Feldman (2000) tried to extend the explanatory capability of the construct of routines by offering a range of mechanism that could account for organisational change processes. Her innovative theoretical contribution was to highlight the role of agency (e.g., participants' reflections on and reactions to various outcomes of performing routines) in the process of maintaining existing routines or of diverging from the established patterns of behaviour. In particular, the influence of organisational participants on the change in organisational routines happened through a self-reflection mechanism - that is to say, organisational participants experienced thoughts, feelings and actions as they engaged in their work, and ultimately activated the repairing, expanding and striving of the organisational routines. Similarly to the work conducted by Feldman (2000), the research presented in this paper can also be conceived as a process of change in organisational routines (activated by the introduction of new management accounting knowledge). Thus Nonaka and Takeuchi (1995) provided the second theoretical perspective employed to analyse the experience studied. The two models of Anderson (1995) and Nonaka and Takeuchi (1995) present fundamental differences. The model from Anderson (1995) points at a range of organisational constructs which have progressively been refined in the management accounting literature, but fundamentally papers over the micro-level dynamics of the participants' engagement in the implementation process. On the other hand, the model from Nonaka and Takeuchi (1995), as employed in Feldman (2000), accounts for the cognitive and social-psychological involvement of the organisational participants in the change processes, even if it does not explicitly address any organisational construct germane to the substantive field of management accounting research. Both theoretical perspectives, however, asked the researcher to exert some degree of interpretative effort when trying to match the theoretically derived constructs (i.e. the etic knowledge) with the emergent conceptualisations of the attitudes and the actions experienced in the implementation process (i.e. the emic knowledge)²⁷.

²⁴ Feldman M. S., “Organisational Routines as a Source of Continuous Change” (*Organisation Science*, 11: 6, Nov.-Dec.: 611-629, 2000).

²⁵ Cohen M. D., R. Burkhart, G. Dosi, M. Egidi, L. Marengo, M. Warglien, and S. Winter, "Routines and Other Recurring Patterns of Organizations: Contemporary Research Issues" (*Industrial and Corporate Change*, 5: 3: 653-698, p. 684, 1996).

²⁶ Feldman M. S., “Organisational Routines as a Source of Continuous Change” (*Organisation Science*, 11: 6, Nov.-Dec.: p. 611, 2000).

²⁷ Emic knowledge is made of "accounts, descriptions, and analysis expressed in terms of the conceptual schemes and categories regarded as meaningful and appropriate by the native members of the culture whose beliefs and behaviours are being studied" (Lett, 1990, p. 130). In other terms, the researcher gains a deep understanding of the fieldwork setting by undertaking an insider's view of the same experience studied. The process of acquiring an insider's perspective generally works in an informal and unstructured way, since it

The experience studied outlined in the previous section can be structured according to the early stages of the implementation process model of Anderson (1995). The initiation stage, for example, includes the identification of internal needs for changing costing and budgeting routines and terminated with the presence of the pressure to undertake the change process. The adoption stage includes the identification of one course of action for fixing the problem of unreliable cost information and terminated with the decision to commit resources (e.g. time availability of the participants) to the implementation project. The adaptation stage is characterised by the tailoring the ABCM model to the specific details of the organisational business processes and management needs. The other stages of the Anderson's model were not observed, since the research terminated before their eventual activation. It is possible, however, to spot some of the factors which, according to the model of Anderson (1995), come into play in affecting the course of the implementation process. Table 1 exhibits the main ones for each stage.

| Process stages | Initiation | Adoption | Adaptation |
|-------------------------------|---|--|---|
| Process stage factors | Internal needs (e.g. the lack of reliable product cost information) | Selection of the solution to the problem of the pressure to change (e.g. selection of the ABCM project implementation) | Identification of unforeseen needs (e.g. need for improving the data collection on the production process) |
| | External pressures (e.g. the owner's dissatisfaction with the financial performance) | | Identification of system shortcomings (e.g. difficulty to reproduce some job tasks) |
| Process stage outcomes | Pressure to change (e.g. motivation to search for solutions to fixing the costing system) | Decision to commit resources in the change process (e.g. availability of time from the organisational participants) | Feedback for the adaptation (e.g. identification of potential uses of the ABCM model for management purposes) |

Table 1

The theoretical perspective drawn from Nonaka and Takeuchi (1995), instead, suggests a very different analysis. In this approach, the experience studied is conceived as a process of conversion among different knowledge modes - from internalised and embodied, to socialised and shared, to externalised, to systematised. The mapping of these constructs over the fieldwork data addresses the attention towards the participants' perceptions, claims, arguments, and plans for actions. For example, the intimate knowledge of the details of the production processes, the subjective assessment of the reliability of the costing system, and the subjective confidence placed on the production data, all were

may involve, for example, the progressive understanding of the participant's myths, rituals, and language structures (e.g., Briggs, 1986). Passing through this process, however, seems a necessary requisite for the effective data gathering, since the validation of the emic knowledge is "a matter of consensus - namely, the consensus of the native informants, who must agree that the construct matches the shared perceptions characteristics of their culture" (Lett, 1990, p. 130). Etic knowledge, on the other hand, is made of "accounts, descriptions, and analyses expressed in terms of the conceptual schemes and categories as meaningful and appropriate by the community of scientific observers ... any and all etic constructs must be precise, accurate, logical, comprehensive, replicable, falsifiable, and observer-independent" (Lett, 1990, p.131).

instances of internalised knowledge base held by the organisational participants. During the course of the field experiment, the organisational participants activated and experienced all the four stages of knowledge conversion. Table 2 exhibits some instances of pieces of knowledge developed through the process.

| Internalised and embodied knowledge | Socialised and shared knowledge | Externalised knowledge | Systematised knowledge |
|--|--|--|---|
| Details of the production processes | Perception of the poor reliability of the product cost information | Formulation of the need for reliable information | Activities map represented in the ABCM model |
| Subjective assessment of the reliability of the costing system | Perception of the credibility of the project implementation | Formulation of the shortcomings of the costing system in place | Data collection needs represented in the ABCM model |
| Subjective confidence placed on the production data | | | |

Table 2

Similarly to the approach followed in Feldman (2000), the conversion among the various knowledge modes can be traced through the interaction (e.g. decisions and actions) among the organisational participants, which acted under the influence of the subjective perception of the organisational knowledge. Bringing agency into play (e.g. the role of the organisational participants in the process) allows establishing interesting connections between the factors influencing the implementation stages [which are identified according to the model of Anderson (1995)] and the knowledge which influences the participants' decisions and actions. For example, Anderson (1995) pointed out that those organisational participants with deeper production process knowledge could more strongly influence the implementation factors that positively supported the implementation process (e.g. constructively contributing to the identification of internal needs, to the selection of the solution, and to the identification of system shortcomings). When borrowing Feldman's (2000) perspective, the linkage between the detailed knowledge of the production process and the contribution to the management accounting model development can be clarified as a step in the process of knowledge conversion from internalised (and embodied) to systematised knowledge.

With respect to the attitudes and actions of the organisational participants towards the exploratory management accounting systems implementation, the analysis highlights the variety of the individuals and groups involved. For example, the consulting team kept an active role in all the phases of initiation, adoption, and adaptation of the management accounting innovation. Together with the researcher, they acted as "prime movers" of the initiative, they contributed creating the shared perception of the organisational problems and of the need for the solutions, they promoted the adoption of the exploratory implementation, and they actively participated in the development of the management accounting software. Their explicit commitment and support to the initiative sustained the credibility of the exploratory implementation effort and the involvement of the other organisational participants. In contrast, the production manager perceived the

management accounting model in close resemblance to his knowledge base of the production process, and this point could account for his acceptance and support to the initiative. The presence of a novel cost accounting system competing with the cost computation technique that he had established at the organisation in the previous years apparently did not elicit any conflict from his side. One explanation could be that his short-term contractual relation with the organisation reduced his substantial concern with management accounting system ownership. Additionally, he sometimes showed to perceive the exploratory implementation as a “pilot project”, which was not probably going to dramatically affect the management accounting and budgeting practices for some time. Finally, the general manager volunteered to be involved in the adaptation of the management accounting system. This participation offered him the opportunity to reinforce his selling of the ideas on total quality management, and to reassert his concern with overcoming information asymmetries with the factory workforce. These pieces of evidence support the idea that organisational routines change because of the reciprocal relationship between ideas and actions endorsed by the organisational participants, rather than because of the only introduction of new knowledge on management accounting systems. From the general manager’s perspective, the outcomes of the existing management accounting system fell short of his ideals of total quality management and management control, and the new management accounting system could allowed to strive for novel organisational routines. From the consulting team’s perspective, the new management accounting system was perceived as an opportunity for expanding existing routines and achieving better outcomes. From the production manager’s perspective, the existing costing system only partially achieved his desired outcomes (he acknowledged the lack of reliable product costing information), and the new management accounting system allowed to repair existing routines by providing better technical aid to cost computation.

5. Conclusions.

This paper intends to show how alternative theoretical perspectives can fruitfully be applied to gain better understanding of how the process of implementing management accounting innovations work. The interpretation of the data collected through a field experiment suggests that this approach might open up novel insight into the process dynamics activated by the introduction of a new management accounting system into the organisational practices. While a great deal of research on management accounting system implementation focuses on the identification of process factors which relate to implementation success, another route explores how the organisational participants take part in the implementation process. This line of inquiry tends to highlight the role of the perception, the understanding, and the attitudes of the organisational participants towards the implementation experience. In particular, their participation to the implementation experience can be conceived as a contribution to the process of developing new organisational knowledge. In this perspective, this research might suggest the importance of developing fine-tuned implementation tactics, which would call the organisational participants into virtuous dynamics leading to the generation of new organisational knowledge. If considering the record of ill-fated implementation experiences, even though from anecdotal accounts, understanding what works in achieving implementation

success would certainly meet the interest of both academics and practitioners engaged in the field of management accounting system implementation.

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