Chapter 2
New Integrated Information Systems and Management Control Change in Small and Medium Enterprises

Maria Pia Maraghini

Abstract  This research attempts to explore the process of change and to examine in more depth the nature of the changes in management control which accompany the adoption of the new information technologies within small and medium enterprises. In particular, recognizing that management control change is a continuous organizational process (rather than an outcome), the trajectory of which is shaped by an incessant inter-play of several influences, this research intends to explore the way in which the implementation of a new integrated information system contributes to this process. To address this issue, the current research combines theoretical and empirical insights. After having reviewed the literature on the main topics and produced a theoretical understanding to illuminate the nature of the aforementioned changes, the research relies upon an illustrative case study concerning a medium-size cooperative society based in Italy. Recognising the complexity of organizational life, the field study does not aspire to isolate and define how and by how much ICT has been a driver of the management control change, but rather to explore the whole process of change in order to appreciate the diversity of interrelated influences which have shaped its trajectory and how these influences interacted with each-other. Among this inter-play of influences, the study aims then to investigate the particular role played by the two-way relationship between ICT and management control. The implementation of the new integrated information system has opened up several opportunities for the business management and in particular for the management control. However, so far, only part of these opportunities have been exploited. Furthermore, while it could be acknowledged that the new system facilitated the changes in management control both in its material and immaterial dimensions, it could not be concluded that they were the result of the implementation of the new system. Many other factors have interacted within the process of management control change. For example, of paramount importance has been the controller’s determination to enact the change. The case study analyzes
these factors and the way in which they have jointly facilitated and/or hindered
the management control change.

2.1 Introduction

Management control in Small and Medium Enterprises (SMEs) is usually very
simple: unstructured, centralized upon the entrepreneur and generally based on
“historical information”.

However, nowadays several factors are pushing SMEs towards the adoption of
more sophisticated (or structured at least) management control systems.

Above all, the globalization of the markets and the consequent increased com-
petition, the context instability and the SMEs’ often severe financial situation lead
to the need for much more information (and more efficient – i.e. reliable and quick)
for the enterprise management.

Furthermore, some specific requests to adopt more sophisticated management
control practices are now coming from the institutional context (requests which
sometimes become obligations – i.e.: Basel II). Several more generic calls have
also been made by public officers in charge of economic development, trade associ-
ations and professional bodies, and also by academics. In this sense, in the last few
years particularly vigorous has been the push made by the consultants and software
houses which try to persuade firms of the need for more control in order to sell their
services and/or computer packages to management.

But is management control in SMEs actually changing? And, if so, how (what
is the nature of the change) and by how much? Who or what leads the change? In
particular, what is the contribution of the implementation of the new Information
and Communication Technologies (ICT), especially integrated information
systems?

The numbers of adopters of these ICT solutions among SMEs (mainly medium
enterprises) is increasing rapidly. The reasons for implementing a new integrated
information system in a SME are various (economic, technical, strategic and/or
institutional reasons).

Despite the numerous arguments that could jointly explain the decision to adopt a
new integrated information system within a SME, the roots of such decisions seldom
reside in management control.

Although the new integrated information systems are not primarily designed to
facilitate management control, it does not mean that they have no significant impli-
cations for the latter. Many changes could be expected due to increased integration
of the business information flows and consequently easier and faster access to oper-
adional data (for example, see Johnson and Kaplan, 1987; Henson, 1997; Anastas,
1997; Wagle, 1998; Cooper and Kaplan, 1998; Sutton, 2000; Chapman and Chua,
2000; Quattrone and Hopper, 2000). Also, it is a common practice that when major
scale changes are carried out regarding information systems, the logic of accounting
and control also becomes a subject of evaluation and possible change.
However, so far there exists little published scientific evidence on the actual manifestation of these changes. After several calls to study the interrelationship between accounting and information technology (for example, Chapman and Chua, 2000; Hunton, 2002), in the last few years some experimental, field and analytical research has explored the effects of the new ICT systems on management accounting and management accountant’s work (for example see: Fahy and Lynch, 1999; Maccarone, 2000; Booth et al., 2000; Beretta, 2001; Granlund and Malmi, 2002; Caglio, 2003; Hyvönen, 2003, Scapens and Jazayery, 2003). However, these studies seldom focus on management control, especially in SMEs: the effects of the adoption of the new integrated information systems (mainly enterprise resource planning systems – ERPs) are usually studied within multinational organizations or large companies at least (Caglio, 2003, provides a longitudinal case study of a medium-sized company which explores the change in accountants’ expertise and role). On the other hand, it is also a fact that so far only large firms have experience of these systems for a relatively long time period: few SMEs have adopted a new integrated information system and most of the implementation projects still tend to be ongoing. We felt, however, that now is the right time to study these issues, as the actual developments in the firms can be observed. We are thus not forced to rely on accounts of what happened a long time after the fact (Granlund and Malmi, 2002).

Recognizing that, this study focuses on two different research questions:

– How does the process of implementing new ICT, especially integrated information systems, affect and is affected by management control change?
– What is the impact of the new integrated information systems upon traditional control methods, systems, practices, tasks, organization and role?

2.2 Background

The theoretical framework that informed our research combines the so-called “structurational model of technology” (Orlikowski, 1992) and its “practice-based extension” (Orlikowski, 2000) for analyzing the nature and role of technology in organizations, with the institutional framework provided by Burns and Scapens (2000) for studying processes of change (and particularly management accounting change). Both of these frameworks refer to the fundamental contribution of structuration theory (Giddens, 1976, 1979, 1984).

In particular, in the context of our study, we look at ICT as one of the factors that could affect (and which is affected by) the continuous process of management control change. More specifically, we recognize management control systems and practices as organizational rules, roles and routines that encode the existing institutions within the organization (see also Scapens, 1994; Busco, et al., 2001). The adoption of new information and communication technologies can lead to a change of these rules, roles and routines. If it actually does modify them, how and with what magnitude is neither predictable a priori, nor generalizable. It depends on many disparate factors which are different, not only from one company to another,
but also within the same organization if we consider two different points in time. Furthermore, these various factors interact with each other in a continuous, dynamic and dialectical process which make it very difficult, if not impossible, to agree on what has determined the trajectory of change and to what degree.

Recognising the complexity of organizational life, our research does not aspire to isolate and define how and by how much ICT has been a driver of the management control change, but rather to explore the whole process of change in order to appreciate the diversity of interrelated influences which have shaped its trajectory and how these influences interact with each other. Among this inter-play of influences, we propose to investigate the particular role played by the two-way relationship between ICT and management control (we speak about a two-way relationship because ICT can both shape and be shaped by the management control).

More specifically, two main aims are central to this research: first, to produce a theoretical understanding to illuminate the nature of the aforementioned changes; second to provide detailed empirical evidence of such a change process by means of an interpretative longitudinal case study.

2.3 Theoretical Foundations: Conceptualizing the Role of ICT in the Management Control Change Process

For understanding the nature and role of ICT and management control in organizations we refer to the fundamental contribution of structuration theory (Giddens, 1976, 1979, 1984).

The usefulness of structuration theory in studying management accounting, and hence management control, has already been explored by Macintosh and Scapens (1990) who argued that management accounting can be theorized as modalities of structuration in each of the three dimensions of signification, domination and legitimation. The same has been done by Orlikowski (1992) with reference to technology in general and by Caglio (2003) with regard to ICT in particular (specifically ERPs).

Hence, recognizing that human activities (action) and institutions which structure these activities are not independent (as there is a duality between action and institutions), we identify ICT and management control as modalities of structuration. As such, they can both shape and be shaped by the human action and the institutions which govern organizational activity.

However, as noted by Archer (1995) structuration theory, since it does not incorporate historical time, is not particularly helpful for exploring process of change. Recognizing that, Barley and Tolbert (1997), starting from structuration theory, explored the relationship between agency and structure over time, and then outlined a framework describing the process of institutionalization. Afterwards, Burns and Scapens (2000) modified the Barley and Tolbert’s framework to develop an institutional framework for studying management accounting change (Fig. 2.1). We will apply their institutional framework to explain some of our observations. This framework has been demonstrated to offer a credible and intelligible basis for the analysis and explanation of the forces that may drive accounting change and continuity (see Granlund, 2001; Busco et al., 2001).
On the other hand, as regards technology, Orlikowski (2000) proposed an extension to the structurational perspective in order to study the ongoing use and change of technology in the workplace (“a practice lens for studying technology in organizations”). Starting from the “practice-based extension to the structurational model of technology” (Orlikowski, 2000), the Fig. 2.2 sketch a theoretical framework for studying the process of ICT change within organizations and its fundamental characteristics.
The next section of the study will extend these perspectives to propose a model which aims to provide a better understanding of the relationship between ICT and management control processes of change.

2.3.1 Institutional Framework for Studying the Relationship Between Management Control and ICT Processes of Change

The two processes of ICT and management control change within an organization are closely linked and each influences the other in various ways in a continuous and dialectical process through time, as diagrammatically shown in Fig. 2.3.

Unfortunately, paper is not three-dimensional. So, in order to show all the linkages in a comprehensible way, we have drawn the two processes of management control and ICT change and their interrelationships sequentially. However, we are aware – and we want to underline – the possibility that squared boxes and ovals in Fig. 2.3 could be (and usually are) overlapped and the different processes and their respective influences take place at the same time.

The Fig. 2.3 combines elements from Figs. 2.1 and 2.2. Thus, we refer to the explanation of these figures for elucidations about the individual components of the scheme. What we want to do now, instead, is to draw attention to the relationships which exist between the two processes of ICT and management control change.

**Realm of Institutionalized Culture**

**Realm of Organizational Interaction**

<table>
<thead>
<tr>
<th>Key:</th>
<th>a, e = encoding</th>
<th>d, h = institutionalization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b, f = enacting, employing</td>
<td>c, g = reproduction, recurrent interaction</td>
</tr>
<tr>
<td></td>
<td>i, j = reproduction, repeated use</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 2.3 Realm of organizational interaction
Relationships which could be various, which could have different directions and which are difficult – and even impossible – to distinguish from one another: each of them influences the other and often overlap. However, in order to have a better comprehension of the connections between ICT and management control change processes, and purely for analytical purposes, we will analyze all these relationships one by one.

We will start by studying the way in which management control and its process of change might affect ICT within an organization. However, we want to underline that this is an arbitrary starting point for our analysis: the processes of ICT and management control change are continuous and simultaneous: thus, it is impossible to define which first influences the other. Consequently, it is also important to highlight that, as for Figs. 2.2 and 2.2, there is not a beginning (neither an end) for Fig. 2.3 (except the formation and the ending of the organization itself) and that on the farthest left there could be an oval instead the squared box.

The management control and its change process could influence ICT change in a variety ways. First of all, management control could be one of the reasons for ICT development within an organization: new ICT solutions could be designed (and/or bought) and deployed in order to solve specific management control problems and/or to help controllers to accomplish their routine work. In effect, since the first ICT solutions were developed to be used by business organizations, management control has always been related to it: ICT is the platform for company information – which constitutes the base and the output of management control activities – and it allows certain sophisticated queries to be performed (Granlund and Mouritsen, 2003). Thus, management control often looks to ICT for help to accomplish its goals and to sustain and/or promote its change.

However, this relationship between ICT and management control, could have an opposite direction: the management control (rather than being one of the reasons for the development of ICT) could be one of the explanations for its stability. For example, it is sometimes the controller who hinders the adoption of new technologies because concerns on his role and power within the organization (the new technologies may facilitate a diffusion of business information, whereas before it was accessible only to the management control function) (for a case in point see Caglio, 2003).

Secondly, the management control may not only motivate the development and/or the stability of the ICT system, but may also help and/or stimulate them, in particular by way of its process of change through time. More specifically, the repeated behaviour by controllers through time might help the development of the ICT system as it contributes to the formation and/or reproduction of control routines. A routine behaviour is easier to standardize and ICT systems work best with standardized activities and processes. However, as described before, repeated behaviour by controllers could lead not only to a formation and/or reproduction of control routines, but can also modify them. In this case, if these routines are codified within the ICT system, it might be necessary for the ICT system itself to be modified in order to help in the execution of the new control routines. Thus, the management control change can stimulate the development of the ICT system.
The routinization of the controller’s behaviour, on the one side can facilitate the ICT change process, but on the other side may hinder it. The adoption of a new ICT system may require certain modifications to at least some of the previous control routines to fit the new technology. If these routines are institutionalized within the organization, they may be quite resistant to change and, thus, they could discourage the implementation of the new technology. But if sometimes the consolidation of control routines can inhibits the ICT development, it is also their possible failed institutionalization (i.e. their continued change through time) that might prevent it. If control routines are often modified, it may not be convenient to adopt a new ICT system for the management of control activities. Firstly, it could be difficult to codify these activities in the new system. Then, the effort to configure and implement the new system could produce advantages only for a short period of time since the continued change of control activities may soon make it incoherent with them and, hence, there could be the necessity to modify it.

Thus, the repeated behaviour of controllers through time, which contributes to a formation, reproduction and/or modification of control routines, could affect the ICT process of change in various ways and with different directions; that is, it could contribute to the development and/or the stability of the ICT system (arrow i).

Besides the aforementioned relationships, there are other possible ways in which the management control change process could have an effect on the composition of the ICT system and its modification and/or stability through time. First of all, management control affects the configuration of the ICT system. The extent of this influence could be various and depends on several factors; including the specific reasons for the adoption of the ICT system, and the controller’s motivation and participation in the design, implementation and development process. In any event, with the exception of the eventuality that the ICT system is intentionally adopted to change the whole control system currently in use, most of the management control rules, roles and routines existing at the moment of the configuration will be embedded on the new ICT system (dotted horizontal arrows between squared boxes and ovals in Fig. 2.3).

Then, the management control process of change also has an indirect effect on ICT change. More specifically, it could reinforce and/or modify the organizational culture (arrow d) which will then shape the whole process of ICT change (arrow e). Also in this case, the influence might be in different directions; that is, it could create a favourable context for the development of ICT or, on the contrary, for its stability.

On the other hand, the ICT change process itself could influence the management control change process. Also here there are many possible relationships. First of all, the ICT change process could be one of the causes of modifications in management control: it is a common practice that when major ICT changes are implemented, the logic of accounting in general and management control in particular is a subject for evaluation and possible change (for example, see Johnson and Kaplan, 1987; Henson, 1997; Anastas, 1997; Wagle, 1998; Cooper and Kaplan, 1998; Chapman and Chua, 2000; Quattrone and Hopper, 2000). There are two main reasons for these potential modifications. In the first place because, as it is often very difficult
to modify an ICT system, especially the more recent ones (e.g.: ERP systems – see Davenport, 1998), it is the organizational practices and, thus, management control, that are typically changed to fit the new technology, not vice-versa (Granlund and Malmi, 2002) (dotted horizontal arrows between ovals and squared boxes in Fig. 2.3). In the second place, the adoption of a new ICT system is a good opportunity to review the management control techniques and practices currently in use in order to make them more efficient and to exploit the opportunities offered by the ICT. In the case of ERP systems, for example, these opportunities are represented by the possibility to follow the best practices embedded in such systems and by the business process re-engineering (BPR) that usually (and hopefully) precedes their implementation.

However, it is insufficient to take a simple one-way view which sees the role of ICT as being only to support and enhance management control procedures (Granlund and Mouritsen, 2003). In effect, as ICT facilitates modern management control, it may also limit the design and implementation of new management control systems (see Granlund and Malmi, 2002). One possible way in which ICT processes of change could hinder the development of management control is related to the difficulties and the long project times of ICT projects. To face the several problems that frequently arise during the implementation of a new ICT system (particularly in the case of ERP systems), effort is needed from all the members of the organization whose attention, thus, is turned away from other important development initiatives (such as the adoption of new management control techniques). Another possibility is related to the complexity and/or modest quality of certain ICT applications designed to support the more sophisticated management control solutions (i.e. ABC, BSC, etc.), which could make controllers reluctant to promote the adoption of such solutions.

In addition, it is important to emphasize that the analysis of the effects of the ICT change process on management control should not be limited to simply studying whether ICT drives or delays the implementation of new control techniques. The adoption of a new ICT system might have important implications for other dimensions of management control; that is, the nature of management control, the organization of control activities, the role of controllers and his/her relationship with operating managers (for more details see Scapens and Jazayery, 2003; Caglio, 2003).

Thus, even in the relationship which links the ICT process of change to management control change, there could be both direct (as the ICT change modifies directly, for example, reporting practices) and indirect effects (as the ICT changes alter, for example, the organizational structure), each of them in different directions (that is, they could contribute to the management control development and/or stability).

Moreover, these effects could be shaped through time (arrow j). Even if the initial implementation of a new ICT system may have relevant impacts on management control it is after the first deployment that the major effects may be expected (the so-called temporal-lag – see Granlund and Malmi, 2002). For example, as mentioned before, through time problems linked with the adoption of a new ICT system could be solved and members of the organization could find new ways to interact with
it. Hence, more attention could be paid to how to make the best use of this new system and/or to adopt new advanced control systems. Additionally, the use of ICT, especially the more recent ones, generally contribute to greater team working and more cross-functional communication and cooperation, which in turn could lead to different activities and change the role of the controller and, consequently, give rise to a need for different competencies and skills. On the other hand, by the continued use of the ICT system the actors could become used to it and the ICT system itself might be difficult to change. Thus, in order to avoid possible resistance, it could be decided not to modify the management control system if it also involves alterations on the ICT.

Furthermore, through time, the ICT process of change could have another (indirect) effect on management control change. In particular, the continued use of ICT could reinforce and/or modify the organizational culture (arrow h) which will then shape the whole process of management control change (arrow a). Also in this case, the influence might have different directions; that is, it could create a favourable context for the development of management control or, on the contrary, for its stability.

The brief analysis presented so far about ICT and management control processes of change and their potential interactions, illustrates the complexity of the relationship which links these two processes. But the complexity does not end there. The possible mutual effects of each process of change on the other, besides being numerous and with different directions (i.e. they may contribute to change and/or stability) and different time scales (i.e. they may be immediate or take time to be produced), could take place simultaneously, so they continuously determine and influence each other. For example, as discussed earlier, the existing control rules, roles and routines could affect the configuration of the ICT system (dotted horizontal arrows between squared boxes and ovals in Fig. 2.3). However as these rules, roles and routines are codified in order to be embedded in the ICT system, they could be modified themselves (dotted horizontal arrows between ovals and squared boxes in Fig. 2.3).

Furthermore, the two processes of ICT and management control change often overlap. For example, when the members of a company use ICT, and consequently they constitute, maintain or change it, they reproduce the control rules, roles and routines embedded in it, either by reinforcing them (more typically) or by transforming them (less frequently). These effects are often not consciously reflected upon by users, who are generally unaware of their role in either reaffirming or disrupting existing control rules, roles and routines. When users conform to the ICT’s embedded rules, roles and routines, they unwittingly reinforce them and so sustain the institutional structures in which the technology is deployed. When users do not use the ICT as it was intended, they may undermine and sometimes transform the embedded rules, roles and routines, and hence challenge the institutional context and the strategic objectives of the ICT’s creators, sponsors and implementators. Thus, the appropriation and use of ICT by the members of an organization (arrow g) implies a change or reinforcement of the rules, roles and routines embedded in it (arrow c) and, consequently, of the institutional properties of the organization (institutional consequences of interaction with technology) (arrows d and h).
Finally, the complexity of the relationship between the ICT and management control processes of change is further enhanced by the interaction of other multiple factors, which might be of both organizational and extra-organizational in nature, and which could affect all the individual elements and relationships shown on Fig. 2.3 (organizational culture, human action, ICT, management control rules, roles and routines, etc.).

All the aforementioned complexities make it difficult – and even impossible – to predict the outcome of a specific intentional attempt to introduce a change that involves ICT and/or management control (in order to put the accent on such impossibility, Quattrone and Hopper [2001] suggest replacing the concept of organizational change with the notion of “drift”). However, a recognition of all the interrelationships which form the framework depicted in Fig. 2.3, will enable those involved in the processes of change to anticipate and to be sensitive to the potentialities, the issues and the difficulties which can arise and, hence, to act in manner which exploits the synergies between the ICT and management control process of change and avoids possible problems.

Thus, the framework described above is not an attempt to reduce to simple terms the complexity of the ICT and management control processes of change. On the contrary, we want to highlight this complexity and, in the meantime, to provide a means of understanding it. Furthermore, this framework could help researchers to explain the relationships between ICT and management control processes of change in specific organizations, after they have taken place. At the same time, insights from such interpretative case studies could also be used to refine the theoretical understanding itself. Thus, detailed interpretative case studies are needed in order to comprehend the complexity of the ICT and management control processes of change. The following section is built around one such study, concerning the investigation of ICT and management control processes of change within I.V.V., an Italian medium-sized firm.

2.4 The Case Study

2.4.1 The Methodology

The empirical evidence which is used in this paper is based on an ongoing longitudinal case study of an Italian medium-sized firm.

Our contacts with the company began in November 2001, when, on the occasion of a seminar organized by the University of Siena on the theme: “Integrated information systems for SMEs: potentialities, limits and benefits”, it was agreed about a research co-operation.

The primary method of data collection has been in-depth interviews with personnel from different levels of the organization and from various functions. In order to appreciate the evolution experienced by the ICT and the management control
function during the period of our investigation, the same persons have been inter-
viewed several times. To date, approximately 15 interviews have been conducted,
mainly as unstructured or semi-structured discussions in order to minimize inter-
viewer bias. For the same reason and also to talk in a more confidential way, the
interviews were not tape-recorded.

Our data, however, are not limited to that gathered in the interviews: a large quan-
tity of internal material has also been collected. Furthermore, our co-operation with
the company is not limited to this research, it is also related to a certain amount of
internal training activities. This dual role gives us wide-ranging access to the organi-
zational setting and allows us to participate actively in the process of organizational
transformation.

2.4.2 The Firm

The focus of the case study is I.V.V. – Industria Vetraria Valdarnese, an Italian
medium-sized cooperative society which operates in the glassware sector (for home
use and gifts) since 1952. Its workforce is composed of 140 people (of which 128
are “partners”) and its sales are around 17 million Euros per year. In 2008 its profits
were approximately 170,000 Euros.¹

About two million items are produced per year; the company catalogue contains
over than one thousand products (which, if we consider the possible variations of
each product – some can have as many as than fifty variations! – there are nearly four
thousand separate products). This makes I.V.V. one of the leaders in the glassware
sector, both in the national and international markets.

2.4.3 The Adoption of a New Integrated Information System

Our research has explored the process of change that has involved ICT and the
management control function in I.V.V. since the year 2000, when a new integrated
information system was implemented.

The decision to adopt the new system was taken in 1997 by the top-management
(Direzione Aziendale [DA], composed by the Director and the Production, Sales
and Administrative Managers). Various factors jointly influenced this decision. In
the opinion of the interviewees the main ones were the following:

- *Increased complexity of the business management.* Although largely artisan
  production, I.V.V. is a medium-sized firm which requires management to con-
  trol a multitude of dimensions: millions of goods produced per year, thousands
  of different articles, many clients both in Italy and abroad, etc. The management

¹ The relatively low amount of I.V.V. profits is due to the particular form of the society. According
to the Italian system cooperatives have some restrictions about their abilities to earn profits.
of this complexity had already induced I.V.V. to modify its previous information system in the early 1990.

- **Inadequacy of the previous information system.**

  *Need to renovate the system’s technology.* The previous information system had been built on a rigid, Unix, environment and in a programming language which is no longer used (Cobol).

  *Need to achieve a greater system flexibility.* The need to manage the rigidities of the previous system had already made it necessary to support it with other computer applications but, as Paolo Casalini, the Assistant Manager of the Product Planning and the Person in Charge of the Packaging and Shipping Department, testified:

  > We bought new functionalities, but while we used them we realized that there was somethings we could not do.

  *Need to achieve stronger system integration.* The previous system was made up of a series of standard applications customised to the peculiarities of the business by internal employees or external consultants. However, each application was different from the others and each time a new functionality was implemented, new interfaces to integrate it with the others had to be produced. Nevertheless, as Marco Casucci, the Manager of the Data Processing Center (Centro Elaborazione Dati [CED]), remarked:

  > ... often the data passages from one computer application to an other were manually made. Obviously, the copying by hand of the information that came out from one application to put them in another one, required us a lot of time: if someone asked us ‘How much are the total sales today?’ we could not give him the answer in less than five days, when the information was no longer necessary.

  *Need to improve the system’s efficiency.* The increased need of information due to the greater complexity of the business and the rigidity of the previous system, linked to the relative low number of employees in charge for the business information flow (two persons which on the half of 2002 enlarged to three) were the causes of the increased inefficiency of the CED (the office responsible for the information management). It was necessary to support the CED Office to give reliable and timely information and, moreover, to allow managers and final users to consult the database directly in order to extract the information they need.

- A relevant factor in the decision to implement a new integrated information system was the relative inadequacy of the previous legacy system to deal with the Y2K problem and the euro currency.

- But, above all, as claimed by most of the interviewees, the choice to renew the information system had been a strategic decision. In this respect, Marco Casucci, the Manager responsible for the CED Office, admitted that “it was strategic to make the change”, because, in the words of Dino Guidelli, the Director of I.V.V.:

  > The previous system was quite simple and it would have not allowed us to develop both our internal and external business.
However, the decision to change the previous information system rapidly showed itself to be a contingent choice, rather than a strategic decision. If we consider the huge developments of the ICT and the increase in I.V.V.’s business complexity in recent years we can easily assume that the previous system would soon have been stopped working.

I.V.V. chose not to buy a pre-constituted information package (ERP) in order to protect its critical source of advantage. I.V.V. strongly believes that its business processes are unique and crucial to the success of the company. Since they did not want to change their way of doing business in order to employ an enterprise system offered by the market, the DA chose to produce a customized application: the only standard package implemented was the administrative one, which had been developed using proprietary application modules.\(^2\)

Furthermore, it was decided to involve the final users in the configuration of the new system, even though it would require numerous discussions and, consequently, longer times for implementation. The participation of the final users in the configuration process was judged the best solution because:

- the final users know in more depth the business activities and the actual information needed; consequently, their participation ensure the efficiency of the system as well as being an important vehicle for training;
- the involvement of the final users also helps to reduce internal resistance to the new system.\(^3\)

Thus, the DA decision was limited to the strategic management of the implementation process of the new information system (i.e. it was its responsibility to define the objectives and to supervise their achievement). The operational management of the project was the responsibility of consultants, the CED Office and all the other business functions members which took care of this on the inside of the work groups specially composed for the configuration of the system. Five groups were created: (1) Gruppo Direzione (Top-management Group); (2) Gruppo Amministrazione (Administrative Group); (3) Gruppo Commerciale (Sales Group); (4) Gruppo Produzione (Production Group); (5) Gruppo Logistica (Logistic Group). These groups can be defined as “fundamental groups”. There were also several other groups which were called together from time to time to discuss particular problems (such as the Purchasing Group, etc.). Targets of the groups were to:

\(^2\) The choice to implement the standard administrative package is due to the peculiarity and complexity of the Italian fiscal and economic regulation and because it isn’t a key process for the I.V.V. success. Using a standard solution makes it easier to revise the system for the changes which often occur in national regulations: it is the responsibility of the seller to update the system in order to follow the change in the law.

\(^3\) Related to this, it is important to remember the particular form of the society: in a cooperative firm where more than the 90% of the employees is also partner decisions imposed by the top-management cannot be easily accepted.
• standardize the business processes and practices:
  • explain the I.V.V. business process to the consultants and to the CED members;
  • list the information needs;
  • choose/assess the validity of the solutions proposed by the CED members and the consultants;
• learn to use of the system;
• test the new system (and its modules) before deployment and, hence, demonstrate through use that employees know what they have to do and that the system could be sufficiently stable.\(^4\)

The meetings of the work groups took place in 1998 and 1999. In the same period the modules of the new information system were produced. The deployment of the new integrated information system started on 2nd January 2000. After 3 months the whole system was operative (the implementation process is shown in Fig. 2.4).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose of the consultant</td>
<td>Consultant - DA meetings</td>
<td>CED training</td>
<td>Work groups</td>
<td>Go-live</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>System configuration</td>
<td></td>
</tr>
</tbody>
</table>

**Fig. 2.4** Implementation process scheme

---

\(^4\) Each group comprised a few people (the biggest one, the Production Group, had 7/8 members) and it convened one/two times a week for about 3 h (from 3:00 p.m. to 6:00 p.m.) within the span of different periods on depend the particular group. For example, developing the module to manage the bill of materials (considered the crucial factor for the company success) required about 1 year of meetings. The others were more brief. For each meeting minutes were produced. This has been important because:

• making clear and formalizing what emerged from the meetings reduced the risk of misunderstandings (some meetings had been very inflamed);
• the minutes maintain memory of the decisions taken during the meetings (often many days passed before one group got together again: it could cause the dispersion of some information);
• the minutes were always read by the DA which could ensure all decisions were coherent with the goals they had been originally fixed (if they were not, the next meeting would start with the re-discussion of these decision).
2.4.4 The Management Control Change Process

In this section of the paper we analyze the change that has been involved the management control function in I.V.V. since the beginning of 2000, when the new integrated information system was adopted. In particular, we focus on the transformations that have interested the work and the role of the controller in the broader organizational process. Thus, we use a narrow concept of management control as compared to the traditional concept, which encompasses all those practices which are primary directed to guide managers in achieving the objectives of the organization (Otley, 1994; Riccaboni and Merchant, 2001; Catturi, 2003).

Since the deployment of the new integrated information system, the management control function in I.V.V. has experienced several changes, which could be considered in part as consequences of the implementation process.

Referring to this, it has to be said that any advanced management control technique (Activity-based Management, Balanced Scorecard, etc.) has not been introduced with the new integrated information system. Furthermore, the initial configuration of the system did not include any specific functionality to support the management control function: the budget and all the reports continued to be produced using the spreadsheets developed by the controller, with the some help from the CED Office. Although the new system has not led to the introduction of new, more sophisticated management control techniques, nor to the computerization of the control tasks, there have been changes in this function.

First of all, some transformations have been a consequence of the integrated management of the organizational information flows. Before the implementation of the new system, the controller had to apply to the CED for most of the information he needed. By the 1990s such requests for information by the management control and other organizational functions had become excessive for the CED, which had difficulties meeting them. As a result, the information provided were progressively less reliable and timely. As previously described, the need to solve these problems was one of the reasons that motivated the decision to change the previous information system (but it was not the only, nor the main, reason). Thanks to the implementation of the new system, the controller is now able to directly consult the database (without asking to the CED) to extract nearly all the information he needs.

In addition, the new system provides much more information which is also now more reliable, timely, integrated and articulated. Thus, the controller can now provide more articulated budgets and more frequently reports, which are more often used by the management in taking its decisions. As testified by Paolo Casalini, the Assistant Manager of the Product Planning and Person in Charge of the Packaging and Shipping Department:

The previous system provided only final information. So, it was impossible for us to change before negative effects had been produced. With the new system we can also do some simulations. A great progress had been made, for example, with the implementation of the module which manages the bill of materials: before that, sometimes we decided the price of our product at random!
Consequently, besides the management control techniques are formally the same, they are now substantially different and used in a different way.

Secondly, with the adoption of the new information system, and in particular as a consequence of the work groups organized for its configuration, all the business processes have been modified in order to make them simple and more efficient, and the whole organizational structure has been altered. This fact has led to a change also in the management control function and principally in the cost accounting system (84 different cost centres have been identified compared to the 19 before).

Third, the adoption of the new integrated information system has had some impacts also on the management control activities. Nevertheless, opposite to what might be expected, the new system has not eliminated any routine jobs for the controller. Although some of the controller’s previous routine jobs are now carried out automatically by the new system or directly by the operating personnel, most of them have remained of his responsibility and additional others activities have taken their place. To give some examples: with the new information system some of the reports about the sales and the stock are now directly managed by the departments responsible. Furthermore, the allocation of costs among the different cost centres is largely done automatically by the system or at the time of the data input (when the operating personnel enter a cost into the system they also insert the cost centre for that cost). However, this elimination of previously routine jobs has been accompanied by an increase in other activities. In particular, during the implementation, the controller worked for months to create historical information about the new cost centres (i.e.: he had re-process many of the invoices of the previous years in order to re-allocate the relative costs). Now, the controller has to constantly check the allocations of costs (i.e. whether the input made by the operational employees is correct). Initially, until employees acquired familiarity with the new information system and the new accounting language, the controller verified all their inputs into the system, but nowadays he restricts his control to random tests.

Thus, many of the controller’s previous routine activities continue to be done by him. But though he can now directly obtain the information he needs without asking the CED Office, he still has to copy information from the system to his spreadsheets and this occupies a considerable amount of the controller’s time. Remember the system initially did not include any specific functionality to support the management control function. Consequently, almost all the controller’s time is still spent doing routine jobs (relocation of the information from the system to the spreadsheets, checking the accuracy of the information, drawing up of the financial reports, and so on . . .).

Fourth, as mentioned before, the adoption of the new information system has contributed to another important change: by infusing “non-accountants” with a common language of accountability based on financial and non-financial metrics, it has stimulated the progressive diffusion of a new shared vocabulary based on management accounting and control knowledge. For example, having to input cost centres for every particular cost each time they register it into the system, employees have started to understand what a cost centre is and its function and, consequently, the importance of their correct data input for the firm’s results.
Moreover, due to the new system, the controller can rely on more timely information which allows him to provide managers with monthly reports. Thus, every month top-managers discuss variances, ROI, ROE, and many other financial (and also non-financial) performance measures. As a consequence, at least the top-managers within I.V.V. are increasingly understanding the financial and control aspects of their own activities.

All these things have played an important role in the process of diffusion of a new language. This process, once started, continues to feed itself: beginning to understand a new language creates enthusiasm and, consequently, interest in it. Then, when a certain language starts to spread, people who do not know it feel themselves “shut out” from the business management (for example, when financial reports are discussed in the general meeting). Many employees, nowadays, would like to understand better the performance measures provided during the company’s general meeting and how the business is managed (an indication of such interest is that at the last training course arranged for I.V.V. employees, the module on management control was the largest participation).

Referring to the last point, we want to underline the role played by the controller in the diffusion of the new control language. Since the initial configuration of the new system his role has been of paramount importance: he has participated in most of the work groups and he has been one of the main people responsible for creating the new “rules of the game” (identification of the cost centres, etc.). Moreover, he has played a key role also in teaching the workforce new concepts useful to the efficient use of the new system. As recognized by all the interviewees:

Claudio [Salmeri, the controller] is an obstinate, meticulous and very competent person who strongly loves and believes in his work and puts a great effort in doing it. He is always obliging to anybody who needs his aid. Furthermore, his help doesn’t stop at giving the information required, but he wants to be sure that we have completely understood all the underlying logics.

An evidence of the value of the controller’s work is a report (2–3 pages long) that he monthly submits to the DA since the 2001, where he gives some interpretations to the management control data provided. Nobody ever requested to the controller to set down such document, but he decided to do so because:

“The work I was doing was not appreciated and understood. The DA did not make use of it in taking its decisions” (Claudio Salmeri, I.V.V. controller).

Initially the report was not considered by the members of the DA to be of much importance, but as the time passed much more attention has been given to it and nowadays the controller himself is invited to take part to the DA meetings in order to explain his report.

At the beginning of 2003 something else changed in I.V.V. management control’s function: some specific functionalities to support this particular function were included to the system. More specifically, two different computer applications were deployed: one for the allocation of overheads to products and one for the management of the budget system. Referring to the latter, it has to be said that the decision of implementing it was taken since 2001. However, at that time it was chosen to not adopt this particular functionality because the budget application offered by the
consultant was judged as not sufficiently reliable. This application, in fact, even if included in the software package offered by the consultant, had never been tested before and the controller, in his assessment of it, found many defects. Thus, during all the year 2002, the controller, the CED responsible and the consultants have worked together in order to check and to correct these defects, to strengthen the system and to customize it.

The adoption of the new functionalities has led to a substantial reduction in the controller’s routine jobs, even though much time is still spend on checking the data and information produced.

The process of management control change in I.V.V. is still ongoing. Furthermore, in the next future this process is expected to accelerate or, at least, to be more evident, as I.V.V. managers are now assessing the possibility to implement a Balanced Scorecard.

2.5 Findings and Preliminary Interpretation

The study of I.V.V. offers an insight into the complexity of the interrelationship between management control and ICT processes of change. In this case it is possible to identify many of the potential linkages between the two processes.

First of all, it has been possible to see how management control can be one of the reasons for ICT development: the new integrated information system was introduced in I.V.V. also in order to offer to the controller the more reliable, timely and articulated information he needed and to allow him to have a direct access to the information without the intermediation of the CED Office.

On the other hand, the ICT process of change itself can be one of the reasons for management control transformation: the adoption of the new integrated information system within I.V.V. has stimulated numerous changes on the management control function. The more integrated, reliable, timely and articulated information provided by the new system has allowed a greater efficiency of the function; the reform of the organizational structure has led to a modification in the cost accounting system; both these factors have also induced different reporting practices and schemes in order to gather and show new and different information. Furthermore, as described before, the adoption of the new integrated information system has also encouraged the change in the management control activities, in the role of the controller within the enterprise, as well as in the nature of management control.

Nevertheless, such changes are all of indirect nature. The implementation of the new integrated information system has had no direct impact on the management control system and practices: so far, no advanced management control technique have been adopted; furthermore, until some months ago, the new system had even not included any specific functionality to facilitate the controller to accomplish his particular tasks.

However, by the beginning of 2003 two computer applications have been included in the system in order to support the management control function. This time lag may be explained in economic terms: only once all the functionalities
needed for the company to maintain its basic activities and to meet legal requirements worked well, could extra complexities be added to the system for the management of the other activities (such as management control). In that way, the ICT process of change can be viewed as one of the reasons for management control stability.

Nevertheless, if this may be a probable explanation of the time lag between the first implementation of the new integrated information system and the design and deployment of some functionalities to support the management control, it is not the only possible justification to it. The potential reasons are multiple and only considering all of them and their continuous inter-play we can really understand the causes of a certain process of change. For example, another reason which may explain the aforementioned time lag could be linked to the specific organizational culture.

When the new integrated information system was built, management control was not considered as a priority: at that time in I.V.V. there was no “control culture” (see also Catturi, 2000; Catturi and Riccaboni, 2001). Thus, it was not judged necessary jeopardize the system in the first phase adding extra functionalities to support the management control (institutional conditions of interaction with ICT: arrow e in Fig. 2.3).

But, since that time, the interest on management control has considerably grown, in part due to the implementation of the new information system. As just mentioned, such implementation has caused some changes in the management control rules, routines and roles (dotted horizontal arrows between oval and squared boxes). Furthermore, through time, the employment and continued use of the new information system by the member of the company (arrows f and g) has continued to stimulate the diffusion of new management control rules, routines and roles (arrow j). For instance, the availability of the more timely, reliable, articulated and accessible information offered by the new system has gradually stimulated the managers to meet together more often – every month – to discuss about the wider range of financial and non-financial performance measures provided them by the controller. In addition, it has enabled to produce better forecasts, facilitating a more forward-looking emphasis in the use of management control information.

However, this change has required time and it is still ongoing. As testified by the controller, even after over a year since the first implementation of the new information system, the DA did not make use of much of the management control information in taking its decisions. For this reason, starting from 2001, the controller decided to integrate his monthly report with a 2–3 pages long interpretation of the data provided. This report is one of the controller’s activities which have stimulated and sustained the progressive diffusion of management control knowledge and competencies within all the company’s members. These activities encompass the daily support tendered to anyone who needs his help and aimed not only to submit the information required, but also to enlighten and explain to the counterpart the logic which stand behind it.

Moreover, the progressive diffusion of such management control knowledge and competencies have also allowed, through time, the spread of a new language within
I.V.V. and a new wider and more significant role is now starting to be assigned to – and covered by – this function.

The continue enactment and reproduction of such new management control rules, routines and roles through time (arrows b and c), has led the employees and the managers to find mutually acceptable ways of working, i.e., some management control practices have become institutionalized (arrow d). For example, nowadays, at I.V.V., the controller is expected to draw up a monthly 2–3 report where he provides an interpretation of the management control information. Not only, he is also expected to take part in the DA monthly meetings in order to personally explain his report. Consequently, the logics underlying this practice are becoming institutionalized. The I.V.V. organizational culture and knowledge is being infused with shared metrics of performance accountability and a new control culture is now progressively affirming within all the company.

However, it is important to underline that many other factors – both internal and external – have affected and are continuing to affect the change in the I.V.V. institutional culture. Firstly, a role in this change has been also played by the new integrated information system itself. Its introduction and recurrent use by the members of the company for the execution of their tasks through time (arrows f and g) has contributed to the institutionalization of some of the rules, roles and routines embedded in it, among which are the management control ones (arrow h). For example, the recurrent use of the system for inputting costs, requiring workers to enter the cost centres, has helped them to know and to better understand the I.V.V. organizational structure, its cost accounting system and some of the management control logics which stand behind it, helping and reaffirming, at the same time, the diffusion of a new language based on management control terms.

Furthermore, the institutional context outside the organization has changed a lot during the last years, deeply influencing the firm: the increased competition of the East European and Asiatic countries, the changes in the distribution system, the economic recession after the 11th September 2001, the continuous variations on the euro/dollar exchange and the consequent alteration of the methane cost (the main I.V.V. cost) are all factors that have led – and that are still pushing – I.V.V. to a change of its beliefs and practices about conducting business and towards an increased attention to management control. In such a scenario, it is of paramount importance for the managers to rely on timely information about every aspect of the business in order to make well-timed and efficient decisions.

However, even after the adoption of the new integrated information system, it was difficult for the I.V.V. managers to receive this kind of information from the controller. The reproduction of the data from the system to the worksheets, their check and elaboration and the drawing up of the reports, requested him a lot of time. Consequently, it began to emerge the consciousness of the necessity to support the controller on his work. And the ICT could provide this help (arrow i).

Thus, at the beginning of 2003, two new functionalities were included to the information system to sustain the management control function. The decision to implement a computer application for the management of the budget had been taken
at least 1 year before its actual implementation. Before adopting such functionality a great deal of work had to be done in order to make it more coherent with the I.V.V. budgeting process and, hence, to embed in it part of the existent management control rules, routines and roles (*dotted horizontal arrows between squared and oval boxes*).

The implementation of the two new functionalities represent another example of how the organizational culture may affect the ICT configuration (*arrow e*): their adoption could be interpreted also as a consequence of the diffusion of a new control culture within I.V.V.

All the aforementioned factors are still influencing the process of change on the management control function. The same influences, in fact, may explain the probable future implementation of a Balanced Scorecard and some changes that are currently taking place in the management control tasks. In particular, the introduction and continuous use of the new information system (*arrows f, g*) have progressively provided more reliable data and information. Thus, much information checking activity is no longer undertaken by the controller (only some random tests are conducted now) (*arrow j*). Then, the new functionalities recently implemented are supporting the controller in part of his routine jobs (*arrow f*). The time so saved may be assigned by the controller to provide more direct support to business managers to interpret the various financial and non-financial information with which they are faced and to assess both the operating and strategic consequences of alternative courses of action.

The increase on the relative weight of these activities (support to business managers) to detriment of the routine activities is not only a consequence of the adoption of the new computer applications. On the contrary, as mentioned before, it is especially due to the new I.V.V. institutional context (*arrow a*): the increased instability and competition that have to be faced required not only reliable and timely information about all the aspects of the business, but especially to be able to interpret them in order to made timely and efficient decisions. Thus, nowadays, I.V.V. managers are gradually turning more to the controller to ask for help to accomplish this interpretative task: a wider role for the controller is starting to emerge.

However, this particular process of change is still in its first phase: the main part of the controller’s time is still devoted to accomplishing his routine tasks. Thus, although he is ready (and he hopes and would like) to cover this broader role, he is currently prevented from doing it: he does not have enough time to transform himself to “business support” or “internal business consultant” (see also Anastas, 1997; Scapens et al., 2003). Furthermore, the managers themselves need time to recognize this new figure: they still consider the controller mainly as a “bean-counter” or “score-keeper”, so, they are disinclined to look to him for a support.

The case study described in this paper highlights the complexity of the relationship between ICT and management control processes of change. In particular, it shows that while the adoption of a new integrated information system within I.V.V. has facilitated changes in management control, it cannot be portrayed as the only driver of such transformation. The implementation of the new information system has only opened some opportunities. So far, only part of these opportunities have been exploited. To transform them into actual changes requires joint action of many
other factors of both internal and external nature. Furthermore, it is necessary also a certain period of time in order to allow organizational members to find new mutually acceptable ways of working through a complex process of mediation.

Thus, many of the changes in management control in I.V.V., even if stimulated by the implementation of the new information system, cannot have been produced, for example, without the action of the controller who has believed in change and worked for it. However, the effort of the controller itself could have been vain if it were not sustained by the DA (about the role of the top manager in the evolution of the management control system see also: Fligstein, 1990; Euske and Riccaboni, 1999). And, at least in a first moment, it was so. But, as time went by, the aforementioned factors (recurrent use of the new information system, behaviour of the controller, etc.) jointly with other changes in the external institutional context (increased competition, economic recession, etc.) have led towards an increased attention on management control, facilitating its change.

In short, the management control change process in I.V.V. has been – and still is – the result of a continuous interplay of multiple factors of diverse nature (among which are the implementation of a new information system) and the outcome of a complex mediation between organizational members.

2.6 Conclusions

This paper seeks to offer further insight into the interrelationship between ICT and management control processes of change. Through the experience lived at I.V.V. we have had the opportunity to go into the nature of these processes of transformation and to explore them in more depth, and as a result we have developed an institutional framework to interpret how and why ICT and management control systems evolve across time.

More specifically, there is mutual interdependence in the relationship between our theoretical framework and longitudinal fieldwork in I.V.V. While, on the one hand, the case research has contributed to our search for an institutional explanation of the evidence experienced and collected, on the other hand, the empirical data itself may be illuminated by the theoretical insights gained from the framework.

For this reason, as the research is still in progress, both the theoretical perspective and the case study will be further developed. In particular, a specific attention will be paid to trying to understand how the SMEs peculiarities and, moreover, the specific features of the cooperative firms could affect the ICT and management control processes of change.

References


Catturi G (2000) Cultura del controllo e gestione del segnale informativo contabile, Quaderni senesi di Economia aziendale e di Ragioneria, serie interventi n. 61, Siena, Copinfax.


Business Performance Measurement and Management
New Contexts, Themes and Challenges
Taticchi, P. (Ed.)
2010, XXI, 376 p., Hardcover
ISBN: 978-3-642-04799-2