

Briefing 09.03

Management control systems in
multinational organisations:
the effects of implementing ERP

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Background and research aims

This research studied control, especially at higher management levels, in two multinational organisations (MNOs) following Enterprise Resource Planning Systems (ERPs) implementations.

It was of interest for two reasons:

First, accounting in large organisations is often discussed in terms of centralising or decentralising control. Accounting is important as it gathers information on remote subsidiaries and thence helps control them. However, accounting measures are taken for granted: how organisational members, including accountants, define important information is often neglected. Controllers in large, complex organisations face problems of diversity and choice, for example, different accounting procedures and legal requirements in various countries; cultural differences across continents; varying sophistication of accounting procedures. Thus, especially in change periods, the process of establishing accounting technologies is important. Key research questions were:

- How does diversity affect management control?
- Is globalisation making accounting and control systems homogeneous?
- Does employee resistance affect management controls during change?

Secondly, MNOs are an important terrain for management controls employing new information technologies (IT), including ERPs. Their headquarters (HQ) must manage subsidiaries often scattered across five continents. How HQ obtains information to create a virtual vista for them to 'see', and thence control subsidiaries is crucial. Key research questions here were:

- How does the **process** of implementing new IT, especially ERP, affect management control?
- What is the impact of ERP upon traditional accounting systems and controls, such as budgets and divisional performance evaluation, and the roles of accountants, controllers, and the controlled?
- Do integrated real time information systems collapse distances between HQ and subsidiaries, thereby enhancing central control?

Key research details and findings

The case studies

The research drew from case studies within an American and a Japanese MNO. Senior managers, system implementers, users, and accountants were interviewed, documentation was collected, and limited observational data was obtained. Further interviews, emails, and the feedback of preliminary reports clarified and developed emerging issues, and checked the validity and reliability of observations.

ERPs seek to integrate the information needs of all departments and business functions in a company using a single computer system. A shared database can give real time data from multiple locations (assuming they have access) on any segment of the MNO. Adopting best practices as standard throughout the MNO should produce productivity savings. The research concentrated on accounting and control issues arising from implementing ERP.

The study of the Japanese MNO commenced in the sales and distribution function of its European HQ and culminated with a visit to central HQ in Japan. The MNO markets office automation products, and industrial and domestic sewing machines. It has manufacturing and selling and distribution facilities in Japan, the Far East, Europe, and the USA. The American MNO manufactures and supplies home building products and composite materials worldwide. The case concentrated on links between an UK subsidiary providing insulation products and the USA central HQ, which operated via a regional HQ in Brussels for its European businesses. Interviews were conducted at each location in the UK, Belgium, and the USA.

The choice of MNOs proved fortunate, as both had recently implemented the same ERP system. Thus the researchers could observe why different ERP configurations, management control methods, and accounting ramifications emerged.

Enterprise Resource Planning Systems: what do controllers want to see?

Nowadays using personal computers and various software packages is commonplace. Acquaintance with pre-purchased software packages can lead potential ERP purchasers to believe that ERP has well defined, predetermined characteristics and functions. However, both organisations found, unlike many simpler software packages, this was not so. ERP is not immediately ready-to-use, nor was its application a matter of appropriately training staff to use given functions and commands. Both MNOs purchased virtually identical ERP systems, commenced implementation at broadly the same time (mid to late 1990s), and both cloaked it in the rhetoric of a global integration strategy. However, each ended up with very different systems. The Japanese MNO undertook limited evolutionary change: ERP made existing transactions more efficient in parts of the organisation, whereas the USA MNO made revolutionary changes leading to almost all operations being controlled by a single, real-time, integrated system. Why was this so?

Implementing ERP in both MNOs brought major reviews of existing routines, business processes, and accounting systems. It was not merely an issue of using the new IT to reproduce and speed up current practices or modifying them to meet the system's constraints. ERP forced senior managers, including financial directors and controllers, and local managers, to re-assess their information needs and philosophy of control. However this was not a linear, logical process of determining ERP aims, redesigning systems and procedures, training users in new methods, and then operating them. Intentions were redefined during implementation. The standard package was transformed through learning, mediation, and customisation.

ERP implementations are learning processes, which proved to be evolutionary and unpredictable. Organisations face considerable choice on what parts of an ERP package to implement: it is malleable. Managers had only approximate ideas and myths about what it could deliver. On first acquaintance, according to one manager, ERP appears to 'Do anything!'. Initially, senior managers in both MNOs, especially IT specialists, saw ERP as a means of integrating operations globally in real time. However, user needs were diverse, often not clearly articulated or understood, and frequently discovered during design, implementation, and operation. Training prior to usage tended to be ineffective: external trainers were of little help.

Most learning about the technological possibilities and constraints of ERP, and many subsequent changes came post-implementation following 'learning by doing'. For example, in the USA MNO new ways of analysing prices and informing customers about the progress of orders emerged after implementing ERP. Five years after starting

to implement ERP, managers were still learning new functions. The discovery process was, especially in the USA MNO, often chaotic, lengthy (more than three years), and unpredictable.

Abstract integration ideals did not become meaningful, pressing problems for managers until they realised that they must agree how to represent global operations using a common technological platform (ERP). Getting accountants, controllers, and managers to concur what they should appear on their PC screens was a long and perilous journey. Mediations between functions, geographical locations, hierarchical levels, and IT technologies shaped the eventual configuration and usage of the new technology.

Negotiations over what could, should, and would be made visible proved vital. For example, managers were habituated to local ways of calculating costs and margins, and performance evaluations based on budget variances. In the USA MNO standardisation needs provoked disputes over how best to represent operations with respect to overhead allocation, transfer pricing, inventory valuation, and which currency to use. Managers found previous well-understood key indicators and variances in their 'Green Book' (official accounting manual) were not automatically revealed by the ERP. Running previous reports on Excel spreadsheets and inputting them to the ERP resolved this. It enabled local users to retain some diversity whilst giving HQ the uniform aggregated reports it desired. Compromises had to be made. For example, an Italian subsidiary retained another ERP system because the cost of converting the new ERP into Italian or retraining Italian staff to use the English system was prohibitive.

However, mediations resulted in contrasting ERP applications and redefined objectives in each MNO. The Japanese MNO had a complex structure of routing orders and financial transactions to and from manufacturing and selling subsidiaries through regional HQs and central HQ in Japan. When managers realised the organisational disruption that a fully integrated ERP might cause, the project was restricted to speeding up existing transactions and incorporating best practices in selected parts of the MNO. More dramatic change was rejected due to an organisation culture of incremental change, consensus seeking, and a desire to retain existing organisation structures, power relations, and traditional methods of control. In contrast, the USA MNO pursued a revolutionary fully integrated, real-time system and dramatically changed its organisation structure.

Especially in the USA MNO, incorporating local managers' and accountants' support entailed incorporating some diversity. In the words of a manager interviewed: *'The good [thing] about ERPs is that they can be customised. The bad [thing] about ERPs is that they can be customised!'* Initially many managers tried to preserve existing systems and/or preferred ways of operating through customisations and add-ons. But customisations are costly and in-house capable programmers were sparse and highly sought after. Moreover, customisation proved problematical when new versions of the ERP package emerged. It was expensive and operationally fraught to redo customisations, and often reactivated cycles of mediations and learning amongst managers with uncertain outcomes. The greater the difficulties in agreeing and translating wants into operational business processes and IT procedures, the greater the probability that the ERP implementation will fail. In addition, doing so is expensive, unpredictable, and fraught.

However, despite their differences, both MNOs implemented operational and feasible systems that satisfied managers. Although, given their different contingencies, aims, timescale, and cultures evaluating relative success is difficult.

'Real time' management control systems (MCSs): a dream or nightmare?

MCSs and IT define, manage, and ultimately reduce distances between HQs of MNOs and scattered subsidiaries. It is argued that new forms of IT (along with other communications) 'shrink' the world, i.e. eliminate distance. Distance has two dimensions: space – the physical distance between two idealised poles (be it the 'controller' and the 'controlled', or HQ and subsidiaries); and time – how long information takes to flow between two poles, e.g. between determining plans at HQ, their execution in subsidiaries, and reports on the subsidiary's performance to HQ.

Accounting and distance is under-researched and problematical. MCS tools such as budgets and divisional performance measures create and reinforce spaces between poles, for example, by defining divisions and HQ, production departments, and line and staff functions. This creates distinct 'islands' of localised jurisdiction that require co-ordination and control. Accounting procedures and measures resolve this by establishing relations between controllers and the controlled, for example by allocating responsibilities for tasks and targets, monitoring progress, and establishing accountability systems. Paradoxically, accounting creates distance between organisational units and then claims to solve its problems by transforming abstract power relations into practical routines. Its key variables represent distant 'islands', which enables controllers to 'see' what is happening without physically visiting them. Thus accounting permits 'decentralised-centralisation' whereby HQ concentrates on strategy, establishing and monitoring subsidiaries' performance targets, and troubleshooting. Subsidiaries are treated as black boxes: how they reach financial targets is their prerogative providing they are attained.

Accounting systems order MNOs by creating pools of local discretion within systems of centralised accountability. ERPs challenge this. ERPs are sold on their potential to integrate activities globally in real time, which ruptures traditional boundaries between segments ('islands'), and challenges accounting systems that formally exert periodic control (e.g. monthly reports). With ERPs control can be exerted at any point in the organisation, from different vantage points, at any time. This redefines staff's habitual notions of time and space, and may provoke resistance and attempts to restore previous systems.

The American MNO implemented ERP to deploy a 'global, common and simple' MCS. They wanted to eliminate distances between HQ and subsidiaries by fully integrating business areas and functions. This had consequences for accounting. Data was now stored centrally in a common database in real time. Staff inputting data or outputting results were now not necessarily in the accounting department (e.g. the purchase department made entries for raw materials). This created problems. For example, before ERP financial analysts in subsidiaries used some accounts to record costs for purposes not in the official HQ manual. Plant accountants avoided reconciliation problems by reducing the balance to zero at period ends. Thus some local diversity and flexibility within ostensibly uniform accounts was possible because of time delays. However, doing so within ERP created difficulties. Accounting ledgers were now kept in real time on the centralised database: local adaptations led to inaccurate accounting data. This was eventually resolved by ensuring everyone uniformly posted to central accounts.

However, accounting data was no longer controlled by subsidiaries. Posting accounts at different points of the organisation meant local managers could arrive at work and face HQ questions based on accounts different from those when the manager left work the previous evening. Tracing reasons for differences was often difficult. Managers found it difficult to track errors in data posting or why accounts had unexpectedly changed, and thence to relate their actions to the data on their screens.

This led some managers to restrict access to postings or insist they be informed in advance but these attempts largely failed. Moreover, local managers now found it difficult to manipulate accounts under real-time accounting to influence results prior to periodic accountability meetings: they were no longer masters and guardians of their local accounts. Overall, managers felt a loss of control.

Implementing ERP led to a matrix organisation in the USA MNO but ERP exacerbated its problems. It used ERP to break down functional separation by integrating activities and providing real time visibility. Now business activities could access data immediately from different locations (the collapse of space) and controllers could access business results simultaneously or sometimes before those responsible for them (collapse of time). However, this did not necessarily enhance control in the conventional sense, which relies on separations between controllers and the controlled, and an MCS that creates and enhances distances between them. The diffusion of responsibilities and data inputs made it difficult to hold organisational actors and segments accountable for their actions, which left the MNO in a state of continuous flux.

The Japanese MNO achieved contrasting results. Here managers implemented ERP to prevent greater integration between HQ and subsidiaries, to maintain distances between controllers and the controlled, and hence retained traditional notions of control, contrary to the initial rationale for ERP from its advocates within the organisation and purveyors outside. This challenges assertions that ERP systems inevitably enhance integration and reduce distances in organisations.

Changing MCSs: who (and what) leads the change?

How did ERPs wreak MCS changes? First, ERPs offer integration and standardisation but they are flexible and malleable. There is no direct casual relation between implementing an ERP, greater integration, and better control. Implementing ERP is an act of faith. Second, the implementation process produces unexpected developments. The end point (if one is ever reached) may be different from initial expectations, which are often vague. In both cases the ERP configuration and MCS changes did not stem from the centre but from complex dynamics involving mediation, learning, and customisation at local levels. Centrally imposed strategies became modified and translated in different organisational contexts. For example, the Japanese case illustrates how ERP technologies can be moulded to reflect dominant organisational cultures and power relations. ERP was restricted to automating, standardising, and making existing transactions more efficient. It thus reinforced traditional methods of control and distance. In the USA MNO a more revolutionary system was adopted that collapsed distance but some diversity was maintained through customisation and mediation.

This is linked to the 'decentralised centralisation' issue and the effect of ERPs. In the Japanese MNO, its European and Japanese HQs retained power using conventional MCSs that preserved islands of devolved control. Real-time, integrated ERP systems were used to reproduce 'decentralised centralisation': revolutionary change would have threatened existing structures of order, perhaps diminishing HQ control of operations in Japan and leading to the abolition of regional HQs. In the USA MNO an integrated, central, real-time database gave the possibility of increased central control and co-ordination, for they could now 'see' all operations worldwide in real time on their computer screens. However, this was an illusion, for local managers and mediations created the ERP and its constant evolution: HQ could not directly control its usage or design. ERP accumulated accounting data centrally but the collapse of distance ruptured traditional boundaries between departments, functions, geographical areas, and hierarchical levels. Individual accountability and personal feelings of 'being in control' were reduced by dispersion – not increased central

intervention. This brought decentralised ERP data usage. For example, prior to deploying ERP the UK subsidiary's performance was evaluated centrally from regional European headquarters in Belgium. The plant analysts (plant accountants) had to wait for data from the centre to know how his plant was performing relative to sister-plants across Europe. The centre then gave instructions on how to improve performance and profitability. With ERP, plant analysts could constantly benchmark their plant with others in real time, seek advice from other plants and service centres, and take remedial measures, unbeknown to the centre. Such processes emerged across all plants and areas of activity. Thus a multitude of centres of control emerged. It was not fruitful to identify where the centre of the MNO lay: points of control and decision-making became multiple, unstable, shifting, and constantly interacting. This MNO became neither centralised nor decentralised but 'a-centred'.

Implications for accountants and management control

The 'interdisciplinary' accountant: From controller to financial knowledge consultant?

How did ERP implementations affect accounting control and the tasks of accountants? This research found several implications. The first concerns the design and implementation of ERPs. Implementing ERP was not just an issue of learning how to use a given system. Standardisation required managerial agreement on definitions of organisational routines, such as calculating costs, and measuring performance and profits. The outcome is unpredictable, for managers' preferences evolved and changed during and after implementation. Mediations extended to structural issues. These included: drawing boundaries between HQ, subsidiaries, divisions, functions, and geographical areas; who could access and input data; which methods were 'best' – did ERP incorporate them or could it be customised? Should one ERP embrace the entire MNO or should different ERPs in different locations be tolerated? As detailed above, the results impacted upon controls in both MNOs, albeit differently. However, the outcomes emanated from implementations by managers not decisions by the financial function. Given the centrality of accounting modules in ERP packages, the accountant played an important role, especially advising and securing consensus on 'good' accounting information. But the accountant became a knowledge consultant not a systems designer. To be effective accountants required a good knowledge of ERP and other management functions, and communication and group skills. Without these the accountant is peripheral. However, possession of such skills does not guarantee retention of a central role in control.

Whatever, the accountants' job is transformed and is under threat. ERP comes with pre-designed accounting modules: potentially the accountant's role in systems design may be less, especially as they lack skills in customisation and implementation is spread across functions and often breaks down functional barriers. Once ERP is installed the accounting function – traditionally centralised in the accounting department – becomes dispersed across employees with the 'right' to post the books. Many technical accounting tasks are done outside accounting departments, often by non-accountants, or automatically by the IT system. Anyone with access can create accounting reports. This leads to what academic colleagues John Burns and Bob Scapens describe as a 'de-centering' of accounting knowledge from accounting departments to other management functions. This, coupled to standardisation and automation of information processing, reduces the number of accountants needed. What is left for accountants then? The research suggests accountants must make those with ERP access (the 'new accountants' according to an interviewee) aware of the implications of their activity. Employees posting the books in real time must understand how the accounting system works and the technical problems that ensue from incorrect entries. Non-accountants who generate financial reports from ERP databases need training on their limitations, potential, and interpretation.

Accountants in transition to financial knowledge consultants must explain the knowledge of accounting knowledge!

Where is the accounting and control function now? Trends towards centralisation and decentralisation

The fragmentation of accounting following major ERP implementations deprives accountants of their privileged status in establishing and administering management controls. Potentially, anyone with access to the ERP database can generate financial reports in various formats, degrees of analysis, and aggregation. This diffuses decisions and accountability, and makes it harder to establish who is driving organisational change and why.

Control traditionally denotes prescription: feedback controls designate right courses of actions and monitor progress accordingly. But this was questionable when it became unclear who was prescribing what to whom. In the USA MNO the loci of control became more diffuse, unclear, shifting, and constantly evolving. New representations of performance and relevant information emerged continuously, often at local levels. Accountants were no longer masters of the control system or financial data. This being so then accountants and their controls may have to be less prescriptive. Instead their task may shift to creating scenarios of alternatives for decision makers. Imposing conventional controls that establish, reproduce, and manage traditional forms of distance may not represent the complex dynamics between accounting knowledge, decision making, and change. This is another piece in the complex puzzle of the possible transformation of the accountant into a financial knowledge consultant, which may prove difficult to achieve given competing claims to expertise by other managerial functions. However, as the Japanese case illustrates, this change is not inevitable. ERP systems, at least in the short run, may be used to preserve and reproduce extant structures, roles, and controls, albeit in a more uniform, automated basis.

Conclusions

We wish to return to the questions posed at the outset but with a caveat. ERPs are not homogenous, predetermined technologies. They are not *table d'hotes* but *à la carte* menus giving choices. However, the dish comes in the making – not merely from pre-set menus. The diners enter the kitchen with unpredictable results.

FAQs about ERPs

How does diversity affect management control?

ERPs lessen accounting diversity in MNOs though customisations and limited ERP deployment may offset this. However, the diffusion of information in centralised databanks, given employee access, may spawn new representations of operations and services locally. This is continuous and unpredictable.

Is globalisation making accounting and control systems homogeneous?

The desire of MNOs for globally integrated systems promotes uniformity and standardisation within organisations. Process re-engineering, automation, and the adoption of 'best practices' often accompany this. The predefinition of accounting practices in ERPs also promotes uniformity. However, MNOs vary considerably regarding how and to what purpose accounting and control systems are changed. Given that many decisions flow from implementation it is unlikely that different organisations will adopt homogenous systems. Whatever, their usage may become less homogenous, given opportunities for greater local experimentation and learning.

Does employee resistance affect management controls during change?

Yes. Resistance has to be mediated, e.g. by customisation or redefining aims. It may be unwise to see this as resistance. Often it is due to learning (few people understand ERPs at the outset).

How does the process of implementing new IT, especially ERP, affect management control?

Considerably. The eventual configuration and usage of ERPs and thence management controls is defined during implementation and its subsequent usage by employees, not exclusively by systems designers or senior management at the outset.

What impact does ERP have upon traditional accounting systems and controls, such as budgets and divisional performance evaluation, and the roles of accountants, controllers, and the controlled?

If ERPs just automate and standardise existing conventional practices within existing structures the effects may be minor. However, fully integrated, real-time, accessible systems collapse traditional notions of time and space created and reproduced by conventional accounting systems. Flatter organisations with less clear functional and segmental boundaries, and integrated central databases may diffuse ownership of information, responsibilities, and loci of control. How performance is represented and evaluated may change considerably. The consequences for the roles of accountants, controllers, and the controlled are considerable.

Do integrated real-time information systems collapse distances between HQ and subsidiaries, thereby enhancing central control?

Integrated real-time information systems that merely automate existing systems may, paradoxically, reproduce and preserve conventional forms of accounting control and distance based on 'centralised-decentralisation'. More revolutionary changes collapse distance and give the potential for enhanced central control. However, this is mitigated by information processing constraints, the diffusion of information and decisions throughout the organisation, and the constant evolution of ERP systems design and usage by local users. The centralisation may be an illusion rather than reality.

About the authors

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Trevor Hopper is a part-time Professor of Management Accounting at Manchester University. He was Head of School and its Director of Research and Postgraduate Studies. Prior to this he worked at Wolverhampton and Sheffield Universities and as a cost accountant in industry. He has held visiting positions at the School of Business, University of Michigan, Ann Arbor, USA; the School of Business, Queen's University, Kingston, Canada; Griffith University, Gold Coast, Australia; and the Universities of Kyushu and Fukuoka, Japan.

He has co-edited three books and has published extensively in professional journals, books, and international research journals including *Accounting and Business Research*, *Accounting, Organizations and Society*, *The Auditing, Accounting and Accountability Journal*, *British Accounting Review*, *Journal of Management Studies* and *Management Accounting Research*.

His major interests lie in the social, organisational and political aspects of management accounting. His current research interests lie in how new forms of operations management and ERP systems impact upon management control systems, activity based costing applications, management accounting in developing countries, and control in multi-national organisations. He has recently led projects in these areas funded by the EU, CIMA and ICAEW.

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