

THE EFFECTS OF CLOUD TECHNOLOGY ON MANAGEMENT ACCOUNTING AND DECISION MAKING



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KEY CONCLUSIONS

- *Cloud computing offers advantages for decision making*
- *Cloud computing delivers cost savings and eases systems administration*
- *The collaborative advantage of cloud technology is less than expected, or not yet realised by finance*
- *The primary reason for not adopting cloud technology in finance processes is data security concerns*

INTRODUCTION

The advent of the internet brought technological change at a more rapid pace than previous, and in the past two decades, businesses and consumers have witnessed the advent of technologies such as social media, cloud computing and big data. Relatively young companies such as Google, Amazon and Facebook have taken such technologies deeply within their business models.

Advances in information technology have been noted as a key force in changing management accounting (Scapens et al, 2003; Dechow et al, 2007). Managers and boards continuously see advances in technology offering potential business advantages, but also raising issues and risks (EisnerAmper, 2014).

This report focuses in particular on cloud computing. In simple terms, we can think of cloud computing as a utility like water or electricity in that computing resources are available on demand, anytime, anywhere, at a relatively low cost. Following NIST (2011), cloud computing can be understood as: a model for enabling ubiquitous, convenient, on-demand access to a shared pool of computing resources. These computing resources can be anything from storage space, to software, to full information systems (hardware and software). As the definition says, cloud computing resources are shared, and may use a public or private cloud configuration. A public cloud is one where services are offered over a public network, such as many of the services offered by Google. A private cloud is one operated by an organisation itself, often implemented at the organisation's premises. As cloud resources are typically centralised and shared, a cost saving is expected as investment and staff costs are lower. In the case of cloud services offered by firms like Amazon, Rackspace or Google, smaller firms can access computing resources typical of larger firms at a minimal cost, and with no capital expenditure. Another advantage of cloud computing to businesses is ease of accessibility. With a network connection, it is possible to access files and software from any device at any time. So, in theory, any manager with a laptop or smart device (tablet or smartphone) can access business information systems; and this may contribute to faster and more collaborative decision making.

However, cloud computing does raise several potential concerns. One key issue is that of data security in a public cloud. With data potentially no longer in-house, a business may find it has less control over who can access key systems and data. A business may also experience vendor lock-in to a particular cloud service provider – i.e. the inability to change providers without incurring cost or changing systems in some way. There are also some potential legal issues, such as where data is stored (geographically) or what data protection laws apply.

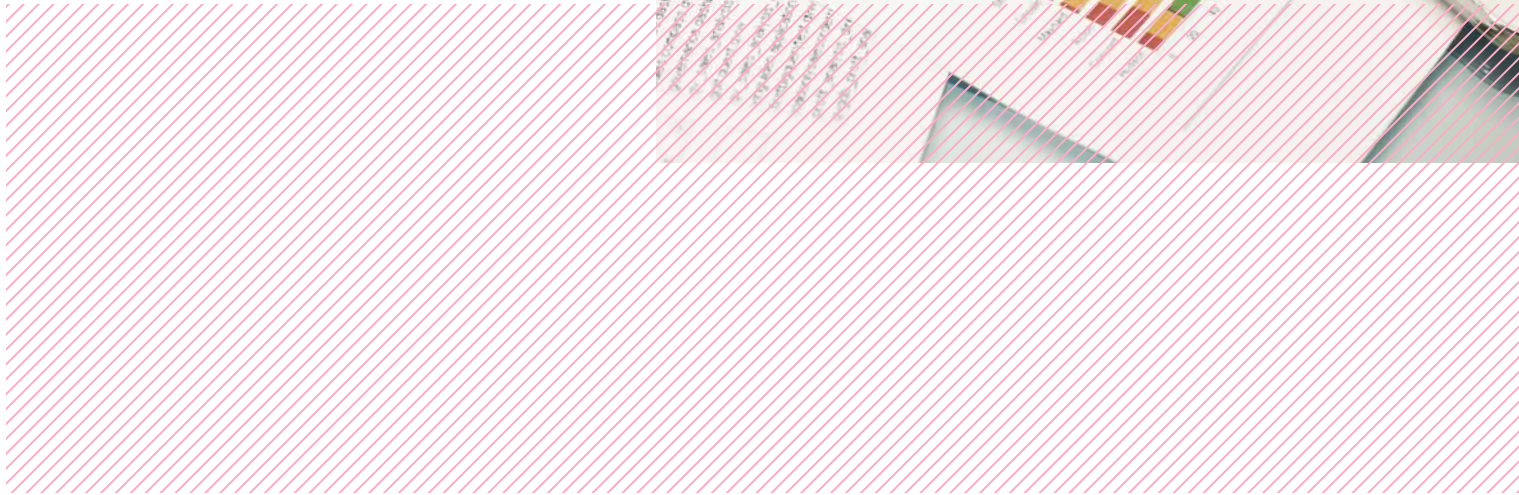
These advantages and issues can affect management accounting. A business may be driving cost savings, and thus explore cloud computing as an option, and no doubt a management accountant may be involved providing impact assessments and cost estimates. Cloud computing may even be used for key financial reporting and management information systems. The way in which management accountants and managers interact to make decisions may even change as a result of the ubiquitous ease of access to information. However, these are all suppositions that need to be fully researched and were the key rationale for this exploratory project.

OBJECTIVES

The effect of cloud computing on management accounting is presently not widely researched. Thus, this study was set out in an exploratory fashion to gain some initial insights on how cloud computing affects management accounting and decision making.

Our specific objectives are:

- to explore reasons why businesses adopt or do not adopt cloud technology
- to assess the extent of cloud technology use in finance, management accounting and similar systems
- to establish how cloud technology affects the provision of decision-making information – in particular information format and any change in the role of the management accountant in the provision of information.

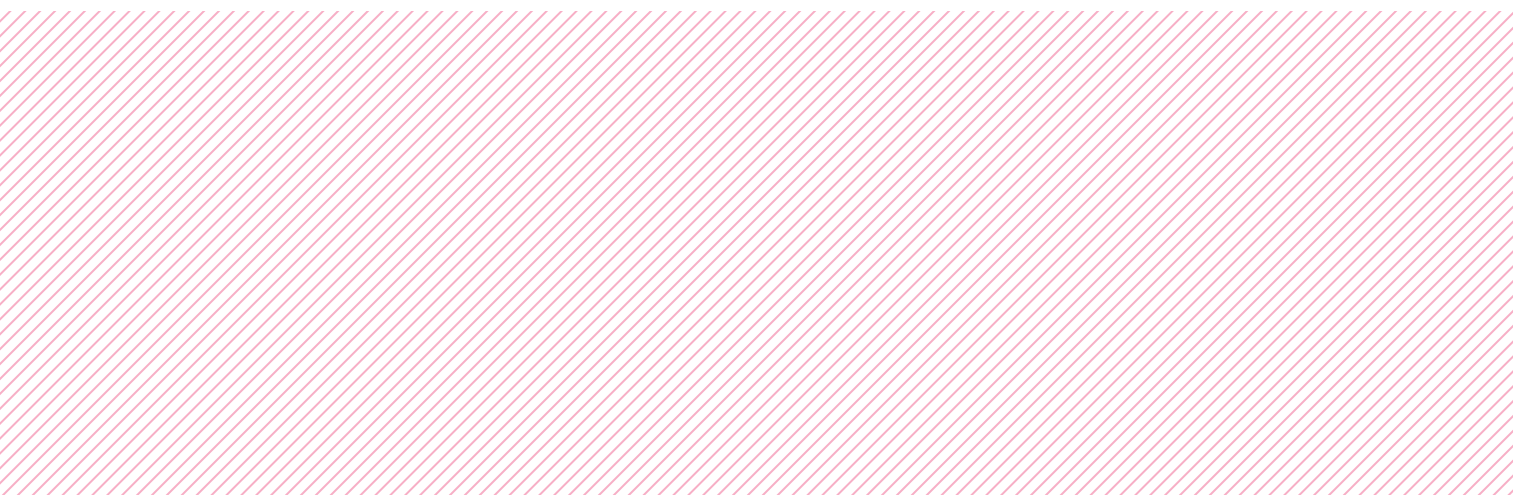


RESEARCH METHODOLOGY

Following from the research objectives, we adopted a mixed methods approach. Given the relative lack of existing relevant research in accounting, we needed to first acquire some basic knowledge of concepts, benefits and issues associated with cloud technology.

To achieve this, we conducted a review of the information technology literature and conducted three interviews with technology experts. The first interviewee is the founder/ managing director of a cloud storage solution provider and is a technical expert. This interview assisted us in acquiring some technical knowledge. The second interviewee is the founder/ managing director of a technology firm which both uses and sells cloud technology solutions. This interview gave some insights into how businesses use cloud technology at present. The third interviewee is a sales manager with a leading provider of accounting software in the UK and Ireland. This company provides traditional desktop software and cloud-based software. This interview gave us some valuable insights into the features of cloud accounting software and how customers of the company are adapting to cloud accounting software.

Based on the literature and the expert interviews, we designed a survey as the main data collection tool. From the interviews, we established that small and medium-sized enterprises (SME) are more likely to adopt cloud technology and gain cost and efficiency benefits in the short term. We thus designed our survey with an SME audience in mind, but did not specifically seek to address solely SMEs. The survey was sent to a subset of the members of the Controller Panel at WHU Otto Beisheim School of Management, Germany. This panel was founded in 2007 by the Institute of Management Accounting and Control in close association with the International Controller Association (ICV) for the purpose of identifying best practices and benchmarks in controlling as well as supporting field research in this area (see also Hiller et al. 2014). The majority of the members are heads of controlling. In the 2014 annual survey, we asked respondents to partake in our survey. A total of 182 agreed to partake, and we received 139 responses (76% response rate). Respondents cover a broad industry spectrum including; consumer goods, engineering, chemicals, electronics, energy, metals, construction, media and public bodies. The vast majority of responding firms (>90%) can be classified as small or medium.



MAIN FINDINGS AND IMPLICATIONS FOR PRACTICE

One of our technology experts highlighted the key benefits of cloud technology as follows:

- increased security – in spite of public perception, cloud providers can typically provide more secure services than that which most SMEs can afford
- technology support staff costs are reduced, or even eliminated
- capital expenditure on hardware can be removed, replaced by operating expenditure on cloud services
- elasticity of services provided
- flexible provision of information – anywhere, anytime, any internet enabled device
- software management simplified – cloud software installed and updated centrally.

Such benefits would seem useful for any business, and given the apparent lack of large capital investment requirements, one might expect a relatively high level of use of cloud technology. However, our research reveals that just one in four firms have adopted cloud technology for business systems. And within this group, finance and management accounting systems are least likely to use the technology. The following sections outline our main findings and some implications in more detail.

1. Why do businesses adopt or not adopt cloud technology?

Our survey shows that 25% of respondents use cloud technology for business systems – we specifically excluded common uses such as email and file sharing. Figure 1 shows the main reasons given by respondents who have adopted cloud technologies – these correspond closely to the advantages cited earlier.

Most cloud users have adopted a private or hybrid cloud setup (66%), suggesting a concern with systems security or loss of control to a cloud services provider. This is substantiated when we explore the reasons for not adopting cloud technology. The overwhelming reason given was concern with data security (see Figure 2).

This concern for data security is not surprising given many media reports in recent years of leaked or compromised data. Interestingly, our technology experts suggested the security offered by cloud technologies is more robust than that of a typical SME systems configuration. For example, cloud service providers can offer security backups, redundant systems, physical security and expertise which are often beyond the financial and human resources of most SMEs. They also noted that the move to the cloud is slower for accounting and finance type systems. This contrasting view of businesses versus technology experts, suggests a lack of understanding, fear or

a lack of communication to firms on the security benefits of the cloud. Management accountants can play an important role here, assessing not only cost and other benefits of cloud technologies, but also draw on their information systems skills to provide managers with clear information.

We also asked respondents for advantages of using cloud technologies. As Figure 3 shows, time savings and more efficient business processes were noted as the main advantages. While we did not query respondents in detail on advantages, those reported are typical of cloud-based systems (see Marston et al (2011) for more).

Actual disadvantages reported were initial problems with data security and initial problems with interfaces to supplier and customer systems.

2. What business areas use cloud technology?

One of our technology experts (the seller/user of cloud services) noted that in his own business, CRM systems were the first to go to the cloud, with finance being last. We asked why, and two reasons were cited: 1) CRM was the easiest to start within a cloud environment and 2) a cloud version of their finance system was not available at the time. Our survey results show a similar pattern, see Figure 4, with non-finance systems being the most common use of cloud technology (31% CRM, 19% financial accounting and 59% other business processes).

However, Figure 4 also shows just over one third of respondents (34%) make use of cloud technologies for management reporting. Based on our results, as only 19% of firms use cloud technology for recording daily finance transactions, it would seem that internal and non-financial reporting is more common. This of course is a key realm of the management accountant, and is explored in more detail in the next section

However, given the security concerns noted previously, it is not surprising that firms are reluctant to move key financial accounting processes/data to a cloud environment. If these concerns are allayed in the future, then the reported cost efficiencies (see Figure 1) may entice firms to adopt cloud technology.

Figure 1 – reasons for adopting cloud technology

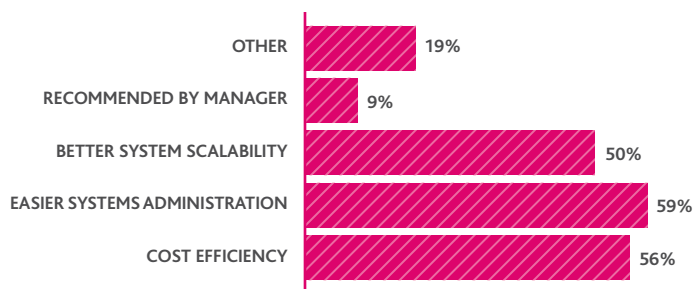


Figure 2 – reasons for not adopting cloud technology

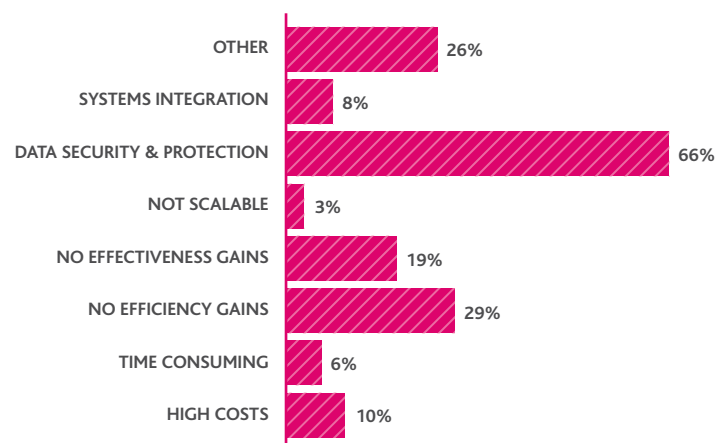


Figure 3 – reported advantages of cloud technology

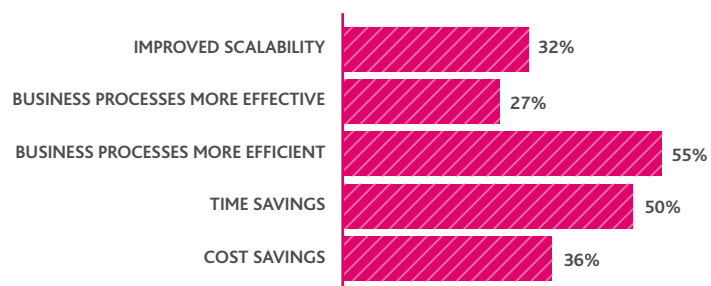
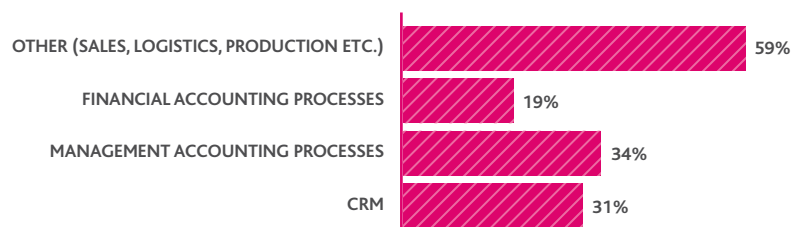


Figure 4 – business areas using cloud technology



3. How does cloud technology affect the provision of decision-making information?

We questioned respondents on several aspects of their use of cloud computing including:

- How frequently do they interact with cloud-based systems, what device do they use and what is their physical location when accessing?
- What format does the information they access take – e.g. numeric or graphic, detailed or summarised, standard or customised format?
- Do managers at all organisational levels use cloud technologies?
- How do they find decision making in comparison to pre-cloud technologies?

The interactions of managers with cloud-based systems is something which management accountants (as providers of information) should closely monitor, as cloud systems can allow managers to access decision-making information in new ways. For example, using a cloud-based system a manager can access information at any time using a smart device. While this has advantages, two issues need to be considered: 1) the manager may not be physically close to an expert such as a management accountant to verify or question information and, 2) the accuracy/completeness of the information. Our survey reveals that cloud-based systems are still primarily accessed by using a corporate computer or laptop (73%), with corporate smartphones and tablets being used less – about one-third of the time. Personal devices are used much less, which is better from a security viewpoint. Despite the potential flexibility offered by the cloud, our findings also show most access happens within the business premises and within working hours, a trend common across all business areas. Thus, based on our data, cloud technology has not yet affected the physical time and space within which decisions are made. Of course, we cannot say that this is the case in other countries, where cloud-usage and work/life balance may be culturally different.

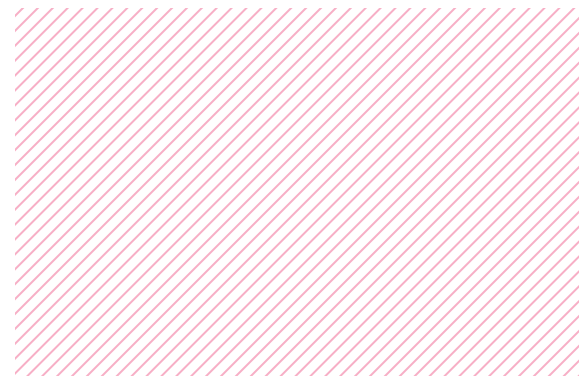
Our findings show that information from cloud-based systems is mainly presented in a mixed graphical/numeric format (84%), with the vast majority of it rated as detailed, timely and complete. The information is primarily in a standardised format (from ERP or similar standardised systems), and just under half of respondents have access to self-service type reporting functions – although less than half of those with access to self-service use it frequently. Interestingly, finance and management accounting systems are reported as using a mixed reporting format only – implying there is no pure text-based reporting through cloud-based systems. While mixed format reporting is not the sole realm of cloud-based technologies, it may be more amenable to presentation on smart devices. For management accountants, this may ultimately simplify the preparation and communication of key business reports. We also found that cloud technology is used by managers at all levels, although operational managers (71%) were more likely to use it than senior managers (50%).

Finally, we asked respondents for their overall perception of the decision-making process since their adoption of cloud-based technology. An overwhelming 93% of respondents agreed that cloud technology contributed to decision making, with 32% suggesting it has improved decision making in comparison to previous systems. Given that cloud technology can promote collaboration, we were also interested to know if there was a greater degree of involvement in decision making. As Figure 5 shows, the perception is that the level of involvement in decision making has not changed dramatically.

Figure 5 – collaboration in decision making – cloud versus previous systems*



*The 10% of respondents that did not answer this question are not included in this figure.



CONCLUSION

Cloud adoption is, according to one of our technology experts, almost inevitable for SMEs – only larger firms can continue to incur costs of hosting and maintaining their own information systems.

Our study generates a number of useful insights. First, our research shows that management accounting and finance systems are least likely to be cloud-based in preference to other systems, despite an appreciation of the advantages of cloud technology in general (see Figure 3). While the reasons for this may be valid (data security), the realisable cost savings and systems flexibility need to be carefully considered. Management accountants can play a role in not only evaluating costs and benefits of cloud technology, but also in ensuring that the advantages of more collaborative business processes are communicated to managers and realised by any implementations of cloud technology.

Second, management accountants are well-placed to work with technical experts and/or cloud service providers to ensure data security issues are properly addressed. It may be that businesses decide to always keep some data in-house, or to adopt a private-cloud configuration, and finance systems will always be less likely to use the cloud. However, with a broad knowledge of finance and other business processes, management accountants should be key advisors in this decision.

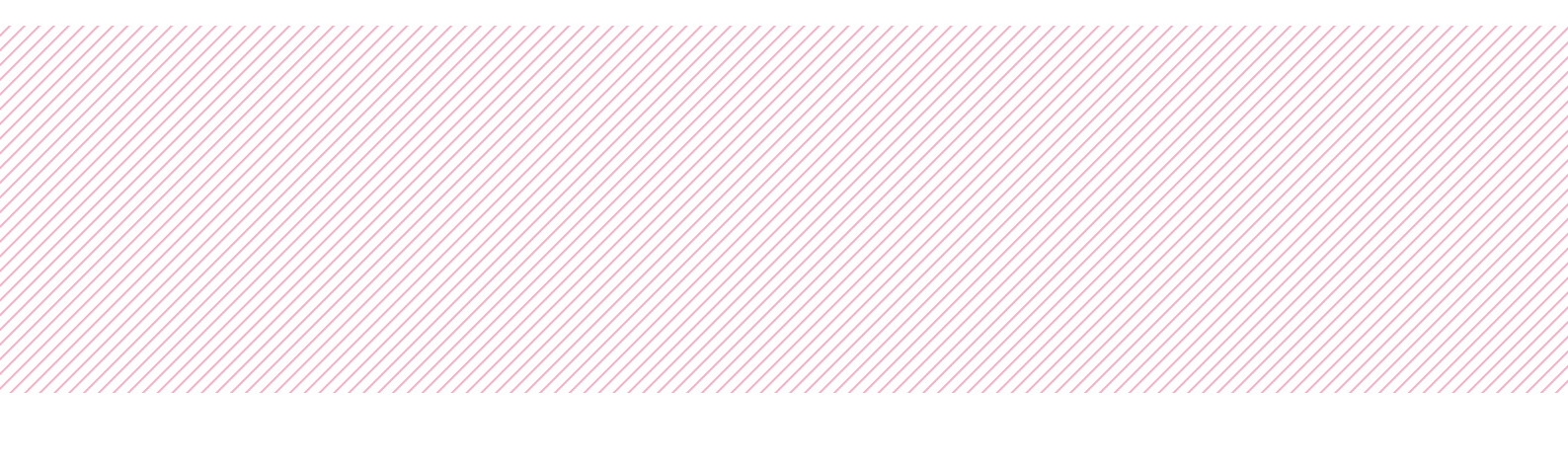
Third, our results show that information from cloud-based systems is still mainly accessed on premise within normal working hours. This may be due to the specific firms in our sample, or may be reflective of organisations in general. However, it does seem likely that, in time, cloud and other technologies will bring a 24-7-365 approach to business information in all business areas, including finance. Our survey shows that in excess of 90% of managers are seeing no disadvantages to decision making using cloud technology.

Given this level of satisfaction, if cloud adoption increases in the future, someone needs to be a controller of information. Again, management accountants can play a key role in ensuring the right information, gets to the right person at the right time, and in the right format.

Fourth, although we are suggesting the management accountant can play a key role in adopting cloud-based finance and management reporting systems, we are assuming that the management accountant (or other organisational members) has sufficient knowledge of cloud technologies.

The vast majority of our respondents were SMEs. While we did not specifically set out to study SMEs, from our interviews with technology experts it seems SMEs can gain most from cloud technology. However, our survey revealed the key reason for non-adoption was data security issues – despite the fact that from a technical view, cloud service providers can typically offer more security than certainly most SMEs can afford. Thus, there may be an educational need for management accountants in the field to clarify this issue.

Finally, our research suggests that the role of the management accountant has not changed much as a result of cloud technologies. Our research sample is small and our survey does not reveal detailed accounts of how cloud technology is affecting the role of management accountants. However, it does reveal that cloud technology has penetrated finance and management accounting systems to some extent. We would expect its use to grow over time, and further research on how the technology will affect the provision of decision-making information and the role of the management accountant would be welcome and insightful.



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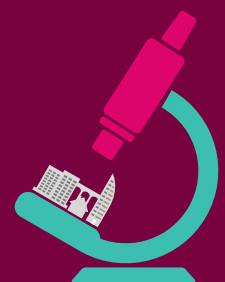
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