

# International Journal of Information Systems and Project Management

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# IJISPM

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Managing enterprise  
information: meeting  
performance and  
conformance objectives  
in a changing information  
environment

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Verena Hausmann  
Catherine A. Hardy  
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keep up with  
competition: the case of  
SAP

*Michelle Antero  
Jonas Hedman  
Stefan Henningsson*



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The mission of the IJISPM - International Journal of Information Systems and Project Management - is the dissemination of new scientific knowledge on information systems management and project management, encouraging further progress in theory and practice.

The IJISPM publishes leading scholarly and practical research articles that aim to advance the information systems management and project management fields of knowledge, featuring state-of-the-art research, theories, approaches, methodologies, techniques, and applications.

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IJISPM



## Editorial

It is our great pleasure to bring you the eighth number of IJISPM - International Journal of Information Systems and Project Management. The mission of the IJISPM is the dissemination of new scientific knowledge on information systems management and project management, encouraging further progress in theory and practice.

In this issue readers will find important contributions on enterprise information management, governance challenges on temporary organizations, and on sourcing challenges.

The first article, "Managing enterprise information: meeting performance and conformance objectives in a changing information environment", presents the findings of an in-depth survey to examine the current status of enterprise information management (EIM) in organizations. The survey explores five key areas: drivers and capabilities of EIM; current status of EIM strategies; EIM content and technologies; EIM and compliance; and the changing role of the information professional. The survey reveals that the drivers for EIM cannot be simply reduced to a series of technical or organizational needs and that EIM is a complex sociotechnical phenomenon. As the authors Susan P. Williams, Verena Hausmann, Catherine A. Hardy and Petra Schubert state, a fine balance is required to achieve business performance objectives whilst at the same time also meeting conformance requirements. To date, few organizations have implemented enterprise-wide EIM strategies; however those who do have them are better able to keep track of, and achieve, performance objectives. In terms of technologies and content the landscape is complex with organizations focusing their efforts into managing and reducing this complexity. Finally information management work is changing; the survey reveals EIM as a multi-stakeholder activity requiring the combination of a wide range of professional groups, skills and knowledge. The survey findings provide the basis for further research investigations in supporting organization in their EIM initiatives.

The second article, "Governance challenges in temporary organizations: a case of evolution and representations", is authored by Magali Simard and Danielle Laberge. According to the literature, formal project governance often stops at the steering committee, which is also identified as the main link between the permanent and temporary organizations. Generally, top managers play an active role as sponsors in this committee until the project is approved and launched. Afterwards, the project execution is usually delegated, enabling middle managers to participate in strategy operationalization. As such, they are likely to take part in the project governance and its operationalization. In this article, the authors are especially interested in the governance zone reporting to the steering committee. Within this zone, formal and informal governance is intertwined, and there is likely to be considerable overlap with the permanent organization. The article focuses on a specific liaison device within this zone: the Project Coordination Committee, which has rarely been studied. The authors explore how project governance evolves and is represented by project participants. The results show a surprising diversity in participants' representations. This allows to identify a number of conclusions that go beyond the governance form issues and relate to the complexity of this governance zone and its influence on the disruptions between permanent and temporary governance structures within a large organization.

Michelle Antero, Jonas Hedman and Stefan Henningsson, in their article "Sourcing strategies to keep up with competition: the case of SAP", apply the Red Queen theory to explain how organizations utilize various sourcing arrangements in order to compete in an evolutionary arms race where only the strongest competitors will survive. The case study incorporates competition, and views sourcing strategies as a means to improve the firm's viability to survive competition in the marketplace. The study begins by positioning the Red Queen theory within the sourcing literature. It subsequently applies the framework to a case study of SAP AG to illustrate how sourcing strategies have changed over time in response to the logic of competition. The case study reveals that (a) organizations are adaptive systems and capable of learning to make strategic changes pertaining to sourcing arrangements; (b) organizations select the terms on which they want to compete by developing certain capabilities within the firm; (c) organizations are reflexive and over



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time develop competitive hysteresis which allows them to become stronger competitors. In the case of SAP AG, various sourcing arrangements were selected over its 40-year history to respond to technological and market changes.

We would like to take this opportunity to express our gratitude to the distinguished members of the Editorial Board, for their commitment and for sharing their knowledge and experience in supporting the IJISPM.

Finally, we would like to express our gratitude to all the authors who submitted their work, for their insightful visions and valuable contributions.

We hope that you, the readers, find the International Journal of Information Systems and Project Management an interesting and valuable source of information for your continued work.

The Editor-in-Chief,

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João Varajão is currently professor of information systems and project management at the *University of Minho*. He is also a researcher of the *Centro Algoritmi* at the *University of Minho*. Born and raised in Portugal, he attended the *University of Minho*, earning his Undergraduate (1995), Masters (1997) and Doctorate (2003) degrees in Technologies and Information Systems. In 2012, he received his Habilitation degree from the *University of Trás-os-Montes e Alto Douro*. His current main research interests are in Information Systems Management and Project Management. Before joining academia, he worked as an IT/IS consultant, project manager, information systems analyst and software developer, for private companies and public institutions. He has supervised more than 50 Masters and Doctoral dissertations in the Information Systems field. He has published over 250 works, including refereed publications, authored books, edited books, as well as book chapters and communications at international conferences. He serves as editor-in-chief, associate editor and member of the editorial board for international journals and has served in numerous committees of international conferences and workshops. He is co-founder of CENTERIS – Conference on ENTERprise Information Systems and of ProjMAN – International Conference on Project MANagement.

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# Managing enterprise information: meeting performance and conformance objectives in a changing information environment

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# Managing enterprise information: meeting performance and conformance objectives in a changing information environment

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## **Abstract:**

This paper presents the findings of an in-depth survey to examine the current status of enterprise information management (EIM) in organizations. The survey explores five key areas: drivers and capabilities of EIM; current status of EIM strategies; EIM content and technologies; EIM and compliance; and the changing role of the information professional. The survey reveals that the drivers for EIM cannot be simply reduced to a series of technical or organizational needs and that EIM is a complex sociotechnical phenomenon. A fine balance is required to achieve business performance objectives whilst at the same time also meeting conformance requirements. To date, few organizations have implemented enterprise-wide EIM strategies; however those who do have them are better able to keep track of, and achieve, performance objectives. In terms of technologies and content the landscape is complex with organizations focusing their efforts into managing and reducing this complexity. Finally information management work is changing; the survey reveals EIM as a multi-stakeholder activity requiring the combination of a wide range of professional groups, skills and knowledge. The survey findings provide the basis for further research investigations in supporting organization in their EIM initiatives.

## **Keywords:**

Enterprise Information Management (EIM); information capability; compliance; strategy.

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## 1. Introduction

The volume and variety of information available to organizations from both external and internal sources is growing rapidly [1, 2]. This growth in the amount and complexity of digital information has renewed attention on its effective management and protection as a key corporate asset [3, 4, 5, 6]. While concerns about effective information management are not new [7, 8], the types of information and the way they must be managed have changed, raising new challenges for organizations [9, 10, 11]. In order to progress both theory and practice and to assist organizations to achieve greater effectiveness in their information management activities we need a clearer understanding of what these information management issues and challenges actually are and what they mean in the context of achieving an effective enterprise-wide information capability.

This paper reports on the findings of a survey-based study to investigate the current status of enterprise information management (EIM) in organizations and explores the issues and challenges that organizations are facing. The survey is part of a wider program of interactive industry research, which examines how organizations are managing the rapidly changing information environment and achieving competences and capabilities towards the long-term, enterprise-wide management of digital information [12, 13, 14, 15, 16]. Building on the findings of this previous work, the aim of the study reported in this paper is to investigate EIM issues and challenges more deeply, to identify key trends and themes and begin to benchmark how organizations can achieve an effective information capability.

The paper is organized as follows. The next section provides a more detailed overview of the EIM literature to provide context and background to the study's research objectives and questions. Following this we present the research approach and survey design. In section 4, the main part of the paper, the survey findings are analyzed and synthesized to provide insights into current EIM issues and challenges. The paper concludes with a summary and discussion of the implications of the findings for both organizations and for future research studies.

## 2. Background to EIM: ongoing challenges and ambiguities

In the past decade EIM has emerged as a topic of significant interest in both scholarly and practitioner research [5, 6, 17, 18]. In 2006 Logan and Newman, research analysts at Gartner, provided a "working definition" of EIM [19] that led to much discussion and "conflicting interpretations" about how EIM differed from information management (IM). The definition was revised, describing EIM as "an integrated discipline for structuring, describing and governing information assets, regardless of organizational and technological boundaries, to improve operational efficiency, promote transparency and enable business insight" [3]. This definition has remained the same for close to a decade, and broadly represents characterizations of EIM in the literature; that is, it "[elevates] enterprise information to the position of a strategic asset that is effectively governed, leveraged and exploited for significant business value" [20].

Enterprise information management is not a new phenomenon; although largely unacknowledged in recent research, EIM has its origins in what in the 1980s and 1990s was defined as information resource management [21, 22]. Information resource management (IRM) focused attention on managing "information as a valuable entity, independent of the technology that manipulates it" [21] and on the management of information assets as a strategic business activity [7, 8]. Recent commentary indicates that "[i]nformation (and specifically, information management disciplines like EIM) is at the start of a 'renaissance'" [20] and that there is "a new sentiment" [23] towards delivering business value through the effective management of information, hence the (re-)emergence of EIM. *What has motivated this renewed interest in EIM? Does it differ from older ideas about information resource management?* A review of the current discourse on EIM reveals a number of key changes in the information environment that have motivated this renewed interest. We have grouped these into three areas of change and briefly summarized them below.

*Quantitative and qualitative changes in the nature and type of business information*

The first and most profound set of changes relate to the volumes, variety and velocity of information being produced [24]. It is estimated that 4.4 zettabytes of digital information was created globally in 2013 with predictions that by 2020 this volume will rise to 44 zettabytes [2]. Much of this information is unstructured or perhaps a better description, is less well structured, e.g. emails, business reports, blog posts, web pages; raising new issues for its management. While structured information, such as transactional data in databases or ERP systems, is today largely well managed, challenges remain around the management of unstructured information, which now accounts for over 80% of information being produced [25]. In addition to the traditional business documents and records (contracts, letters, policies, etc.) there is now huge variety in the types and nature of information being created. These include communications (emails, instant messages, blog posts, etc.); coordination information (diary entries, workflows and forms, etc.); information products (leaflets, websites, web/podcasts, newsfeeds, etc.); business media assets (photos, video, sound files, infographics, etc.); analytics and surveillance information (logfiles, BI reports, monitoring data etc.) – *all of this information must be managed*. There is also the expectation that the velocity at which this information is updated and made available is close to real time, bringing additional challenges and constraints to its management [24].

*Proliferation of information creation and information management technologies*

There has been a proliferation of information systems and devices. Alongside traditional information management systems such as document, content and records management systems, are new types of systems used to create, share and manage digital information. Organizations are increasingly adopting social software applications including wikis, blogs and open platforms such as Facebook or twitter [26]. With the use of new social software applications comes new types of content, changing the nature of the business documents and records that are created [27] and bringing the need for organizations to manage this software and its content [28]. The increase of mobile devices and BYOD within organizations is blurring the distinctions between the personal and business use of devices [13] and the increasing use of cloud services and externally hosted software raises new issues relating to ownership, access and security of enterprise information [29].

*Requirements for protecting the information asset*

As the volumes and variety of information have increased, so have the requirements for securing and protecting information assets. Many of these requirements are driven by statutory rules mandated by international and national laws (e.g. privacy, data protection) or through industry regulations. However, whilst protection and security requirements have increased, estimates of the amount of unprotected information have also increased [1, 2] indicating potential future risks and challenges. Overall the legal and regulatory compliance burden is now much higher than ever before.

In light of these changes, the importance of EIM for ensuring a coordinated and integrated approach to effectively manage and leverage an organization's information assets is widely acknowledged [5]. However, recent evidence suggests that many EIM initiatives are being conducted in a piecemeal fashion, information silos are proliferating and that benefits are not being realized or sustained [6, 9]. Gaining business understanding and engagement to justify necessary investments has been consistently identified as a key issue for EIM over a number of years [6, 10]. Hausmann et al. [16] argue that perhaps EIM is suggestive of something more than a "next phase" for information management, turning attention towards the need for reconsidering assumptions, processes and practices grounded in disciplinary traditions and legacy technologies. The current literature tends to focus on a limited set of issues, largely based on fragmented industry surveys with different foci, such as digital records management or participant groups consisting mainly of business and IT executives [16]. Whilst this research provides valuable insights, a systematic overview of EIM issues and challenges that garners the views of a wider group of information specialists and middle level managers (because of their practical intelligibility of work practices) is required [16]. The next section outlines the aims and objectives of a study that begins to address this requirement by obtaining deeper insights into the organizational readiness for EIM and the issues and challenges that organizations are facing. This research will assist practitioners in

understanding the challenges and issues they may encounter when developing EIM. At a theoretical level, findings from this research will form a solid basis for conceptualizing EIM challenges in future work.

### 3. Research approach and research design

As noted in the introduction, the authors are engaged in a long-term program of interactive, industry research to assist organizations to develop an information capability that enables them to manage their enterprise information assets more effectively in an increasingly complex and changing information environment. This study is part of the second cycle of research; the first cycle of research comprised a series of industry focus groups, in-depth practitioner interviews and a pilot EIM survey to identify key research imperatives and industry challenges associated with EIM.

#### 3.1 Research objectives and survey design

The findings of the first cycle of research (reported in [12, 13, 14] identified five key areas for further research to provide a deeper understanding of i) the issues and challenges driving EIM initiatives, ii) organizational EIM readiness and strategies for EIM, iii) the impact of new technologies and new information types, iv) the governance, risk and compliance standards and policies impacting EIM and v) the changing role of the information professional. These five areas provided the input to the second research cycle, which begins with the survey-based study reported in this paper. The objectives of the survey are to:

- RO1: identify the range of *drivers of EIM* in organizations
- RO2: investigate the current status of *EIM strategy* and its benefits and EIM challenges
- RO3: identify the *information types, technologies and systems* that are (or are not) currently being managed
- RO4: identify *compliance requirements (standards, frameworks and regulations)* that affect EIM in organizations
- RO5: understand the *role of information professionals* and the required skills and knowledge for EIM

Drawing from the findings of our earlier research and recent academic and practitioner surveys on enterprise information management, a database of survey questions was developed to address the five research objectives. The questions were then evaluated and tested and an online survey was designed and implemented. A pilot test of the questions was conducted with five domain experts to test the suitability of the survey questions and to improve their comprehensibility and relevance. Following this the final survey was produced and implemented using the open source online survey application LimeSurvey®. The final survey comprises 34 questions with a range of question types (including: open, closed, Likert, selection) structured into the seven groupings (Table 1). Groupings 2-7 between them address research objectives 1-5 respectively. Further details of the study aims and design can be found in [16].

Table 1: EIM survey structure

Survey Question Groupings	No. of Questions
1. Company (Demographics)	3
2. EIM Drivers and Capabilities	3
3. EIM Strategy	6
4. EIM Challenges	2
5. Information, Systems and Technology	4
6. Standards, Frameworks and Regulations	6
7. Information Professionals	10

### 3.2 Data collection and data analysis

The target audience for the survey were individuals with specific responsibility for information management within their organization. The invitation to participate was sent to key professional bodies and special interest groups representing a range of information-related professionals, including, for example, ISACA, IIM, RIM, Asia Pacific Data Quality Congress and ARK Group. The main data collection period for the survey was January-April 2013.

For the purposes of analysis and to meet our universities' ethics requirements all data collected has been anonymized; no individual respondent or company can be identified from the study results. Respondents were invited to submit their contact details if they were interested in receiving a copy of the survey report and to participate in future studies. Almost all respondents provided contact details; these contact details were stored separately from the main results to maintain anonymity. At the end of the data collection period all data items were exported to a spreadsheet and organized for analysis. Two rounds of analysis were conducted. In the first round descriptive statistics were produced and presented for each survey section. In the second round a deeper analysis of the findings was conducted to identify cross-sectional themes.

*Survey demographics:* In terms of respondent demographics our initial target country was Australia with 71% of respondents coming from Australia. However, due to the international reach of many organizations respondents were also located internationally: UK (11%); USA (4%); rest of world (15%). We received submissions from 207 individual respondents. A preliminary analysis showed that not all respondents answered all the questions; 87 respondents completed every question and it is on these respondents we have focused our analysis for this paper. These respondents are individuals with a primary job responsibility in records/document management, IT management and/or strategy and business development (for more details see Figure 17). Respondents represent public sector and government agencies (32%) as well as private sector organizations (68%) and 70% of respondents represent medium and large sized organizations with more than 250 employees.

## 4. Findings and discussion

In this section we report on the survey findings, addressing the findings from each survey question group in turn.

### 4.1 EIM Drivers, capabilities and outlook

The first question group addresses RO1: to identify the range of *drivers of EIM* in organizations. The aim of these questions is to identify what factors are driving organizational EIM initiatives (Section 4.1.1); identify current organizational EIM capabilities (Section 4.1.2); and to obtain an assessment of how EIM will change (or not) in the next 2-5 years (Section 4.1.3).

#### 4.1.1 EIM drivers

Respondents were asked to identify what has motivated and driven the need for EIM over the past two years in their organization. As can be seen in (Fig. 1), the top five EIM drivers identified as very important are: improving access to business information (39%); improving internal information sharing (31%); improving information integration across multiple systems (30%); meeting regulatory compliance requirements (29%); and improving information capture (28%). Of least importance *as a driver for EIM* is meeting green IT initiatives/targets (4%).

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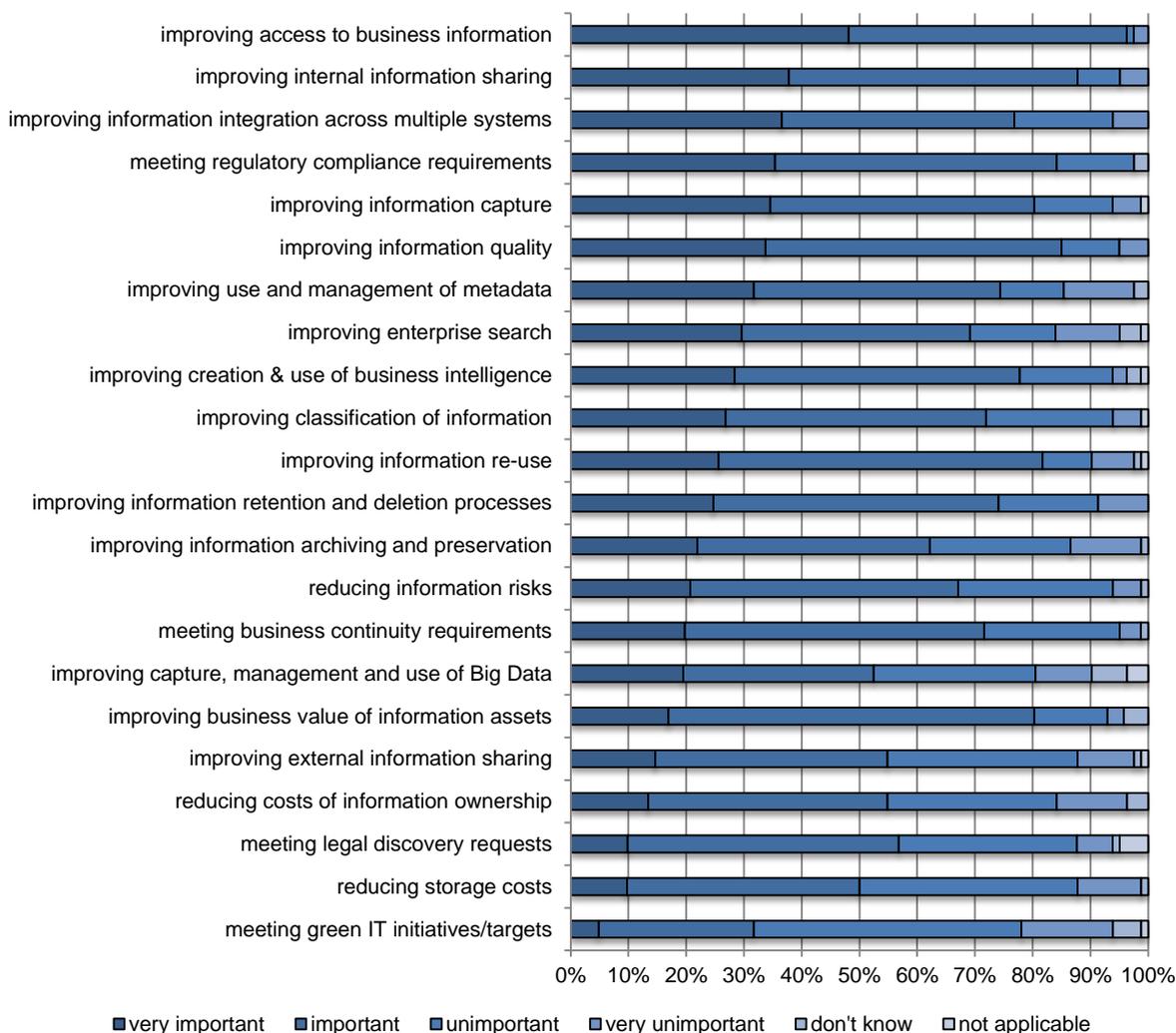


Fig. 1. Drivers of EIM over the past two years (sorted by “very important”)

These findings reveal three important themes about the current drivers of EIM.

*Obtaining business value.* The most important drivers are closely linked to improving business performance and to obtain greater value from information by improving the organization’s ability to access and share information, to re-use information and gain business intelligence. It is notable that reducing costs (whilst always desirable) was not rated as an important driver in comparison with the objective of generating value from business information.

*Meeting regulatory compliance.* As well as obtaining business value, there is also a conformance objective to the drivers of EIM. Respondents identified the need to meet regulatory compliance obligations such as maintaining data security and privacy laws and protecting and securing business information assets as important. This presents organizations with an interesting and potentially conflicting situation; balancing performance objectives by generating

business value with conformance objectives of meeting legal and regulatory requirements and protecting information assets.

*Sociotechnical complexity.* The drivers of EIM are not limited to one aspect of EIM but are evident at all stages of the information lifecycle, from information creation through to archiving and preservation of information at the end of its active life. They are both extensive and wide reaching and cannot be isolated to organizational or technical aspects, positioning EIM as a complex, sociotechnical activity within organizations.

#### 4.1.2 Current EIM Capability

To understand organizations' current EIM capabilities we asked respondents to rate a series of statements about their company's current enterprise-wide information management capability (Fig. 2). Organizations self-assessed their capability to meet the conformance aspects of EIM as high; the findings reveal that 75% of respondents rated their organizations as very good/good at meeting regulatory compliance requirements. However, their assessment of their capability to meet performance objectives of EIM is low. Only 42% of respondents rated their organizations as very good/good at creating business value from information and only 38% considered themselves very good/good at providing business intelligence.



Fig. 2. EIM capability (sorted by "very good + good")

#### 4.1.3 Outlook: Significant EIM activities for the next two years

We asked respondents to look forward over the next two years and provide an assessment of the significance for their organization of a range of EIM activities. The responses (Fig. 3) fall into two areas: i) technology and systems; and ii) building human capacity.

*Technology and systems:* There is a clear focus on EIM technologies predicted over the next two years. Significant activities include: evaluating, implementing or migrating to new EIM technologies and improving existing systems and their integration with other systems.

*Building human capacity:* In terms of developing human capacity organizations reported that providing end-user training and managing and developing staff as expected to be very significant activities over the next two years. Again, this outlook draws attention to the sociotechnical nature of EIM as a business activity.

Respondents were also asked how they expect the complexity of EIM to change in the next 2-5 years. 66% of respondents expected it to become more complex; 16% think it will remain the same; and only 17% think it will become less complex.

The findings so far reveal that whilst organizations are aware of the need for EIM and have a clear idea of what is driving EIM in their organization, their assessment of their own EIM capability indicates that they have not yet reached a state of EIM readiness. This, and the anticipated increase in EIM complexity points to a need for greater understanding of what it means to have an EIM capability and how an organization might reach an adequate level of EIM maturity. This led us to ask our respondents a series of questions about the existence (or not) of an enterprise-wide EIM strategy in their organization.

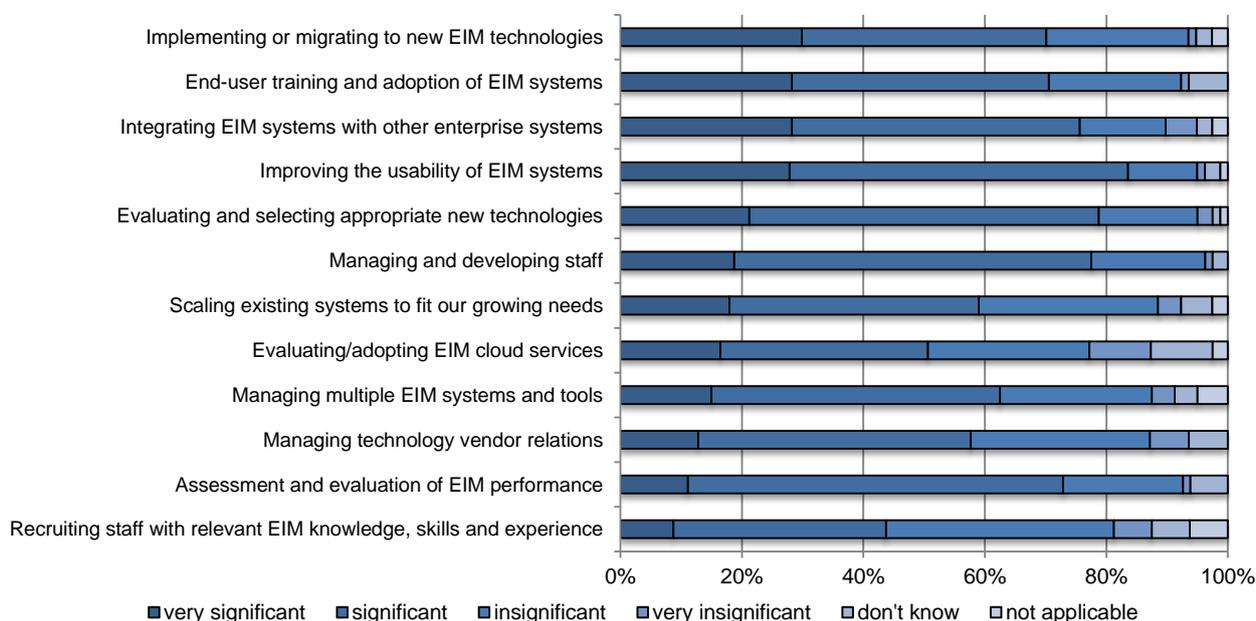


Fig. 3. Significant EIM activities for the next two years (sorted by "very significant")

## 4.2 EIM strategy

In this section of the survey we address RO2: to investigate the current status of *EIM strategy* and its benefits and challenges. The aim of this question group was to examine to what extent organizations have developed and implemented enterprise wide EIM strategies and, where such strategies exist to identify what benefits and challenges have arisen following implementation.

### 4.2.1 Enterprise-wide EIM Strategy

Respondents were questioned about the existence (or not) of an enterprise-wide information management strategy in their organization. As can be seen in Fig. 4, 34% of organizations have a documented and fully implemented EIM strategy; 17% of organizations have a strategy that is currently only partially implemented; and 22% have a documented strategy that is not yet implemented. The remaining 27% of organizations do not yet have and/or are not planning to develop an enterprise-wide information strategy. For 84% of respondents from organizations that have an EIM strategy,

the strategy was approved by the Executive Board or by specific C-level executives (most usually the CIO) pointing to the high strategic importance of EIM in these organizations.

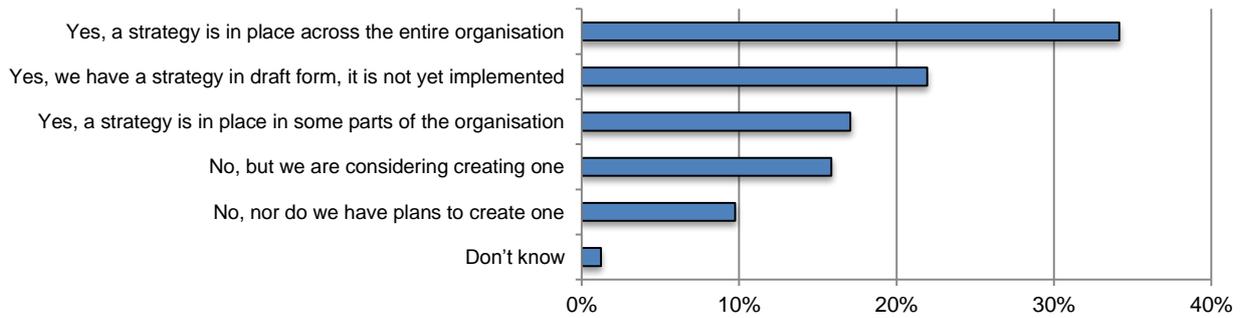


Fig. 4. Status of EIM strategy (sum of responses is 100%)

4.2.2 Benefits and Challenges of an enterprise-wide EIM strategy

EIM is being portrayed in the literature as a key strategic business activity [3, 5, 6, 17]. In order to understand more fully what having an EIM strategy means we continued to question those respondents whose organizations have an EIM strategy. Our aim is to identify the most significant benefits and challenges that an EIM strategy is bringing to their organization. The most significant benefits reported by those who have an EIM strategy in place (Fig. 5) relate to better information sharing (23%), information integration (13%), and reducing non-compliance with regulatory requirements (16%). Whilst reducing IT costs was seen as a benefit by some organizations (4.3%) it appears that the major benefits are associated with improving the organization’s use of information. Thus, the benefits serve to meet compliance requirements but are also leading to meeting the imperative to generate business value from information. The key finding here is that organizations with an EIM strategy appear to be better at meeting both the performance and conformance objectives associated with EIM.

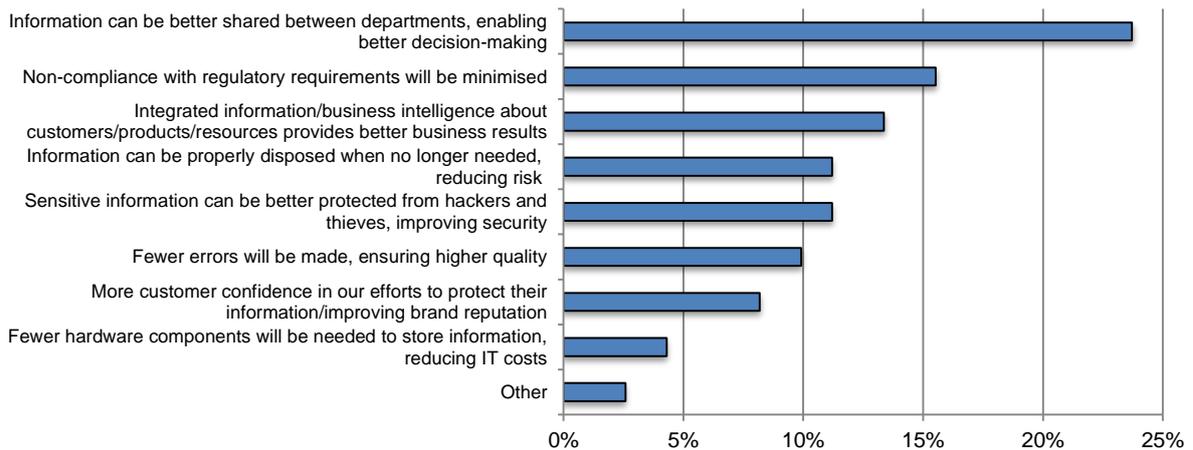


Fig. 5. Most significant benefits of an EIM strategy (percentage of total)

Respondents whose organizations have an EIM strategy were also asked to indicate the most significant challenges encountered when implementing their EIM strategy. The findings (Fig. 6) indicate that having a strategy is only the first step, translating that enterprise wide strategy into business activity was somewhat problematic and getting from strategy to action is in many cases proving difficult. For example, 45% of organizations report significant challenges in enforcing policies company-wide and in gaining the support of department and line managers. Thus, whilst having an EIM strategy can lead to significant benefits, the challenge lies in effectively implementing it across the entire organization.

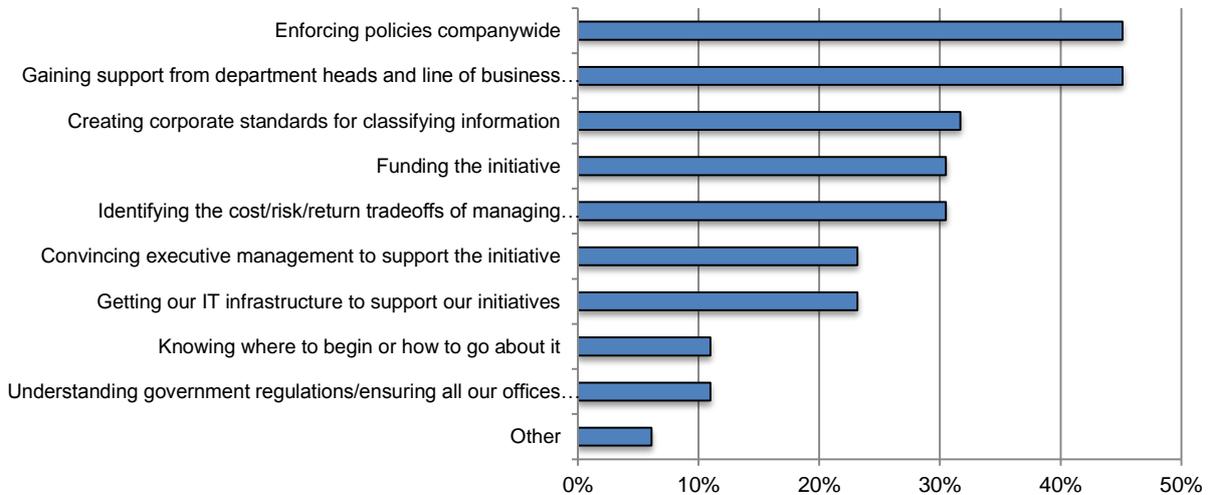


Fig. 6. Most significant challenges of implementing an EIM strategy (percentage of total)

#### 4.2.3 Strategies for specific EIM activities

Whilst the majority of organizations reported that they did not yet have an implemented, enterprise-wide EIM strategy in place, we were interested to discover whether other types of information strategy have been implemented.

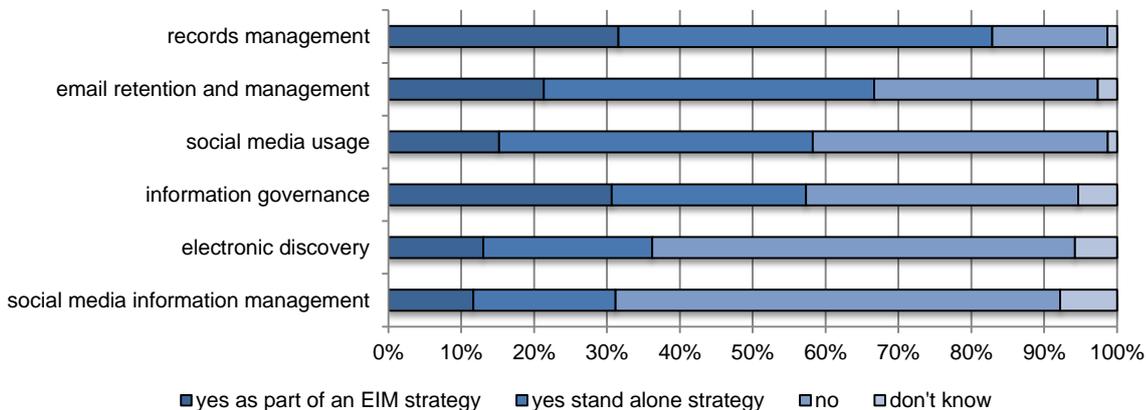


Fig. 7. Formal strategies for specific EIM activities

All respondents were asked whether they had formal strategies for managing different information types and information activities (Fig. 7). The majority of companies (82%) have some form of strategy for records management and email retention and management (67%). Interestingly, whilst 58% of organizations have some form of strategy in place for social media usage, only 31% have any strategy for social media information management. Social media content is proliferating and this lack of strategy for the management of social media information may lead to problems in the future.

4.3 Information, systems and technology

Section 4 of the EIM survey “Information, Systems and Technology” is aimed at addressing research objective 3 by identifying how, if at all, different information and content types are currently managed in organizations (Section 4.3.1); identifying the systems and technologies that are currently used for information management (Section 4.3.2), and evaluating the main EIM-related technological challenges for the next 2 years (Section 4.3.3).

4.3.1 Information and content types

Within recent years the development of technologies to collaborate and share content has led to the development of a range of new content types. While a large body of literature can be found that deals with the management of traditional content, such as physical and confidential documents, business application data from ERP systems and email messages, much less attention has been given to the management of new collaborative content such as instant messages, wiki entries or blog posts. Therefore we asked respondents to indicate how, if at all, different content types are managed within their organization (Fig. 8).

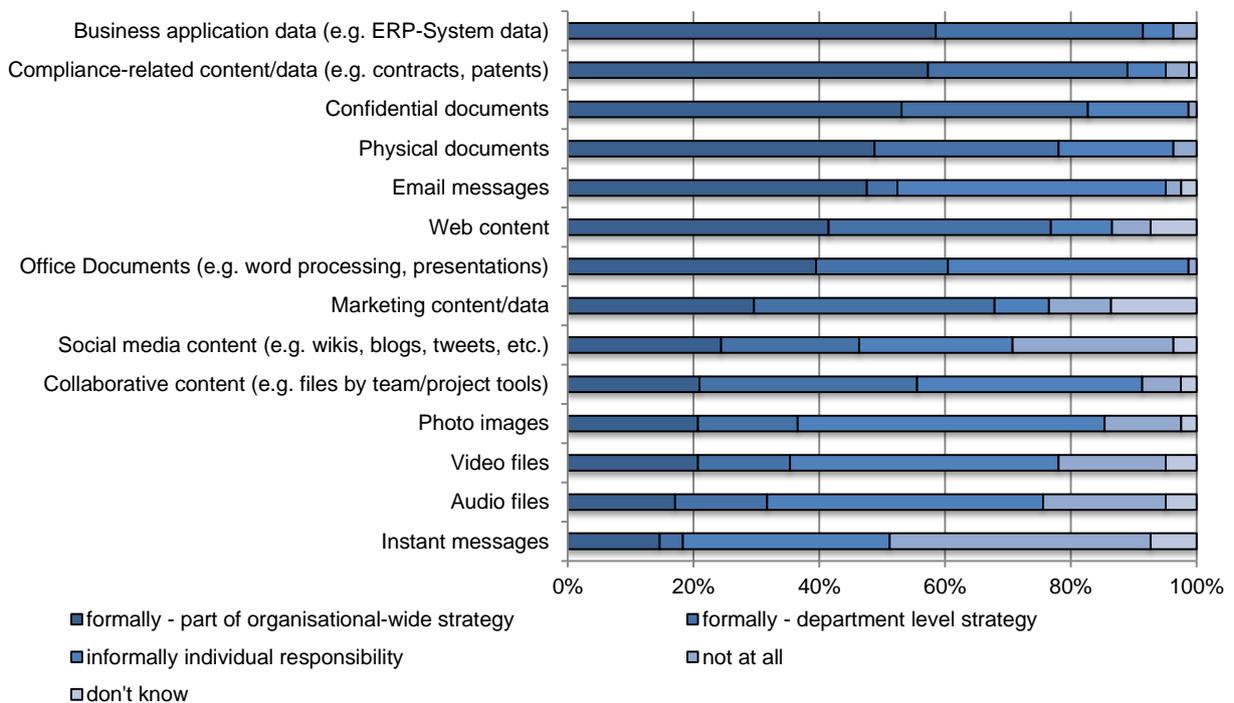


Fig. 8. Degree of the management of different content types

In more than 80% of organizations traditional content such as ERP systems data or compliance and confidential content is managed on a formal basis. However, the findings reveal a lack of formality in managing newer content types and media assets such as photos, videos or audio files. There is a clear lack of attention being paid to the management of more unstructured and newer content types. In over 25% of organizations instant messages and in more than 15% of organizations social media content are not managed at all, perhaps a consequence of the lack of strategy for social media information management reported in section 4.2.3.

#### 4.3.2 EIM systems and technologies

The range of systems and technologies for managing organizational content has increased within recent years. Furthermore, the complexity in terms of functions and the content that these systems handle and produce is overlapping and converging. It is increasingly difficult to distinguish between different system types such as document and content management systems. Survey respondents were asked to indicate the kind of technologies they are using for information management and to name the specific systems they are using in their organization (Fig. 9).

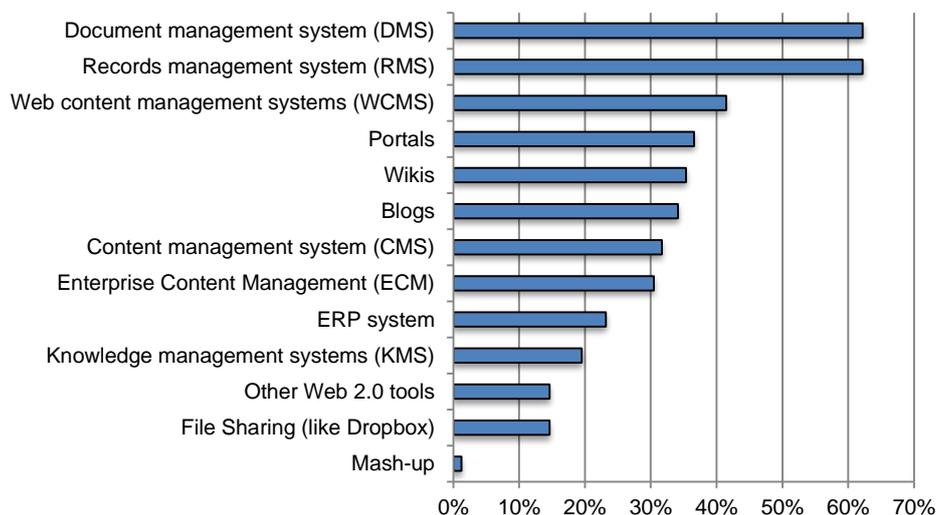


Fig. 9. Technologies used for information management

The findings show a dominant usage of document and records management systems in more than 50% of organizations. However, web content management systems, portals, wikis, blogs and content management systems are also used in more than 30% of organizations.

We also asked respondents to name the specific systems they are using for each technology; a wide range of systems was named. For example, 20 different document management and 16 different records management systems were named. Interestingly, systems like MS SharePoint or Drupal were mentioned in several categories (i.e. they are being used for several different purposes) and many respondents indicated they used multiple systems to serve the same purpose (e.g. they had implemented more than one system for document management or web content management). This emphasizes the complex array of system and functionalities of the systems on offer today and that multiple systems are often in use to serve the same needs.

4.3.3 Outlook: EIM-related technological plans and challenges

We concluded our technology-related survey section with questions about organizations’ plans and the perceived challenges for EIM technologies within the next two years. The findings show that most organizations (43%) are planning to upgrade/expand their existing system. Although only 13% of organizations are directly planning to buy a new system, 39% are evaluating new EIM technologies and 35% are planning to migrate from an existing to a new system. Furthermore 34% of organizations are planning the consolidation of systems and the integration of EIM systems with other enterprise systems (see Fig. 10).

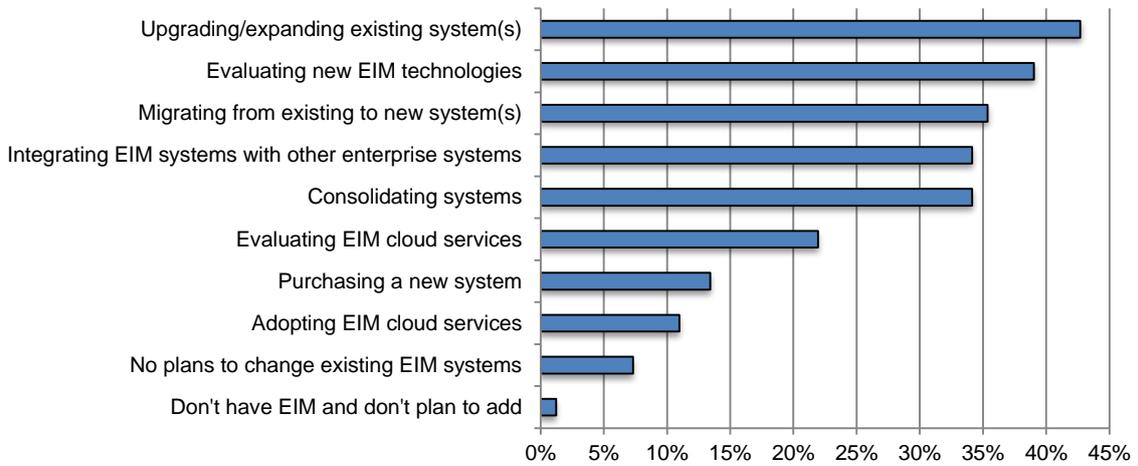


Fig. 10. Plans for EIM technologies for the next two years

The most significant EIM-related technological challenges are shown in Fig. 11 and are related to the integration, consolidation and customization of EIM systems. This perhaps is an effort to harmonize the complexity and variety of systems in use that was identified in the previous section.

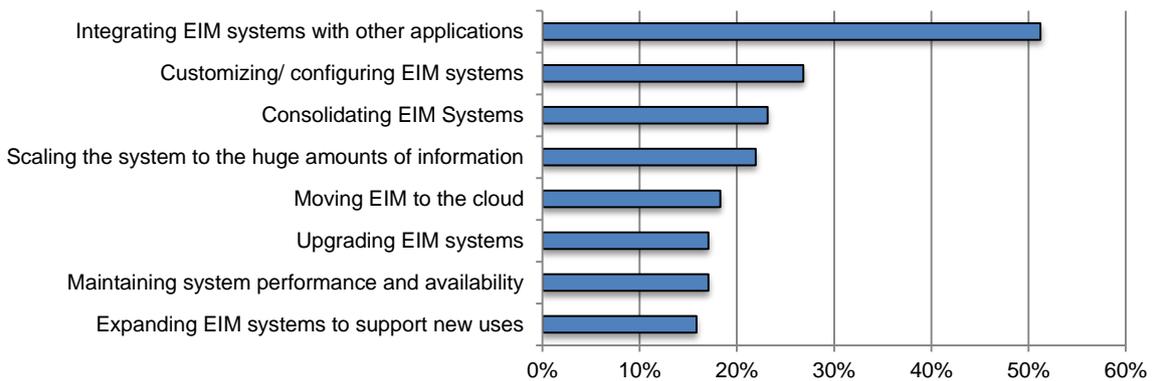


Fig. 11. Biggest EIM-related technological challenges over the next 2 years

#### 4.4 EIM and compliance

Compliance is one of the eight Generally Accepted Recordkeeping Principles® published by ARMA International to effectively manage records and information assets [30]. It is also one of the most challenging and pressing concerns for organizations because of the complexity and variety of regulatory obligations at an international, national, industry and organizational level. Obligations may also encompass a range of areas such as financial reporting, privacy and data retention and based on past experience are likely to increase and become more complex in the future.

In this section we address RO4: *identifying compliance requirements*. Respondents were asked to identify legal and regulatory obligations relevant for EIM in their organization. The findings are as follows.

##### 4.4.1 Information disposition: retain or destroy?

Disposal/destruction regulations (62%) and access to information/freedom of information regulations (57%) were identified as the most relevant regulatory obligations faced by organizations (Fig. 12). These are also the most influential areas shaping technology selection decisions (Fig. 13) and in developing EIM policies and practices (Fig. 14).

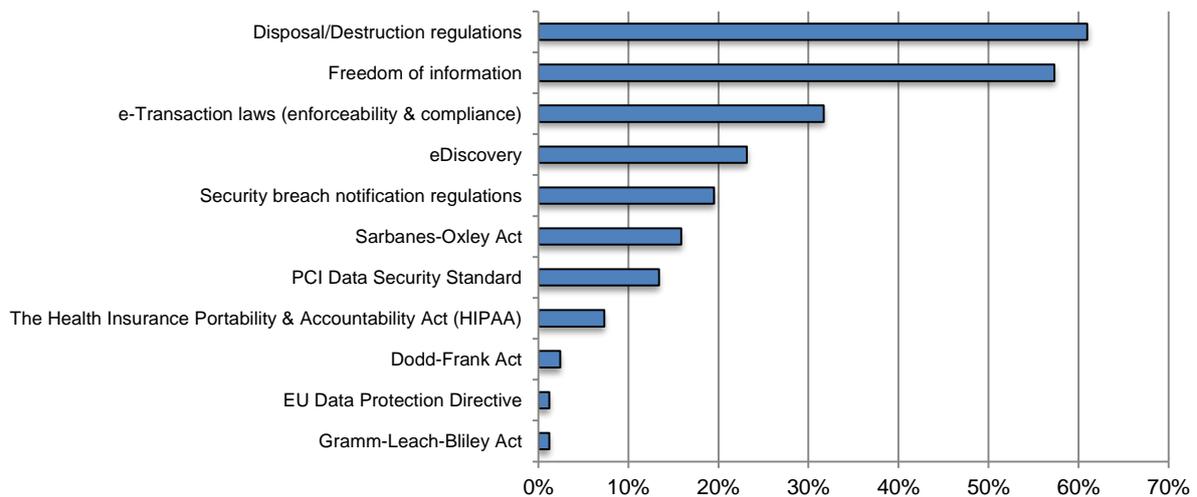


Fig. 12. Relevant legal and regulatory obligations

These findings go partly towards explaining why improving information retention and deletion processes were identified as important drivers for EIM over the past two years. With the growing volumes and variety of digital information come greater challenges in making decisions about what to retain and what to destroy. These findings also point to potential challenges in the future as identified earlier. Whilst 82% of organizations had a formal strategy for records management, only 31% have a strategy for social media information management (Fig. 7).

Managing enterprise information: meeting performance and conformance objectives in a changing information environment

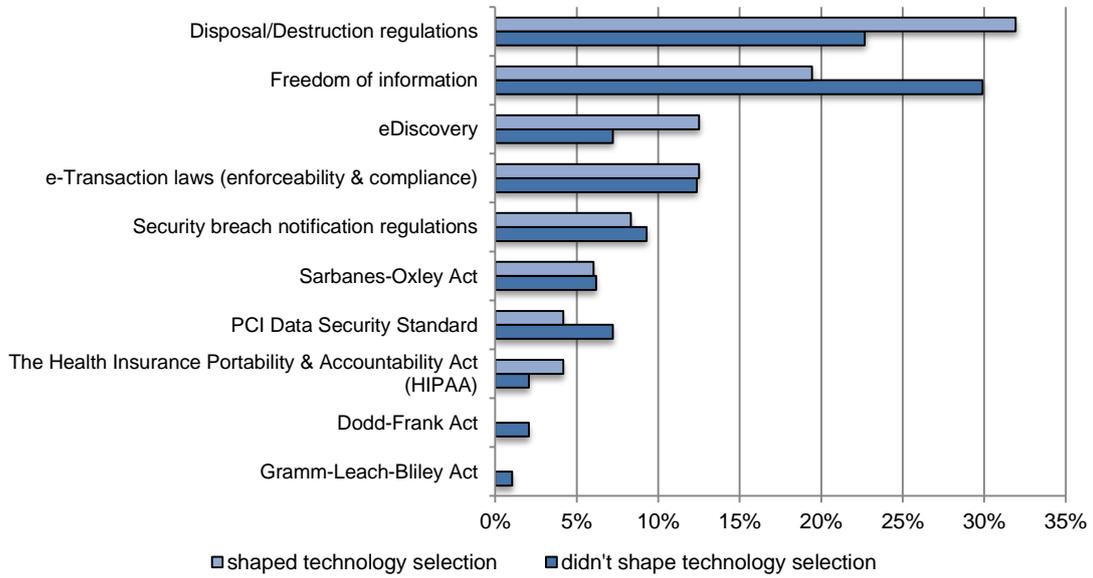


Fig. 13. Relevant legal and regulatory obligations and technology selection

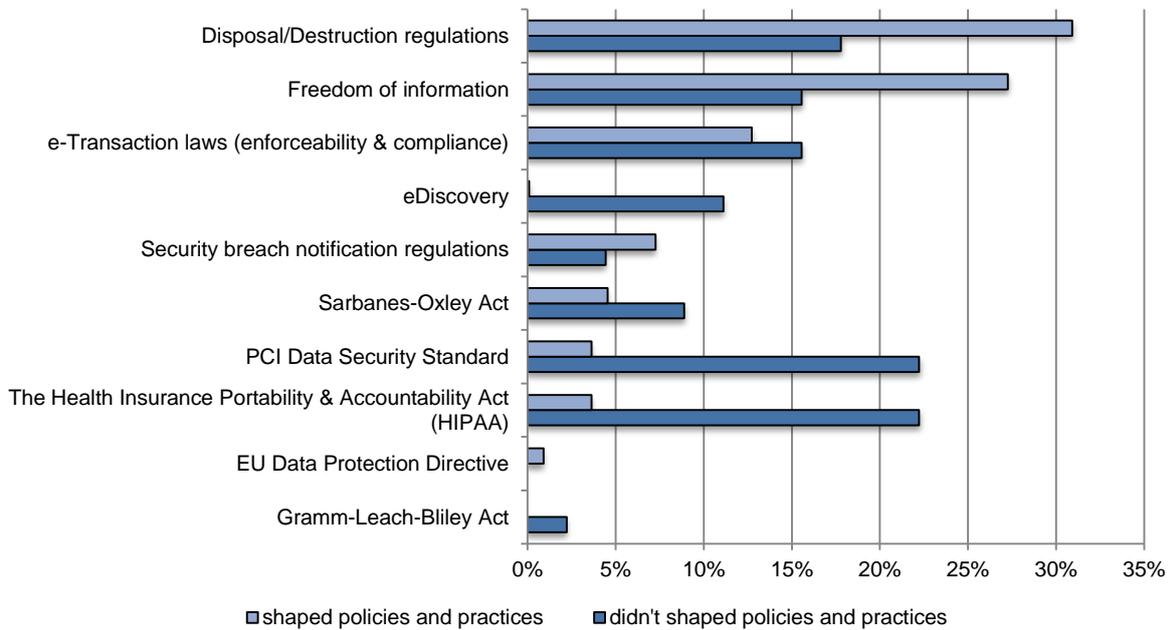


Fig. 14. Relevant legal and regulatory obligations and shaping of EIM policies and practices

4.4.2 Complex, multi-stakeholder effort

Respondents were also asked to list any additional legal and regulatory obligations relevant to their organization. Those listed include business related areas encompassing privacy, laws, data protection, corporations and financial regulations, intellectual property, taxation and evidence laws and matters such as archives and financial management. This broad range of regulations highlights the challenges faced by organizations in meeting their information compliance obligations and points towards the need for designing policies and controls that will meet the requirements of multiple regulations whilst avoiding duplication. This also requires a multi-stakeholder effort; no single employee or department has oversight of all of these areas. This is a topic that is developed in section 4.5.

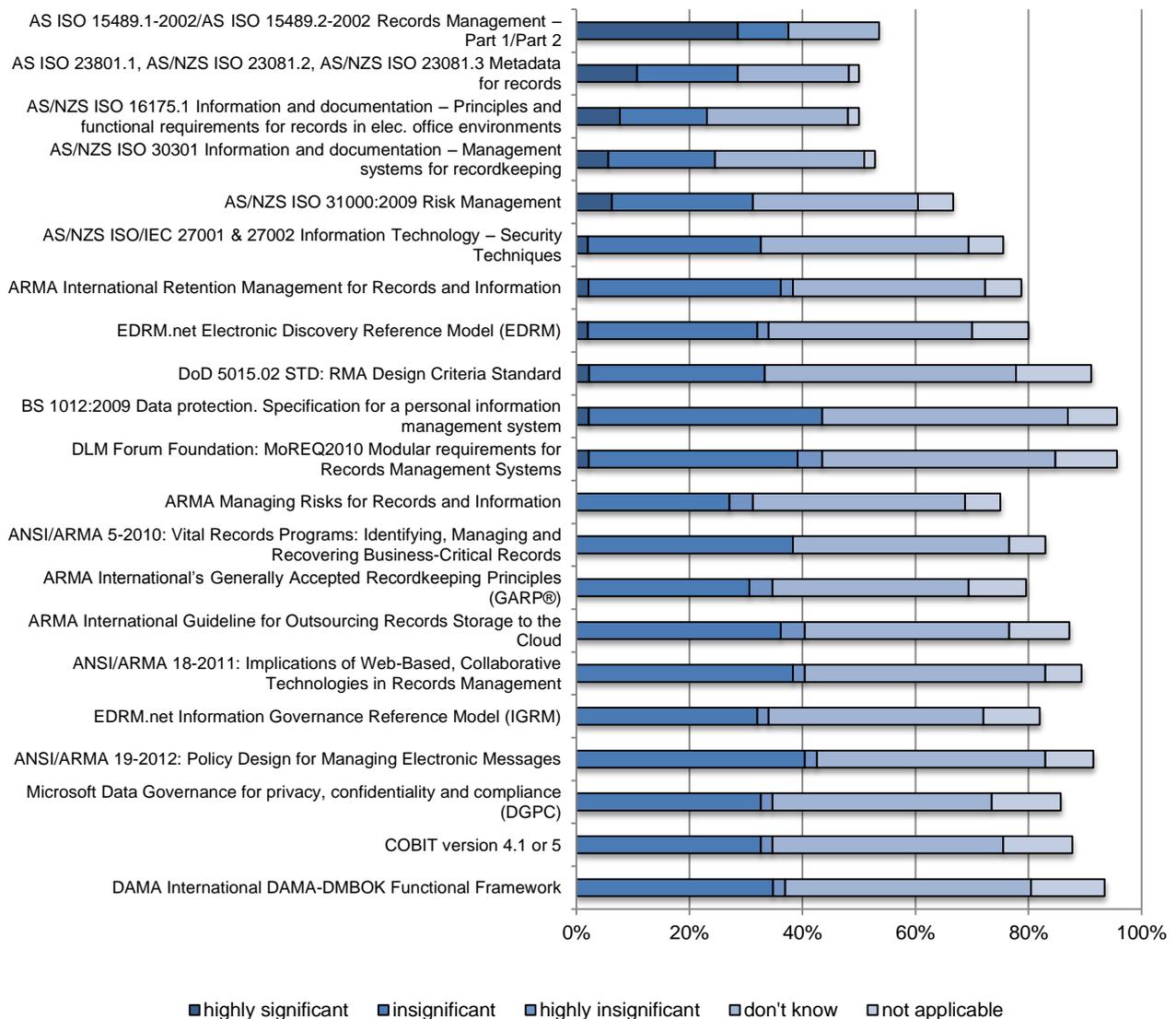


Fig. 15. Standards and Frameworks for information management and governance

#### 4.4.3 Proliferation of standards and frameworks

There has been a proliferation of standards and frameworks over the past decade to assist organizations respond to a wide variety of compliance mandates. They have originated in various disciplinary areas to serve particular needs (e.g. records management, information security, risk management) and are increasingly applied across these areas to address current challenges. However, the range of standards and frameworks available to organizations has also created uncertainty as to what will provide a reasonable level of assurance that they are complying with all relevant mandates.

Respondents were asked how significant standards and frameworks (Fig. 15) are in the development, implementation and evaluation of enterprise information management in their organization. The AS/NZS ISO/IEC 15489 Records Management standard was identified as the most significant standard. This of course may be due to the significant representation of Australian organizations in this survey. It may also partly explain why the majority of organizations reported that they already have a formal strategy for records management (Fig. 7). No significant difference was identified between the different governance frameworks (e.g. EDRM, COBIT, Microsoft Data Governance) in developing, implementing and evaluating information governance programs.

#### 4.5 The Information Professional

To address RO5: to understand the *role of information professionals* and the required skills and knowledge for EIM we asked respondents a series of questions about their EIM roles, knowledge and skills.

##### 4.5.1 Job responsibility and expertise

In terms of primary job responsibility (Fig. 16) the largest single group of respondents (35%) identified records and information management as their primary responsibility. However, 65% of respondents combine information management with another role, with their primary responsibility being in areas such as IT management, strategy and business development and general management. What we see is that whilst there are some clearly dedicated roles for EIM, the role is also distributed across many different business areas.

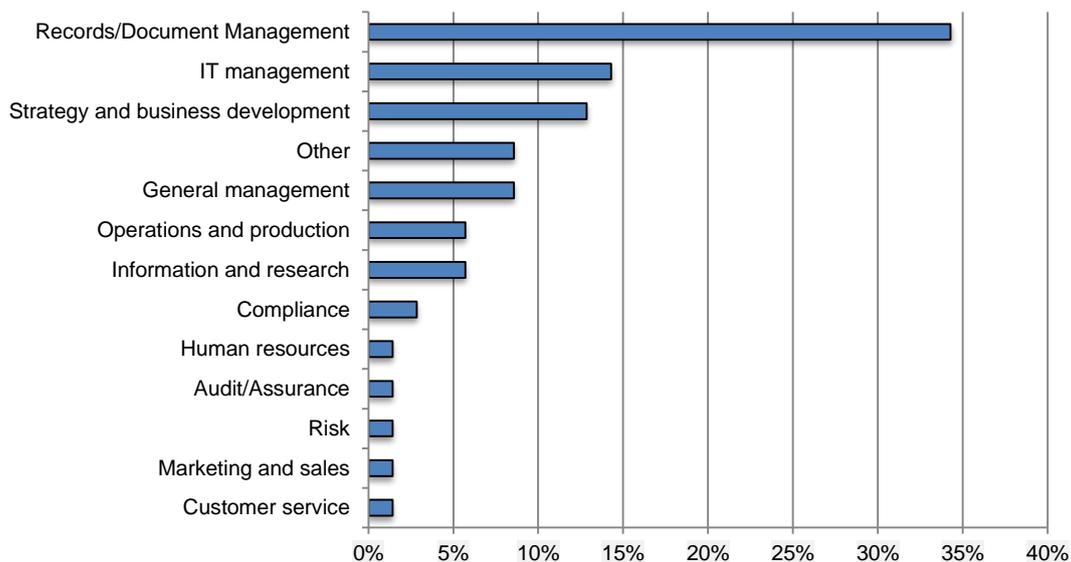


Fig. 16. Primary job responsibility of survey respondents

We pursued this further to identify in which areas our respondents had high levels of expertise (Fig. 17). Following the findings about primary job responsibility, expertise is mainly found in the areas of records management, information technology and strategy and business development. Interestingly information security, risk management, business continuity and audit/assurance are also common, revealing a high level of emphasis on conformance and the risk and compliance side of enterprise information management.

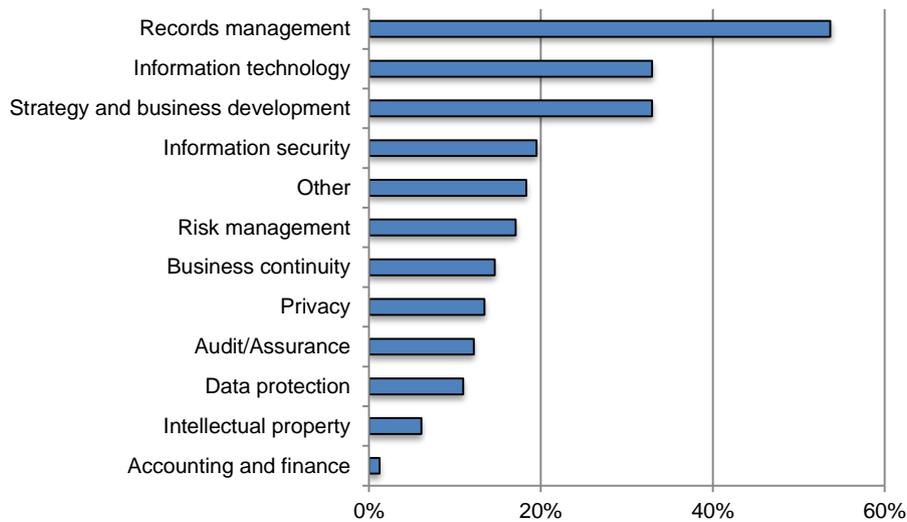


Fig. 17. Respondents' areas of expertise

4.5.2 EIM Skills and knowledge

Given the range of professional groups involved in EIM and its potentially distributed nature, we were interested in discovering to what degree information skills and skills development were recognized and supported in the respondents' organization. As seen from Fig. 18, most organizations recognize that information skills are important. 59% of respondents stated that their organization rates information skills very highly or highly. However, interestingly only 43% of organizations followed through on this by encouraging staff to undertake relevant training to develop their skills in information management.

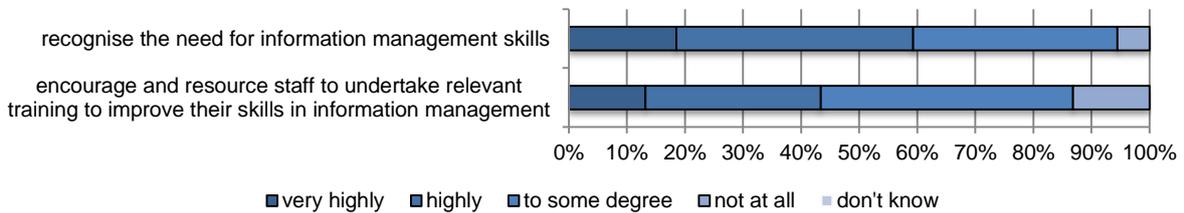


Fig. 18. Recognition of information management skills

We explored this further by asking respondents to identify what they see as the skills and knowledge areas required by contemporary information professionals. This was an open question and the responses were extensive and wide-

ranging. We used an open coding method to classify the skills and knowledge and identified six main skills areas: information and knowledge management; records management; governance, risk and compliance; technology; business; and soft skills. These are briefly discussed below.

*Information and knowledge management skills.* Not surprisingly the largest group of skills relate to management of the information (and knowledge) itself. Skills range across various levels from understanding the business and contribution of information and its value, to specific skills such as managing information quality, metadata design and management, information audit and information needs analysis, information architecture design, etc.

*Records management skills.* Specific skills in records management were highlighted, including understanding records management principles and the legal requirements and standards for records management through to being able to design and manage retention/destruction schedules, business classification schemes, etc.

*Governance, risk and compliance (GRC) skills.* A small but clearly defined group of skills relate to aspects of governance, compliance and risk management more widely. These include meeting statutory and regulatory compliance mandates, skills in developing governance policies and procedures through to practical skills relating to risk management and the protection of information assets.

*Technology skills.* Respondents identified a broad range of required technology skills; ranging from general IT awareness and understanding through to IT and systems admin/support and the ability to design and customize EIM systems.

*Business skills.* These range from having a good understanding of the business and business processes through to being a strategic thinker, preparing business proposals that meet business needs, engaging stakeholders and managing customers both internal and external.

*Soft skills.* One of the largest skill areas was that defined as soft skills. All the survey respondents identified these as important. Information professionals need skills in people management and relationship building, negotiation and communication, project management and planning.

This examination of the roles, skills and knowledge reveals that enterprise information management is the responsibility of many different stakeholder groups within the organization and requires the combination of a wide range of skills and knowledge.

## 5. Concluding remarks

The aim of this study was to investigate key research imperatives and industry challenges associated with enterprise information management. Building on previous work the study examines five, inter-related aspects of EIM to understand the current status of enterprise information management in organizations and to identify the issues and challenges organizations are currently facing. A number of imperatives have been identified from the study; these are discussed below along with the implications of these findings for future research.

### *Meeting performance and conformance objectives*

In terms of the drivers of EIM, we identified an emphasis on both performance (deriving greater business value and meeting business objectives) and conformance (meeting compliance requirements and protection of information assets). Whilst meeting performance and conformance objectives are high-level strategic goals, EIM drivers are found to impact on every stage of the information lifecycle from information creation to information disposition or destruction indicating a significant need for operational readiness to handle this complex mix of drivers. Further, EIM drivers cannot be simply reduced to a series of technical or organizational needs but reveal EIM as a complex sociotechnical phenomenon.

In terms of organizations' current EIM capability the survey reveals that organizations are largely meeting their conformance goals but are still struggling to improve business performance. The challenges that they are facing over the next two years relate to the effective selection and implementation of technology and to develop human capacity towards effectively using EIM technologies.

#### *EIM as a strategic issue*

Given the enterprise-wide nature of EIM we placed a special emphasis on understanding the current status of EIM strategy. Few organizations currently have an EIM strategy in place across the whole organization to coordinate and manage EIM activities. The survey revealed that those organizations that do have an EIM strategy in place have been better able to achieve key performance objectives such as improving information sharing and information integration. However, implementing an enterprise-wide EIM strategy is non-trivial and most organizations are struggling to achieve buy-in from departments and to enforce enterprise-wide policies and standards. There is currently limited guidance available in scoping the complexity of the activities and capabilities required to generate and sustain effective EIM strategies. This points to the need for further research to examine how EIM strategies are being implemented successfully and how these enterprise-wide issues of buy-in and policy/standards enforcement can be most effectively achieved. A direction we are currently following is to examine if, and how, the well-established capability view in the IS scholarly literature (e.g. [8, 31]) and its focus on the strategic value of information system resources provides a potentially useful base upon which to progress EIM research. This forms the foundation and direction for the next stage in this research project, which is currently underway.

#### *Growing complexity and diversity of technologies*

In terms of technologies and content the landscape remains complex and changing, with organizations focusing their efforts into managing and reducing this complexity. The survey reveals a wide diversity of EIM systems in use for purposes such as document, records and content management. Organizations frequently support multiple systems of the same type and identified that integrating multiple different systems is a key technology challenge. Survey respondents also expected that enterprise-wide information management would become more complex in the future pointing to an imperative to accelerate and deepen research into EIM to assist organizations to handle this increasing complexity.

#### *Social business content management*

The survey also reveals a growing use of social business content and social software. However, for most of the organizations surveyed, the content from these systems is currently not being systematically managed, nor do they have a strategy for managing social business content. This is a weak spot and a potential area for significant information risks and preservation concerns in the future. A new study is currently underway to specifically examine the nature of social business content and strategies for its effective management.

#### *Legal and compliance*

Organizations have reported a wide range of legal and compliance requirements shaping their EIM activities. Disposal/destruction regulations and access to information/freedom of information regulations are identified as the most influential in developing enterprise information management policies and practices and have also shaped the selection of technology solutions. Whilst frameworks to support EIM and compliance exist, no single framework is achieving widespread use or dominance. This requires further examination to establish the inhibitors to uptake of these frameworks and to assess their scope and fitness for purpose.

#### *Changing nature of information work*

Whilst most organizations clearly recognize the importance of enterprise information management there is less evidence that organizations are providing support for EIM training and development. The survey shows that there is an increasingly diverse range of skills and knowledge required by the information professional. Traditional information and records management remain at the core and are complemented by the increasingly important technology, business

and strategy knowledge and a good understanding of wider governance, risk and compliance. What becomes clearer is that EIM is a responsibility shared between a wide range of professionals and is a multi-stakeholder, multi-disciplinary activity. This is currently being explored through a series of in-depth case studies that examine the nature, scope and requirements of information work.

The findings of this study have assisted us in gaining a clearer understanding of the current status and implementation of EIM in organizations; it has also revealed a number of imperatives for further research as outlined above.

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## Appendix A. Questionnaire Items - 2013 Enterprise Information Management Survey

### 1. Company Background

**[] Which industry sector is your organization in?**

Please choose only one of the following:

- Agriculture, forestry and fishing
- Mining and quarrying
- Manufacturing
- Electricity, gas, steam and air conditioning supply
- Water supply; sewerage; waste management and remediation activities
- Construction
- Wholesale and retail trade; repair of motor vehicles and motorcycles
- Transporting and storage
- Accommodation and food service activities
- Information and communication
- Financial and insurance activities
- Real estate activities
- Professional, scientific and technical activities
- Administrative and support service activities
- Public administration and defence
- Education
- Human health and social work activities
- Arts, entertainment and recreation
- Other services activities
- O: \_\_\_\_\_

**[] What is the size of your organization?**

Please choose **only one** of the following:

- 1-9 employees
- 10-49 employees
- 50-149 employees
- 150-249 employees
- 250-999 employees
- > 1000 employees

**[] In which country are you located?** \_\_\_\_\_

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2. EIM Drivers & Capabilities

**☐ Over the past 2 years how important have the following drivers been for enterprise-wide information management in your organization?**

Please choose the appropriate response for each item:

	very important	important	unimportant	very unimportant	don't know	not applicable
improving business value of information assets	<input type="checkbox"/>					
improving access to business information	<input type="checkbox"/>					
improving creation & use of business intelligence	<input type="checkbox"/>					
improving capture, management and use of Big Data	<input type="checkbox"/>					
improving information capture	<input type="checkbox"/>					
improving classification of information	<input type="checkbox"/>					
improving use and management of metadata	<input type="checkbox"/>					
improving enterprise search	<input type="checkbox"/>					
improving information re-use	<input type="checkbox"/>					
improving information quality	<input type="checkbox"/>					
improving information integration across multiple systems	<input type="checkbox"/>					
improving internal information sharing	<input type="checkbox"/>					
improving external information sharing	<input type="checkbox"/>					
improving information archiving and preservation	<input type="checkbox"/>					
improving information retention and deletion processes	<input type="checkbox"/>					
reducing costs of information ownership	<input type="checkbox"/>					
reducing information risks	<input type="checkbox"/>					
reducing storage costs	<input type="checkbox"/>					
meeting regulatory compliance requirements	<input type="checkbox"/>					
meeting green IT initiatives/targets	<input type="checkbox"/>					
meeting legal discovery requests	<input type="checkbox"/>					
meeting business continuity requirements	<input type="checkbox"/>					

**☐ Please list below any other very important drivers.**

Please write your answer here:

\_\_\_\_\_

**☐ Rate the following statements about your organization's current enterprise-wide information management capability.**

Please choose the appropriate response for each item:

	very good	good	poor	very poor	don't know	not applicable
...integrate and share information internally between departments is	<input type="checkbox"/>					
...integrate and share information externally with customers, suppliers, business partners is	<input type="checkbox"/>					
...create value from business information is	<input type="checkbox"/>					
...use our information assets to provide business intelligence is	<input type="checkbox"/>					
...manage the cost of collecting, storing and securing information throughout its lifecycle is	<input type="checkbox"/>					
...provide access to critical business information when it is needed	<input type="checkbox"/>					
...meet our regulatory compliance requirements is	<input type="checkbox"/>					
...achieve information governance is	<input type="checkbox"/>					

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### 3. EIM Strategy

**□ Who sponsors or “champions” enterprise-wide information management within your organization?**

Please choose **all** that apply:

- Board/Executive Management Team
- Chief Executive Officer/Director General
- Chief Information Officer
- Legal/Compliance Officer
- IS/IT Manager
- Internal Auditor
- Records Manager
- O: \_\_\_\_\_

**□ Does your organization have a formal documented enterprise-wide information management strategy?**

Please choose **only one** of the following:

- Yes, a strategy is in place across the entire organization
- Yes, a strategy is in place in some parts of the organization
- Yes, we have a strategy in draft form, it is not yet implemented
- No, but we are considering creating one
- No, nor do we have plans to create one
- Don't know

**□ Who approved the enterprise information strategy?**

**Only answer this question if the following conditions are met:**

Answer was 'Yes, a strategy is in place across the entire organization' or 'Yes, a strategy is in place in some parts of the organization' or 'Yes, we have a strategy in draft form, it is not yet implemented' at question '8 [Q8]' (Does your organization have a formal documented enterprise-wide information management strategy?)

Please choose **only one** of the following:

- Board/Executive Management Team
- Chief Executive Officer/Director General
- Chief Information Officer
- Legal department/Chief Counsel
- Internal Auditor
- IS/IT manager
- Records Manager
- O: \_\_\_\_\_

**□ In your opinion, what are the greatest benefits of an enterprise-wide information strategy at your organization?**

**Only answer this question if the following conditions are met:**

Answer was 'Yes, we have a strategy in draft form, it is not yet implemented' or 'Yes, a strategy is in place in some parts of the organization' or 'Yes, a strategy is in place across the entire organization' at question '8 [Q8]' (Does your organization have a formal documented enterprise-wide information management strategy?)

Please choose **all** that apply:

- Information can be better shared between departments, enabling better decision-making
- Integrated information and business intelligence about our customers, products and resources can be leveraged for greater business results
- Sensitive information can be better protected from hackers and thieves, improving security
- Fewer errors will be made, ensuring higher quality
- Non-compliance with regulatory requirements will be minimized
- Information can be properly disposed when no longer needed, reducing risk
- Customers will have more confidence in our efforts to secure their information, improving brand reputation
- Fewer hardware components will be needed to store information, reducing IT costs
- Don't know
- O: \_\_\_\_\_

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**Q8** In your opinion, what are the greatest challenges of an enterprise-wide information strategy at your organization?

Only answer this question if the following conditions are met:

Answer was 'Yes, a strategy is in place across the entire organization' or 'Yes, we have a strategy in draft form, it is not yet implemented' or 'Yes, a strategy is in place in some parts of the organization' at question '8 [Q8]' (Does your organization have a formal documented enterprise-wide information management strategy?)

Please choose all that apply:

- Identifying the cost/risk/return tradeoffs of managing information companywide
- Enforcing policies companywide
- Gaining support from department heads and line of business managers
- Knowing where to begin or how to go about it
- Convincing executive management to support the initiative
- Getting our IT infrastructure to support our initiatives
- Creating corporate standards for classifying information
- Funding the initiative
- Understanding government regulations and ensuring that our various international offices are meeting those requirements
- Don't know
- O: \_\_\_\_\_

**Q9** Does your organization have formal strategies for the following?

Please choose the appropriate response for each item:

	yes, part of an EIM strategy	yes, stand alone strategy	no	don't know
records management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
email retention and management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
social media usage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
social media information management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
electronic discovery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
information governance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**4. EIM Challenges**

**Q10** In the next two years how significant will the following activities be for enterprise-wide information management in your organization?

Please choose the appropriate response for each item:

	very significant	significant	insignificant	very insignificant	don't know	Not applicable
End-user training and adoption of EIM systems	<input type="checkbox"/>					
Improving the usability of EIM systems	<input type="checkbox"/>					
Managing and developing staff	<input type="checkbox"/>					
Assessment and evaluation of EIM performance	<input type="checkbox"/>					
Recruiting staff with relevant EIM knowledge, skills and experience	<input type="checkbox"/>					
Integrating EIM systems with other enterprise systems	<input type="checkbox"/>					
Scaling existing systems to fit our growing needs	<input type="checkbox"/>					
Managing multiple EIM systems and tools	<input type="checkbox"/>					
Evaluating and selecting appropriate new Technologies	<input type="checkbox"/>					
Implementing or migrating to new EIM technologies	<input type="checkbox"/>					
Evaluating/adopting EIM cloud services	<input type="checkbox"/>					
Managing technology vendor relations	<input type="checkbox"/>					

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**□ Over the next 2-5 years how do you expect the complexity of enterprise-wide information management will change?**

Please choose **only one** of the following:

- It will become more complex
- It will stay about the same
- It will become less complex
- Don't know

**5. Information, Systems & Technologies**

**□ How are the following content types managed in your organization?**

Please choose the appropriate response for each item:

	formally - part of organizational-wide strategy	formally – department level strategy	informally individual responsibility	not at all	don't know
Office Documents (e.g. word processing, presentations, spreadsheets)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Email messages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Photo images	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Audio files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video files	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Instant messages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Collaborative content (e.g. files generated by team/project tools)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Web content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social media content (e.g. wikis, blogs, tweets, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing content/data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business application data (e.g. ERP-System data, invoices, orders)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compliance-related content/data (e.g. contracts, patents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confidential documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**□ Which of the following technologies are used for information management within your organization?**

Please choose all that apply and name the vendor and system (if known)

- Document management system (DMS) \_\_\_\_\_
- Records management system (RMS) \_\_\_\_\_
- Content management system (CMS) \_\_\_\_\_
- Web content management systems (WCMS) \_\_\_\_\_
- Knowledge management systems (KMS) \_\_\_\_\_
- Enterprise Content Management (ECM) \_\_\_\_\_
- Wikis \_\_\_\_\_
- Blogs \_\_\_\_\_
- Portals \_\_\_\_\_
- Mash-up \_\_\_\_\_
- Other Web 2.0 tools \_\_\_\_\_
- File Sharing (like Dropbox) \_\_\_\_\_
- ERP system \_\_\_\_\_
- Other \_\_\_\_\_

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**□ What are your plans for EIM technologies within the next 2 years?**

Please choose all that apply:

- Evaluating new EIM technologies
- Purchasing a new system
- Migrating from existing to new system(s)
- Upgrading/expanding existing system(s)
- Consolidating systems
- Integrating EIM systems with other enterprise systems
- Evaluating EIM cloud services
- Adopting EIM cloud services
- No plans to change existing EIM systems
- Don't have EIM and don't plan to add
- O: \_\_\_\_\_

**□ What do you expect to be the biggest EIM-related technological challenges over the next 2 years?**

Please choose all that apply:

- Integrating EIM systems with other applications
- Expanding EIM systems to support new uses
- Upgrading EIM systems
- Customizing/configuring EIM systems
- Maintaining system performance and availability
- Moving EIM to the cloud
- Consolidating EIM Systems
- Scaling the system to the huge amounts of information
- O: \_\_\_\_\_

**6. Standards, Frameworks & Regulations**

**□ Which of the following legal and regulatory obligations are relevant for your organization?**

Please choose all that apply:

- Sarbanes-Oxley Act
- Dodd-Frank Act
- The Health Insurance Portability & Accountability Act (HIPAA)
- Gramm-Leach-Bliley Act
- EU Data Protection Directive
- PCI Data Security Standard
- e-Transaction laws (enforceability & compliance of electronic documents generally)
- Security breach notification regulations
- Disposal/Destruction regulations
- eDiscovery
- Freedom of information

**□ Below is the list of legal and regulatory obligations that you selected from the list above.**

**Please indicate whether (or not) these obligations have shaped your technology selection and/or the development of enterprise information management policies and practices.**

Please choose the appropriate response for each item: ('Which of the following legal and regulatory obligations are relevant for your organization?')

	shaped technology selection	didn't shape technology selection	shaped policies and practices	didn't shape policies and practices
Sarbanes-Oxley Act	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dodd-Frank Act	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Health Insurance Portability & Accountability Act (HIPAA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gramm-Leach-Bliley Act	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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EU Data Protection Directive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCI Data Security Standard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e-Transaction laws (enforceability & compliance of electronic documents generally)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security breach notification regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disposal/Destruction regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
eDiscovery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freedom of information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**□ Please list any other significant legislation & regulations that influence your organization's enterprise-wide information management.**  
Please write your answer(s) here:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**□ How significant are the following in the development, implementation and evaluation of enterprise information management within your organization?**  
Please choose the appropriate response for each item:

	highly significant	significant	insignificant	highly insignificant	don't know	not applicable
ARMA International's Generally Accepted Recordkeeping Principles (GARP®)	<input type="checkbox"/>					
EDRM.net Information Governance Reference Model (IGRM)	<input type="checkbox"/>					
EDRM.net Electronic Discovery Reference Model (EDRM)	<input type="checkbox"/>					
COBIT version 4.1 or 5	<input type="checkbox"/>					
Microsoft Data Governance for privacy, confidentiality and compliance (DGPC)	<input type="checkbox"/>					
DAMA International DAMA-DMBOK Functional Framework	<input type="checkbox"/>					
DLM Forum Foundation: MoREQ2010 Modular requirements for Records Management Systems	<input type="checkbox"/>					
DoD 5015.02 STD: RMA Design Criteria Standard	<input type="checkbox"/>					
AS ISO 15489.1-2002/AS ISO 15489.2-2002 Records Management – Part 1/Part 2	<input type="checkbox"/>					
AS ISO 23801.1, AS/NZS ISO 23081.2, AS/NZS ISO 23081.3 Metadata for Records	<input type="checkbox"/>					
AS/NZS ISO 16175.1 Information and documentation – Principles and functional requirements for records in electronic office environments	<input type="checkbox"/>					
AS/NZS ISO 30301 Information and documentation – Management systems for recordkeeping	<input type="checkbox"/>					
ARMA International Retention Management for Records and Information	<input type="checkbox"/>					
ARMA International Guideline for Outsourcing Records Storage to the Cloud	<input type="checkbox"/>					
ANSI/ARMA 19-2012: Policy Design for Managing Electronic Messages	<input type="checkbox"/>					
ANSI/ARMA 18-2011: Implications of Web-Based, Collaborative Technologies in Records Management	<input type="checkbox"/>					
ANSI/ARMA 5-2010: Vital Records Programs: Identifying, Managing and Recovering Business-Critical Records	<input type="checkbox"/>					
BS 1012:2009 Data protection. Specification for a personal information management system	<input type="checkbox"/>					
AS/NZS ISO/IEC 27001 & 27002 Information Technology – Security Techniques	<input type="checkbox"/>					
AS/NZS ISO 31000:2009 Risk Management	<input type="checkbox"/>					
ARMA Managing Risks for Records and Information	<input type="checkbox"/>					

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**□ Please list any other significant frameworks and guidelines that influenced your organization's enterprise-wide information management.**

Please write your answer(s) here:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## 7. Information Professionals

**□ What is your job title? Please name:**

Please write your answer here:

\_\_\_\_\_

**□ Which of the following best describes your primary job responsibility?**

Please choose **only one** of the following:

- Audit/Assurance
- Compliance
- Customer service
- Finance
- General management
- Human resources
- Information and research
- IT management
- IT Security
- Legal
- Marketing and sales
- Operations and production
- Procurement
- Records/Document Management
- Risk
- Research & Development
- Strategy and business development
- Supply-chain management
- O: \_\_\_\_\_

**□ What is the name of the business unit/department that you are located in? Please specify**

Please write your answer here:

\_\_\_\_\_

**□ Please indicate any of the following areas in which you believe you have a high level of expertise.**

Please choose **all** that apply:

- Accounting and finance
- Audit/Assurance
- Business continuity
- Data protection
- Information security
- Information technology
- Intellectual property
- Privacy

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- Records management
- Risk management
- Strategy and business development
- O: \_\_\_\_\_

**[] What areas best reflect your professional background?**

Please choose **all** that apply:

- Audit/Assurance
- Law
- Library and Records management
- IT
- Public administration
- O: \_\_\_\_\_

**[] What is your highest level of qualification?**

Please choose **only one** of the following:

- Secondary Education
- Certificate/Diploma
- Bachelor Degree
- Master Degree
- DBA or PhD

**[] Are you a member of any professional associations and/or have any professional accreditations?**

Please choose **only one** of the following:

- Yes
- No

**[] Please list your professional memberships and accreditations**

**Only answer this question if the following conditions are met:**

Answer was 'Yes' at question '30 [Q27]' (Are you a member of any professional associations and/or have any professional accreditations?)

Please write your answer(s) here:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

**[] To what degree does your organization...**

Please choose the appropriate response for each item:

	very highly	highly	to some degree	not at all	don't know
...recognize the need for information management skills?	<input type="checkbox"/>				
...encourage and resource staff to undertake relevant training to improve their skills in information management?	<input type="checkbox"/>				

**[] What are the 5 most important skills and knowledge areas required by the contemporary information professional? Please name:**

Please write your answer(s) here:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Biographical notes



### **Susan P. Williams**

Susan Williams is Professor of Enterprise Information Management at the Faculty of Computer Science of the University of Koblenz-Landau and Director of the Information Design Lab. She is also Visiting Professor at the Human-Centred Technology Design Research Group, University of Technology, Sydney. With a focus on the complex interplay between human-centred information design, technical innovation and organisational change, her research program is directed towards assisting organisations to improve the design, management and protection of their digital information assets.

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Verena Hausmann (M.Sc.) is currently a research assistant and PhD student with the Enterprise Information Management Research Group at the University of Koblenz-Landau. She holds an MSc in Information Management and previously worked as a student assistant at the University of Koblenz-Landau. She was involved in the student council of Information Management and today she is the chairperson of the Association of Information Management. Her current field of research is in the area of unstructured information management and documentary practices.

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Petra Schubert is Professor of Business Software at the Faculty of Computer Science of the University of Koblenz-Landau and Director of the Institute for IS Research. She is also Director of the Competence Centre for Collaboration Technologies sponsored by IBM. She had previous engagements as a professor at Copenhagen Business School, and two Swiss Universities in Basel and St. Gallen. Her research interests include Enterprise Systems especially ERP Systems and Collaboration Software. She co-edited ten books containing articles and case studies on successful business software projects.

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## Governance challenges in temporary organizations: a case of evolution and representations

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## Governance challenges in temporary organizations: a case of evolution and representations

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### **Abstract:**

According to the literature, formal project governance often stops at the steering committee, which is also identified as the main link between the permanent and temporary organizations. Generally, top managers play an active role as sponsors in this committee until the project is approved and launched. Afterwards, the project execution is usually delegated, enabling middle managers to participate in strategy operationalization. As such, they are likely to take part in the project governance and its operationalization. In this study, we are especially interested in the governance zone reporting to the steering committee. Within this zone, formal and informal governance is intertwined, and there is likely to be considerable overlap with the permanent organization. Our study focuses on a specific liaison device within this zone: the Project Coordination Committee, which has rarely been studied. We explore how project governance evolves and is represented by project participants. Our results show a surprising diversity in participants' representations. This allows us to identify a number of conclusions that go beyond the governance form issues and relate to the complexity of this governance zone and its influence on the disruptions between permanent and temporary governance structures within a large organization.

### **Keywords:**

project governance; temporary organization; project coordination committee; sensemaking; project coordination.

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## 1. Introduction

Projects do not replace existing organizational forms; they overlap with them in permanent organizations (i.e., parent organizations), thus adding complexity to the way we organize [1]. In this paper, we explore this complexity by delving deeper into the project governance structure. Interestingly, in the current literature, studies often stop at the steering committee level [2]. The steering committee, typically chaired by a top manager who acts as the project sponsor, can include such diverse members (e.g., top managers, middle managers, expert domain managers, etc.), knowledge and levels, that it could be argued that it needs further development. Additionally, top managers tend to delegate the execution of a project, following its approval and launch [2]. Through this delegation, middle managers, including supervisors, participate in the operationalization and monitoring of the project strategy, which comes from top managers. As such, they are likely to take part in project governance and operationalization. Furthermore, the literature suggests that the main link between the permanent and temporary organizations (i.e., the organization and the project) is the steering committee [2]. Such arguments add still further reasons to explore the project governance structure beyond the steering committee, which seems to be a particularly inclusive notion in the current literature.

In this study, we aim to gain a deeper understanding of the project governance structure by exploring how project governance is operationalized and evolves during the project's execution. We focus especially on the project governance zone located lower down in the structure, below the steering committee, where formal and informal governance is likely to become intertwined. Within this zone, we examine a specific liaison device [3] called the Project Coordination Committee (PCC). This committee is a governance mechanism at the lower management level where project coordination takes place between the various disciplines. This mechanism should be significant, because the coordination of diverse expertise is considered to be an important predictor of a project's effectiveness [4]. The PCC may have different names in practice, and can be more or less formalized. When formalized, it usually reports to the project steering committee and thus is part of the formal project governance structure. Its main purpose is to participate in managing the project's multidisciplinary coordination throughout its execution. This coordination generally involves units of the permanent organization, which is usually the most important resource provider for the project [5]. Indeed, within this governance zone, the boundaries of the permanent and temporary organizations are likely to overlap. This overlap is probably even more significant for projects performed using matrix ways of organizing.

Our case study took place in a large Information Technology (IT) business project, which was planned to result in business process changes. Originally, our study was focused on collaboration within the PCC. However, as we shall see, instead of observing collaboration, we discovered a case of non-collaboration within the project and in relation to its parent organization. This dysfunction required us to broaden our study and explore the project governance structure in more depth. Fortuitously, a crisis arose during our field period [6, 7]. This crisis gave us an opportunity to observe the governance challenges of this project, especially those associated with the PCC. Interestingly, it is during crises that we can observe the basic structure of organizations [8, 9], and it is in change situations that governance principles surface [10]. Within this study, we have explored project governance and multidisciplinary coordination, especially at the PCC level. It enabled us to focus on the people who are responsible for ensuring this coordination; since decision-making tends to occur where information resides [3], this adds to the interest of studying this governance mechanism, which is too often neglected in the current literature.

In this study, our goal is to contribute to a better understanding of project governance, including its relationship with project coordination and its parent organization. It goes beyond the issues of governance forms as we shall see in our concluding remarks. First, however, we will start by presenting our theoretical background, introducing the notions of project and governance, including the relationship between project governance and coordination; then, the sensemaking process and the project's trajectory will be discussed. Next, the study and its methodology are presented. Finally, we conclude by presenting our findings and their implications for future research.

## 2. Theoretical background

### 2.1 *Project and governance*

Projects are conceptualized as temporary organizations [11]. The temporariness of temporary organizations is their crucial and unique characteristic, which distinguishes them from other organizational forms, and thus from permanent organizations [12]. A project can exist within a permanent organization or be stand-alone. In this paper, we focus on projects within a permanent organization, also called the parent organization. Such projects are often used to operationalize the strategy coming from the parent organization's senior management [13]. Thus, they can be challenging endeavors, since they usually result in some changes in the parent organization [14].

Both corporate and project governance literature conceptualizes governance as an oversight function. Corporate governance is defined as the system relating to the management and control of companies. Its structure specifies the distribution of rights and responsibilities among different actors and dictates the rules and procedures governing decision-making [15]. The principles of corporate governance are linked to projects by means of project governance [16]. The general purpose of project governance is to ensure that the project will meet the goals and expectations defined by various stakeholders [17]. This purpose should be achieved by consistent and coherent implementation of governance roles and responsibilities by different management levels within the organization [2]. Although, its implementation implies the use of mostly temporary components, which are dispersed throughout the organization in multiple layers of networks; this situation poses a difficult problem of alignment or fit between the components themselves; moreover, the boundaries between these networks are not clear [18]. Thus, the implementation of project governance in the project and the parent organization presents challenges.

Meanwhile, top managers often tend to consider project management as a tactical concept [13] used to operationalize strategy. In fact, top managers normally act as project sponsors and play an active role until they get the project approved and launched. Afterwards, the project is usually delegated, because top managers have little time for projects, and in practice, focus only on the most important ones. Thus, they tend to delegate most projects and their monitoring to intermediaries [3]. Throughout the project's duration, the project sponsor is considered to be the primary point of authority, followed by the project steering committee of which he/she is a member [2]. This committee is viewed as the mechanism for implementing project governance and the main governance link between the temporary and permanent organizations [2]. Normally, this committee is composed of decision-makers who have managerial authority; other participants, such as domain expert managers, can be added as needed for part of the project [2]. In fact, the notion of the steering committee is very inclusive because of its members' potential diversity, principally in knowledge, power and hierarchical level. This situation suggests that the notion needs to be developed further. Nevertheless, the investigation of the formal governance structure of projects in the literature generally stops at the project steering committee, implying that the remaining governance is mainly informal.

According to the literature, the multidisciplinary nature of projects means that knowledge is usually dispersed among the various actors within a governance network [19]. There is a move towards more informal collaborative governance at the project level, which depends on the cooperation of the actors involved [20]. Thus, since decision-making tends to be located where information resides [2], projects can also be considered as coordination mechanisms [21], in which governance is used as a horizontal approach to govern and organize [20]. In fact, projects may be considered as temporary organizing processes rather than delimited organizations; actually, they are often composed of streams of activities, which are more interrelated than the theories indicate [21]. These considerations suggest that project governance tends to be horizontal and informal, in order to enable collaboration, cooperation and coordination. The coordination of diverse expertise is considered to be an important predictor of project effectiveness [4].

## 2.2 Coordination and project governance

Mintzberg [3] suggests that coordination mechanisms are “the most basic elements of structure” (p. 3) in organizations and include both formal and emergent elements. According to Okhuysen and Bechky [22], there are three integrating conditions for coordination: accountability; predictability; and common understanding. These conditions are the means by which people collectively accomplish their interdependent tasks in the workplace. Thus, coordination is facilitated when the interdependence among parties, their responsibilities and the progress of tasks is made visible through accountability [22]. Furthermore, an understanding of the relationship between roles in organizations, or role structure, which is a kind of governance mechanism, has been found to help people acquire a general sense of who does what in the work process [23]. Of course, this understanding needs to show some sort of commonality among actors. Formalization is another means of making sense when coping with problems of understanding in collaborative relationships [24]. Formalization can also play a positive role in helping organizations deal with ambiguous reality [24, 25]. Thus, the formal attribution of a role may be an important enabling condition for leaders or key actors to engage in sensemaking activities [26]. However, relatively little attention has been paid to the formalization of such roles, including coordination committee roles like the PCC. In addition, there is little explanation of the means by which coordination occurs: a focus on the “how” behind the mechanisms [22]. It is also important to note that organizational structure theorization has mainly been developed based on insights from permanent organizations; in other words, organizations that do not have an institutionalized limitation on their existence [2].

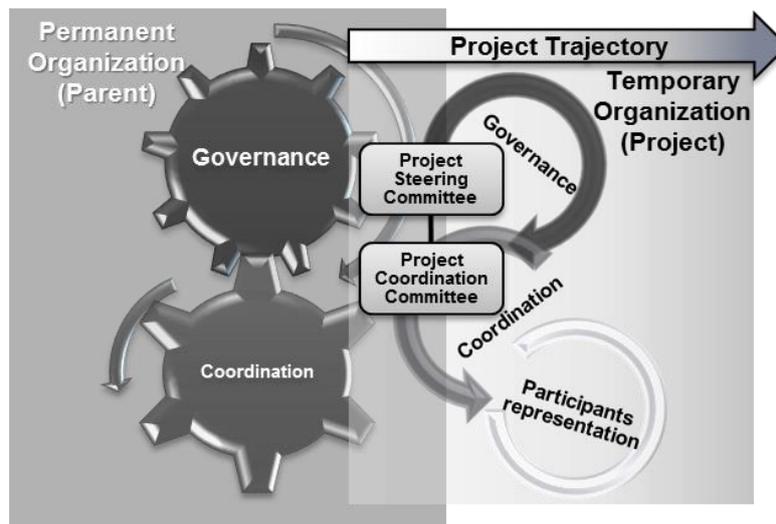


Fig. 1 - The Project Coordination Committee (PCC) context overview

Within the project governance structure, the PCC is a formal governance mechanism, which usually reports to the project steering committee. Its mandate is to coordinate the various multidisciplinary groups assigned to projects and to foster collaboration. While this is the “accepted truth”, it is difficult to find systematic studies on the subject. So far, few authors have focused on structures in temporary organizations [27], and the role system is found to be a governance mechanism that has an important coordinating function [23]. This type of committee includes people who are responsible, formally or informally, for project delivery: being responsible in this context means that they participate directly or via the management of their units in the project’s execution. Fig. 1 provides a generic view of the PCC context. It shows that the PCC is located in the governance zone where the parent organization’s boundaries intersect and are juxtaposed with those of the temporary organization, that is, the project [20]. The PCC represents a lower-level governance mechanism where project coordination takes place between diverse groups. Through the PCC, we want to

explore how members of this committee coordinate the work. This leads us to explore the PCC's formal governance structure and its evolution throughout the project's trajectory.

We also want to observe how the project governance structure is represented by project participants. For coordination to take place, accountability and common understanding are two important conditions [22], implying that the actors' representation of the formal project governance structure, which results from their sensemaking, should be considered. Participants' representations are subject to variations over time, as is the project trajectory, which can influence their representations.

### 2.3 Sensemaking and the project's trajectory

Sensemaking may be considered to be an evolutionary process, where retrospective interpretations are built upon interdependent interactions between actors and their environments [28]. Weick draws attention to ambiguity and uncertainty, known as "equivocality," in the process of "making sense" [29]. Most of the time, we only have sensemaking [30], which generates a provisional understanding that is plausible, subject to revision, fast, directed towards the continuation of the activity interrupted, available, tentative, infused with ignorance, and sufficient for everyday use [29].

The basic formulation of sensemaking is: "How can I know what I think until I see what I say?" It emphasizes that people must do or say something first and then see what they think [29]. The effect precedes the cause [29]. Within sensemaking, enactment is people's insistence on taking action to develop a sense of what they should do next. Thus, behavior is not directed by goals; instead, it interprets goals. Behavior includes writing, editing and reading, which are not very visible in discussions of enactment, although they do enact the environment. Furthermore, the only way to see what one said is literally to read what one wrote [31]. Central to this process is individual identity, which provides a focal point from which judgments of relevance and meaning unfold. Included in this identity is one's association with the permanent and/or temporary organization, which is specifically referred to as organizational identity [32]. Thus, an individual can have multiple organizational identities of varying strengths.

In the context of this study, we mobilize sensemaking to observe how the project governance structure is represented by project participants. The project has a mission, a governance structure, etc., which may be understood differently by stakeholders depending on how they make sense of them. Sensemaking is strongly influenced by one's identity. The project follows a trajectory within its parent organization: at different points in time, each stakeholder perceives the project to be following a path to success or failure. This corresponds to their perceived project trajectory, which can differ between stakeholders. In parallel, at each specific time T throughout the project lifetime, a formal project status report is issued, which is usually influenced by the most powerful stakeholders [33] and reflects the formal project state at time T; this is the official project trajectory. This trajectory is part of the context within which sensemaking is performed. It changes over time and should influence sensemaking, since it refers to the potential for success (or failure) in realizing the project's *raison d'être* of the project, which is fundamental.

In conclusion, in this section we have presented the main theoretical notions mobilized by our study. Based on the current literature, analysis of the formal project governance structure generally stops at the steering committee. We want to fill this gap by exploring the governance structure below this committee through the study of a specific liaison device located in the governance zone reporting to the steering committee. This liaison device, often called the Project Coordination Committee (PCC), has rarely been studied and is located in a zone where multiple boundaries intersect: permanent vs. temporary organizations, and formal vs. informal governance. We aim to contribute to expanding knowledge of how projects work by studying project governance and its evolution, including project actors' representations of this governance through time. According to Sjoblom and Godenhjelm [20], the formal and informal composition of a project's governance structure and its fluidity and complexity remain to be better understood, including where the parent organization's structures meet those of the temporary organization – the project. Furthermore, Soda and Zaheer [34] note that the interplay of formal and informal has rarely been empirically examined in depth, nor have its performance implications been investigated at the level of the individual organizational actor. Through this study, we also want to respond Jones and Lichtenstein's [35] request that researchers focus on projects

rather than organizations and networks, which are the subjects of most studies on project-based organizing, and to Söderlund's [36] plea for a more fundamental understanding of projects, such as better knowledge of how they function.

### 3. The study

Our research approach is a case study with a flexible design, which uses narrative strategy, temporal decomposition, and visual mapping. Its main unit of analysis is the PCC. It also has two secondary units of analysis: the project and the participants' representations of the project governance structure. A theory-based sampling method was used for the project and the coordination committee. The selection criteria we applied were: an IT business project that included software development, with a formal coordination committee composed of business and technical representatives, and with a steering committee. This type of project usually involves two major types of participants: those responsible for business changes and those in command of technological changes. They must coordinate their activities through various formal and informal governance mechanisms. This coordination involves stakeholders from the permanent and temporary organizations and from many disciplines such as project managers, technical leads, domain experts, business analysts, change experts, middle managers, etc.

Our empirical exploratory study was carried out in 2012 in a private telecommunications company, which is a major player in its sector in Canada. The TOBO project was one of the top three highest-priority projects. It was executed in matrix mode and involved around 150 people at the time of the study. These people were from three major sectors of the parent organization, one IT and two business sectors (sectors A and B), distributed in more than 20 units overall. The first author was present in the field to observe meetings and conduct interviews on 13 days out of a potential 25 working days and for durations varying between one and six hours (average three hours). In 2013, additional interviews were conducted to gather supplementary data on the project history and its outcome. The research data sources were semi-structured interviews (interview structure presented in Appendix A), meeting observations, documentation on the project and the organization, the researcher's logbook and notes and memos. The method for these interviews and observations was typical case sampling. Five coordination committee meetings were observed, and 12 participants who were members of the PCC or in a direct relationship with it were interviewed. These participants were considered representative of the different sectors and point of views; indeed, following the original identification of participants by the project manager, the senior manager who was responsible for the project in the permanent organization decided to become directly involved in this activity by adding participants in order to ensure that people with different points of view would participate. Thus, the first author met the project manager, who was also responsible for coordinating the committee, technical people and business people (including both pilots), who were involved in the PCC or in direct contact with members of the committee; they had different perceptions and opinions of the project. Later, we also decided to contact the previous project manager, who was no longer working for this company, in order to obtain more information on the project's past. Thus, emergent sampling was also used. We also got access to the project records, which were quite voluminous since the project had started two years before. The documentation related to project committee meetings since the project's inception was extracted from the records. We received more than one hundred formal documents containing data about the project's status, which included activity progress, issues, risks and points of information.

The main analysis strategy resulted in the use of the traditional scientific research criteria as we sought to describe and explain phenomena as accurately and completely as possible, so that their descriptions and explanations would correspond as closely as possible to the way the world is and works [37]. Validity criteria were mainly fulfilled by data triangulation and by conducting semi-structured interviews with open-ended questions using a single detailed interview guide, ensuring uniformity in the information gathered and questions. In addition, an experienced researcher validated the approach. Since this is a simple case study, it may be pointed out that the main potential limitation of such studies relates to their transferability [38]. Nevertheless, Passeron and Revel [39] note that a case study is at the basis of the first observations we make about phenomena to be discovered. Thus, the deficit of the theory defines the event of narration, whereby narrative is used to explain a situation and understand how we got to the point where there is a problem.

#### 4. Analysis

The analysis was carried out in five major steps. Some of these steps emerged and were progressively adapted during our field observations, because as soon as the field period started, there were some surprises with respect to the PCC, which was called the *Core Team* in this project. In fact, the ambiguous nature of the structure soon became evident. Originally, only one type of meeting for this committee was expected to be observed, but soon after the fieldwork was allowed, two types of meetings were identified: one for IT and one for Business. Shortly afterwards, two other types of meetings were also mentioned. These surprises prompted us to try to understand what the “real” day-to-day project structure was. Therefore, the first step became the analysis of the project structure. We also decided to ask interviewees to draw on paper and then comment on their representations of the project organization chart; the variety of representations obtained confirmed the structure’s ambiguity.

Secondly, the case history and the chronology map were drawn up. Thirdly, transcripts and relevant documentation were coded. To ensure validity, transcripts were sent to interviewees for feedback. Interpretations made during analysis were validated with a participant informer to prevent potential biases and distortions. The research data showed that there were major conflicts between the temporary and permanent organizations. The governance zone associated with the PCC was an important area of conflicts, triggering non-collaboration. Initially, we had planned to study cross-functional collaboration, but the observed structure made this difficult. The project coordination seemed rather complex in terms of formal communications arenas. The project coordination was coordinated at various meetings each week. There were two large coordination silos in the project: Business sectors (i.e., customers) and the Information Technology sector (i.e., Information system providers). Some clarification of the project’s governance structure was required, especially the role of the PCC. How did it work and how had it evolved from its initial mandate? Consequently, a fourth step was performed in order to analyze the project documentation and triangulate our findings with observation and interview data, which enabled us to identify some unresolved governance issues. Finally, the last step was to analyze the interviewees’ representations of the project org chart. The case history and chronology map were revised throughout those activities to reflect the latest findings.

The following sections provide an overview of our findings. We start with the changes in the project governance structure throughout the project trajectory, followed by the interviewees’ representation of this structure.

##### 4.1 *The project trajectory and the changes in governance structure*

The research data showed that the project had been in trouble almost since its inception, its trajectory becoming progressively more problematic. However, it should be noted that this project was initially considered to be a great unifying force by all sectors involved, even though significant business process changes were envisioned. Our analysis identified unaddressed issues in the project governance and scope from the start. These unresolved issues added ambiguity throughout the project execution and appeared to have been the source of many struggles. At first, there were issues related to the project scope, as each sector had its own understanding of it. This understanding also varied by hierarchical level in each sector, and was also influenced by certain specific agendas. Thus, while top managers mainly focused on the strategic dimension of the project, which concerned end customers’ services, middle managers aimed to improve their own units’ productivity, and supervisors wanted to make sure their staff would not suffer from the envisioned process changes. Throughout the project execution, problems and tensions gradually accumulated. In parallel, there was an increasing need to minimize the project’s already ambiguous scope for budget reasons. Tensions were especially significant in the governance zone corresponding to coordination, where they were exacerbated by governance ambiguities.

Indeed, the initial project structure, which was publicized in a graphic form to the project’s stakeholders (see Fig. 2) was composed of: 1) the *Strategic Committee*, in command of the project budget and calendar; its members were principally top managers; 2) the *Steering Committee*, in command of the project scope; its members were mainly middle managers; 3) the *Project Manager and Core Team*, which represents the PCC referred to in this study; 4) the three functional sectors involved in the project.

This structure was inherited from the feasibility study that gave rise to the TOBO project. At that time, more detailed information was only provided for the Strategic Committee and Steering Committee. Then, when the TOBO project started up, the Core Team was initially defined. This team, which corresponds to the PCC in our study, was responsible for following up on issues and activities, and also for approving all project deliverables. Although this is not explicitly shown on the chart, this team was divided into two project committees: IT and Business. The project manager was expected to act as the bridge between these two committees. Fig. 3 illustrates this implicit project structure, which was roughly described using text only in the initial project documentation. This documentation specifies that the members of the IT project committee should be IT team managers from the permanent organization; more than 14 IT team units were part of the project. The members of the Business project committee were supposed to be business area representatives (e.g., domain experts); more than five Business team units participated in the project. However, a few months after the project inception, most of this committee's members were business team managers from the permanent organization.

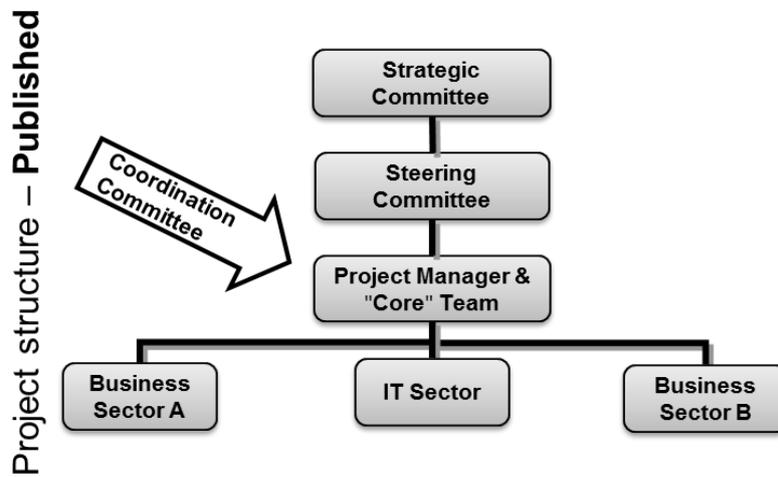


Fig. 2 – Published Project Structure

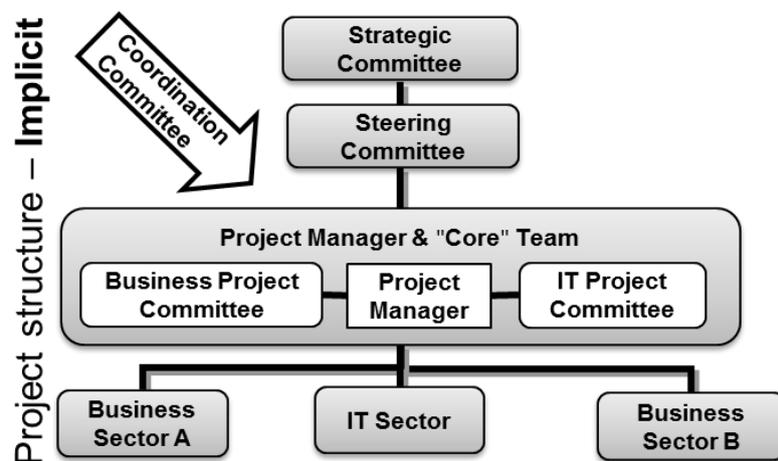


Fig. 3 - Implicit Project Structure

The implicit project structure (Fig. 3) was thus composed of four committees instead of the original three (Fig. 2). Additionally, the initial decision to assign domain experts to the Business Project Committee was not implemented. Nevertheless, during the first months, two domain experts were formally assigned to the project to act as pilots, formally representing their business sectors. However, only the pilot who was a manager in the permanent organization was included in the Core Team, specifically in the Business project committee. The second pilot's supervisor was assigned to this committee instead.

The left side of fig. 4 illustrates the changes in the formal project governance over time. It starts with the creation of the initial project org chart, followed by the project launch and a formal governance adjustment period, which lasted around six months. During this period, two changes were made: 1) Change in approval of project deliverables: the Steering Committee transferred the Core Team's approval responsibilities to the two pilots; 2) Formalization of the scope change management process: the process was to ensure that the project scope would be kept at a minimum. Within the Core Team, these changes implied that only the project manager was formally accountable for the project success and subject to some formal control mechanism.

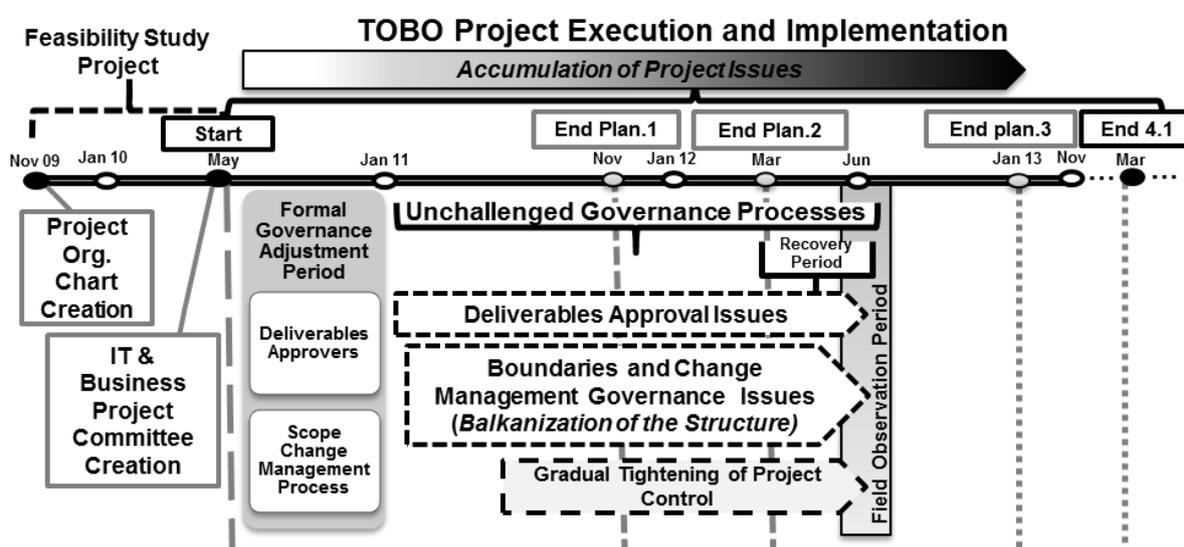


Fig. 4 - Changes in Project Governance

After the adjustment period, the project governance processes remained unchallenged, as illustrated in the central part of the Fig. 4, although two important governance issues were never resolved throughout the project: 1) The deliverables approval process required many kinds of expertise for their understanding and validation, which the pilots were unable to provide. Since they were formally and solely responsible for approving all deliverables, thus the overall solution, this issue made them to be reluctant to approve deliverables that they did not fully understand, especially those which were more technical, as one of the pilots said: "When I read some IT functional document, it's like reading Chinese. I don't understand. And they stressed the importance of the pilots approving these documents. I had nearly a hundred. I can't challenge them; it's internal data processing". 2) The management of the planned changes to be created by the project was also an important issue. Most changes targeted current business processes, and no sector had full control over all the business process changes that would affect it, because some boundaries between the two business sectors were being redesigned by the project. Business managers who were part of the Core Team via the Business Project Committee were formally accountable for their units' operations, but not for the project deliverables anymore. As well, they were increasingly rejecting any real or perceived form of control coming from the temporary organization or other

sectors in respect of these changes. However, they had to coordinate these changes together, which was complex and problematic because their main priority was their own operations.

These two important governance issues, combined with the ambiguous project scope, which had to be increasingly contained in order to respect the budget, progressively exacerbated the existing tensions, decreasing trust in the project. Thus, as time passed, process changes were gradually becoming imminent and scope issues were increasingly discovered and acknowledged. These issues, combined with the intrinsic complexities of the project, were increasing tension and confusion among project stakeholders. It gradually became obvious that the project would not fulfill all expectations. Planned changes were about to have a significant impact on tasks and data ownership, causing some responsibilities to switch between the two business sectors.

As the project's trajectory became progressively more problematic, some control processes were gradually reinforced, at the request of the Steering Committee. Its goal was to try to get more information, especially about the management of the business changes, in which members of the Business Project Committee had to participate. In parallel, decisions that were taken by top managers about resource allocation for the project were not automatically executed down their chain of command by the middle managers, even if they were communicated, as the project manager explained: "Decisions travel down. I can see it when I meet the 'direct report' of a VP (Vice-President). He has been informed. However, execution requires one to go deeper into the subject. It's always much more complex than getting the VP to say: 'Yes, the ball's in my court'... For their 'direct report', my project is among 10 or 20 other projects. So, afterwards, I still need to convince him about the high priority of my project in order to get the requested resources assigned to it".

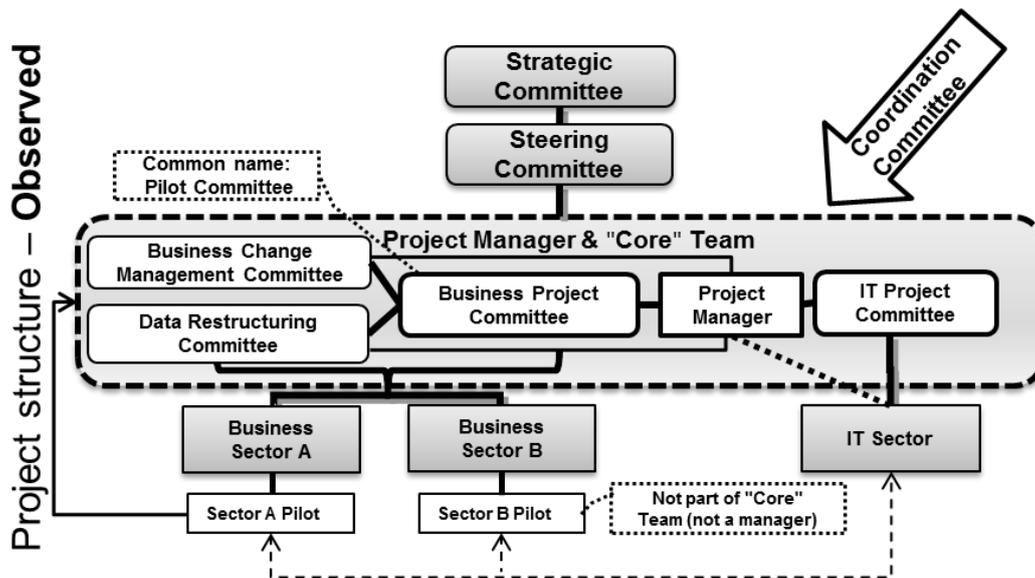


Fig. 5 - Observed Project Structure

Throughout the project execution, the control of information became increasingly significant as issues were uncovered. Old disputes from the permanent organization and its past were brought back into the project, and past project failures and past sector battles gradually resurfaced, creating additional tension and distrust in the project. This situation favored the balkanization of the project structure by creating two additional business project committees associated with two main change issues (business data change and business process change management). This balkanization reinforced boundary protection and information fragmentation not only between the temporary and permanent organizations but also within these organizations. Fig. 5 illustrates the results of this balkanization, presenting the project structure as

observed during the field period. This figure shows that resources were directly controlled by their functional managers. The project manager had only some weak matrix reports coming solely from the IT sector. The two pilots had no reporting link to him and acted as bridges between their sectors and IT. In addition, the Core Team designation was never used; none of the interviewees mentioned this name or recalled it when probed. The Business Project Committee was nicknamed the Pilot Committee, which seemed strange to us, since only one of the pilots was part of it. When participants were challenged about this nickname during interviews, they acknowledged that it was awkward. They realized that the project structure had not been challenged for a long time, as one director admitted: “Actually, this pilot is not on the committee. It might not have been necessary that he be included, or should he be? I don’t know, because the committee was set up over a year and a half ago. And it was decided that it was these people. It was to see where things were going. (Silence) (Sigh) However, we call it the Pilot Committee. (Silence)”.

Finally, as mentioned above, at the start of the field research period, the project’s governance structure was found to differ from what was expected. These expectations were based on our preliminary field access discussions with some managers involved in the project. Consequently, each interviewee was asked to draw and then comment on their own representation of the project org chart. This simple exercise provided an astonishing diversity of representations, which gave us some leads to follow about potential ambiguities in the project structure, roles and responsibilities. This also caused us to analyze the evolution (formal and informal) of the project governance structure, which has been presented in this section. What follows are the results of our analysis of these representations, which we performed from a sensemaking perspective.

#### 4.2 Participants’ sensemaking of the project governance structure

Originally, the interviewees were asked to produce their org chart drawings so we could understand the current project structure. The variations in these drawings surprised us while confirming our feelings about the ambiguous structure. We were also surprised that nobody had produced a drawing similar to the published org chart (Fig. 2). In fact, participants were inclined to draw org charts showing the main units and roles that were part of their own day-to-day project experience. When asked about committees, most interviewees knew about the six committees presented above and illustrated in Fig. 5. Only the Strategic and Steering committees were usually shown on two distinct and higher hierarchical levels. All remaining org chart components were often shown at the same hierarchical level; they included the various participating units, the project manager and the pilots. Even the supervisors of the project manager and the pilots were often considered to be at the equivalent level. The drawings of the hierarchical order in which committees were represented also resulted in some surprises. Some interviewees drew the committees in reverse order of hierarchy; when questioned about the perceived influence exercised by the IT and Business project committees, some interviewees argued that the strategic and steering committees were only there to approve their proposals. When probed to identify the project sponsors, surprisingly, all participants indicated that their own sector’s top manager was the main project sponsor, although it was clearly stated in the project documentation that the top managers of both business sectors were joint project sponsors.

All these interpretations were part of the context within which the participants engaged in their sensemaking; it influenced their representation of the project governance structure. Even if these drawings showed variations in the project org chart, they all represented the coordination level as having a horizontal trend and minimal reporting links, especially to the project manager. The project manager’s role was particularly ambiguous in these drawings. He symbolized the temporary organization, the project, and he was deemed responsible for its delivery. However, minimal or no reporting links (formal or matrix) were drawn from project resources to him: some drawings showed some reporting links from the pilots to the project manager, but there were rarely links from the functional team managers (or their resources) to the project manager. Nevertheless, even in these few cases, the links shown were almost horizontal. Interestingly, when asked about their representations, some respondents were surprisingly candid. For example, an IT manager had this to say: Question: “You have drawn the chart without any reporting links to the project manager, right?” Answer: “I love the fact that you mention that there are no lines between the project manager and the resources. It was unintentional. I didn’t draw lines. I didn’t realize it. But, actually, there are no reporting links”.

However, the project was officially sharing resources in matrix mode with the permanent organization, with a mix of low to high matrix structures, depending on each functional manager's involvement in the project. When probed about the coordination of their resources for the project, though, most managers specified that they themselves were coordinating project activities in their own teams, while the project manager said that he communicated directly with most of the project's IT resources, because he could not usually rely on the IT managers to do so. Furthermore, the project manager had no direct access to the Business managers' resources, only to the pilots participating in the project; yet they did not report to the project manager, who was considered to be part of the IT sector.

The Business participants clearly considered their own operations as their main priority, and the project was perceived as a threat for their operations' stability: "The project will not give us a fun solution that will save us time. Instead, it will be the opposite. The best we can do is to fight as best as we can in order to get the maximum – the maximum being well below what is needed". The IT participants viewed the project as a priority if they were in the direct chain of command of the senior project director in the permanent organization. However, the others saw the project as consuming critical resources and delaying all other major projects, which annoyed them: "We are told, I don't have resources, so I can't deliver to you. Everyone is caught in this project..." They all managed teams in the permanent organization and also participated in and shared their resources with various ongoing projects. This sharing is typical of matrix structures, which are prone to conflicts. The participants associated themselves more with the permanent organization at the time of the fieldwork. Since the project trajectory was showing clear signs of future failure, many people were dissociating themselves from the so-called never-ending project: "So this project is like... (Sigh) It may have a life of its own".

Finally, the remuneration system seemed ill-suited for the temporary organization. No project-specific goal was systematically part of annual appraisals. There were generic goals for projects and, even when some goals were more precise, they were highly negotiable. Thus, most functional managers gave higher priority to the permanent organization's goals, which favored their identification with this organization and their focus on its operations.

## 5. Discussion

This study shows how ambiguity in the formal project governance structure, especially at the coordination level, can have a harmful impact on the relationship between the temporary and permanent organizations, not to mention on the organizations themselves, and particularly on project survival. It is also an example of collective amnesia of the initial project governance structure, which its participants had replaced with their various representations. This amnesia may be caused by the atemporality of projects [40], within which participants are more focused on the present; thus, memory is absent or unimportant. This detachment from the past may be the result of the lesser legitimacy of the project as an entity [40], which is quite possible because of its problematic trajectory. However, what is unusual in this case is the collective nature of this amnesia: nobody could recall the official project org chart that had been presented at various project meetings at the project's inception, not even after participants were shown a copy from the project records during interviews.

This diversity of participant representations shows the lack of a common knowledge base of the inner project governance; especially in the governance zone where coordination should take place. In fact, the day-to-day execution of the project and its coordination between the units were mainly informal, and thus lacked formal accountability. This left space for members of the Core Team to build their own representation of governance, without being aware of the diversity of their representations. The research data showed that these representations were somewhat incompatible [24], especially at the PCC level. The creation of a common knowledge base is the first mechanism of inclusive governance, enabling consensus on the project and ensuring its progress [19]. Our study suggests that the project governance structure is a significant component to consider within this common knowledge base. Additionally, accountability is an important parameter for coordination [22], and most people involved in coordination were not formally accountable for the project. In fact, coordination meetings were progressively transformed into areas of negotiation for resource availabilities, dates and budget. Thus, these meetings became purely administrative and

disconnected from the project, enabling non-collaboration instead of collaboration; the managers were more accountable for their operations in the permanent organization.

Almost since the project's inception, the influence of the permanent organization hierarchy infiltrated the project governance structure, progressively trying to ensure the reproduction of its silos via the balkanization of the Core Team. Conflicts from within the permanent organization enforced boundary protection and information fragmentation, mainly between the temporary and permanent organizations, by mimicking the permanent structure. The permanent organization tended to reject any existing or perceived form of control coming from the temporary organization, even regarding business change management. Additionally, each business silo was likely to reject any real or felt form of control coming from the other silo. Two underlying logics were competing for the management of business changes to be created by the project: the permanent organizational logic, where all business process change must be the sole responsibility of its managers, who were responsible for the permanent organization's operations, and the temporary organizational logic, in which all process change coming from the project must be under its control, although executed in partnership with the permanent organization representatives due to the temporariness of the project.

The formal governance was symbolized by the steering and strategic committees, and remained unchanged throughout the project. All project participants were aware of them. These two committees corresponded to Müller's [2] definition of the steering committee, which is viewed as the principal entity of project governance and which is responsible for the classic project triangle (i.e., budget, schedule and scope). In this study, the changes in project governance acknowledged that formal systems tend to be fixed for the duration of a project, while informal systems are much more flexible and can evolve [41]. However, in this study, this evolution was not for the good of the project. As well, the PCC, which corresponds to the Core Team in this study, is located in a governance zone that requires accountability for coordination, implying some kind of governance process. Our study has revealed the complexity of this zone, suggesting a need for a specific, adapted governance process, either formal or informal, that is commonly understood by all participants. In this zone, middle managers have the challenge of grasping a change they did not design and negotiating the details with other people who are equally removed from the strategic decision-making [24]. These details can have a major impact on the project's design and trajectory.

This study suggests that the temporary nature of a project seems to influence managers not to question the existing formal project governance structure: once the project is underway, the focus is on its ending, especially when the project has a problematic trajectory. Within projects, time is a limited resource, and time is usually needed to change a governance structure; role systems need time to stabilize [12]. Thus, changing the formal structure of a project entails using resources that were previously planned for the delivery of the project. In the case of a project that already has a problematic trajectory, this type of unplanned change is likely to be difficult to envision. Indeed, during field interviews, the discussions about the org chart made it clear that our open questions were triggering sensemaking from participants, making them realize that the structure showed some deficiencies. In fact, during that time, the participants considered the project delays to be the most important issues, not its structure.

However, there is a need for a "flexible strategic process" [42] in which the governance structure adapts and evolves in response to: changes in the project environment, the emergence of unforeseen events, and the requirements of the various stages of the project. Conversely, the finite duration of projects may imply that they cannot easily adapt to changes, because there is always an interval between change and structural adjustment [43]. This is quite a paradox and may imply that members' awareness of the limited project duration [27] could prevent it from adapting, even though the project is viewed as a vehicle for change.

Finally, we can add that, especially at the coordination level, the horizontal nature of the structure, combined with the power provided by knowledge, adds to the challenges faced by top managers in their quest to get project information and to support these projects. In this case study, we have also shown that top managers were isolated from the project's day-to-day situation and depended upon their chain of command for information and action. Meanwhile, the project manager lacked formal power, especially over resources. Nevertheless, project managers are often compared to CEOs in the literature [44]. For projects operated in matrix mode, is this kind of model applicable? According to Mintzberg [3], the matrix mode is prone to conflicts, and Larson and Gobeli [45], among others, add that matrix mode is

inefficient. Nevertheless, organizations are still using matrix mode in projects. Furthermore, according to Pettigrew et al. [1], projects do not replace existing organizational forms; instead, they overlap with them in the permanent organization, thus adding complexity to the way we organize. Interestingly, according to Jansen et al. [46], there is an emergent dialogue regarding the hierarchical level at which integration of exploratory and exploitative efforts needs to happen; the idea that differentiated exploratory and exploitative efforts are integrated at the senior team level needs to be expanded by incorporating lower-level cross-functional linkage devices as well. In addition to the senior team social integration, formal organizational integration mechanisms are needed to provide the necessary horizontal linkages across differentiated exploratory and exploitative units [46].

## 6. Conclusion

In the project management literature, the steering committee is seen as an important project governance entity. Nevertheless, it is only one piece of the puzzle. The main contribution of our study lies in its description of a case of ambiguous project governance practice and its formal coordination mechanism – the PCC (identified as the Core Team in this case study). This ambiguity led in time to non-collaboration between the permanent and temporary organizations and had a significant negative impact on the project, showing the importance of studying project governance in more depth, especially where governance and coordination are juxtaposed and intersect. It also shows the influence of the interaction between temporary and permanent organizations, where many governance issues originate.

The literature states that project governance structures tend to be horizontal and informal; they are coordination mechanisms. However, in parallel, in order for coordination to happen, accountability is needed [22], which usually requires some form of governance. Thus, our analysis highlights the importance of studying further project governance mechanisms, which allow for coordination, and especially project liaison devices such as PCCs, on which there is a dearth of studies in the literature. Indeed, few studies have focused primarily on coordination in temporary organizations [12], and Söderlund [36] calls for us to deepen our understanding of how projects work. Additionally, our study aims to help bridge the gap identified by McEvily et al. [47], who suggested that the interplay between formal and informal is often disconnect in research, and that we need to reconcile the two in order to get a better understanding of the phenomenon.

The coordination committee represents a governance mechanism at the lower management level, where project coordination is managed between the various disciplines. It is where numerous boundaries intersect, including those between the temporary and permanent organizations. We believe that this study does not reflect a unique case, but describes a widespread problem, especially in organizations that use matrix structures. Project management norms like those of the PMI [48] tend to present matrix structures relatively basically, so that the complexity created by this way of organizing is often overlooked.

This case study is also an example of how project atemporality [40] can lead to collective amnesia of the initial project governance structure, which participants replaced with their various interpretations without even being aware of it, and thus without any attempt at a consensus. Some studies have already highlighted the diverse understandings of project goals, scope, etc. But project structure representations, especially within the governance zone located at the coordination level, seemed somewhat messy and even questioned the project manager role's at this level. With the reinforcement of horizontal processes in the project literature, what impact can be envisioned on the project manager's role, particularly in matrix ways of organizing?

Lastly, as a note for practitioners, the governance ambiguities encountered in this case study underscore the significance of adapting and publicizing the formal project governance structure throughout the duration of a project. It also acknowledges the influence of middle managers throughout the project execution, especially because of their control over resources. The multidisciplinary nature of projects has many impacts on the permanent organization and on project governance, which add to the complexity of managing projects. Even when a project may seem straightforward, the accumulation of simple elements (or issues) can lead to complexity: "The devil is in the details".

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## Appendix A. Semi-structured interview structure

### A.1. General guidelines for the interview

This guide is to be used during semi-structured interviews of members of the Project Coordinating Committee (PCC) and of other participants who are in direct relationships with them, especially members of the project steering committees. Prior to interviews, each participant should have been met, either during a preliminary meeting or at least during the phone call to schedule the interview. During interviews, the same themes will be applied to all types of participants, but adapted to their hierarchical level. Thus, interviews of participants who are members of the project steering committee will be at more macro, strategic levels than those of participants who are members of the PCC, which will be at more micro, operational levels.

### A.2. Beginning the interview

- Welcome the participant and present the purpose of the research;
- Specify the terms of this research with the participant: 1) Ethics form; 2) Confidentiality agreement; 3) Get approval to record interview: transcript will be sent for approval and comments;
- Present the main themes to be discussed during the interview;
- Start the interview with the following question: Can you tell me about your current role in the organization?

### A.3. Ending the interview

- Summarize the discussions and ask if there is any other information that should have been discussed;
- Ask for feedback on the interview;
- Ask if participant can be contacted if additional information is required, and explain the terms for the validation of the transcript. Get unavailability dates, if applicable (e.g., summer vacation, business trip).

### A.4. Themes of the interview

#### A.4.1. Contextual factors

- Project context –general project description: project goals, characteristics (priority, resources, budget, complexity, duration), history (reason for project creation, initial hypothesis, main issues, involvement of sectors, and evolution);
- Project structure: ask participant to draw the project organization chart, including committees, and to comment on it;
- Organizational factors: usual integration of projects into organizational structure (Business versus IT projects). History of similar business IT projects. Main characteristics of projects portfolio (e.g., average project duration, budget). Main project management processes in use (types and uniformity of use).

#### A.4.2. Project Coordination Committee

- For committee members: role, tasks, responsibilities, expertise, sector and unit. Project and committee seniority;
- For all participants: description of the committee and of its level of influence. Participant's expectations for: committee, project, other;
- Interactions: description of the usual course of this type of meeting. Description of a significant event (agreement, disagreement, compromise). Description of the influence of the committee in the project (course of the project, business change, technical change, steering committee). Evaluation of this type of meeting (collaboration, knowledge sharing, commitment, respect).

*A.4.3. Business and technological changes*

- Identification of major changes created by the project (business and IT) and of their main characteristics (size, units involved, processes);
- Description of the main change management activities and actors. Identification of the main related coordination and management activities.

*A.4.4. Project results*

- Identification of current work activities in the permanent organization that are impacted by the project (participant's unit and other units);
- Evaluation of the project's overall performance and goals;
- Evaluation of the main changes created by the project (past, current, future), and at which level (and/or committee) they are managed within the project and the organization.

*A.4.5. Characteristics of the participant*

- Job position, unit and seniority in the organization. Quick overview of past experience, when applicable;
- Experience working in projects versus in functional mode;
- Participation in committees and associated experience;
- Sex, age range (25–35, 36–45, 46–55, 56+).

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## Sourcing strategies to keep up with competition: the case of SAP

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## Sourcing strategies to keep up with competition: the case of SAP

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### **Abstract:**

This paper applies the Red Queen theory to explain how organizations utilize various sourcing arrangements in order to compete in an evolutionary arms race where only the strongest competitors will survive. The case study incorporates competition, and views sourcing strategies as a means to improve the firm's viability to survive competition in the marketplace. The study begins by positioning the Red Queen theory within the sourcing literature. It subsequently applies the framework to a case study of SAP AG to illustrate how sourcing strategies have changed over time in response to the logic of competition. The case study reveals that (a) organizations are adaptive systems and capable of learning to make strategic changes pertaining to sourcing arrangements; (b) organizations select the terms on which they want to compete by developing certain capabilities within the firm; (c) organizations are reflexive and over time develop competitive hysteresis which allows them to become stronger competitors. In the case of SAP AG, various sourcing arrangements were selected over its 40-year history to respond to technological and market changes.

### **Keywords:**

ERP vendor; sourcing strategies; Red Queen Theory; SAP.

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## 1. Introduction

The study of information technology (IT) sourcing strategies has primarily focused on the analysis of IT functions that can be managed internally or transferred to third party vendors [1-4]. The focus is on firms that use IT to support their business. As such, sourcing strategies are viewed as alternatives to managing resources based on a maximization strategy, which assumes limited resources [2]. These studies have contributed greatly to understanding the benefits of sourcing strategies with a tendency to focus on the processes within a firm, however they do not take into account how these decisions were made against the backdrop of a competitive marketplace, and few have considered investigating the use of sourcing arrangements from a software vendor point of view. Researchers who have looked at these decisions have studied them at a particular point in time but did not consider how they altered the ability of an organization to compete in the long-run. Considering that software vendors are viewed as having the “sole job ... to follow the trends and provide leading-edge software and systems” [5], little sourcing research has studied the way software companies utilize sourcing strategies to manage their business activities and resources.

This paper fills a gap in the literature by addressing how sourcing strategies can contribute to the ability of software firms to keep up with the dynamic changes in the competitive market, as well as how these sourcing strategies evolve over time. Specifically, it answers the research question: how can software firms utilize various sourcing strategies to keep up with changes in the market – technological changes, market demands and rival actions?

The paper applies the Red Queen theory [6, 7] to explain how companies evolve and come up with various sourcing arrangements to keep up with the pace of technological innovation. The Red Queen theory is an evolutionary theoretical perspective, which suggests that sustaining the current level of performance of an organization requires continuous adaptation to the competitive environment in order to keep up with rivals who co-evolve in an attempt to win an evolutionary arms race. The Red Queen theory suggests that organizations select the terms on which they want to compete by developing certain capabilities within the firm. Over time, organizations develop competitive hysteresis, which allows them to become stronger competitors. In this view, organizations can be seen as adaptive systems that take part in the process of selection and adaptation of sourcing strategies to develop into stronger players. Specifically, this paper applies the Red Queen theory to taking into account other influences that are external to a software firm in order to contextualize its organizational strategy. In doing so, the paper illustrates a case study of how SAP changed its sourcing strategies over time in response to the logic of competition, to come out as a market leader in its field. By reviewing the various sourcing arrangements that SAP undertook over the past 40 years, we can show how the organization responded to technological and market changes.

## 2. Sourcing research

IT sourcing arrangements have been considered an undeniable trend as a cost-saving option for outsourcing IT functions since Eastman Kodak's decision to outsource to IBM, DEC and Businessland in 1989 [1-4]. Many of the studies that have looked at various sourcing arrangements have done so from the perspective of a customer [3]. Advances in the field have provided models to explain various approaches to sourcing [2]; provided decision-criteria for determining when to choose a particular sourcing strategy [8]; explained the risks [9]; uncovered myths and motivations [10]; understood factors that contribute to success [3, 11]; and provided best practices [1].

Sourcing arrangements require the formation of alliances which are “cooperative relationships driven by a logic of strategic resource needs and social resource opportunities” [12]. Strategic alliances enable organizations to leverage a partner network's resources [1, 13]. Networks that are formed through the creation of strategic alliances not only allow organizations to manage resources more effectively but also to increase the rate of innovation [14] and obtain economies of scale [5, 15]. Such alliances allow organizations to participate in a branching process and encourage innovation [14]; the rate of innovation is increased because strategic alignment with multiple partners provides access to different clusters of information [16]. These alliances are especially “relevant in high-technology industries, as the cost

of R&D has sky-rocketed and access to privileged information has become increasingly difficult in an industry where innovation is the main competitive weapon” [17].

An organization’s ability to innovate is dependent on its ability to recognize innovation opportunities as “a result of a conscious, purposeful search” [23, p. 6]. A firm can make several decisions and take action to come up with innovative opportunities to market a new product and/or service that is unique [18], rare [19], low cost [18]; valuable, inimitable, non-substitutable [19]; or scalable [20]. Another way is develop and patent new products through extensive research and development activities to keep competition at bay [21]. From an economic perspective this assumes scarce resources, however, and one of the limitations of innovating alone is that it becomes too costly to chase every technological shift. Coming up with new ideas is so difficult that once the original design is made, it becomes even more difficult to make substantial changes, making further enhancements incremental [14].

As a potential way around these inherent issues this paper proposes to look at sourcing arrangements as a way to support innovation activities that take place within a software vendor’s organization. These sourcing arrangements can be viewed in the following broad forms: insourcing and outsourcing. Insourcing arrangement is a sourcing strategy where an organization considers an outsourcing option to augment its current resources with external resources [22]. It may take the form of either a temporary resource or long-term relationship with a preferred supplier [23]. For a software provider, in-house sourcing arrangements assume that a firm has the ability to develop innovative products and services for customers through effective management of internal resources. In this situation, an organization optimizes its internal resources and processes to develop new capabilities [19]. Studies suggest that selective outsourcing – “the decision to source selected IT functions from external provider (s) while still providing between 20% - 80% of the IT budget internally” [1] – is more successful. Outsourcing is a sourcing arrangement where the work is moved outside the company. One unique form of outsourcing, known as netsourcing, is defined as the ability to access or rent business applications and services through the internet [8, 24]. In this particular model, the development of newer technologies has played a significant role in outsourcing arrangements [24].

A considerable amount of the strategic management literature suggests that an organization is able to compete if it has (a) the ability to recognize new opportunities that provide it with first mover advantage [21, 25, 26]; (b) a strategy that is formulated in relation to competitive forces [18]; (c) the ability to transform resources into abilities that are valuable, rare, inimitable and non-substitutable [19]; (d) the introduction of newer technologies has allowed companies to innovate at a cheaper rate at a faster pace [27]; or (e) the ability to scale up and learn from early innovator experiences [20]. While these theories of competitive advantage have provided useful lenses to explain how organizations innovate to compete, the analyses of the actions in organizations are seen as separate items rather than simultaneous actions that occur. Thus, this paper looks at how firms are selectively adapting their sourcing strategies to respond to competition and integrating a strategic process perspective into the analysis of various sourcing arrangements using Red Queen theory as a lens.

### 3. Red Queen Theory

The Red Queen theory [6, 7] can be used to explain competitive advantage. It is a useful lens to understand how organizations evolve by combining behavioral aspects that take into account organizational learning and economic rationalities – such as the desire to increase market share and profitability – to explain how and why organizations compete. It is predicated on the notion of coevolution, which suggests that organizations are in a never-ending race that requires them to constantly adapt simply to sustain their level of relative fitness [7]. This view of competitive advantage departs from earlier theories [18, 19], which do not consider that when firms coexist with rival firms, the improvements and feedback from the market are triggered simultaneously [7].

The Red Queen theory suggests that the evolution of a firm develops through a selection process. To win the race, an organization needs to outperform its rivals according to the context’s logic of competition by “matching or exceeding the actions of its rivals” [7, 28]. The Red Queen theory assumes that the organization’s viability to survive competition is based on its relative fitness to the competitors. It further stresses the importance of contextualizing an organization’s

strategic actions in relation to its historical and social setting to ascertain that the organization has the requisite ability to succeed [7]. According to the Red Queen theory, an organization that is historically exposed to competition generates stronger competitors and is likely to be more fit than the average organization that has not faced much competition. Likewise, new entrants are faced by the challenge of perhaps needing to come up with an industry-altering innovation to survive the entry process. Thus, changes in the industry are part of a selection-driven process.

For an organization, the choice of actions in responding to competition is informed by the experiences that the organization has had in the past and is relative to the knowledgeability of the human agents. Thus, the organization's solutions show elements of reflexivity based on "competitive hysteresis, the current-time effects of having experienced competition in the past" [7]. When new challenges are faced, organizations try to develop new capabilities where the costs of adapting against multiple competitors tend to be higher than if the same organization competed against a single rival. Over time, organizations accumulate experiences in responding to competition and gain the ability to deal with certain types of problems. One of the dangers for an organization that has established routines for solving similar problems is the possibility of falling into a competency trap which provides a disadvantage when circumstances have changed [7].

We posit that various sourcing strategies have aided SAP in the process of developing capabilities, where the costs of adaptation have increased at a time when more rivals have challenged SAP. By looking at a historical view of SAP's sourcing strategies, we can assess how various sourcing arrangements can aid the competitiveness of an organization rather than merely focusing on the cost-saving benefits that various sourcing strategies are purported to have.

Fig. 1 illustrates an application of the Red Queen Theory to sourcing arrangements for ERP vendors. We demonstrate that the Red Queen Sourcing Framework (RQSF) is a relationship between four players, the Vendor that creates the ERP System, the User Organization who buys and uses the ERP System, the Rival who competes with the vendor and a Sourcing Partner who delivers services to the Vendor to produce and deliver the ERP system.

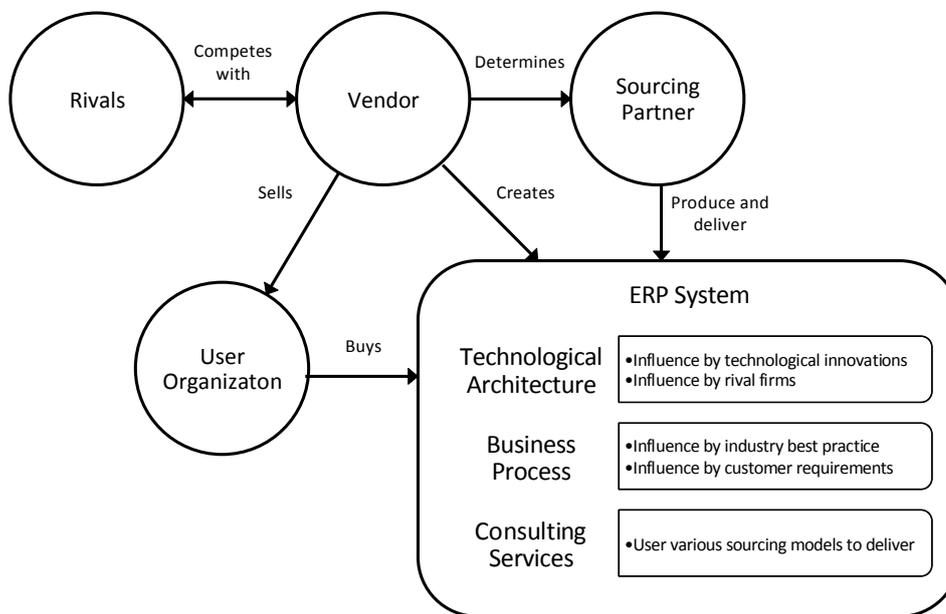


Fig. 1. Initial Red Queen Sourcing Framework

An ERP System is defined by the Gartner Group as “the ability to deliver an integrated suite of business applications” [29]. This definition suggests that the creation of an ERP system requires that a vendor is able to create a product and deliver a service on a particular technological platform, inscribed with specific business processes. A firm’s ability to compete amongst a multitude of alternative solutions is therefore impacted by its ability to maximize the resources available to it so that it can create innovative solutions that keep up with the changes in the market place. Various sourcing arrangements can thus be considered and selected to target specific business needs – such as operational effectiveness, tactical support and strategic impact [30]. This is especially important in the context of competition and the speed of technological evolution, which affects the internal sourcing responses of organizations over time.

#### 4. Methodology

In order to make an explanatory study of the sourcing strategies of an organization within the ERP industry, we performed a qualitative analysis [31] using a case study method [32]. Data was gathered from publicly available sources, including textbooks, theses, news articles, corporate documents and information from the websites of SAP and its rivals. We began writing SAP’s narrative by identifying key events (e.g., the announcement of a merger or change in strategy), which were related to business models from multiple sources of data such as corporate documents, websites, and conferences. The narrative tells the story and enables analysis of events using theory. We then performed a qualitative analysis of the data by applying the Red Queen Sourcing framework [31]. To illustrate the causal linkages between various components of the framework, we used the framework to analyze the evolving sourcing strategy of an ERP vendor in a case study [32, 33].

The case was selected from the market-leader in the ERP industry, SAP AG, who has had a long established record of business success in pre-packaged software since the 1970s, as it entered a market that was dominated by IBM, and managed to withstand the dynamics of competition in the 1990s and outlast most of its competitors who succumbed to acquisitions in the 2000s. SAP AG is a recognized market leader by industry analysts. Instead of using a multiple-case study comparing different business models, a retrospective case study analysis of a single firm, SAP, allowed us to look at historical events and the corresponding changes to its business model after technological innovations were introduced to show how business models evolved. Prominent exemplars of retrospective case studies include Intel’s transition from memory chips to microprocessors [34], NCR transition into an electronics-based office equipment company [35], and Polaroid’s entry into digital photography [36].

A retrospective case study has both advantages and disadvantages [37]. A retrospective case study lends itself to the creation of a high-level story that outlines major events, transformations, and their outcomes. Some important transformation processes span decades, which make them extremely hard to follow in real time. In particular, it may only be possible to ex-post determine which transformational processes provide new interesting insights to fuel theory building. The retrospective case study is not, however, appropriate for addressing the micro-level process of *why* decisions were taken and the cognitive processes behind these decisions, as explanations of these detailed levels frequently become ex-post constructions that do not necessarily match how the process played out a few decades earlier. We therefore restrain our analysis to those factual circumstances that can be documented, and recognize the need for future real-time process studies to explain why some organizations manage to make the transitions described in the analysis.

#### 5. SAP AG

The story of SAP demonstrates how a software firm was able to fend off rival actions, which were destabilizing the current mode of developing software, and led to its adoption of a new sourcing activity. The case of SAP is interesting because it started out as a disruptive idea that challenged traditional models of developing individual customized solutions for businesses. Over time, it was able to adapt to changing technological shifts, which enabled it to obtain and maintain a market leader position in developing ERP systems.

### 5.1 *Surviving the Entry Process*

In 1972, five former IBM employees started SAP with a vision of commercially developing an off-the-shelf-system (COTS) for real-time data processing. As a new entrant, SAP changed the way software was developed – SAP developed a core solution that was customized to fit its clients – at a time when software development was traditionally customized by consultants like IBM to meet specific client needs, developed on mainframe systems and catered to large enterprises. “New innovations by IBM’s rivals had to be exceptionally valuable from a customer’s perspective” [7].

In the first year, SAP’s main revenue came from helping clients in their data centers. At night and weekends they spent time developing their first software on borrowed computers. In 1973, SAP releases its first financial accounting module. This module served as the cornerstone in the on-going development of other software modules of the system that would eventually bear the name SAP R/1; where R stood for real-time processing [38]. All development was done on externally located IBM mainframe servers running the DOS operating system. In 1974, the first technological shift occurred when SAP converted the financial accounting module from the DOS to the OS operating system for larger IBM servers. Over the next years, modules for purchasing, inventory management, and invoice verification were released.

A few years after the first installation, SAP obtained customers in Switzerland. The development of SAP’s software progressed after SAP completed the asset accounting module and its corresponding implementation with a pilot company. One of SAP’s customers – John Deere, the farm equipment manufacturer – played a significant role in the internationalization of SAP’s product when SAP was requested to develop a multi-lingual version of their accounting software to support several languages, countries and legal entities in 1975 [38].

In 1979, SAP operated its own development environment/server (i.e., Siemens 7738) for the first time, and built its own data center. Prior to this period, all development activities had been distributed across the data centers of regional customers. Later that year, SAP made an in-depth examination of IBM’s database and dialog control system, which led SAP to rethink its software and pave the way for SAP R/2, which was released in 1982 [38]. The following year they launched a sales and distribution application module, through a custom development project based on customer specifications.

### 5.2 *Cost of Adaptation and Expansion*

In the 1980s, SAP’s rivals were focused on developing modular solutions for both large- and medium-size enterprises. One of SAP’s biggest rivals was the Baan Corporation, an established company founded by Jan Baan in the Netherlands in 1978 to focus on financial and administrative consulting services [39, 40]. In 1981, the Baan Corporation started developing solutions on a UNIX operating system. By 1984, there were attempts to specialize in certain industry verticals to allow it to build a stronger position [40].

At the beginning of the 1980s, SAP grew into a company with around 100 employees and appeared at an IT trade show. Joint development with customers was used as a strategy to develop and enhance the R/2 system, a mainframe-based software that is still considered to be a very stable system. During this period, the production management module was released, followed by a module for production planning and control in 1983. In the following year, SAP expanded internationally and its first subsidiary, SAP International AG, was founded in Biel Switzerland [38].

SAP’s own data center grew, and hosted three IBM servers and a Siemens server with a total of 64MB of main memory and used for the development of software. An internal quality assurance committee was established to improve the stability of software and increase the quality of work processes. Its first US headquarters was established in 1985 and as global expansion continued in 1986, a subsidiary in Austria and a German branch office were opened. The eventual growth in the number of employees – reaching 300 – forced SAP to restructure and create different departments with managers. Changes in the legislation governing balance sheets led to 100 new customers, and a subsequent growth in revenue. After three years of work, the SAP module for human resource management was released at the CeBIT Fair in Hanover.

In 1987, the first non-German-speaking subsidiary in the Netherlands was opened. SAP opened offices in France, Spain, and Great Britain in the same year, and also held its first user conference in Karlsruhe, Germany, aimed at establishing a platform that enabled current and potential users to share experiences. IBM's new generation of servers enabled SAP's software to become available to midsize customers. SAP also established SAP Consulting to support new customers. In the next year, SAP began developing RIVA – a billing and administration module for utility companies – to meet the requirements of selected industries. A user-friendly interface for SAP R/2 was later introduced. The company also launched various development projects, including the ABAP/4 programming environment in 1989. In 1990, SAP strengthened its financial basis by raising DM 85 million on the capital market and used it to further develop SAP R/2 and the new SAP R/3 system. A focus on mid-sized companies led SAP to acquire the software companies Steeb and CAS.

By the late 1980s, distributed computing allowed newer applications to be built using UNIX workstations and personal computing [7]. In 1991, a sneak preview of the first modules in the new SAP R/3 system were shown at CeBIT (Centrum für Büroautomation, Informationstechnologie und Telekommunikation). With its client-server concept, uniform graphical interface, dedicated use of relational databases, and support for servers from various manufacturers, R/3 was to be sold on the midsize market as well as to the branch offices and subsidiaries of larger corporate groups. Expansion was also directed to the east after the lifting of the "Iron Curtain", including a cooperative agreement with the largest Russian software company ZPS, and with the development of a Russian version of SAP R/2.

After the launch of R/3 in 1992, SAP changed its partner strategy to include independent consulting firms, which SAP referred to as "logo partners", to support customers in implementing the new system. As part of the new partner strategy, SAP entered a partnership with Microsoft to port SAP R/3 to the Windows NT operating system in 1993. SAP also began participating in the IXOS project, a joint undertaking involving the development and marketing of an electronic archiving system for original documents. Efforts to improve the technological basis were made, a version of SAP R/3 was created with support for kanji characters for the Japanese market and R/3 was also ported to SUN hardware, enabling it to run on all relevant RISC platforms.

In 1994, the R/3 system was released for Windows NT. One month later, a Swiss company became the first customer to go live with this new version. In addition to the utility focus, SAP began to focus on the retail industry by acquiring a 52% holding in DACOS Software GmbH, and in 1995, more emphasis was put on midsize companies with the help of system resellers. Later the same year, SAP started to develop an industry solution for the telecom industry together with Deutsche Telekom AG.

In 1996, SAP took another technological leap when it introduced its joint internet strategy with Microsoft. Through open interfaces, customers could now connect online applications to their SAP R/3 systems. In addition, SAP could also take advantage of IBM's new AS/400 platform. They continued to involve consumers and had 4,300 guests at the European SAPPHIRE event in Vienna. Over 8,000 attendees flocked to the corresponding event in the U.S., and more than 5,000 were on hand for the first SAPPHIRE event in Japan.

In 1998, a new interface was launched – EnjoySAP – at SAPPHIRE in Los Angeles. SAP planned to make its software easier to learn, faster to work with, and simpler to customize to customer needs. In May 1999, SAP announced a new strategy that completely realigned the company and its product portfolio: mySAP.com. This reorientation would combine e-commerce solutions with SAP's existing ERP applications on the basis of cutting-edge Web technology. To support the Internet focus a German Internet subsidiary, e-SAP.de, was founded, reflecting the strong focus on the customer in the Internet age. This was followed by new applications for marketplaces and portals and by outsourcing to its SAP Portals subsidiary and starting partnerships with Commerce One and TopTier.

Building on the Internet focus a new platform was launched in 2004 – SAP NetWeaver. This technology enabled SAP to offer fast, open, and flexible business applications that support end-to-end business processes – no matter whether they are based on systems from SAP or other providers. SAP Labs China marked the ninth opening of a development location outside Germany. This and the other research centers in India, Japan, Israel, France, Bulgaria, Canada, and the

United States helped SAP convert IT expertise into business utility for its customers. A new technological vision was put in place when SAP introduced its plans for service-oriented enterprise architecture.

### 5.3 Competition Through Predation

The widespread adoption of ERP systems in the late 1990s and early 2000s challenged several ERP vendors in their race to increase market share [41]. As such, the industry experienced a period of consolidation and witnessed several mergers and acquisitions. Shortly after SAP released its SOA-enabled ERP in 2006, they made several acquisitions – including Pilot Software, Yusa, OutlookSoft, Wicom, and MaXware. SAP also announced its intention to purchase Business Objects, a company specializing in business intelligence (BI) applications. In May 2010, SAP announced plans to purchase the company Sybase for approximately US\$5.8 billion. Sybase was the largest business software and service provider specializing exclusively in information management and mobile data use. The synthesis of the two leading companies was to produce solutions for "wireless" companies.

## 6. Discussion

SAP's entry into the new market in the 1970s was made possible because the founders of SAP were able to utilize knowledge of the market from their prior positions in IBM. SAP's founders had traditionally worked with an industry-leader, aiding its ability to survive entry into the race through knowledge of the market. Its ability to develop modules that inscribed "common business functions" reduced the cost of developing the system. From a development point of view, SAP insourced much of the application development for user organizations. For instance, it first developed software for its clients by building it on externally located IBM software. It was only in 1979 when it began to operate its own development environment that it built its own data center. It later used insourcing through joint development with clients to produce software in other languages. Interestingly, from a customer point of view, SAP was actually providing them with an insource solution to develop enterprise applications for the user organization. Fig. 2 below shows the structural arrangement of SAP's decision to enter the new market of creating IT systems for organizations.

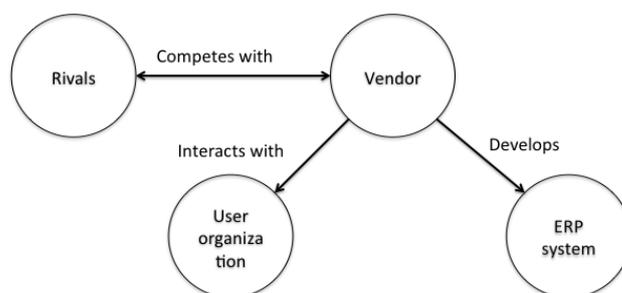


Fig. 2. Red Queen effect of insourcing

In the 1980s, SAP responded to its competition by expanding globally through selective alliances and packaging their solutions as an integrated solution, at a time when its competitors were focused on selling modular solutions. SAP started developing solutions on multiple platforms to keep up with various technological changes in the market. Instead of betting on a single platform, SAP decided that it would compete in the market with solutions on different operating systems. This was a very costly way to expand globally, not only did SAP face multiple competitors and competition,

but it also quickly needed to learn how to develop software that supported multiple technological architectures and a way to deliver it.

In the late 1990s/early 2000s, at a time when there was an increased demand for ERP packages, and companies started buying ERP software as a way to achieve business process reengineering, SAP responded to the competition in multiple ways.

- First, it changed its partner strategy to outsource some of its sales and customization efforts to increase the economies of scale and reach more customers. This increase corresponded to an increase in sourcing activities from a user-organization point of view (as seen in Fig. 3), where SAP can be seen as a long-term partner that developed business applications for the user organization;
- Second, SAP insourced part of its development efforts in the form of joint development efforts with Microsoft to enable the delivery of new products;
- Third, it developed internet-based solutions to try to generate new sources of income, essentially netsourcing some of its applications. SAP netsourced its product by hosting its solution for the user, and later by selling directly to the user. Customers continued to have the same vendor-relationship with SAP but the need to create an in-house server architecture was reduced, which enabled a reduction of cost on their part. SAP's provision of a new architectural solution enabled it to provide a software solution that fit the new demands of a user organization based on the software available in the market. SAP's choice of outsourcing strategies enabled it to respond to the increased competition that it faced and found a new solution to its dilemma of scaling up its production and sales of software to meet market demand;
- Fourth, in the late 2000s SAP participated in a process of acquisition to allow it to increase its market shares, as well as expand its modular base. This predatory response to competition suggests that, in order to compete, SAP started acquiring knowledge and market bases to increase its capacity to innovate and scale. By acquiring solutions in the market place, SAP not only killed the Red Queen, but it also incorporated new knowledge about the market and new software solutions into SAP. The consolidation efforts during this period and predatory response of existing ERP vendors to obtain a market share allowed new entrants, such as Microsoft, to participate in this marketplace. Such a predatory response further proves that there is a real threat to the viability of an organization. In a competitive marketplace where only the strong players survive, SAP's attempts to improve the products and service it delivered thus entailed an ability to be agile, adaptive, innovative and responsive to market demands, and these efforts were supported by engaging in various sourcing activities while maximizing its resources.

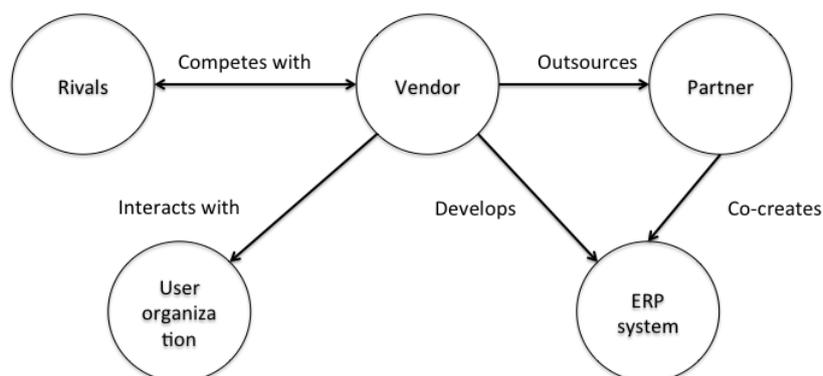


Fig. 3. Modified Red Queen Sourcing Framework

As we have seen in the case study, competition and technological evolution have made a significant impact on software development, and technology management, thus organizations change their sourcing arrangement to respond to these shifts over time. Table 1 summarizes the logic of competition for SAP over time.

Table 1. Summary of rival activities and responses

Period	Rival activities	SAP's responses		
		Motivation	Activities	Mode
1970S	Current Business Model: Software provider of "in-house" development of business applications for a user organization IBM is the biggest rival Technological Architecture: Mainframe-based Target Market: Large Enterprise	Development of new business model "off the shelf systems"	Technological Architecture: Mainframe Business Process – focused on Manufacturing and Accounting Business Process - Develop common modules that can be sold as COTS Services – customizations can be made to the software Market – Large Enterprises	Insourcing by developing software on externally located IBM software Later in 1979 operated its own development environment and building its own data center Insourcing through joint development with client to produce software in other languages
1980S	Modular solutions Baan is the biggest rival New Technologies: UNIX + C New Market segment: Midsized-market New business processes emerged: Human Resources	Focus is on global expansion Raise financial capital	Sold integrated solutions Technological Architecture: New Generation of Mainframe Servers (AS400) Business Process: Introduction of Human Resource Module Services – translation of software into different languages	Insourcing by knowledge acquisition - Acquires Steeb and CAS
1990S	Technological Architecture: Client/Server Compete for new market Multiple competitors New Business Processes: Supply Chain Management, Customer Relationship Management, Product Lifecycle Management	Focus is to compete for new markets	Technological Architecture: Client/Server Business Process: Develop document archiving process Customer response: Improvement in software interface to make software easier to learn and use Market: Midsized market	Outsource development efforts e.g. IXOS project, industry solutions Outsource sales and implementation to partners Joint internet strategy with Microsoft in 1996 to develop new software
2000S	Y2K/internet boom Multiple competitors Focus on expanding to new markets and new offerings Enters a period of acquisitions	Focus on expanding to new markets and new offerings	Technological Architecture – Web-based, delivers new platform NetWeaver Cloud solution Market: SME market	Insourcing by knowledge acquisition Enters a period of acquisitions to acquire knowledge and customers

Fig. 4 shows a modified RQSF to demonstrate that sourcing arrangements are in fact based on three things: competitive environment (e.g., new technologies, new target markets, rival actions); maximization of resources; and customer requirements. In the case of SAP, we can see that it was an adaptive organization capable of making the necessary changes to allow it to fend off its competition and maintain its market leadership. This shows that over time it developed competitive hysteresis which provided it with the know-how to respond to new competition, and it was able to take advantage of its 40 year expertise in the field of developing COTS products.

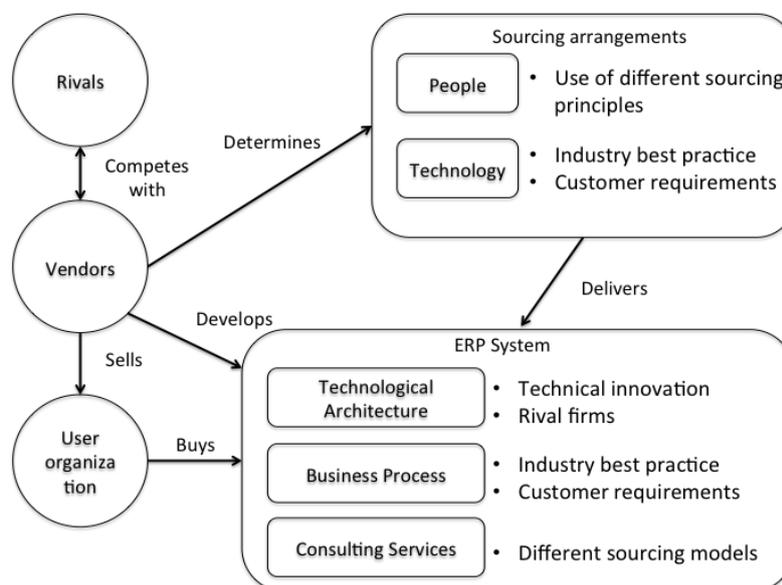


Fig. 4. Modified Red Queen Sourcing Framework

## 7. Conclusion

The case study method effectively illustrates the applicability of the EBF theoretical framework to the study of sourcing arrangements. Future case-study research can investigate and compare multiple organizations to see how various organizations have used various sourcing strategies to compete. By incorporating the Red Queen theory to explain outsourcing strategies, we showed that the motivations behind outsourcing are not limited to the maximization of resources but can be attributed to the viability of the firm to outperform and survive its competition. This implies that practitioners should consider various sourcing arrangements in order to compete, and academics need to consider the competitive landscape to explain sourcing decisions.

The findings reported here suggest that sourcing strategies play an important role in the ability for firms to compete in the marketplace. By applying the Red Queen theory to SAP's case study, we have illustrated that organizations make strategic choices pertaining to sourcing arrangements. Organizations select various capabilities, often referred to as a core competencies, for the firm in order to preserve their competitive advantage. In reviewing the various sourcing arrangements that SAP undertook over the past 40 years, we revealed how a software organization adopted various sourcing arrangements (i.e., insourcing, outsourcing, netsourcing), which changed over time in order to keep up with technological shifts, customer demands and rival actions. We have seen that sourcing decisions have been generally applied in response to competition in multiple ways. First, sourcing decisions were used for the management of the technological base. Second, sourcing decisions were used to develop new offerings (e.g. new modules or industry solutions) and enhance existing offerings (e.g. support of several languages). Third, sourcing decisions were used as a means to scale up operations by partnering with business integrators to increase sales. Finally, sourcing decisions were made to acquire knowledge and extend capabilities. Over time, SAP developed competitive hysteresis, which allowed it to outperform and outlast its competitors. To date, SAP remains a dominant player in the field of developing ERP software.

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