

# Records management practices in construction industries: Australian perspectives

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## Abstract

### Purpose

This paper presents findings from research undertaken in Australian Construction Companies that describes some issues faced in the management of records on large-scale projects.

### Design/methodology/approach

Ethnographic data were collected from several projects by observations, interviews and looking at records management systems. Thematic analysis was employed, where common descriptions of practice and frequency of themes emerged.

### Findings

This paper found three themes Australian Construction Companies experience in daily records work. A construction project's pace means project staff create records, but neglect to share them amongst other team members. Secondly, there are differences between overseas trained project staff and local staff in the way they give importance to records management issues. Thirdly, the pace of modern construction projects and managing the many data types that now make up records causes difficulty in keeping records current. Learnt work habits and resistance to changing practices is common despite pressures to ensure records are current, accurate and easily retrievable. The paper's findings also discuss the merits and drawbacks of ethnographic research suggesting strategies for undertaking such work.

### Practical implications

Using ethnographic methods is a way of uncovering micro-level reasons for resistance to change and what work practices hinder successful records management. These findings produce an account of daily practice that provides detailed information to management to identify areas of change.



**Originality/value**

This paper provides a description of one way of researching records management issues and an insight into such issues occurring in the Australian Construction Industry.

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**Article Type:** Research paper

**Keyword (s):** Construction Industry, Ethnography, Change Resistance

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## **Introduction and paper's aims**

The complexity and fast pace of contemporary large-scale construction activity impacts heavily on those using a project's records management systems (RMS). Construction records need to be accurate, current and quickly retrievable. Unexpected obstacles to project continuation and completion always occur. Meeting cost and time commitments can mean records may not be managed consistently well when RMS procedures are not followed. This is despite the current capacity of electronic and paper RMS to increase the speed of retrieval of record information and store vast quantities and formats of records. This paper is an exploration of some RMS issues that occur in the Australian Construction Industry through research undertaken in construction companies.

This paper has three specific aims that will give insights into RMS use and issues on Australian construction projects. First, a definition of, and discussion of, ethnographic methods used to research RMS issues on projects will be undertaken. This is to show how the data collection and analysis methods of ethnography can yield rich insights into RMS practices. The second aim will be to discuss three key themes that arose from the research. These suggest reasons why effective practice and use of RMS does not always occur during daily project operations. The final aim is to suggest possible ways of improving RMS practices on projects, as well as assessing how useful ethnographic research methods are for undertaking RMS research.

## **RMS issues in Australian construction companies**

This paper was inspired by Craig and Sommerville's (2006) article reviewing information management and records systems used on United Kingdom construction projects. Their findings were similar to RMS and information technology practices occurring in Australia. A common finding in information communication technologies (ICT) and RMS research is that such technologies lag behind many other industries (Stewart *et al.*, 2004). Yet it has been reported that electronic document and filing systems overall produce benefits such as quick accessibility of records, simultaneous documents sharing and better adherence to ISO 9000 standards (Edwards *et al.*, 1996). The question asked of the Australian Construction Industry is, if benefits of RMS and other electronic technologies assist project success why is there resistance to their use?

Resistance to using such technologies in RMS practices has contributed to poor project performance in areas such as time, cost and quality. Technological resistance on construction projects has been linked to professional work divisions such as that between the designer and constructor (Faniran *et al.*, 2001; Craig and Sommerville, 2006). Some project professionals see the function of managing records as belonging to administrative and support staff, resisting pressure to maintain orderly record systems themselves. Further to this, project staff may view records management as an activity with less importance as the investment of their time is spent on completing other work.

Past negative experiences with the introduction of new electronic technologies also contribute to resistance to changes in procedures and working arrangements (Mitropoulos and Tatum, 2000). These are a sample of the types of reasons that may account for resistance to following efficient RMS practices on Australian construction projects.

Craig and Sommerville's (2006) research into United Kingdom construction projects has similarities to RMS practices in Australian construction companies. Construction industry experts and construction academics have found the lack of information flows, information currency and poor archiving and retrieval all contribute to poor project performance (Craig and Sommerville, 2006). Having access to records quickly is especially problematic when issues occur on the site itself while the project office can be located far away from the site. This claim by Craig and Sommerville (2006) reflects RMS practices that occur in the Australian Construction Industries as much as in the United Kingdom:

Historically, the onus of storing, disseminating and managing project information has fallen to each of the individual project team members of the many organisations involved within the project. Hardware advances, coupled with improved electronic and paper-based IMS facilitate synergistic standardised filing and information control, which reduces the reliance on each individual or organisation to undertake the task of storing and controlling information. An IMS also has the capability to engage with performance management and reporting systems which aid not only management of the project, but also management of the organisation.

They suggest that organisational change, despite such advances in technology to control and organise information and records was difficult to implement. Shifting RMS processes from an exclusively administrative staff duty to a project team responsibility is a major organisational change. RMS and IMS systems support such a change; however, changing attitudes and habits in performing current RMS practices differently has been a challenge to implement in Australian construction companies.

An issue in Australian RMS practices is how to manage multi-format record types. Photographs, drawings, even video and multimedia data, form part of a record.. Signatures on design and construction drawings often approve, legally, the authority to proceed with a certain part of the construction. These need to be current and accurate, and importantly, able to be retrieved quickly. However, the pace of the project has often seen records be created haphazardly with no updating, files not stored correctly electronically or manually and a backlog of information not matched to the correct types of files.

The state of RMS practice in Australian is one where the importance of the information contained in records is vital to project success. Yet on a daily project basis, the RMS may

not always be utilised efficiently due to the sheer volume of generated records. Project staff are under pressure to adhere to project RMS standards including those demanded by local and state authorities. For example, in Queensland, where the head office of the studied copy resided, it was necessary to archive past project records under legislative requirements (Queensland State Archives, 2006). But a shortage of administrative staff trained in RMS practices can prevent such efficiencies and compliances from becoming a project priority.

Australian construction companies strive to comply with legislative standards and maintain a quality RMS. Yet successfully maintaining the project's records management functions consistently accurate and current is a major organisation problem. This paper will now explore some RMS practice themes through a research project undertaken in Australian Construction Companies.

### **Using ethnographic research to understand RMS practice issues**

These findings are the result of three years of research conducted in Australian construction companies. Whilst projects were subjected to a high level of client confidentiality, this paper reports results whilst protecting the companies' informants. The study used ethnography as the research method to explore how well companies were managing RMS procedures. Ethnography is defined as the study of people in naturally occurring settings where the researcher participates in a setting's social life (Brewer, 2000). Ethnographic research has evolved from studies of native cultures by anthropologists to investigating modern corporate and community issues. Ethnographic research is investigative and scientific in approach, building theories to account for peoples' behaviour in a particular physical setting or social or business issue (LeCompte and Schensul, 1999).

Ethnography uses mixed methods of collecting and analysing data. The observation of people's practices and behaviours is the main gathering data instrument. Observations and descriptions are made as unobtrusive as possible, by writing ethnographic fieldnotes. Descriptions of place, time, interactions with records and conversations are recorded, as are diagrams of anything useful, such as a records form used by an informant. Detailed descriptions of people's actions and behaviours were crucial, what was said by informants during everyday practice and what types of technology they were using formed a data pool. This supports the research concept of the ethnographer describing a social world, in this case a construction company office setting, and the people who inhabit that world (Emerson *et al.*, 1995). Data was also collected by interviewing informants and observing the records systems and other electronic technologies they used. The research question asked in this research was 'how are electronic and paper records managed in Australian Construction Companies?'

Data was analysed by thematic analysis allowing it to be grouped in a systematic way, allowing different themes to emerge from data. Such data is grouped according to counting the number of certain phrases, events, activities, behaviours and observations that occur

repeatedly in the data (LeCompte and Schensul, 1999). Checking results with people through asking questions and making further observations assisted in supporting findings and triangulating the data for accuracy.

The clients allowed the researcher access to people who had priorities other than being observed or interviewed. People often do not like being closely watched and may believe the study is a report to management on their work performance. Much literature exists on the problems of ethnographers working in corporate sectors and undertaking such research. Sometimes the ethnographer may never fit into the group and must find better strategies to establish trust with informants (LeCompte *et al.*, 1999). Access to records is difficult because the construction industry is highly competitive. Tender documents, drawing plans, material purchase records and emails were all viewed. Constant permission had to be sought to view such material due to the confidential project material contained in such records. Despite such drawbacks, ethnography can produce useful results and provide excellent descriptions of practice from an outsider perspective. It is a way of showing what practices are being done at a daily project level and why they are done as they are.

The study took place initially in one company, but across several of its divisions, namely, civil, building, mechanical and process engineering. Each had different RMS procedures but were subject to the same legislative requirements. Some of the divisions were in one state, however, some interstate divisions were visited over the 3 years of the project, hence a range of RMS procedures were observed.

Some of the study's thematic results are now discussed. Three key themes emerged from the research where practices were hindering the retrieval and management of records. They were the use of spreadsheets as records, the cultural divisions of project staff using RMS and the difficulties in maintaining ISO standards when faced with large volumes of data.

### **Spreadsheet culture and the RMS**

The frequently observed RMS practice was a heavy reliance on Microsoft Excel as a project record medium for a variety of information purposes. This is done for expedience in finding information. Yet it was also an ingrained in the daily practices of the project. The spreadsheet was considered a record because it met the company's guideline that it is evidence of a company function (National Archives of Australia, 2007). It also contained content, structure and context of an activity and, although often contained on an individual's own computer, was still considered part of the project's RMS. Figure 1 is an example of such a record and the data it contains. Its simplicity assisted the construction managers to see how much concrete was used on a particular building over a period of time. It was considered by the project team that such simplicity eliminated the need for creating more complex record documentation.

The issue became the sharing of such records amongst team members and their storage not in the total RMS but on individuals' computers. It was a policy of the project that records be shared amongst the team and stored on enterprise wide document management systems. Yet it became a habit in daily practice to create a spreadsheet and store it on the individual's personal computer. Hence it was assumed by some project staff that data were being kept by an individual for unknown purposes. This was especially problematic on alliance projects where the expectation was most documents would be shared among many team members. An alliance project is one where two or more construction companies join to share expertise in many areas, including their records systems and records procedures.

One construction manager commented that the spreadsheet saved time before going to client meetings rather than having to use the complex electronic document numbering system. Clients, it was claimed, appreciated more seeing the extracted record information in graphical and list formats than complicated detailed records. This reoccurring view was attributed to the pace of the project; it was considered easier to manage data in a spreadsheet record for quicker retrieval.

Conflicts between staff arose when the construction manager who held the record was not present in the office. Trying to locate managers to gain password access was frustrating, especially if that manager was overseas or on a construction site. Second, if access was granted what was considered frustrating by project staff and management was the naming conventions of the .xls files. Versions of documents would be named differently; hence much time was spent checking file names and drives.

The company's head office management wanted adherence to consistent naming conventions for .xls files; that is, to have a project identifier according to discipline eg. Name\_Civil.xls. But the belief was expressed by several project managers that such conventions were a nuisance and often forgotten in the pressure of the daily work practices. Asking the managers about this the suggestion was made that using spreadsheets as records was simply what they had been taught to do during their career for expedience and convenience when seeking information. This reliance on Excel as a record keeping method was called by three informants "spreadsheet culture" which meant that was the accepted way on the project to manage a record. There was awareness among the managers that creating and storing records away from the central RMS caused retrieval speed and record access problems. But the ingrained nature of turning to a known medium for creating a record was too strong. Nevertheless, some managers began depositing their spreadsheets into a central repository after senior management gave directives for them to do so.

### **Cultural differences in workforce RMS use**



The second theme was the noticeable differences between Australian project staff and overseas staff in their adherence to efficient records management practices. To manage and share information, and have records retrieved quickly, electronic document systems were observed as being deployed on more projects during this research project. Such systems were considered efficient at indexing and storing multiple forms of data for project such as emails, drawings, correspondence, photos and .wav audio files.

A frequent observation was a marked difference between certain project staff when undertaking RMS procedures. Project staff recruited from European and Asian firms were trained differently in RMS procedures to Australian project staff.

Watching their use of the electronic document system showed the overseas project members to be meticulous in creating and classifying records. Often they would not leave the office until the classifying and metadata requirements were done. The project members would write technical specifications on the drawings rather than on other records. This ensured a change to any design was communicated on one record and uploaded to a central server for most project staff to view and retrieve. This is considered a useful and efficient practice in the industry (Queensland Division of Engineers, 2005). To the overseas project staff it was a habit to do this practice.

To illustrate, ten staff that came onto projects from overseas were observed in their daily practice. Project staff were asked questions about their previous commercial and academic experiences. What was reported was that it had been 'drilled into them' to keep record information current at all times. One German project member recalled that on one overseas project some design information not recorded had resulted in a bad design decision being made. That had taught him 'to take very seriously the updating of the record hence anything terrible might happen to the structure'. RMS and document management systems seemed an ingrained part of their daily practice; hence it was considered a priority to have the record current. It is not necessarily claimed that Australian project staff are less efficient in updating. Rather, through observing the RMS practices of the overseas staff for months, it is suggested they paid thorough attention to good RMS practices because it was their habit to do so.

### **Managing high volumes and types of records**

The third theme emerging from the data was observing how thoroughly classifying and storing large volumes and types of records was practiced as project pace intensified. Differences in priorities given to RMS practices at a particular point in time were observed for a period of 24 months. The tendering stage, where the company puts a case to clients to build the structure, produces many crucial documents which, by Queensland legislation, must be retained if the bid is successful (Queensland State Archives, 2006). Therefore, the project members carefully classify, backup and file those records into a repository for

instant access. Yet as time, cost and client demands increase mid project the volume and types of, records dramatically increase. Many created records are not filed at the end of a day due to other project priorities. As a consequence there is a problem when these records cannot be located quickly.

An example of managing volume issues was observed on one project where over 5000 design drawings had to be printed and bound as required for the company's RMS. This job was allocated to fourth year university engineering students who sorted, classified and bound the drawings into permanent records. This relieved the burden off administrative staff struggling to keep the system orderly. Yet not all drawing records later appeared in the electronic system as was requested by management. It was considered a surprise to the senior staff of the construction companies that electronic technologies and the online RMS were not utilised fully after much spending was done on these resources. The suggestion was that, as Faniran et al (2001) asserted as general behaviour on construction projects, that divisions between designer and constructor, as well as administrative and project staff, were creating an attitude that records management were a trivial part of project operations. However, the volume of records and lack of classification made management employ more resources as a short term solution to gain order back to the RMS.

Construction records on many of the observed projects contained not only paper media, but photos and other electronic media. On one project senior management insisted that it was written into employment duty statements the goal of using electronic and paper records efficiently and keep most records in central physical and electronic repositories. During the third year of this research it was noticed on the new projects that document management systems were put into the project from the start rather than phased in midway. The resistance to such use from some engineers was attributed again to the ingrained habits of using no or little technology. However, as one project engineer commented, although little time was made for learning the new technologies it became obvious to him that these technologies were useful. In one example, a three-way teleconference meeting between engineers in three countries saw issues arise where information contained in project records was needed immediately. The chief engineer, who previously admitted being resistant to 'the gadgets' keyed in a search into the electronic RMS and the records appeared quickly on screen. He commented at a later date how 'it had made life so much easier finding all this stuff'. This had 'saved him face and time' at a crucial part of construction negotiations. Such small reported incidents reassured senior managers in some of the companies that at least overcoming resistance to using electronic RMS systems was possible.

### **Study conclusions**

The purpose of this paper was to give insights into RMS practices in Australian Construction Companies using a study in one company as an example. It is not claimed that the results here are indicative of every company or of the industry as a whole. Rather, the study suggests through a number of themes why some RMS practices are not effective and what possibly accounts for this. The general conclusions are:

1. Habits, such as using the spreadsheet as a record, were ingrained in the training and commercial experiences of project staff, who valued them as time saving devices for information gathering
2. Resistance to change seems to be overcome when the RMS is seen as useful by previously sceptical project staff
3. There are cultural differences in the value placed on having records current and easily retrieved daily as overseas project staff seemed more meticulous in their RMS practices
4. Much work needs to be done in changing attitudes towards RMS use and that the importance of current and timely records must be constantly stressed over the life of the project

The study described not only the actual things done in RMS practices that were ineffective but also the motivations of the project and administrative staff as to why they behave as they do. The project succeeded in giving companies an account of why things happen daily that hinder RMS efficient practices. This gave company management an insight into what needs to be achieved to make RMS a greater priority on construction projects.

### **Ethnographic practices in researching records management issues**

The merits and drawbacks of ethnographic research are now discussed to illustrate that it can be difficult methodology to use in modern corporations. For a beginner researcher seeking advice from those who have used this method is vital. Ethnography is more about studying human behaviour in a particular setting rather than researching purely technical records management issues. Nevertheless, it can give useful descriptions of how records are created

It is likely that research would be undertaken in conjunction with an industry partner. The partner is often interested in how the results can be used to improve records management processes or solve a particular records management issue. Yet the researcher may be under pressure to produce academic work with an expectation that criticism of company practices should be reported in their own research. Therefore, the boundaries of what the researcher can access and write about, and in what mediums, such as academic journals, must be established. As this article shows the details of company and work practices have been masked to avoid identification. Corporations will protect their interests and the confidential data their RMS will hold. Therefore, constant communication between the researcher, supervisors and management is vital to avoid potential conflicts or a withdrawal of project support.

If a researcher decides to use ethnographic methods, this list suggests some examples of desirable ethnographic practices to maximise acceptance of the research method:

1. Present research findings in the language of the company using the company's report writing style
2. Assure people that it is not an undertaking to report on individual's work performances
3. Be aware of cultural, workplace and social behaviours that are present and respect them as much as possible
4. Adhere to the company's and tertiary institution's ethical standards of behaviour
5. Have someone at the company be constantly supportive so that any arising issues can be discussed to avoid conflict
6. Be aware of the demands on professionals' time and work out appropriate times to meet for interviews and work observations
7. Do undertake appropriate work for the company but do not allow this to be abused; for example, filing records can help with understanding the records system used but this should not take precedence over research commitments

The general assessment from undertaking such research is that much work needs to be done in convincing management that ethnography is a worthwhile and useful methodology. Time is a valuable resource and as the project's pace quickens the availability of informants can be limited as tasks become urgent. This includes records management tasks especially if there is a project requirement to have records current. The advice suggested is to plan an ethnographic project with suggestions for changing practice and improving project performance. That way management and stakeholders can see the potential for the methodology to be useful to their organisational needs and be receptive to its use.

This paper has discussed some perspectives on records practices in the Australian Construction Industry using an ethnographic methodology. It is one suggested way of approaching RMS issues which can yield a rich description of results in order to improve records management practices.



**Figure 1** Example of spreadsheet record used on construction project

	A	B	C	D	E	F
1	PROJECT NUMBER	CONCRETE TYPE	MEASUREMENT	DATE OF ISSUE		
2	vt-4948-4398	Sulphur Resistant	10m x 20m	2004/02/01		
3	vt-3889-8721	Low Heat	9m x 40m	2004/09/08		
4	vt-3782-9854	General Blend	2m x 90m	2005/05/07		
5	vt-4948-4398	General Purpose	5m x 70m	2004/04/09		
6	vt-6798-9848	Low Heat	9m x 87m	2005/05/03		
7	vt-3782-9854	General Purpose	32m x 9m	2004/09/03		
8	vt-9889-9897	General Blend	89m x 34m	2004/04/02		
9	vt-4948-4398	Low Heat	9m x 66m	2005/02/02		
10	vt-6798-9848	Sulphur Resistant	76m x 22m	2004/08/02		
11	vt-5238-8703	Sulphur Resistant	50m x 12m	2004/09/24		
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