KNOWLEDGE MANAGEMENT STRATEGY FOR THE BUILDING DIVISION, QUEENSLAND DEPARTMENT OF PUBLIC WORKS

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Abstract
This paper describes the background and methodology developed and employed in undertaking research developing a Knowledge Management Strategy for a key construction focused government agency. This paper reviews this methodology and examines a likely Knowledge Management Strategy.

Two central objectives structure this Case Study:
1. Identify categories of important information generated by the Building Division, Queensland Department of Public Works in its service delivery to internal and external stake-holders, and
2. Formulate an appropriate and targeted Knowledge Management Strategy to meet the needs of the Queensland Building Capital Works program.

The structure of this paper includes:
➤ Description of the Queensland construction industry setting
➤ Review the relevant literature
➤ Design an appropriate research methodology
➤ Analyse results
➤ Formulate conclusions, contributions and implications of the targeted strategy.

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INTRODUCTION

This Case Study seeks to prove that a strategic approach to Knowledge Management will facilitate improved information sharing between the Building Division and its Stakeholders. The high level strategy for a Knowledge Management Strategy will be developed by following a rigorous process. The path taken includes undertaking a literature research locally and internationally, undertaking primary research with Building Division's stakeholders, analysing the results and developing a targeted strategy. The developed strategy will enhance the Building Division's abilities to manage important information and provide an enhanced client-focussed service delivery to government, the Queensland building industry, and the community. It will also improve business processes across the Division. The basic research methodology and structure of this paper includes:

➢ Describe the industry setting
➢ Review the literature
➢ Design research methodology
➢ Analyse the results
➢ Formulate conclusions, contributions and implications of the targeted strategy

INDUSTRY SETTING

In order to understand the importance of Building Division's role in the Queensland Building and Construction industry, the authors consulted with its key stakeholders, reviewed corporate documents and reviewed existing industry studies to position the organisation in a context.

Historically, the Department of Public Works was the Central Agency for Capital Works Procurement throughout Queensland. This role changed in the early 1990s through Government action to improve client Department accountability. The impact of that decision has the Building Division developing new directions of focus to add value to the Queensland building and construction industry. The research described in this paper seeks to develop a strategy to allow the Building Division to harness and share its knowledge and expertise through an integrated Knowledge Management Strategy (KMS).

The building and construction industry in Queensland is a major driver for the State's economy (Board of Construction Queensland, 1999). It is has a direct relationship with the level of employment, infrastructure provided and general standard of living for the community. It has a major cost input to all other industries, generates 7% of the Gross State Product and is the fifth largest employer in the state. It employs 130,500 people—representing approximately 8% of the State's workforce.

Approximately A\$11.9 billion is spent each year in the Building and Construction Industry with 65% concentrated in the south-east corner of Queensland. Government is the single largest client, purchasing approximately 25% of the value of non-residential building and 70% of the civil sector.

The Queensland Department of Public Works also plays an important role in establishing and regulating industry policy. As a major client to the construction industry and as a regulator, it is important for Government to act as a change agent. It has a community obligation to undertake research and development, promote best practice and act as an informed client role model.

The Department of Public Works is a line agency providing infrastructure and support services to government and the community. In addition to fleet management, printing and publishing, the agency has a lead role in the Government's building, construction and maintenance activities. Service delivery is through a number of

commercialised business units, support groups, corporate and executive services. The Building Division forms part of the support services area of the Department. Unlike the commercialised divisions, Building Division provides advice, information, and policy as a non-fee paying service to the Department, Government agencies and the community.

The Department has a budget of approximately A$1.8 billion and has more than 3,850 employees. It was formed on June 29, 1998 from the former Department of Public Works and Housing. Building Division: Prior to the early 1990s, Department of Public Works was the central agency for Capital Works Procurement in Queensland. This responsibility was then decentralised and now rests with the respective agencies. Department of Public Works, in particular the Building Division, has sometimes had difficulty and articulating its services and then promoting them to stakeholders. In response to this, in 1998 the Building Division developed a Business Plan for 1999/2000. Their Vision is as follows:

> *Our vision is to be recognised by the government sector and industry for our standards of excellence in building and property management and providing advice on all matters related to the strategic asset management of property and built assets*. (Department of Public Works, Building Division, *Business Plan 1999/2000)*

However, Building Division's potential influence on the Building and Construction industry and the community at large is evident in the Mission statement:

> *To ensure the State's investment in, and use of building infrastructure supports the social, economic and environmental priorities and expectations of government and the community.* (Department of Public Works, Building Division, *Business Plan 1999/2000)*

The Building Division has four stakeholders:

➢ *Minister* – The elected Minister with the portfolio of Public Works.
➢ *Central Government* – the elected Government, and central agencies like Departments of Treasury, Premiers and State Development.
➢ *Government Agencies* – budget and non-budget funded that use and Control State property.
➢ *Building industry* – range of services providers and industry bodies from the building and asset management sectors.
➢ *Community* **–** expectations of meeting service delivery needs, value for money, maintenance of safety and environmental responsibility.

Building Division provides expert and independent advice and assistance on asset management, including the procurement and management of built assets. It has four core business units to meet the needs of its government, industry and community obligations as follows:

➢ *Portfolio and Housing Unit* - Develop and maintain best practice management in the planning, procurement, operation and disposal of Government's Asset portfolio.
➢ *Asset Management Unit* - Provide expert advice and support to Central Government and Government Agencies on Strategic Asset Management.
➢ *Industry Policy Unit* - Facilitate the development of the Queensland building and construction industry, and
➢ *Built Environment Research Unit* **-** Facilitate the adoption, within Government and the private sector, of an ecologically sustainable built environment.

It is the management of information generated through research and development, expert service delivery and policy formulation that is the essence of this case study. In order to meet its goals and objectives, the Building Division, gathers, creates and administers large quantities of information. This Case Study seeks to categorise the

information by users needs, and manage its storage and dissemination by suggesting a number of improvement strategies.

Knowledge Management

Research analysts for the *GartnerGroup[1]* predict that organisations in information control-oriented mode would either significantly reduce staff or cease to exist by the year 2002 if they do not evolve into information service-oriented organisations. While this appears to be an extreme view, it is an issue that must be considered by organisations like the Building Division. The Building Division's goals include being a client focussed, service-oriented organisation by the provision of important information.

There is a difference between Information Management and Knowledge Management. Information Management uses technology for information collection, storage and control. Knowledge Management is a discipline that uses technology to share and leverage information for innovation. (GartnerGroup, *Information Management is not Knowledge Management*, 1997) The New South Wales Government Office of Information Technology has developed the whole of government *Information Management and Technology - Framework Guidelines* for implementation in all Government agencies. The aim of these guidelines is for Government to utilise information to better serve business and the community. (New South Wales Government, Office of Information Technology, 1997)

The New South Wales Government Framework Guidelines include a model for Business Planning and Business processes as shown below in Figure 1. The model does not illustrate the sharing of information with stakeholders. The model appears to collect, store, provide access for users and dispose of information, but does not consider the culture of collaboration and sharing of knowledge with stakeholders.
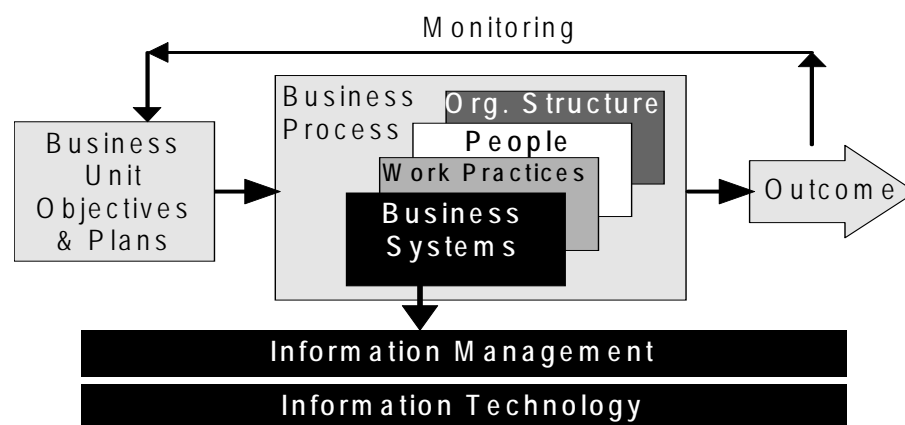

Figure 1. Business Planning and Business Processes
(New South Wales Government Office of Information Technology, *Information Management and Technology Framework Guideline,* 1997)

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[1] As one of the world's leading authorities on Information Technology (IT), the **GartnerGroup** is a recognised authority on global communications and information industry trends and developments. Its primary business consists of research and analysis of significant IT industry developments and trends. **Dataquest** is the leading provider of market intelligence information on the C&I industry, providing quantitative and qualitative reports on new products, market developments, technology trends, company strategies and end user attitudes.

Conversely, research analysts for the Meta Group[2] indicate Knowledge Management is not information technology like data warehousing/data mining, search engines, "Groupware", document supply chains, decision support, scanners, etc—it is the interface of people, process and content supported by the organisation's culture and technology. Figure 2 is indicative of Meta Group's view on Information Management.
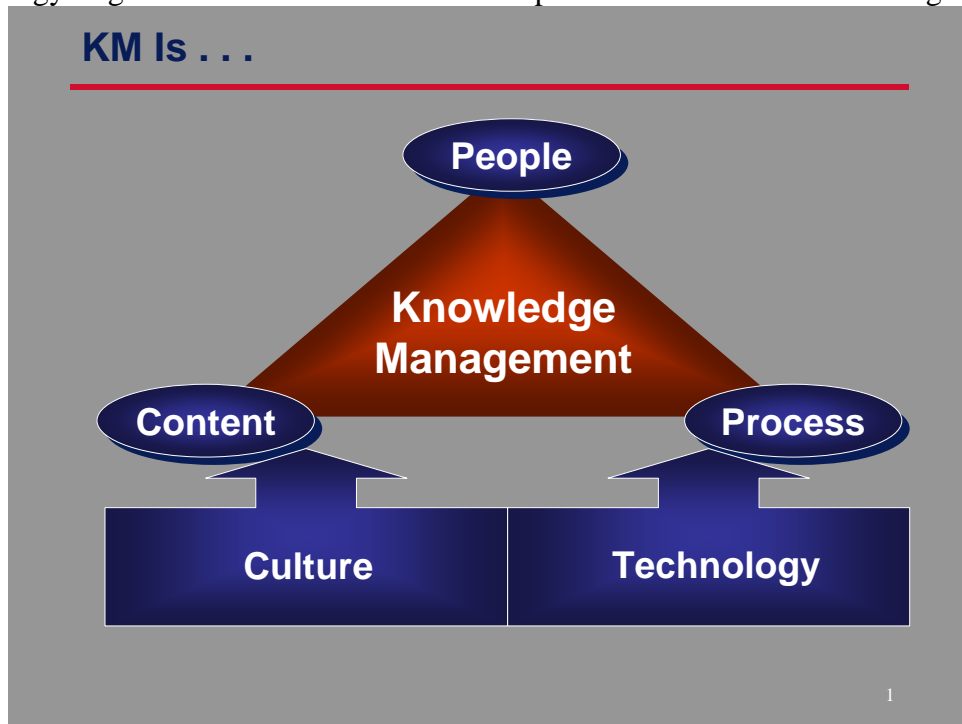

Figure 2**.** Knowledge Management Model (Source: Meta Group Inc., *Knowledge ManageNETS: From Concepts to Reality, 1999*)

The GartnerGroup (GartnerGroup, *Information Management is not Knowledge Management*, 1997page 1) defines Knowledge Management as:

> … *a discipline that promotes an integrated approach to identifying, capturing, retrieving, sharing and evaluating an enterprise's information assets. These information assets may include databases, documents, policies and procedures as well as the uncaptured, tacit expertise and experience resident in individual workers.*

The GartnerGroup claims Knowledge Management emphasises human interactions as the focal point surrounding the collection, distribution and reuse of information. In the past, organisations such as the Building Division have been insular in sharing internal information on the basis that it formed a component of their competitive advantage. Information is stored behind layers of bureaucracy. The challenge would be to move from a vertically integrated self-contained organisation to a virtual agency that interacts and reacts to its stakeholders in sharing and leveraging information. This would be a cultural shift to introduce a more collaborative approach to partner with stakeholders.

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[2] The Meta Group is a leading research authority keeping information specialists up-to-date with latest information and trends in information technology and management. The Advanced Information Management Strategies service of Meta, pragmatically analyses technologies and trends impacting business and organisational transformation, including electronic commerce, knowledge and information management and the creation of content-centric 'net applications and environments.

The aim of this research is to develop a strategy and make recommendations to create fundamental and beneficial changes in the way the Building Division manages and shares information. In an effort to change its focus from internal to external, the Building Division must review its supply chains by sharing knowledge about its business objectives and processes.

The changes will not be implemented during 1999, however, a Knowledge Management Strategy, based on intelligent use of Information Technology (IT), will be developed for implementation during the year 2000.

LITERATURE REVIEW

In developing this research, the authors reviewed available literature on Information Management, Knowledge Management and strategy development to instigate change in an organisation like the Building Division.

Literature was reviewed from a variety of sources, particularly from Australia, the UK and US including:
➢ Industry periodicals,
➢ Academic papers,
➢ Research papers developed by GartnerGroup and Meta Group (global research analysts specialising in IT),
➢ Commerce literature and periodicals,
➢ Knowledge Management periodicals,
➢ Information Technology periodicals and research papers, and
➢ Conference papers on Knowledge Management and related topics

To place the Queensland Building Division into a broader Australian industry context, an initial review of various industry studies on the Queensland and Australian Building and Construction industry was carried out. The objective was to determine the role the Building Division could play in the Queensland construction setting. This primary research stage provided the authors with leads to consult with several stakeholder groups like government agencies private companies and industry associations. As the Division has had difficulty articulating its role, the aim is to place the organisation into a context as a service provider of "important information".

Defining Knowledge Management, characterised by the gathering, storage and dissemination of information, followed this. Defining knowledge requires the identification of what is "important information" to the stakeholders of Building Division.

In parallel with this, a literature review was undertaken on the development of high level strategy and identification of essential elements to consider when contemplating the introducing of a Knowledge Management System. This review process provided an analysis of the change process.

With this background research, the primary research process of briefings, focus groups and face to face structured and unstructured interviews could be planned.

RESEARCH METHODOLOGY

To develop a methodology for the Primary Research stage, the first priority was to get organisational commitment to the process. Personal professional relationships with the organisation provided a lead to management and appropriate external and internal stakeholders. The approach used was to:
➢ Identify a Change Agent within the Building Division,
➢ Identify a method to gather information from appropriate sources, and
➢ Consult with specialists where required.

The methodology allowed the collection of qualitative and quantitative primary data from stakeholders by delivering briefing sessions, facilitating focus groups and undertaking face-to-face detailed interviews.

The *Change Agent* was identified as Building Division's Business Development Manager. To conduct the project efficiently and effectively, access is required to organisational information, resources, executive management and operational staff. This person is in a position to keep the key decisions makers of the Division and Department informed of the project's status. Data collection is conducted so as to minimise disruption to personnel and other resources. Regular meetings are scheduled with the identified Change Agent and a Reference Group of Building Division staff was formed to help drive the project.

Information Gathering from Stakeholders: To gather data and capture corporate knowledge, encouraging stakeholders to participate in the process is essential. Providing a safe and efficient outlet for ideas is one way of achieving this. The establishment of a team or group to discuss and brainstorm issues under professional group facilitation is the method employed.

Participants of the group came from various levels in the Division's hierarchy to access a cross section of viewpoints, experience and delegation (Viljoen, 1995). It was necessary to identify relevant experience from all levels in the organisation, and relevant external input from stakeholders. All group members, internal and external, had the opportunity to provide honest input based on their experiences and viewpoints. This information was used to develop detailed questionnaires for face-to-face interviews with internal and external stakeholders.

Ten people from within the Building Division were identified as appropriate for a *Knowledge Management Reference Group* for the study. It is anticipated that these participants will continue with the implementation stage of the Knowledge Management Strategies.

During 1998, The Department of Public Works established a reference group to obtain an external perspective of the IT initiatives undertaken by the Department. This group is termed *IT in the Building Industry Initiative: Government/Industry Reference Group.* It has been briefed, and several participants and a number of other external organisations have also formed an external stakeholder's focus group to identify their information needs. This external group is made up of representatives from government and industry—either clients of the Building Division or with a strong working relationship with the Department.

Consultation with Specialists: "Good planning systems make limited use of planning specialists." (Viljoen, 1995, Page 16) However, to obtain expert advice in the facilitation of focus groups, development of questionnaires, and interviewing stakeholders, input was obtained from two professional consultants. A professional facilitator was consulted and engaged to run the focus group meetings for both internal and external stakeholders, and a corporate consultant hired to provide expertise in questionnaire development, interviewing and analysis of data.

Both experts complemented the academic input and added an external and commercial perspective to the research process.

Selection of the *Knowledge Management Reference Group*

A selection of staff were identified—not only because of their ability to make decisions—but also to gain as much knowledge from them regarding the type of information available and its current or potential use. Often these types of decisions are made several hierarchical levels higher than they should be. This case study will provide

Building Division management the opportunity to empower the creators and users of information to implement changes and develop an effective Knowledge Management System.

Briefing of the *IT in the Building Industry Initiative: - Government/Industry Reference Group* occurred at a scheduled meeting during March 1999.

External consultation was carried out by a focus group meeting and face-to-face interviews with government and industry organisations who are participants in the building project chain shown in Figure 3, and have a direct working relationship with the Building Division.

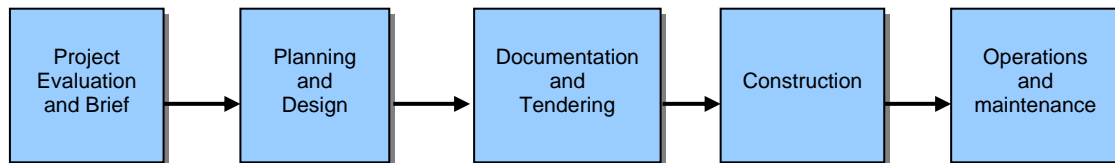| Project Evaluation and Brief | → | Planning and Design | → | Documentation and Tendering | → | Construction | → | Operations and maintenance |

Figure 3. Building project chain (External focus group members drawn from each phase)

Interviews were undertaken with three organisations from each stage of the building project chain. Organisations included client groups, building design professionals, contractors, and project managers and facilities managers.

Briefing Session

In order to maintain management commitment, every opportunity was used to keep them informed and involved. The Executive Director - Building Division and Business Development Manager - Building Division, are committed to the project and are drivers for change. The Deputy Director General - Department of Public Works is interested and committed to the project, as he would like to see the results used as a model for other areas of the Department.

Management's involvement has been essential in the briefing sessions to the *Knowledge Management Reference Group* and *IT in the Building Industry Initiative: Government/Industry Reference Group*. The agenda for the briefing sessions included:

Introductions
Aim of the Research Project
Methodology
➢ Background information on the Department
➢ Local and international literature search
➢ Primary research by focus group and face to face interviews.
➢ Analysis of key findings - 3 to 4 issues
➢ Recommendations for implementation
What commitment required from the reference groups?
The next stage.

The members of the *Knowledge Management Reference Group* need to be "Champions" of the project participate through to its implementation.

Focus Groups

A professional facilitator was engaged to facilitate a three-hour focus group with the Knowledge Management Reference Group. The purpose of the focus group was to discuss divisional business objectives in relation to Knowledge Management (GartnerGroup, *Information Management is not Knowledge Management*, 1997) and

produce a summary profile of current information management. The outcome of the Focus Group was an *Ideas List* of the goals and what was considered as the challenges or barriers to change.

The following issues (GartnerGroup, *Enterprise Information Architecture*, 1998) were discussed:

➢ Business Objectives in the Building Division's Business Plan 1998/99
➢ Identification of categories of information generated by Building Division
➢ Identification of who uses this information and for what purposes. This related to both within the organisation and its external stakeholders.
➢ Identification of mismatches between perceived needs and what is currently provided
➢ Identification of other information that could be provided by Building Division to assist stakeholders, consistent with business objectives
➢ Identification of channels by which information is currently disseminated
➢ Development of an *Ideas List* of potential improvements to the generation, quality and management of information.

The findings from the focus group were recorded and used to develop the questionnaires for face-to-face interviews with the *Knowledge Management Reference Group*. They were also used to develop key issues for discussion at the selected government and industry representatives' (External Stakeholders) focus group.

The following were issues discussed at the External Stakeholders Focus Group also professionally facilitated:

➢ Impact of the current approach Building Division has to management of information
➢ What information do Stakeholders consider important
➢ Identification of mismatches between perceived needs and what is currently provided
➢ Identification of channels by which information is currently disseminated
➢ Development of an *Ideas List* to meet External Stakeholders' needs.

The findings of this focus group were used to develop a questionnaire for external stakeholders.

Face to Face Interviews

Face-to-face interviews, while more burdensome on the interviewers, were selected for a number of reasons (Ostereich and Wassenaar, 1980). Self-administered questionnaires, though less time consuming and providing the opportunity for a larger sample, often have a low percentage of returns. Additionally, interview questionnaires provide the option to probe deeper into attitudes and cultural issues if necessary. The interviewer also has the ability to immediately correct any misinterpretations of questions. Two questionnaires were developed—one for the internal participants of the *Knowledge Management Reference Group* and one for the External Stakeholders.

The questionnaires were relatively short and included both questions with open-ended responses and questions calling for structured responses. The structured responses were in the form of multiple choice or *yes*, *no* and *don't know* responses. Even though open responses are time consuming to record and analyse, the ability to gain a better understanding of underlying issues is a distinct advantage. Closed questions are easy to record and analyse and were used where possible. A good understanding of the culture of the Building Division was required and was gained through the Focus Group. This knowledge of the organisation's culture ensured the

questionnaire did not compel respondents to answer questions they did not want to answer.

The Questionnaires were reviewed by academic and industry experts and piloted with two Building Division representatives before interviewing other participants.

RESULTS

Analysis of primary data was based on three steps (Ostreich and Wassenaar, 1980) - editing, coding and tabulating the responses. As the samples for each questionnaire were small, the process of analysing was quite simple.

Editing refers to a cursory glance of all of the responses to ensure there are not any that should be discarded. However with the interview process used, there was ample opportunity during the interview to salvage or clarify any responses made. Coding is the categorising of information into useable data. Coding of structured questions is simple given most are multiple choice. However, the unstructured questions were analysed by *content analysis* and had categories of information on which to code the responses. Any responses lacking clarity were improved by discussions with the participant. Tabulating refers to the counting and recording the data into *frequencies* or *breakdowns*.

CONCLUSIONS

Strategy development involves managing the interface between an organisation and its external environment. The outcomes of the primary research provided a clear indication of the business objectives of the Building Division, the knowledge base within the organisation and how it could be utilised both by internal staff, government agencies, and the general community.

This research for formulating the Knowledge Management Strategy is not yet completed. The following are potential strategy directions, based on a similar project undertaken by New South Wales Department of Health (New South Wales Health, Human Services Department, *Information Management Strategy 1998*):

Knowledge Classification: Assess the importance of information gathering based on Stakeholders' needs. Then adopt a common standard for the classification of knowledge and encourage other areas of Department of Public Works and other Government Agencies to implement the same standards.

Knowledge Exchange: The effectiveness of sharing knowledge across internal and external stakeholders is the key driver to provision of *Important Information*. It is necessary to understand information flows across the Division and its stakeholders during the course of service provision. Effective data and information exchange is closely linked to the issue of stakeholder satisfaction. It is necessary to identify and document information flows for agreed priority areas linked to the Building Division's Business Plan.

Information Privacy: Information privacy is key to engaging support from internal and external stakeholders. Issues of concern here are collection and protection of information and the exchange of knowledge. A key element of the Knowledge Management Strategy is to identify priority areas of interaction between stakeholders and develop protocols over information privacy in relation to these knowledge flows.

Stakeholder Needs Identification: Sharing information within privacy guidelines would enable the Building Division to provide its stakeholders with information they have mutually agreed are important. Benefits would be gained at the individual stakeholder level by facilitating knowledge exchange to support service provision. To provide more effective services, the Building Division will need to identify areas where

improved standards, policies or guidelines would assist stakeholders in their own service delivery.

Infrastructure: Infrastructure that supports service delivery can include information technology and business processes. This is where information technology needs to support the business objectives of the organisation, not conversely. It entails effective communication within the Building Division and between its stakeholders. Increasingly knowledge sharing is done electronically via the Internet, Intranets, and Extranets. Examples could be the creation of an Extranet database for the storage of policies, guidelines and standards from the Building Division, other areas of the Department and external stakeholders. For example, the Building Division could become the gateway portal to the building industry for expert information on capital works procurement and building industry reform.

This strategy identifies the potential appropriateness of Intranet and Extranet technologies for sharing knowledge on the needs of building construction stakeholders. The concept of sharing policy and procedures via stakeholders' Intranet sites still requires exploring. Identifying specific technologies and technology issues for greater and more confident use of information storage and retrieval is also required.

The Meta Group (Kutnick, 1999) believes one way organisations will be judged in the future—as far as the kind of partner they are and the value-adding they can produce—is by their ability to externalise, their ability to enable other organisations to communicate with them, and their ability to partner. A strategic approach to the Queensland Building Division's Knowledge Management System could assist the organisation achieve its goal of being recognised for its excellence in providing impartial policy and best practice advice on matters related to strategic asset management of property and built assets.

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