Effective Information Management through the Opportunity Life-Cycle

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Introduction

The ability of an organisation to operate profitably will depend on many factors, one of which is the ability of people to quickly process information and collaborate with each other. This applies to every stage in the opportunity life-cycle: from concept development, project initiation, project execution, commissioning of plant and ongoing business operations.

Organisational performance will also depend on the ability of people to collaborate outside of their functional silos. Departmental, or inter-company, boundaries can be unnecessary constraints to finding the best solutions to problems. To be competitive, collaboration and joint problem solving will include working closely with suppliers, service providers, customers and other stakeholders.

Multiple information technologies need to work in harmony to support this collaborative effort. In the project environment the emphasis will be on document management, whereas in the operating business the emphasis will be on business process management and the associated transactional systems such as ERP (Enterprise Resource Planning).

This article covers a high level overview of IM (Information Management) in both the project and business environments. In both environments it is important to have an IM strategy that supports the goals of the project and/or the operating business, and which is supported by appropriate technology. The article ends with a list of criteria for selecting a good collaborative technology platform.

Classes of Information Systems

Information systems are often classified into two broad types, namely:

- **Systems of engagement:** These are your collaboration systems e.g. e-mail, shared online workspaces and shared document libraries. They are relatively unstructured in nature and there is no standardised document format.

- **Systems of record:** These are your integrated transactional systems e.g. ERP (Enterprise Resource Planning, incorporating financials, supply chain, manufacturing, human resources, etc.). Systems of record capture and process information from business processes in a highly structured way using standard transactions.

At the beginning of any venture, owing to the more collaborative nature of the work, 'systems of engagement' predominate. As the opportunity moves through implementation to operations, additional "systems of record" are introduced. This evolution of information types through the life-cycle is shown in Figure 1.
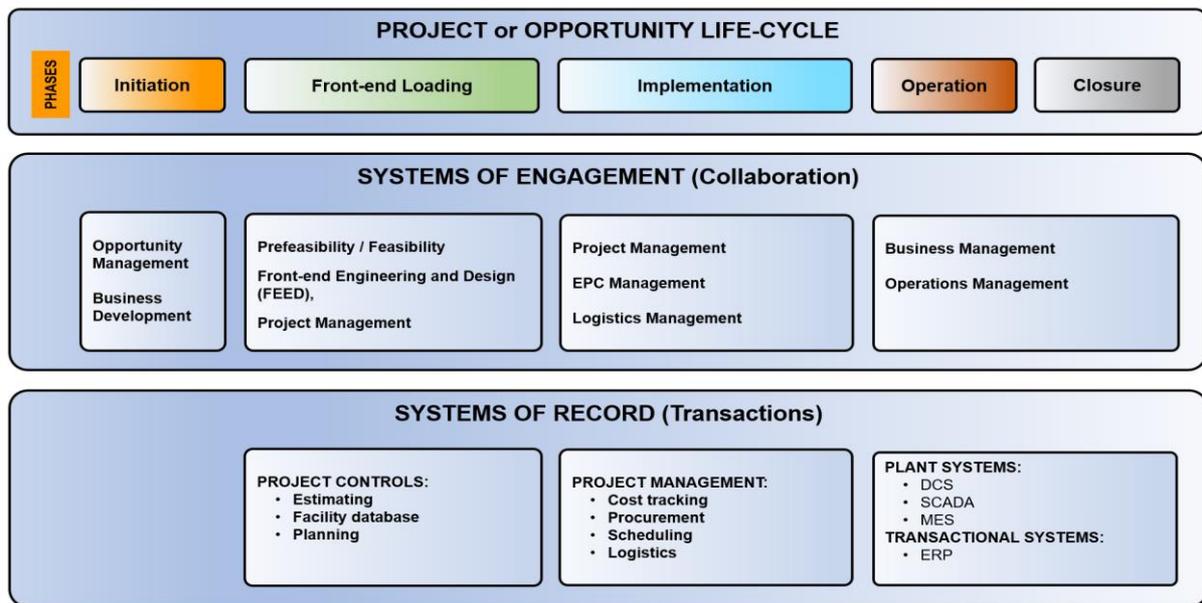

Figure 1: Examples of systems of engagement and systems of record through the opportunity life-cycle

There are fundamental differences between systems of engagement and systems of record in the way the technology is selected, configured, implemented and managed through the opportunity life-cycle. Both types of information system are necessary in a business. Typically, the more structured and predictable the business processes become, the more the information from these processes can be embedded in systems of record.

During the early stages of a project, there is much less structure and the emphasis will be on collaboration. As the design progresses, additional structure will become necessary to manage the growing volume project information. Structured databases are first introduced during front-end loading to manage estimating, scope of facilities and planning data. As the opportunity progresses additional structured databases are introduced for tracking project costs, managing procurement and project logistics. As the business starts up, systems to manage the vast amounts of plant data, manufacturing execution systems (MES) data and business data (ERP) need to be in place.

Defining the requirements, selection and implementation of systems of record such as ERP is a major subject that lies beyond the scope of this article. This remainder of this article therefore focuses on the systems of engagement (collaboration) which is where many of the challenges lie in contemporary information management.

Introduction to Information Management

Definition

According to Wikipedia, Information management (IM**)** is the collection and management of information from one or more sources and the distribution of that information to one or more audiences (Wikipedia, 2018).

In the project world, a project management information system (PMIS) is defined as an information system consisting of the tools and techniques used to gather, integrate, and disseminate the outputs of project management processes. It is used to support all aspects of the project from initiating the project, through to close-out and can include both manual and automated systems (PMI, 2017).

'Information management' is a continuous process intrinsic to the way people work on projects, in the business and for their own personal use. It is not a technology (although information technologies (IT) do support the process). Capturing the flow of information in a formal system is not easy.   Many of the most useful conversations between people take place in fragmented, unstructured ways – the most obvious being e-mail.   When using e-mail, each participant creates their own personal productivity system to organise their information as logically as possible. As a result, much business-critical information loses context and is buried in-between notes, personal e-mails and digital 'noise'.   When individuals leave the company, a great deal of their institutional knowledge is lost because the email account is deleted. At best the main record of that person's involvement ends up sitting in a poorly structured, inaccessible personal e-mail account archived on the company's server somewhere.

IM Drivers in the Operating Business Environment

Digital transformation programmes such as those stemming from Industrie 4.0 are placing pressure on manufacturing businesses to transform their information management systems.   Digital transformation seeks to improve organisational performance using digital technologies that transform their activities, processes, competencies and business models.

Digital transformation across the industry is having a major impact on the way organisations collaborate internally, and with their partners.   New products will need to be brought to market faster. Fast decision making will require visibility of information throughout the value chain. Teams will be geographically dispersed, which necessitates working virtually. This collaboration will be taking place through the web using e-mail, phone, shared workspaces, Skype/Zoom calls, and so on.

Business drivers for better collaborative information management include:

- A retiring workforce that is leading to a loss of skills and institutional knowledge;

- 'Knowledge management' that has failed to deliver the anticipated benefits because despite all efforts to capture knowledge, most of it (knowledge) remains in people's minds;

- Older technology platforms that are out of sync with modern cloud/mobile applications, leading to 'shadow IT' (the use of unapproved software systems without IT involvement); and

- Lost opportunities because of an inward-looking focus, as opposed to collaborating and innovating with the wider network beyond the organisational boundaries.

IM Drivers in the Project Environment

Professionals working in the project environment also face many information management challenges. Successful project teams have learned that effective management of information can be a competitive advantage. Project organisations that manage information better than their peers are more efficient and more competitive.

Information processing on projects costs time and resources and therefore directly impacts on individual project success. A conceptual overview of information management in the project environment was published in the Project Management Journal and shown in Figure 2.
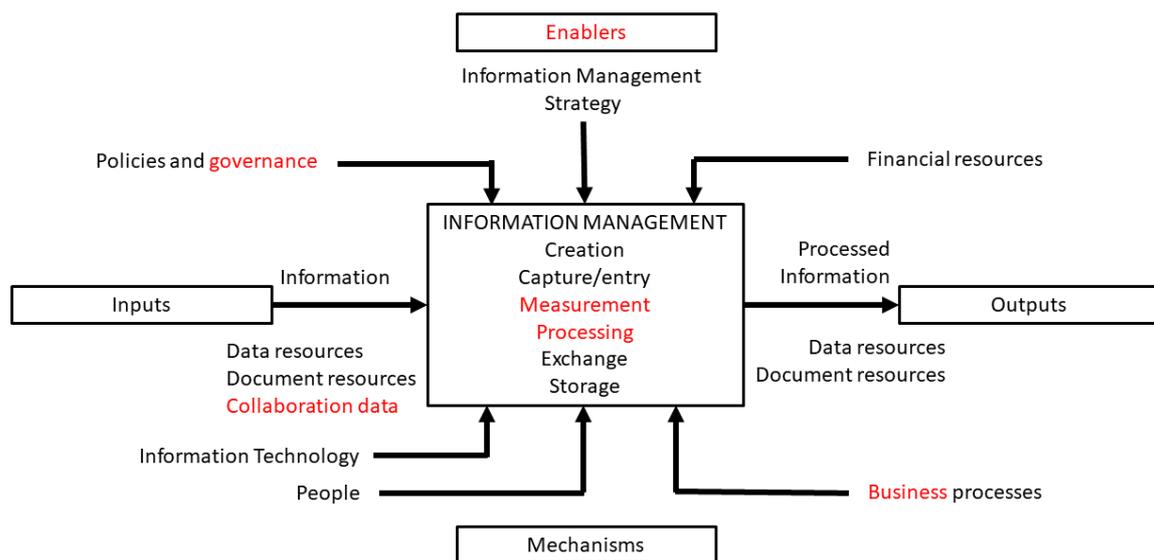
Adapted from Back, W. E. & Moreau, K. A. (2001). (Changes in Red)
Information management strategies for project management. Project Management Journal, 32(1), 10-19.

Figure 2: Conceptual overview of Information Management in the project environment (Adapted from Back & Moreau, 2001)

Figure 2 illustrates the nature of information management in a project environment where inputs (information and data) are processed into outputs (project deliverables such as documents). The information system should be designed to support all the processes necessary to generate these output documents, such as equipment datasheets, operating procedures, drawings, reports, etc. The more efficiently the project team can process input data into formal deliverables, the better; quality is improved, time is saved, and costs are reduced.

Research has shown that project environments are particularly prone to the evolution of islands of automation and functional silos (Back & Moreau, 2001). These silos can develop between companies (e.g. owner, contractor, sub-contractor) and even within companies (e.g. engineering disciplines, operations and departments). These silos can become a real impediment to collaboration and performance. An intentional effort is required to integrate information across the project and to eliminate these islands of information and functional silos.

Practical IM Strategies

An organisation (project organisation or business) that seeks to manage information assets better will develop an Information Management (IM) strategy that specifies the objectives, the desired future situation, the steps to a better system and the management thereof to implement the change.

Key elements of an IM strategy should include:

- **Connecting** all information and data sources;
- **Processing** this connected data into aggregated information to support decision making;
- **Enhancing** a user's ability to share and process the information;
- **Notifying** people of new information quickly; and
- **Controlling** all information assets in the business to meet governance, risk and legislative criteria.

Such an information management strategy will have an impact on personnel, processes, policies and technologies (Back & Moreau, 2001).

A Culture of Collaboration

IM strategy should not only focus on tools and technologies – it should also address the 'cultural' aspects of information sharing. Changing culture, where necessary, is not easy and requires good leadership. Techniques that could encourage organisational knowledge retention could include formal succession planning, together with specific reward systems that recognise collaboration and encourage sharing of expertise.

Facilitating collaboration cannot be effectively achieved by controlling information access in a traditional hierarchical 'command and control' manner. That might have worked in the 1950's but will not work well in 2018. Millennials entering organisations, as well as many modern knowledge workers will find ways to circumvent arbitrary rules imposed on their access to information. Much of the information you need is now just a Google search away, and this changes the requirements of the IT/IM system dramatically.

To be of any use, information needs to be aggregated from multiple sources across the business and made available in the right context, in the right format, to the right individuals at the right time.

Relying solely on a filing system and 'discipline' to capture, organise and classify information is usually ineffective, especially with the diversity and availability of various modern information sources and many new tools available to knowledge workers. A more holistic strategy is required that goes beyond setting up a digital filing system.

Effective collaboration requires open systems that make data and information accessible to people who need it. These systems also need to facilitate easy analysis of this information to support decision making. A suitable system ideally needs to be self-organising as far as possible, in that information is automatically being categorised and classified while people go about their day-to-day work.

IT Tools and techniques are constantly evolving and many of the tools and techniques from the 1990's and early 2000's have become obsolete; the problem is that some organisations have not recognised this yet.

Selecting a Collaboration Platform

Because of the importance of collaboration in both project and business environments, I shall now focus on the selection of a suitable collaboration platform. Selecting the best tools and technologies requires a good understanding of the underlying requirements. Consideration should also be given to the need for continuity between the outputs from the project environment and the requirements of the operating business.

When organisations organise themselves along project lines, conversations can be segregated into different workspaces. Modern collaboration tools and instant messaging such as Google Hangouts, Microsoft Slack and Teams have evolved to help better organise project collaboration by project, topic or by business area. Day-to-day conversations using these platforms become self-organising and therefore the information is much easier to interrogate later for useful insights.

Today's IT manager has many choices when it comes to collaboration technologies. The generic requirements below, if applicable to your organisation, will help you in deciding on the merits of a particular solution:

- The system should allow for shared collaboration spaces easily accessible by people within and outside the organisation;

- Shared information can be organised in multiple ways – e.g. team sites, project sites, work breakdown structure, department and so on;

- The system should support virtual workers using mobile devices, working remotely and from home;

- The system should have proper security that will allow third parties outside your organisation to securely access relevant information;

- The system should be able to integrate and present real time information from all relevant information sources (ERP, plant systems, documents, e-mail, files etc.);

- The system should support short message conversations organised by project, activity or topic;

- The system should make it easy to consolidate formal e-mail correspondence into a central archive for retention, search and retrieval;

- The system should allow you to search in one place across all the different information libraries, including documents, e-mail and databases;

- Document versioning should be built in;

- There should be easy to configure processes that support authoring, review, authorisation and sharing of formal documents;

- Dashboards that summarise relevant metrics should be presented in a user friendly, accessible manner; and

- The system must meet legal and governance standards and the organisations information retention policies.

Closing Comments

Information management has been made easier by modern technologies that support collaboration within an organisation and with a network of suppliers, customers and other stakeholders. These technologies are necessary to manage information in a dynamic, changing workforce that includes virtual workers.

Modern information management platforms can be very effectively used to help organisations gather, retain and process information to gain competitive advantage. This applies to all stages of the life-cycle during the venture; from initiation, through project execution, to operations. Owing to technological advances, a modern project information system will look quite different from that of ten years ago. A new venture, a new project, or a digital transformation programme will sometimes present an opportunity to start afresh and introduce new information management technologies from scratch.

This article has provided some thoughts relating to contemporary information management and provided some high-level criteria for selecting and configuring modern information management systems. Should you require any further information in this regard, whether it is in the project environment or in an established business operation, please contact the consultants at OTC.

References

Back, W.E. & Moreau, K.A., 2001, *Information management strategies for project management.* Project Management Journal, *32*(1), 10–19.

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