



Legacy Issues in the Implementation of Enterprise Content Management (ECM)

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ABSTRACT

Enterprise Content Management (ECM) as a unifying concept is relatively new. ECM is based on the integration of a set of technologies each of which is still evolving. Not surprisingly, research is scarce and the market is still consolidating. As a result, integral ECM implementations are still rare.

It is argued that, pending the widespread adoption and implementation of ECM, much can be learned from experiences with the implementation of Enterprise Resource Planning (ERP) software.

Another reason for taking these experiences seriously is the growing extension of ERP-products with ECM-functionality. This extension may eventually result in an ERP-driven ECM-implementation or even in combined ERP/ECM products.

Lessons learned from the implementation of ERP are that implementations may be compromised by a large number of legacy issues. It is argued that the same issues may similarly affect the implementation of ECM. Therefore, it is advised, with due adaptation, to take these issues into account in devising implementation strategies for ECM.

Keywords: *enterprise, content, management, ECM, ERP, implementation, legacy, BPM*

1. ENTERPRISE CONTENT MANAGEMENT (ECM)

The term “ECM” was introduced by the Association for Information and Image Management (AIIM) and is defined as: „ .. *the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes.*“

Although definitions differ slightly, Enterprise Content Management (ECM) is commonly used as a term to denote an integrated set of technologies each of which is still evolving. The binding element and major selling point of ECM is its potential to integrate, on an enterprise wide scale, all areas that require the management and processing of semi-structured and unstructured content.

Although the technologies on which ECM builds already have a history, their integration under the umbrella of ECM is fairly recent [1].

2. ECM AND ENTERPRISE RESOURCE PLANNING (ERP)

Because the concept of ECM is relatively new, published experience and research results are still scarce [2]. Given this scarcity, it may be of interest to learn from the experiences with

the implementation of Enterprise Resource Planning (ERP). Of course, ERP-products are primarily aimed at managing and processing structured content, i.e. data stored in databases, as opposed to semi-structured or unstructured content. Still, their enterprise-wide focus and their assumed integration benefits in many ways resemble the focus and assumed benefits of ECM. Moreover, the integration of ERP with ECM (Miles, 2010) warrants consideration of lessons learned from ERP implementations.

3. LESSONS LEARNED FROM ERP IMPLEMENTATIONS

Like ECM, (part of) the business case for ERP is integration. Integration benefits increase with the number of areas to integrate. However, the greater the number of integration benefits, the higher the costs, the more risks and the larger the changes that have to be taken into account during implementation.

Most of these costs, risks, and changes are related to legacy issues that have to be dealt with during implementation. Since the development and implementation of ERP already spans several decades, there is a wealth of published research and

experiences (products (e.g. see [3], [4], [5], [6])¹. Without trying to be exhaustive, some of these issues are:

- requirements management,
- standardization,
- data migration,
- interfacing,
- infrastructure,
- organization,
- change management, and
- management commitment

These issues will be illustrated briefly.

4. REQUIREMENTS MANAGEMENT

Specifying requirements requires knowledge of current business practice. This knowledge is frequently only available in the heads of employees. Employees generally find it difficult to specify requirements from scratch. Also, they are inclined to use mainly, or only, current practice as a frame of reference instead of new technological possibilities. Therefore, employees are frequently partnered with business consultants to review best practice alternatives; usually in the form of process models. Partnering is also required to assess the consequences of choices. To speed up this specification process, frequently recourse is taken to so-called reference or best practice models. However, invariably requirements need to be customized and are likely to evolve, for instance due to new insights and, thus, need to be managed. The time to elicit and manage requirements is usually underestimated.

Standardization

The IT landscape of most larger enterprises comprises a large range of different applications covering different generations of technology. Frequently, a huge amount of effort and money has been invested in their development and they may support critical processes. Users may be reluctant to switch them off. To the extent that differences between different uses are larger, standardization becomes a bigger issue, i.e. standardization is not only a technological but also, or perhaps first and foremost, an organizational issue.

In many, especially large, organizations, different applications are used for the same purpose or the same application is used for different purposes. Many legacy applications are home grown and / or are products that are strongly customized to fit their context of use. As noted earlier, it is not unusual that these applications are critical and represent different software generations / versions. Frequently, documentation is poor or non-existent and developers are no longer available.

Typically, these standardization issues, and the time and cost involved, mostly become apparent during, instead of before, implementation.

Data Migration

Data that reside in legacy systems have to be extracted, standardized, extended, and enriched with metadata before they can be added to the ERP-database. Data models are frequently not available or not properly maintained. Often they need to be reverse engineered. Frequently, applications have to be maintained in parallel to the ERP-database because particular processes still require access to the data they hold.

Data migration issues can cause organizations to incur substantial and unforeseen costs in terms of time, money, and capacity (not to mention diminished benefits).

Interfacing

Typically, an ERP system replaces only a subset of the legacy IT landscape. This means that in many cases interfaces have to be developed to be able to exchange data. In the best cases, a middleware layer is available to reduce the interfacing problem. Depending on the number and nature of the interfaces the time and costs to develop them may be significant. Also, customizing interfaces may complicate subsequent necessary upgrades to the ERP-software.

Similar to data migration, these issues, and the associated costs, are difficult to foresee.

Infrastructure

Typically, the IT-infrastructure represents a heterogeneous set of systems that are connected by a “spaghetti” of connections. If only to keep increasing maintenance costs within bounds, this infrastructure needs to be modernized and untangled. Frequently, one of the purposes of the implementation of ERP is to do be just that, i.e. a means to cut infrastructure (maintenance) costs. Whatever its purpose, the implementation of ERP software often necessitates a more or less rigorous renovation of the underlying infrastructure. Not only due to integration requirements, but also because of additional storage and bandwidth requirements. Meeting these additional requirements is needed to ensure sufficient performance.

Also, given the requirement to stay operational during renovation, infrastructural changes are notoriously difficult to plan and control.

Organization

As noted earlier, procedures have to change more or less significantly. This may already become apparent during the elicitation of requirements.

¹ Apart from the referenced literature, this review is also based on experiences of the author with a major ERP-implementation within the Dutch Ministry of Defense [7].



However, usually changes are not restricted to operational processes but will invariably also impact processes up the hierarchy. In many cases, the implementation of ERP is used as a means to more or less force a reorganization. Apart from efficiency and cost considerations, compliance frequently is a driver; notably compliance to financial regulations.

The definition of roles and their accompanying redistribution of responsibilities, powers and segregation of duties, imply a significant revision of organizational structures; most typically these involve a change to a process as opposed to a functional organizational structure.

Typically, these changes are not well planned in advance and may require more time and money.

Change Management

The aforementioned technical changes and organizational changes impose a significant additional burden on all involved. The more so because these changes have to occur in a relatively short amount of time. In order to facilitate a smooth transition from the “as is” to the “to be” (ERP-enabled) situation, a significant change management effort is required.

Communication is very important and this may have a different meaning for different people. It is not sufficient to explain the reasons for change but, for all involved, it also has to be made clear what has to change and how. It is necessary that sufficient and timely guidance and feedback is provided throughout the implementation phase with sufficient attention to usability issues, user training, and adequate support.

Unfortunately, change management, being considered a “soft” requirement, is frequently not taken sufficiently seriously and treated in an ad hoc fashion or as an afterthought (with due consequences).

Management Commitment

During implementation, invariably, many (unexpected) changes and issues will come up and many objections will be raised. From the foregoing, it will be clear that a strong management commitment is required to deal with them, so that their timely and satisfactory resolution is assured. Inevitably, choices have to be made that may significantly impact the business that has to stay open during renovation.

However, management commitment typically is less firm than desired and mostly motivated by short term benefits, e.g. compliance, efficiency gains, and / or cost reductions. This renders it difficult to devise and adhere to a consistent implementation strategy. Still, an implementation strategy, be it organization-, legacy-, or module-driven, is a prerequisite. Also a road map comprising increasing levels of maturity may be beneficial.

Of course, to the extent that management commitment cannot be assured, implementation governance suffers and costs increase.

5. LEGACY ISSUES IN ECM IMPLEMENTATION

Although the evolution of ECM substantially lags behind the evolution of ERP, it is obvious that the concepts of ECM and ERP have much in common. Both have an enterprise-wide focus and their business cases draw heavily on integration benefits, e.g. regulatory compliance, process efficiency, and cost reduction. Even a tendency can be discerned for ERP-products / -vendors to merge / team up with ECM-products / -vendors (e.g. see [8]).

To the extent that the implementation of ECM(-functionality) draws on, or is driven by, the implementation of ERP, transposition of the aforementioned legacy issues is straightforward. In other words, many of the legacy issues that may be associated with the implementation of ERP may be equally relevant for the implementation of ECM. Of course there are differences but these amplify rather than attenuate the need to take them seriously.

Requirements management. The range of requirements that have to be taken account of and integrated is likely to be substantially wider than in the case of ERP. As yet, for much of the processes associated with ECM, reference or best practice models are still lacking.

Standardization. Standardization is indispensable for realizing efficiency gains and regulatory compliance. It is likely that any increase of the range of processes and / or (internal) stakeholders will complicate the standardization process.

Data migration. Data migration is a major factor in the implementation of ERP. Thus far, ERP content mainly, if not exclusively, consists of structured content, i.e. data stored in (a) database(s). It is to be expected that extending the scope of data migration to include other types of data / content, i.e. semi-structured and unstructured content (and associated, federated, repositories) constitutes a considerable complication.

Interfacing. Keeping interfaces within bounds is one of the main integration benefits. The implementation of ECM is likely to result in an extension of the number of interfaces.

Infrastructure. Generally, ECM imposes much higher demands on storage and bandwidth requirements of the underlying infrastructure than ERP. In order to maintain (or improve) performance this may imply a much more invasive renovation of the underlying infrastructure (irrespective of other developments that may be of relevance, e.g. outsourcing, cloud computing, big data, security requirements).

Organization. It is likely that the implementation of ECM will affect more, and more heterogeneous, parts and stakeholders of the organization.

Change management and management commitment. From the preceding considerations it follows that the implementation of ECM is likely to strongly impact change management efforts and management commitment requirements.

6. IMPLICATIONS FOR IMPLEMENTATION OF ECM

Considering the range and potential impact of legacy issues associated with implementing enterprise-wide software and realizing the promised integration benefits, joining the band wagon of ERP seems to be a sound strategy in implementing ECM.

Due to its wider scope, it is likely that the implementation of ECM risks to be a much more drawn out affair than the implementation of ERP already is. This underscores the importance of addressing the legacy issues identified in this paper. It also calls attention to the importance of change management and management commitment as critical success factors. In fact, change management and management commitment have also been recognized as significant factors in the implementation of ECM [2].

In the context of ERP it was noted that ensuring and maintaining the requisite management commitment throughout the duration of the implementation effort is no minor feat. In the case of ECM this may be even more of a challenge. It is hypothesized that, in addition to the use of a roadmap, Business Process Modeling / Management (BPM) may bring the necessary strategic focus into the effort (e.g. see [9]).

7. SUMMARY AND CONCLUSIONS

ECM is a relatively new concept that comprises a wide range of technologies. Given the lack of experience, the scarcity of research, the lack of market consolidation, and the huge impact, organizations are advised to be prudent. Lessons learned from ERP may be useful as a warning and as a guidance.

Given the state of the art with respect to ECM and its wider scope than ERP, organizations should opt for a gradual approach where functionality is extended gradually. Priorities should be chosen strategically for timely application of change management interventions and to ensure management commitment throughout.

It is hypothesized that a BPM-driven approach may be useful as this enables separation of the management of requirements from their implementation. It is also suggested that, in line with the BPM-hypothesis, a process-oriented approach is to be preferred over a function-oriented approach. This may ensure that the

right choices are made in a timely fashion. In this paper a number of these choices have been reviewed briefly. It is concluded that choices with respect to handling legacy issues should be part of any strategy for implementing ECM.

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