

2007

Alignment and IT Project Value Maximization

Benoit A. Aubert

HEC Montreal and CIRANO, benoit.aubert@cirano.qc.ca

Simon Bourdeau

HEC Montreal and CIRANO, simon.bourdeau@hec.ca

Follow this and additional works at: <http://aisel.aisnet.org/pacis2007>

Recommended Citation

Aubert, Benoit A. and Bourdeau, Simon, "Alignment and IT Project Value Maximization" (2007). *PACIS 2007 Proceedings*. 26.
<http://aisel.aisnet.org/pacis2007/26>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2007 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

50. Alignment and IT Project Value Maximization

Benoit A. Aubert²
HEC Montreal and CIRANO
benoit.aubert@cirano.qc.ca

Simon Bourdeau
HEC Montreal (Ph.D. Student) and CIRANO
simon.bourdeau@hec.ca

Abstract

This paper presents a case study of successful ERP implementation in two phases. The second phase included significant efforts to align the business strategy and organizational structure along with the information system components. These efforts enabled the organization to complete its alignment cycle by integrating its IT infrastructure and processes with the organizational infrastructure and processes, as well as fitting business strategy with the new infrastructure and processes and to reap the maximum value.

Keywords: ERP Implementation, Strategy, Structure, Organizational Change

Introduction

Enterprise resource planning (ERP) systems introduce changes on a scale that is larger than most other systems. They link various components of the organization and modify its structure by deploying standardized processes and data models which can lead to higher efficiency and significant cost savings (Soh, Kiwn, and Tay-Yap, 2000).

This paper investigates the adjustment dynamic between an ERP system and the other components of the organization. By documenting over two years the strategic and structural components of the organization, as well as the IS implementation activities, the process of adjusting strategic, structural, and system components is explained. Results show that it is important to complete the alignment cycles (i.e. strategic alignment) in order to collect maximum value. There has been significant work in the IS field on strategy and structure. Some key elements are reviewed in the following section. After an overview of the methodology followed, the case is briefly described. The last sections present the analysis and the main conclusions.

Theoretical background

Several researchers have looked at the strategic contribution of information systems (IS). Earl (1989) offered insights on how to manage IS strategically. More recent efforts have refined early insights and showed that information systems could enhance organizational flexibility and lead to increased performance (Zhang, 2006).

The relationship between information technology (IT) structure and strategy has been investigated for a long time. Tavakolian (1989) used the Miles and Snow (1978) strategic typology to investigate the impact of strategy on structure. There were several efforts linking the structure of the organization with the IS structure. Authors argued that when the organization structure and the IT structure were matching, performance increased (Gwynne,

² Benoit Aubert is also Adjunct Professor at Victoria University of Wellington, New Zealand.
The research was financed by the CEFRIO and the Social Science and Humanities Research Council of Canada

2001). Henderson and Venkatraman (1992, 1993) proposed a model of strategic alignment which clearly identified the linkages between business strategy, IT strategy, business structure and IT infrastructure and processes. In order to be efficient all the components have to be adjusted together. Fit is the critical element. This led to several research contributions. For example, Chan, Huff, Barclay and Copeland (1997) looked at how IS strategy paralleled the business strategy. They found that better fit lead to better performance. The contribution of fit to performance was also observed by Bergeron, Raymond, and Rivard (2004). Sabherwal, Hirschheim, and Goles (2001) have argued that more research taking into account the dynamic nature of alignment would be valuable. While research results suggest that better alignment results in better performance, little is known on the process required to achieve strategic alignment. The data gathered through the case study presented in section 4 offers some insights on the activities involved in such process.

Methodology

In order to understand the dynamic character of organizational transformation, involving IT implementation, a case study was conducted. This approach began with a priori specification of construct to establish the initial research design and the interview guides (Eisenhardt 1989). The methodology used for this research relies on multiple data collections from numerous sources, which help to triangulate the data gathered (Miles and Huberman 1994).

A total of 101 interviews were conducted over two years. The researchers were careful to interview participant equally from the business side (e.g. function managers, users, etc.) and the project team (project leader, power users, etc.), from all functions, and from various levels of seniority. Each interview, which lasted at least an hour, was attended by a minimum of two researchers. All interviews were recorded and transcribed by one of the researcher, and cross-validated the other. The research team performed triangulation and validation of the research results. The information provided by different interview participants was compared, and only information conveyed by two or more employees was included in the final analysis. Each interview quotes were coded and analysed using a coding scheme developed on the basis on the constructs identified a priori and throughout the interviews (Dubé and Paré, 2003)

Case Description

Organizational context and business strategy

The organization is a large manufacturer. In recent years, increased competition from developing countries intensified the pressures on the company. Strategies of simultaneous product and geographical diversification, along with a rapid growth by acquisition, have resulted in a production function distributed across the world which engendered various cultures and work practices within the company. There were different legacy platforms at the various sites. Sharing data between facilities had become difficult. Employees had created a proliferation of stand-alone, user-developed databases throughout the company which were being used to maintain data on operations specific to their function. This fostered a culture where employees were unaware of the implications of data errors or omissions on the rest of the organization. Several problems concerning the operation were beginning to concern management. These included process delays, sequential activities, low inventory turns, supplier proliferation and price inconsistencies, and multiple bills of material. The biggest problems were low visibility of inventory and a lack of integration between legacy systems which impeded the fulfilment of key element of the business strategy.

IT strategy (vision) and IT infrastructure and processes

Vision was proposed to create an integrated organization in which employees would seamlessly share common data across sites and products using a single set of unified systems and processes. The project was more of a business transformation than a technology implementation. An ERP system was considered as the best tool to implement the strategic vision. The envisioned system would support approximately ten thousand users on several continents. The full implementation of the system was planned to take five years and had a budget of approximately 435US\$ millions. Modules that were deemed more strategic (e.g. production planning) would be brought online when a foundation of core modules had been established (e.g. business warehouse). The system would be implemented in seven plants, one plant at a time, beginning with the company's newest and smallest facility.

Phase 1: The newest and smallest facility

For this first implementation, the project "high level" vision was communicated by the COO to all sites since the objective was to create one company. A project team was established with members from the IT department and employees from the business; recruited as business analysts. They were selected to represent their function's point of view and to provide hands-on knowledge about the business. During project planning it was decided that the business would be responsible for cleansing its own data, guided by a data cleansing team.

Power users delivered training to end-users in a classroom environment. Originally employees from the business, they were recruited for their knowledge of business processes and the system. They provided the first real contact between the users and the project. Users expressed reservations about timing, material, and focus of the training. They felt that the e-learning module gave a good overview of high level processes but that there was no tool supporting a detailed view of the processes (i.e. linking the high-level view and related transactions). Training focused on transactions, not on the roles. Users did not understand the impact of their tasks on other users' tasks. The process flows were not explicit and the project team was not able to provide a clear and detailed view of the new business processes.

On the Go live and after, legacy systems were still accessible to users. Several users said that they were still using legacy systems for some aspects of their work since that, even if a new system was implemented, their performance were still evaluated with the same criteria and no incentives were put in place for them to use the new system. Furthermore, no indicators were developed to clearly evaluate the value generated by the use of the new IS.

The system was delivered within the deadline and budget. The project's number one critical success factor of not disrupting production schedules was met. There was a strong sense of pride throughout the project on the project team, not on the business side. This first phase of the implementation project allowed the company to significantly reduce its inventory. This non-recurrent benefit help the company reduce inventory cost by almost one billion dollars. However, some issues were raised after this first phase of implementation: the project team felt that the business was reluctant to assume ownership of the system, and to promote the monitoring of benefits within the business; some users perceived that the new system imposed more restrictions on their work; many data fields have become mandatory and integration increases the required accuracy of the data, thus making some jobs more demanding; since users did not clearly understand the linking between the high-level view of the business processes and their related transactions, users were either by-passing the system, entering wrong information in the system or creating or creating various information label for

similar inventory parts. Incomplete transactions are blocked which engendered delays. SAP 'flags' a user if required information is missing, and guides users to enter the required information.

Phase 2: Improved implementation approach

The project continued after the first implementation and the second roll-out was done at another plant. The project champion for this second roll-out was the Vice-President of the plant who made sure the message and vision went across the various level of the organization. After the first implementation, several tools had been developed to present the overview of the project, the processes, the roles, and how all these elements were tied together. The objective of these tools was to link the sequence of transactions within the EPR (i.e. the IT infrastructure and processes) with the global business infrastructures and processes. For the second phase, changes in the roles and responsibilities were done before the deployment.

Table 1 : Project Success: Comparison of the Two Phases

Dimension of IS Success	First roll-out	Second roll-out
1. System Quality	1. Decreased human errors and errors become clearly visible 3. Incomplete transactions blocked and responsible employees identified	1. Same as first roll-out 2. Less transactions were blocked since users understood the roles and implications of their transactions on the overall business processes
2. Information Quality	1. Standardized processes and data model 2. Low data accuracy rate	1. Standardized processes and data model 2. High data accuracy achieved (97%)
3. Use	1. Some users expressed uncertainty concerning the project vision 3. Legacy system was still accessible after go-live and used by employees 4. Individual performance evaluated with performance criteria which were not link with the use of the new system	1. Project vision and objectives were clearly stated by the CEO and the champion 2. New roles and responsibilities were clarified and explained before go-live 3. Legacy system was accessible after go-live but was not used 4. Performance indicators were linked with the use of the ERP
4. User Satisfaction	1. Incomprehension and frustration from some employees 1. Satisfied with training but expressed reservation about timing, material and focus of the training	1. Employees were almost all positive 2. Satisfied with the timing of the training, the material and the focus of the training 3. Time was made for training attendance 4. Attendance to training was made a priority
5. Individual Impact	1. New restrictions on some employees work 2. Increased requirements for data accuracy. 3. Employees' performance was not evaluated in relation with the new ERP	1. Users felt the system made their job easier 2. Users wanted to have a higher proportion of their job supported by the new IS 3. Performance evaluation was link with the use of the new ERP
6. Organizational Impact	1. Project delivered in time and budget 2. No disruption of production schedule 3. Processes were not as efficient as intended 4. No value indicators were developed to evaluate alignment between the business process change and the business strategy	1. Project delivered under budget and on schedule 2. No disruption of production schedule 3. Processes become more efficient and 4. Value indicators were develop to show the link between the business process transformation and the business strategy

The project went live on the planned date, under budget and there were no significant disruptions to normal operations. A very high rate of data accuracy was achieved (97%). Stabilization phase was shorter than expected. Reactions from the employees were almost all positive. In this second phase, there was almost no work around solution since value and

performance indicators were developed after phase 1 and used in phase 2 to track employees work and use of the system. Most users felt the new system made their job easier. The users would have liked all their activities to be supported by the ERP. A comparison of the two roll-outs success is presented in Table 1.

Case Analysis

When analyzing the case, it appears that the project was overall successful. However, the second deployment led to better results than the first one. A closer examination of the case explains why this was the case.

Success

The benefits achieved by the information system implementation are multi-faceted. Success of an information system implementation is a complex variable. As Delone and McLean (1992) suggested, success can be measured at both the individual and the organizational levels. Moreover, the success included several interrelated variables (system quality, information quality, use, user satisfaction, individual impact and organizational impact). These multiple components will be analyzed to understand the differences between the two phases.

When evaluating the first roll-out; it seems that system quality was high but that information (data) quality was moderate. Data cleansing in the first roll-out was not done extensively and had to continue after the implementation. This reduced the information quality. Because the system was integrated, these data errors had a higher impact. There was lack of understanding of the processes, but this is in part due to training and preparation, not to the system itself. One indication that the system was well configured is that the configuration delivered to the second plant was extremely similar. Usage and user satisfaction were moderate also. There were instances in which the system was not use since users had access to the legacy system. Satisfaction was not always stellar either. Some complaints were formulated about the processes implemented and the extra work that the system demanded. In terms of impact, the users did not report gains at the individual level. However, at the organizational level, inventory reductions (in hundreds of million dollars) were directly attributed to the introduction of the system. This is not a recurrent cost reduction. Operational integration was not achieved entirely.

Phase two offers a very different picture. System was delivered with high data quality and the system quality itself was never questioned by the respondents. The system was used extensively and the users were very satisfied. In fact, the users were requesting from the project team that other aspects of their work be included in the definition of the project scope. It seems that they could measure the gains (individual) of integrating the processes. They could anticipate the benefits gained from the new processes. At the organizational level, the structural changes were observed (on top of efficiency gains similar to the first implementation). Visibility of information changed the way the employees looked at their tasks and at the processes. The clerical tasks were reduced and more time could be spent on analytical tasks. This led, in addition to the expected inventory reductions, to recurring benefits.

The comparison of the two phases (see table 1) shows that both deployments showed benefits. Both were also delivered within budget and almost within schedule. However, a complete examination of the facets of success clearly shows that the second roll-out was

more successful than the first one. The following sections offer suggestions to explain the differences between the two phases.

Alignment

Several observations can be drawn from the case with respect to strategic alignment. First, it seems clear that the company realignment started with a strategic vision. Higher management had an image of the organization. They wanted the company to become one integrated organizations; an organization in which information would be available for everyone and for which plants in different countries would operate in a seamless way. In order to achieve this vision, it appears that the information system was one tool to help make this vision real. The system had to enable the implementation of this vision. The system was the glue that would tie together all the components of the organization. By defining the IS strategy, and the associated system that would be required, they laid out the blueprint for the new IS infrastructure. The ERP system was not solely a new system to use but represented the backbone required to enable the realization of the strategic vision. The ERP provided the support for the processes crossing the organization. Once this system was in place, changes in the organizational structure would be possible to appear. Remote components would share information and start to work together as one. The idea of “the integrated company” was made real by the deployment and use of the system.

In the Henderson and Venkatraman (1993) model, it would be a “technology transformation alignment perspective”. In this perspective, business strategy is the starting point. Strategy drives IS strategic requirements, which, once implemented, provide a modified IS infrastructure. IS infrastructure finally modifies the organization structure. In this pattern, the strategic fit is achieved through the use of information system. Information systems are an enabler of the strategic fit (Henderson and Venkatraman, 1993).

A closer examination of the case indicates that the alignment in the first phase of the project was not complete. The business strategy dictated the IT strategy. It led to a change in the IT structure. However, the corresponding changes in the business structure did not materialize immediately after the first implementation which, for Henderson and Venkatraman (1992), would correspond to a cross-domain alignment. During the second roll-out, a strategic alignment was completed since new processes were understood and adopted, new roles were implemented quickly, the new structure was established and new value indicators were developed and implemented. This new structure corresponded to the IT structure and was supporting the strategic vision.

In both phases, basically the same system was deployed. One key difference between the two deployments was the investment in training about processes which allowed the integration of the IT infrastructure with the organizational infrastructure and the development of value indicators which validate the strategic fit between the business strategy and the new organizational infrastructure. It is through this training that structural changes could be implemented. In phase one, the training focused on tasks and transactions. Users learned how to use the system. In the second deployment, training was different. Users learned about processes and understood how their actions influenced other users downstream. They understood the new structure that the system could support. It facilitated the change in the culture of the organization.

Conclusion

The results obtained from the research are interesting in many aspects. First, the case shows that the objectives pursued in a large project are manifold. In this case, these objectives could be articulated at three levels: operational, financial, and cultural.

The results show that these benefits are not obtained solely by implementing the technology. Technology can be seen as a necessary but not sufficient condition. When technology was implemented without corresponding organizational changes, only some benefits were achieved. The full range of benefits was obtained when all elements were aligned together and the ERP system could be used within the appropriate organizational structure, to support the corresponding strategy.

The results show the importance of investing explicitly in the adjustment of the structure of the organization (done through the training on the processes and development of value indicators in the second roll-out). After making these investments, the organization could go much further in its transformation process. The organization implemented new processes through the use of the system, changed the roles of its employees, created a different way to look at the organization and its activities and new value indicators helped crystallized the new behaviours. This enabled the organization to complete the alignment cycle. Once this cycle was completed, benefits could be measured on several aspects. As shown in Appendix 1, success was observed on all the DeLone and Mclean (1992) dimensions in the second roll-out. The case study complements nicely the work of Sabherwal et al. (2001). The results illustrate how the organization can complete its alignment process. It also shows how the alignment effort is a change management one. The case illustrates the evolution and the different steps in the alignment, as well as the interplay between each component.

References

- Bergeron, F., Raymond, L, and Rivard, S. "Ideal Patterns of Strategic Alignment and Business Performance," *Information & Management*, (41:8), 2004, pp. 1003-1020.
- Chan, Y.E., Huff, S.L, Barclay, D.W, and Copeland, D.G., "Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment," *Information Systems Research*, (8:2), 1997, pp. 125-151.
- DeLone W. and McLean, E., "Information System Success: The Quest for the Dependent Variable", *Information System Research*, (3:1), 1992, pp. 60-93.
- Dubé, L. and Paré, G., "Rigor in Information Systems Positivist Case Research: Current Practices, Trends and Recommendation", *MIS Quarterly*, (27:4), 2003, pp. 597-635.
- Earl, M., "Experiences in Strategic Information Systems Planning," *MIS Quarterly*, 17(1), (1993), pp. 1-24.
- Eisenhardt, K. M. "Building Theories From Case Study Research," *Academy of Management Review* (14:4), 1989, pp. 532-550
- Gwynne, P. "Information Systems Go Global", *MIT Sloan Management Review*, (42:4), 2001, pp. 14.
- Henderson, J.C., and Venkatraman, N. "Strategic Alignment: A Model for Organizational Transformation Through Information Technology", In T.A. Kochan and M. Useem (eds.) "Transforming Organization", Oxford University Press, 1992, 411 pages.
- Henderson, J.C., and Venkatraman, N. "Strategic Alignment: Leveraging Information Technology for Transforming Organizations", *IBM Systems Journal* (32:1), 1993, pp. 4-16.
- Miles, R. and Snow, C., *Organizational Strategy, Structure, and Process*. New York: McGraw-Hill, 1978.

- Miles, M.B. and Huberman, M. *An Expanded Sourcebook: Qualitative Data Analysis* (2nd Edition) Sage, Thousand Oaks, CA, 1994.
- Sabherwal, R., Hirschheim, R. and Goles, T., "The Dynamics of Alignment: Insights from a Punctuated Equilibrium Model", *Organization Science*, (12:2), 2001, pp. 179-197.
- Soh, C., Kien, S. and Tay-Yap, J., "Cultural fits and misfits: Is ERP a Universal Solution?", *Communication of the ACM*, (43:4), 2000, pp. 47-51.
- Tavakolian, H. "Linking the Information Technology Structure with Organizational Competitive Strategy: A Survey", *MIS Quarterly*, (13:3), (1989), pp. 309-317.
- Zhang, M.J., "IS Support for Strategic Flexibility, Environmental Dynamism, and Firm Performance", *Journal of Managerial Issues*, (18:1) 2006, pp. 84-104.