Executive Summary

A common challenge facing firms is how to effectively embed strategic business-IT alignment into daily routines at the operational level. Based on our findings from following an alignment project in a global aerospace industry leader for almost two years, we put forward a framework, which we call OperA, for establishing operational level business-IT alignment. This framework has three dimensions—knowledge, communication and trust, and identifies alignment paths for three strategic situations faced by firms: major planned changes, regular operations and major unplanned changes. Each path is anchored in a different dimension of the framework. The global aerospace case shows how different mechanisms used for each path improve business processes and enable successful change. The case also revealed frequent pitfalls and dependencies between the dimensions and associated mechanisms that top managers should be aware of as they strive to achieve operational business-IT alignment.

THE OPERATIONAL ALIGNMENT CHALLENGE

Creating business value from IT requires a fit between IT and business resources. While most research and practice has focused on strategic alignment to synchronize IT and business plans among the executive team, our research suggests that operational alignment is equally, if not more, important. Operational alignment brings strategic plans into everyday life and creates value from daily operations.

Operational alignment is the set of planned managerial mechanisms to translate strategic alignment into action. Creating operational business-IT alignment is challenging as it involves fostering cross-domain communication and knowledge flows among staff in different departments. Despite considerable research on the topic of strategic business-IT alignment, it persists as a key CIO concern, indicating the scale of the challenge of creating operational alignment. Consequences of poor alignment are inadequate IT utilization, low levels of user satisfaction, limited returns on IT investments and suboptimal business performance.3

Existing frameworks are not sufficient to implement and assimilate alignment into daily work life because they often do not provide actionable recommendations. Moreover, their successful implementation relies on implementers’ individual experiences and their ability to deeply embed these frameworks in the context of the firm. Obstacles identified in trying to achieve operational alignment include “informal organization structures played a far more important role than expected in improving...”

1 Ritu Agarwal is the accepting senior editor for this article.
2 The authors acknowledge the thoughtful and thorough feedback provided by Ritu Agarwal, which helped to substantially improve this article. We also thank V. Sambamurthy and another anonymous reviewer for their helpful comments on an earlier version of the article.
IS performance," which goes “beyond organization chart solutions.” Other challenges include expectations that performance can be improved through cross-departmental interactions (e.g., regular meetings), shared knowledge (e.g., the extent to which the IT staff knows the business processes) and mutual trust and understanding between the IT department and business units. However, the management of “informal organization” is mostly not part of existing frameworks and there is no clear picture of how these social and operational expectations are operationalized and achieved on the basis of formal structural arrangements.

**OPERA: A FRAMEWORK FOR OPERATIONAL BUSINESS-IT ALIGNMENT**

In this article, we extend the dominant and perhaps rigid interpretation of business-IT alignment as being concerned with structures—namely, the areas of IS decision-making rights, reporting structures and centralization issues relating to infrastructure and services—to focus more on the social interactions at the operational level. Our core argument is that IT and business staff need to work closely together toward a common goal, such as delivering good business process outcomes. The better they interact, the more likely the IT department can offer relevant and flexible services, proactively address challenges and opportunities, and solve problems.

Our research shows that alignment will not emerge from randomly implementing singular mechanisms. Rather, the implementation of operational alignment mechanisms must be based on the specific circumstances that prevail within a company and their interdependencies. To accomplish this, we provide an operational business-IT alignment framework, which we call “OperA,” that enables organizations to select and use a sequence of mechanisms. The interplay between these mechanisms will eventually create better alignment.

We illustrate the application of the OperA framework through the experiences we observed over an 18-month period at AIS (Aircraft Interiors Systems) Inc., a large aerospace firm (see the Appendix for more details). AIS is one of the world’s top-five manufacturers of airplane interior systems, providing interiors for more than 150 airlines and leasing companies using planes mainly from Boeing and Airbus. An overview of the business-IT alignment effort at AIS is given in Panel 1.

**Panel 1. Business-IT Alignment at AIS**

AIS managers followed general advice on improving alignment through increased cross-departmental communication by placing people from IT and business departments in the same room. However, a lack of trust and respect for others’ work, not geographic distance, had created a “social” IT silo. Responding to severe production quality issues that caused tremendous cost for rework of manufactured items before delivery and threatened the company’s survival, AIS decided to reengineer its business processes based on new core IS applications. The reengineered processes would address the quality issues, shorten the long process cycle times, and improve delivery performance.

AIS hired a new CEO who initially took over the IS leadership role because the head IT manager was too narrowly focused on technical issues. The new CEO had experience with complex IS implementations and held a strong belief that IT and business must be intertwined to render high performance, and that implementing operational alignment is a necessary precondition for a major change initiative. Over time, the IS leadership role was transferred to a business-knowledgeable manager who was then appointed IT Director, with a direct reporting line to the CEO.

As the company struggled with poor alignment that threatened its survival, it established an alignment program where some mechanisms failed while others were successful. Its experiences provide useful insights for other organizations struggling with operational business-IT alignment.

Drawing on insights from the AIS case and supported by our experience and other research, including a series of case studies, quantitative surveys and key insights from three frameworks published by other...
How to Achieve Operational Business-IT Alignment: Insights from a Global Aerospace Firm

we have identified three key dimensions of operational alignment that translate into business process performance:

1. Communication, or structural linkage (i.e., the frequency and quality of cross-domain interaction)
2. Shared knowledge, or cross-domain knowledge (i.e., the extent of business knowledge among IT staff and vice versa)
3. Trust and respect (i.e., the extent to which IT and business staff respect that the other side displays effort and does a good job).

These are the three dimensions of the OperA framework, which, as Figure 1 shows, is predicated on the premise that cross-domain communication drives cross-departmental knowledge flows, which foster trust and respect. In turn, these three dimensions of the framework can improve communication and knowledge creation by transforming frequency of communication into quality of communication. Together, the mechanisms used in each of the alignment dimensions result in improved operational alignment.

Each dimension of the framework must be managed carefully to establish high-performance routines that span both the business and IT domains and become part of daily business life. Managerial actions should, therefore, be crafted to address these dimensions explicitly. Furthermore, alignment must be developed in a stepwise manner, taking account of what has already been achieved in each dimension. The strategic situation of the particular firm determines which dimension to focus attention on first, and each strategic situation demands a distinct path to alignment.

As Figure 1 shows, the OperA framework creates a virtuous cycle of alignment with the connecting arrows indicating sequential relations between the three alignment dimensions. These three dimensions enable an organization to organize and guide managerial actions aimed at improving operational business-IT alignment. A major challenge is that for each of the three alignment dimensions there are various possible mechanisms that need thorough orchestration to be effective, and many steps require certain achievements in other alignment dimensions before they can work. Typically, a coordinated set of mechanisms will be required to reach a higher level in one dimension before proceeding to the subsequent dimension. (The alignment mechanisms for each dimension are listed below, as each alignment path is described.)

Figure 1. OperA Framework: The Virtuous Cycle of Alignment

7 Communication and shared knowledge: Reich, B. H. and Benbasat, I. “Factors that Influence the Social Dimension of Alignment Between Business and Information Technology Objectives,” MIS Quarterly (24:1), 2000, pp. 81-113;
Communication Dimension

In the communication dimension, top management must assess the status of communication links and, if necessary, establish and foster linkages between the business and IT domains. The goal is to create formal and informal interactions between IT and business staff and thus establish regular patterns of interaction to facilitate knowledge transfer and exchange. These communication channels are important in information systems development projects and, more generally, for information transmission, absorptive capacity and “for knowledge transfer to arrive at a common perspective for problem solving.” A common suggestion is to establish regular cross-departmental meetings to enable knowledge transfer.

The communication dimension involves two aspects. First, it is necessary to establish channels, such as meetings, along which information and knowledge can be exchanged. Second, the channels have to be used if knowledge transfer is to have an effect. While establishing regular cross-departmental meetings may facilitate communication—as may organizational rearrangements (e.g., co-locating IT and business staff)—placing people with no previous relationship in the same room does not guarantee interaction and knowledge transfer. Management therefore needs to explain the goals of the action, emphasize its importance and provide appropriate organizational support.

At AIS, co-location to foster communication worked only when other measures were applied, such as co-locating the bosses of business and IT department staff together with the employees. Doing this signaled the importance of co-location and explained why the action was deemed necessary.

Knowledge Dimension

In the knowledge dimension, IT and business staff need to see beyond their own limited spheres. Shared domain knowledge is an important alignment driver: if IT staff understand the business processes and the firm’s market, the IT department can more likely develop solutions that fit business needs and that fully exploit the IT potential from a relevant market perspective. Also, IT staff with business knowledge and partnering skills are recognized as an important part of the entire IT resource. Enhanced shared domain knowledge will foster trust and mutual respect among IT and business people and will enable the joint development of IT solutions.

The communication alignment dimension provides the channels for knowledge transfer to create shared domain knowledge. This shared domain knowledge is created as one department adds knowledge about another department to its own knowledge base or jointly creates new knowledge through combining and building on the knowledge of other departments. Higher levels of shared domain knowledge enable one department to use the language and narratives of another department, thus increasing acceptance and respect. This, in turn, makes it more likely that relationships between IT and business departments will be built because of a greater openness toward doing so. Hence, cross-departmental knowledge spillovers eventually contribute to trust and mutual understanding.

Yet, what makes the difference is not the “know-how” (e.g., how operational issues are tackled) or “know-what” (e.g., which operational issues are to be tackled by the business), but predominantly the “know-why” (e.g., why are specific issues important to the business).

AIS initiated a joint IT and business value-stream mapping project. The goal was not only to create the foundation for later planned change measures, but also to establish a common “playground” for IT and non-IT staff and create a necessity for them to interact. During mapping project meetings, each process step was scrutinized: Why is it needed at all? What is its purpose? Why should it be carried out in a specific manner (and only in this manner) by the respective departments? Through this mechanism, AIS achieved a substantial “know-why” transfer.

Shared knowledge for interdepartmental coordination and the development of joint solutions is important, and top management must foster its development. One managerial mechanism for moving knowledge from one department to another is to move people with that knowledge. IT personnel who previously worked in a business department, or those previously engaged in a trainee program, often are key to achieving

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operational business-IT alignment. Other mechanisms include assigning key users to IT tasks, liaison units and cross-domain training.

At AIS, appointing an IT manager with business knowledge to replace an IT manager with only IT knowledge helped considerably in promoting business knowledge within the IT department and increasing the overall willingness to exchange and accept knowledge between the two domains. An earlier attempt that just assigned liaison roles had failed when the wrong (incapable) people were selected, or people were selected who were overburdened with regular work and thus could not sufficiently commit to the liaison role. As with the communication dimension, it is critical that management stresses the goals and importance of mechanisms aimed at establishing cross-departmental knowledge, and also provides organizational support and resources, if needed.

**Trust Dimension**

In the trust dimension, top management should take steps to establish and foster mutual respect among departments and thus enhance the willingness to transfer and accept knowledge from other domains. Communication channels and trusted relationships are drivers of business-IT links and knowledge integration, which, in turn, influence the capability to develop information systems successfully. Trust is based on communication and shared domain knowledge and, in turn, influences the status of communication links and shared knowledge (as indicated by the dotted arrow in Figure 1). Where there is trust and mutual respect, both the frequency and quality of communication is enhanced.

Research shows that structural links, implemented with measures described above in the communication dimension, can lead to “mutual trust born out of shared experiences.”12 While cross-departmental knowledge spillovers eventually contribute to trust and mutual understanding, mutual trust and respect for the skills and efforts of colleagues have been found to positively affect the development of shared knowledge and the formation of informal connections.

At AIS, individual departments initially had discretion on designing control objectives, how they were measured and reporting on what was achieved. This resulted in benchmarks and measures that were not only irrelevant to the other departments, but were also doubted by others. As a consequence, AIS introduced a formal procedure for common discussion on which metrics to use, their purpose and definition, and the form, schedule and recipients of status reports. Increasing transparency and being clear about reporting led to more and more of the results that had been promised by the respective departments being achieved. This, in turn, increased the perception that statements from other departments were reliable and useful, and that other departments actually achieved good results as well. Overall, trust levels increased.

**THREE PATHS TO OPERATIONAL BUSINESS-IT ALIGNMENT**

The OperA framework comprises three dimensions of operational alignment and how they interact. The particular strategic situation of a firm determines the relative importance of each dimension. We now describe the three typical alignment paths, each of which suggests the dimension to focus on first and use as an “anchor point” to increase or ensure a certain level of alignment.

These three alignment paths correspond with three basic strategic scenarios.13 Changes within an organization can be minor or major, and the change is either planned (as in a reengineering project) or unplanned (as in a crisis due to unpredictable events). One scenario covers major planned changes. The second, which gives rise to the steady state alignment path, covers all minor changes whether planned or unplanned, as both have to be tackled in daily business. The third scenario covers major unplanned changes. While assuring continuous knowledge flows is the overarching management issue, the three corresponding alignment paths differ in which particular alignment dimension needs the strongest focus and can serve as the anchor for management measures.

**Major Planned Change Alignment Path**

A firm following the major planned change alignment path deliberately sets out to achieve radical change that fundamentally rearranges the organization and results in new sets of processes to improve performance dramatically (e.g., reengineering). The planned change path focuses on communication links as the anchor dimension because the potential reach

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of decisions and the need to establish new working relationships requires bringing together previously unconnected people (see Figure 2).

With the planned change alignment path, top management should promote communication links to provide the “infrastructure” for knowledge exchange that can lead to, for example, a viable reengineering project and results. It is also important that management distinguishes between change that is accepted and understood by the majority of employees and opinion leaders, and change that is not accepted or is questioned by the majority of employees and opinion leaders. The latter typically occurs when employees’ perspective on the firm’s success differs from that of top management. For instance, employees who are convinced that the firm “has always been the best” may not see the urgent need for change, because from their perspective no competitive threat is possible. Similarly, as revenues decrease some
employees may not see the need for change because they perceive the firm as already having “the best product, and it shouldn’t change.” What matters in this situation is not what management defines as success, but how the firm’s success is perceived by employees.

If the need for change is generally accepted, management should use the mechanisms outlined in Figure 3. If planned change efforts are not as successful as desired or even fail, firms should deliberately prepare for unplanned change and resort to implementing specific mechanisms for the unplanned change path (as described later).

Panel 2 above describes AIS’s experience of following the planned alignment change path.

The common pitfalls we found on the planned change alignment path are low levels of involvement of middle management and employees, and also low acceptance of the mechanisms employed. Lack of staff enthusiasm is often a consequence of inadequate top management involvement and presence, while resentment of newly implemented mechanisms often originates from insufficient explanations of why the measures are necessary.

**Steady State Alignment Path**

During regular operations, largely stable processes with known interaction patterns lead to predictable outcomes. Learning happens primarily through the accumulation of experience, resulting in incremental increases in efficiency. At the same time, incremental changes foster learning. Thus, the focus of the steady state alignment path is on accumulating knowledge. A firm following this path hence deals with (planned and unplanned) minor changes. Typical examples of planned minor changes are Kaizen and continuous improvement processes. Unplanned minor changes emerge and can be addressed by, for example, corrective action boards.

With the steady state path, communication links between business and IT are usually at low (but possibly acceptable) levels, and overall relationships are professional but rarely characterized by high levels of cross-domain trust and respect. A key challenge is to maintain stable operations and identify potential for improvement. The role of the IT department is to provide efficient and reliable services, adapt to incremental changes and find better ways to serve business needs. Achieving this requires substantial cross-domain knowledge, which, in turn, requires a certain amount of cross-departmental interaction. The steady state path, therefore, focuses on knowledge as the anchor dimension (see Figure 4).

Management must address any gaps in the communication channels, as these are prerequisites to knowledge-enhancing mechanisms, and then implement knowledge-enhancing mechanisms for the steady state path (see Figure 5).

Panel 3 describes AIS’s experience of following the steady state alignment path.

Managers should be aware of possible pitfalls when following the steady state alignment path. One is a lack of willingness to exchange and accept cross-domain knowledge when there are no resource commitments or if the need to share knowledge is insufficiently explained. Another is resistance to mechanisms when they are led or driven by individuals others might consider inadequate or lacking integrity. Explaining why cross-domain knowledge is desirable and choosing the right individuals is thus crucial.

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<table>
<thead>
<tr>
<th>Figure 3. Mechanisms for the Major Planned Change Alignment Path</th>
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<tr>
<td><strong>Anchor Dimension: Communication</strong></td>
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<td>• Establish regular meetings to improve communication across organizational units and between management and employees</td>
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<tr>
<td>• Relocate staff to improve communication and mutual trust</td>
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<tr>
<td>• Monitor acceptance of change among employees and, if necessary, readjust employees’ perception of the firm’s current and future success through frequent communication and explanation (create a sense of urgency)</td>
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14 Japanese term for a gradual approach to ever higher standards in quality enhancement and waste reduction, through small but continual improvements involving everyone from the chief executive to the lowest level workers.
Panel 3. Following the Steady State Path at AIS

At AIS, management focused on mechanisms to increase the levels of shared knowledge and foster knowledge creation to make operations more efficient. This was done by establishing a key user organization to support regular operations. This was not a formal organizational unit like engineering, but a virtual organization of people from different departments who were selected according to three criteria:

1. They had to be knowledgeable about their departments’ work procedures and possess sufficient practical experience
2. They had to be respected people in their respective departments
3. They had to be IT literate or at least have an affinity with IT and be open to discussion.

The virtual organization followed a meeting agenda for internal discussions and selected a spokesperson who reported to the CEO. The organization was designed to make knowledge transfer easier between business departments and the IT department and overcome barriers to adoption of the new ERP system, thus increasing appropriate use of and continuously developing the system.

While the literature highlights the importance of reciprocal knowledge exchange, the new CEO at AIS also established a dedicated project that involved cross-functional teams working on common process mapping aimed at increasing shared knowledge. This common work to analyze and model processes, which was a perquisite to beginning a systematic cross-functional continuous improvement program, turned out to be the single most-effective alignment tool. The resulting value-stream map also served subsequently as a source for controlling change activities (e.g., identifying reduced process time), as a basis for training and as an intertwined business-IT document that superseded earlier, separate IT and business documents.
Panel 3. Following the Steady State Path at AIS (cont.)

The success of this measure was greatly supported by the cross-business domain knowledge of an IT consultant who has been working for the company in different departments for years, as well as that of a manager of the job preparation department (responsible for industrial engineering and production planning). These two people were able to draw connections between different work areas and act as brokers between employees from different departments. The increase in communication and resulting improvements in shared knowledge could be used to find solutions to problems arising from badly managed interdependencies between units and subprocesses that were not solvable within an individual unit.

Figure 6. Trust Anchor for Major Unplanned Change

![Figure 6](image)

Figure 7. Mechanisms for the Unplanned Change Alignment Path

**Anchor Dimension: Trust**

- Arrange skip-level meetings (i.e., meetings between managers and team members across multiple levels of hierarchy) to intensify direct contact between top management and employees and open communication about status and prospects
- Ensure strict reporting on IT and business results
- Build relationships with trusted third parties
- Carry out a common project (like process documentation)

Major Unplanned Change Alignment Path

The unplanned change path begins with an event that poses an immediate threat to performance and often leads to previously unplanned and radical organizational changes (e.g., organizational crisis). As shown in Figure 6, the anchor dimension of the unplanned change path is trust, as an unplanned major change event produces unpredictable outcomes and often poses threats to performance that disrupt confidence that a process will result in reliable outcomes. Furthermore, organization members react to unplanned changes unpredictably, which decreases trust levels. This frequently leads to resistance to management actions by those affected.

Management in the unplanned change path should hence first make sure that communication channels and basic levels of shared knowledge (which are prerequisites to trust mechanisms) are sufficient and then implement the mechanisms shown in Figure 7 to install trust.

The panel below describes AIS’s experience in following the major unplanned change alignment path.

The common pitfalls to watch out for on the major unplanned change alignment path center on trust relations. First, if basic trust levels between top management and employees are too low, countermeasures to (re-)build trust, such as reliable statements and consistent actions or the involvement of trusted third parties, can help. Second, inadequate reporting structures can curb the effectiveness of the
mechanisms employed and hence hinder objective discussions. Finally, care must be exercised in choosing third parties, like consultants, to ensure that employees accept them and do not harbor suspicions about their motives. The fourth pitfall is involving the wrong people in change activities. Project managers, in particular, need to be assigned not simply because they are available, but because they are knowledgeable and motivated. The fifth common pitfall is overstraining the organization by, for example, forcing too many initiatives at once.

Summary of Key Guidelines for the Three Alignment Paths

The planned change path, characterized by planned major changes, is anchored by Communication links because planned changes typically involve new organizational configurations and even the interruption of well-known relationships. Following this path means fostering communication links among key stakeholders to provide channels for knowledge transfer. Management needs to explain why change is necessary at all levels of the organization, provide sufficient personnel resources and be actively involved in planned change activities.

For the steady state path, where business as usual is prevalent, the anchor dimension is Knowledge. Following this path requires established communication links sufficient to keep the business running, including handling of minor changes. Management then needs to stabilize or increase shared knowledge to encourage permanent improvements for ensuring efficient and reliable outcomes.
The unplanned change path relies on Trust as the anchor dimension. An unplanned major change engenders uncertainty because it upsets the status quo, so following this path requires management to enforce reliability of outcomes of specific measures through strict reporting requirements, increase transparency of organizational actions by explicitly documenting which actions are carried out, why, when and by whom, and to communicate reliably and openly.

LESSONS LEARNED

Our extensive study of operational business-IT alignment efforts at AIS carried out over almost two years identified some important lessons for other organizations seeking to achieve such alignment.

1. Aligning IT and Business is a Continuous Process

Senior management needs to accept that achieving operational alignment is not a “fire and forget” project, but an ongoing responsibility that needs constant re-evaluation. The OperA framework portrays this process as an evolutionary path that traverses the three alignment dimensions:

- First, executives need to perform a situation analysis to assess the current state of alignment and determine the anchor dimension
- Second, if there is need for adaptation, they need to implement mechanisms in the anchor dimension, possibly accompanied by mechanisms in neighboring dimensions, and then bring the state of the firm regarding its strategic situation (such as regular operation) and the alignment mechanisms in line again
- Then they need to start again. The new CIO at AIS summarized this virtuous circle of alignment as “Impulse for change is not the problem, but to sustain change.”

2. Managers Need to Deploy a Portfolio of Mechanisms

IT executives and managers must recognize that there is not a silver alignment bullet; there is no single viable mechanism to achieve sustainable alignment. Top management at AIS learned that many of the mechanisms deployed needed to be followed by corrective actions and that any implementation plan needed to be continuously adapted to changing realities. A particularly impressive lesson at AIS was that surviving a substantial crisis became possible only when trust levels between different departments had risen to a certain level. As indicated by the OperA framework, alignment mechanisms to steer through the crisis took hold just when the IT and business departments had developed improved mutual respect and trust. At that point, communication began to improve and overall creativity and output increased significantly.

3. Management Must Be Transparent About Alignment Goals and Mechanisms

A common obstacle when striving to improve business-IT alignment is resistance to change and to the alignment mechanisms employed. While the need for “horizontal” trust—i.e., between IT and business staff—is important, a precondition for the success of many mechanisms is “vertical” trust—i.e., staff trusting the top management team. Several unsuccessful alignment attempts at AIS could partly be traced back to employees mistrusting top management decisions, perceiving them as useless efforts or even as having detrimental consequences. But once the reasons for the decisions and the intended outcomes were clearly and credibly communicated, change that had been considered improbable suddenly happened. At AIS, transparency and credibility were increased by close monitoring of the discourse to replace rumors with facts and dedicated resource allocation. One IT employee described his new trust in the CEO: “The new CEO allows being productive for the company.”

4. Select Personnel for Key Roles on Qualifications, Not Availability

When management at AIS first established liaison roles to create communication channels between the IT and business departments, liaison managers were primarily appointed because they were available, not because of their capability and willingness. And when capable and willing people were appointed they were burdened by daily operational work within their departments. Success came only when the new CEO mandated a policy of selecting people who were willing and capable of taking on the liaison job, and of liaison work taking priority over operational work.

5. Top Management Involvement is Required, Not Just Support

We found that the most impressive signal on the importance of business-IT alignment was active involvement of the top management team. AIS’s CEO
being on time for alignment meetings, reading reports and asking questions sent decisive signals that turned out to be a precursor of better acceptance of alignment mechanisms.

CONCLUDING COMMENTS

The OperA framework provides a perspective on how to systematically increase operational business-IT alignment in firms, and suggests that existing approaches to establishing alignment need to be rethought. Operational alignment is about the linking of IT and business processes, not so much on a technical level, but rather on a social level. In addition to the obvious consequences, such as better exploitation of IT potential for business processes, good operational alignment enables cooperation and agile actions even in times of unplanned change. There is a lot one unit can do on its own, but, paraphrasing the words of the well-known idiom, “IT takes two to tango.”

APPENDIX: RESEARCH CONDUCTED

This article is based on our findings from an 18-month study of changes at AIS. We captured information through monthly structured questionnaires in the IT, engineering and job preparation (combination of industrial engineering and production planning) departments and by interviewing senior managers, their deputies and up to six specialists in each department. The main purpose of the structured questionnaires was to obtain: (1) ratings for the different dimensions of alignment, (2) subjective measures of performance, (3) perceived quality of management actions, (4) perceived quality of management-employee relationships and (5) change readiness. The firm made meeting protocols and performance data (e.g., cycle time, quality issues, on-time delivery performance) available to us so we could obtain qualitative and quantitative measures of performance, and quantity and quality of interaction for each month.

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