

Changing Foundations for Global Business Systems

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Abstract. Companies are actively seeking new competitive advantages by changing the location and ownership of their manufacturing processes. This process results in increasing fragmentation and dispersion of global business systems of companies. The purpose of this paper is to identify how companies may improve the integration of such business systems. The paper draws on a case study of a Danish industrial equipment firm. The paper describes and analyzes the company's operations network configurations, which lay at the foundations of the company's global business system. It is demonstrated how the operations configurations have been changing over time and affecting the overall business system. The paper identifies the key determinants and outcomes of this change. Moreover, it proposes how the design of operations configurations can be improved through the development of a distinct systemic approach to control and coordination.

Keywords: Business system, global operations capabilities, operations network configuration, case studies.

1 Introduction

The world is changing fast. To accommodate for this change, companies are under increasing pressure to develop new adequate structures for their operations systems. Facing intense competition, companies all over the world are seeking to achieve a higher degree of efficiency and effectiveness by constantly reconfiguring their value networks and subsequently relocating discrete value-added activities to most appropriate destinations. This process may be confined only to crossing geographic borders and occur on an 'intrafirm' basis (i.e. offshoring). However, increasingly, in many industries (e.g., textile, footwear, IT services) it has also been accompanied by vertical disintegration of activities (i.e. outsourcing to external suppliers) [1], [12].

It goes without saying that the idea of global dispersion of work is not new. The existing industrial networks scholarship (e.g. [9], [16]), provides a point of departure for understanding how global operations units are configured on a global basis and consist of diverse and interdependent affiliates (linked both through ownership and non-equity relationships), which are engaged in an exchange of goods, services and information. [7] points to the essential dynamism and organizational temporality

of such global operations agglomerates. With the spread of offshoring and fragmentation of operations, the networks temporality and frequent reconfiguration trends are likely to continue. We argue that the constant ‘process of becoming’ [17] in global operations networks poses a serious challenge for global business system management and the development of adequate systems tools and solutions. In order to avoid. Therefore, this paper investigates how changing operations configurations affect business systems of companies and how companies can establish fitness for continually evolving operations configurations.

The empirical part of the paper is based on a case study of a large Danish industrial equipment company. The offshoring process has affected most parts of its value chain activities and is no longer confined to simple or non-core activities. This process has pushed the company into the development of more elaborate operations strategy structures and infrastructures. The case testifies how Danish companies have advanced far in relocating and reconfiguring most parts of their value chain. However, this has been achieved at great initial cost of intense coordination efforts. Drawing on the experiences of the case study, the key argument of this paper is that companies need to understand the logic, factors and determinants of their global business systems and how they change over time. Such an understanding will enhance companies’ ability to build and continuously upgrade organizational capabilities, support systems and knowledge supporting the integration between the lead firm and the increasingly dispersed operations network

The following section introduces the theoretical background of the study. We then proceed with the methods and the case study used in the paper. Next, the analysis and discussion are presented, before we conclude with key lessons and implications for future research.

2 Theoretical Background

2.1 Business Systems

The global business system is a rather vague concept, which has been applied at multiple levels of analysis. At one end, there is the economic concept of the national business system [20] dealing with the national institutions and conditions for conducting various business processes. At the company level, the business system has been used to describe the organisation, mode and scope of operations [15]. And at the operational level, the business system is often discussed as the specific tools supporting and or governing operations and operations development [6]. One key dimension of the latter perspective on business system is that the business system imposes its own logic on the company and the company often fails to reconcile the technical standards embedded in the system with its specific business needs [6].

In this paper, the business system is discussed as a combination of these perspectives, drawing on the idea that the business system builds on a set of structural and infrastructural means which enable the company to create, deliver and appropriate value. This does not alone include internal resources and capabilities, but also the

company's ability to get access to external resources and capabilities. The paper will be working from the thesis that it is from the understanding of all the above conditions for business that we should draw our knowledge about how to configure the business system appropriately.

2.2 Organizing Principles of Global Business Systems

The business system approach [20] focuses on the effect of factors in the institutional environment on organizations. The basic dimensions of coping with these effects are: 1) coordination, i.e. the mode and extent of organisational integration through common routines, systems and management standards; and 2) control, i.e. the way the activities and resources are controlled within the organization. These two dimensions are also important for determining the degree of centralisation and decentralisation. Prior research (e.g. [14]) differentiates between three major types of organisational structures: centralized, decentralized and hybrid. Centralized structures are characterized by tight coordination and control mechanisms where decision-making authority concentrated at the top of an organisation. In decentralized structures, on the other hand, decision-making authority is pushed down to the business units level making such a structure particularly suitable for organisations with markedly different or even unique business units. In practice, however, most companies have adopted a hybrid approach that combines attributes of both centralized and decentralized form with the intention to overcome centralization-decentralization tradeoffs.

In the strategic management literature, the dimensions of control and coordination are used in defining four basic business configurations with distinctive governance forms: the multinational, the global, the international, and the transnational [4]. The transnational mode helps companies to achieve simultaneously global efficiency of the global mode, national responsiveness of the multinational mode and the ability to exploit knowledge emphasised in the international mode [4]. The transnational mode recognises the importance of decentralisation and responsiveness to cultural differences and, thus, retains national in its name. On the other hand, the transnational mentality also emphasises linking and coordinating between globally dispersed operations, as indicated by the prefix "trans". These four configurations in turn has formed the outset for addressing ERP architectures [5] dealing with the basic dilemma of balancing local responsiveness and global efficiency of the system.

Among other theories providing insights into the foundations for organizing global business systems is the resource-based view (RBV). The view adds an important dimension to this discussion. The fundamental principle of RBV is that the basis for a competitive advantage of a firm lies primarily in the application of the bundle of valuable resources at the firm's disposal [3]. These advantages are dependent on organisational trajectories, which build intrinsic organisational capabilities. The transformation of a short-run competitive advantage into a sustained competitive advantage requires that these resources are heterogeneous in nature and not perfectly transferable; in other words, they develop proprietary properties and are embedded in a specific set of context variables. Within the multinational company these resources are highly dispersed as local entities specialise. According to the RBV, the activities

that enable an organisation to outperform competition should be nurtured and defended. However, the multinational company may have incentives to inject more discipline and centralized control into their dispersed operations if the costs of responsiveness significantly outweigh its benefits.

2.3 Offshoring Trends and Challenges of Continuous Reconfiguration

With the growth of offshoring, the move of competitive resources from intra-organisational base to the inter-organisational network settings is also gaining pace. In other words, the resource bases are getting stretched across locations or even organisations. The practice shows that some more mature and experienced companies are better than others equipped for dynamic, fragmented and to a large degree external set-ups of their operations. However, even these more mature companies cannot avoid challenges and costs of dealing with such complexity. Within a loosely coupled global inter-organisational network, the situation is exacerbated even further in cases of non-standard products, products with integral product architectures, and products whose output is time-sensitive [2].

However, these challenges and costs differ depending on robustness and transferability [10] of the tasks in question. An operations process is robust if its sensitivity to external factors (e.g. managerial practices, infrastructure, and government requirements) is low. Transferability here refers to how easy the process can be captured, decontextualised, transmitted and assimilated. High robustness and high transferability may be highly desired for implementing the offshoring decision. However, referring back to the arguments of the RBV, high robustness and high transferability of all processes may reduce the uniqueness of business and undermine the sustainability of competitive advantages, which in turn may push the company to choose a more integrated organizational mode.

It can be argued that few manufacturing processes possess a sufficient robustness and transferability levels to allow for perfect mobility or a standardised organizational infrastructure, which is also supported by [5] in their discussion of global ERP configuration. This raises the question of configuring business systems solutions to key contingencies. Addressing this effectively means that not only the hardware of the support system has to be changed; the process also involves building organizational capability for global operations through systems, processes, product adaptations and preparing the organization mentally. However, how this can be achieved remains a key unresolved question and therefore this paper explores the following research question: *how can companies effectively coordinate and control globally dispersed tasks which are embedded in differentiated and constantly changing organizational contexts.*

3 Methodology and Data

The primary data set for this study is derived from a case of Danish industrial equipment firm. The case was followed intensely by the authors in 2009-2011. We have interviewed COO and supply chain managers about the process, means, and strategies supporting their international operations.

The case study strategy, one of several strategies of qualitative enquiry, has been chosen for this investigation for several reasons. First, case studies can describe, enlighten and explain real-life phenomena that are too complex for other approaches requiring tightly structured designs or pre-specified data sets [18], [19]. Second, the case study strategy is well-equipped instrumentally for furthering understanding of particular issues or concepts which have not been deeply investigated so far ([8], [19]). Third, the choice of the case study strategy is based on the fit between case research and operations management (OM) [18], which is acknowledged but underexplored in the literature.

Despite having many advantages, case study research also has several pitfalls and poses significant challenges (e.g. [13]). First, there is the problem of the observer's perceptual and cognitive limitation. Second, a high probability of overlooking some key events also constitutes a threat to the quality of case studies research. Third, case studies are exposed to the challenge of generalizability. Fourth, the accuracy of some inferences can be undermined by the reliance on intuition and subjective interpretation of an investigator. To address these challenges, we followed practical guidelines and steps discussed in qualitative methodology literature (e.g. [18], [19]). The current research relied on extensive use of triangulation. Multiple sources of evidence (semi-structured interviews, documents and on-site observations) as well as triangulation of multiple data-points within each source of evidence (e.g. multiple respondents at the top and middle management levels) were used. These data combined with secondary material (annual reports, media material, presentation material to customers and stakeholders) were used to build the database for the case.

3.1 Case Study: Distributed Operations at a Danish Industrial Equipment Firm

The case company is a Danish equipment manufacturer holding a market leader position. With production in twelve countries and a global sales presence, it was working from a strong international base. The company had been acquiring approximately one production company every year since 2000 and with these new subsidiaries, it also inherited a number of business systems, processes and product configurations. By 2011, it had incorporated more than 80 companies, spanning all time zones, 90 languages and more than 100 product families. These developments were signaling a change of mindset from an early ideology of original in-house development, tight control and green-field investments.

Some of the newly acquired firms still controlled their own business agenda, while others were fully integrated under a corporate business system. The pace of acquisition had quickened recently in par with the restructuring of their main product's market characterized by increased concentration, and firms moving from component to system suppliers, adding more competencies. When referring to the business approach one of the company's executives defined it as 'centrally driven global approach with a local presence'. Such an approach inevitably resulted in a highly complex business system characterized by:

- Sales and operations location diversity: Some products were produced in one factory and sold world-wide, other products were produced in the region where they are sold,
- Components supply base diversity: Many components for local assembly were produced in one or a few factories; some components were also shared across product families
- Multiple product/solution configurations: Sales responding to local needs and standards resulting in many potential product/solutions configurations
- Multiple approaches to operations: Network consisted of all operations approaches from make-to-stock to engineered-to-order
- Diverse and dynamic operations network: The global operations network was emerging with addition of new facilities many of which had their own operation conditions

The Danish HQ had the strategic vision of establishing tighter control of foreign subsidiaries with regards to global capacity footprint, R&D and process ownership. However, each business unit had its own budget and certain latitude to select projects, allocate resources and responsibilities. Consequently, coordination efforts were organized in a corporate management function with a key focus on embedding a corporate culture, developing group standards and policies. But the entrepreneurial spirit of the individual subsidiaries remained and was seen as a key driver of development and all KPIs remained related to local operations performance, resulting in what could be termed a loosely coupled global supply chain.

The company was structured around a fundamental process perspective where the interaction between Production, Product Development and the Technology Center played a special role. With Technology Centers being responsible for technology development and establishment of production lines, a certain degree of coordination was necessary to serve their two customers, namely Production and Product Development. Although the main Production hub was still based in Denmark, parts of Production had already been widely offshored and a broad autonomy has been granted to regional hubs. With Product Development also moving out of Denmark, it made sense that Technology Centers followed its internal customers in their global expansion. Consequently, local hubs were opened in Hungary and China and a new hub was planned in Mexico/USA. Although there was a shared agenda at a higher level in relation to operations in different market segments, cooperation between foreign units was largely limited to brief collaboration on assignments and sharing of patents.

The economic downturn hit the company with a delay in 2009. The management group had just reported that the company seemed to be largely unaffected by the global crisis, when a drastic drop in turnover happened. Afterwards, it was unveiled that due to the largely decentralized reporting structure it took more than 6 months to stop component production, from the time it stopped to invoice the external customers. This experience taught the company a valuable lesson, namely that the loosely coupled operations network could not react swiftly to major changes on the

market. To respond to this challenge, a strategic decision was made initiating global integration of Demand and Supply.

For implementing this decision, the company introduced a number of new technologies and processes, which challenged the decentralized approach to the global network of facilities fulfilling demand and consolidating demand planning. An overlaying federal structure was introduced to the global network consisting of a number of business system tools:

- A new process for Integrated Demand and Supply Planning
- New roles and changed responsibilities across the supply chain
- New SAP modules to support the process and decision-making
- A product segmentation according to level of demand predictability and supply chain impact

For further coordination of strategic roles and responsibilities in the global business system these measures were introduced:

- Supply Chain focus and KPIs
- ONE PLAN – transparent and visible to all
- Global decision-making with local execution

The R&D function was also in need of better coordination. The company had over 1000 R&D staff globally, indicating that even highly complex tasks are increasingly dispersed. In the coming 5 - 7 years, this dispersion of activities was expected to grow further. To illustrate, the Asian hub was planned to have the same number of engineers as Denmark. This rapid growth could also be illustrated by the more than doubling of staff in China in just a year, to more than 100 engineers. Though R&D man power in China was growing fast, they had not launched any product range on their own yet, solely supporting central development activities. It was seen, however, that future responsibilities of developing products would be decentralized to a larger extent. One key driver of this was that China had a special status as a ‘second home market’ with a Managing Director reporting directly to the global board. Meanwhile efforts were also taken to develop the US market as its potential had traditionally been unrealized to the full extent. To illustrate, although the company introduced some product ranges over 50 years ago, it could only claim less than 10% share in the market.

It is expected that over time, despite the introduction of measures outlined above, each regional “Network” (Technology Center/Production/R&D) will grow increasingly independent and specialized, replicating best practices, but developing own capabilities, compatible with local culture and markets. The global organization will be nurtured through a positive iterative process by gradually increasing the level of complexity of tasks overseas. The parallel activities at different hubs of the company will continue until outposts reach critical mass or until they matured enough to absorb key competencies from headquarters or other hubs of the network.

4 Discussion and Implications

4.1 Changing Operations Configurations

As a point of departure to discussing the case company and its fitness for global operations, there is a need to highlight how the operations configurations of the company have been changing over time and how the overall business system has been affected as a result of that. The long period of acquisitions and offshoring moves resulted in the creation of a complex loosely coupled network of differentiated partners and affiliates working with a variety of business systems, processes and product configurations. The belief that responsiveness to local conditions should be answered by the development of local solutions led to a number of different standards for operations and a lacking ability to compare and organize a coordinated effort across sites.

The situation is hardly can be seen as unique or just this case specific. All companies are bound to their historical legacy. The long string of strategic and operational decisions introduces a certain dependency to firms' development trajectory making it difficult, if not impossible, to design such a system from a clean slate. The case study in this paper also illustrates how the business system evolves over time and how any system development initiative need to take the changing operational realities of the fragmented system into account. This in turn means that developing solutions and capabilities related to managing the evolving global business system poses a serious challenge for multinational companies.

Factors influencing operations in the case are added incrementally as new facilities are established or acquisitions are made, new markets are opened, new technologies are added, and new suppliers seek integration. These incidences mean that the system is in constant motion and that mechanisms of coordination and control are constantly challenged by diverging standards. While the operations of sites and companies may have a clear agenda and set of stakeholders, the network of operations is not tended to; it is no-one's business. This means that the network may indeed share a common vision, but that its common focus is disintegrated by design, as each entity develops through a series of incremental moves and decisions.

In many companies, this evolution and caused by it increased complexity call for reengineering of the overall business system and its supporting tools. Like any other engineered system, the business system is designed to nurture certain capabilities, and the system is likely to be good at doing certain things, but does so at the expense of others. Ultimately, this property of the system leads to trade-offs, which have to be dealt with. The issue may, however, be solved by focusing on the possible complementarities of the system elements rather than their conflicting characteristics. We know from the field of operations management that certain complementary effects can be gained from capabilities, which are often seen as conflicting [11]. This approach has won widespread recognition as a key organizing principle for a modern business world and transnational mode of operations [4]. However, it is also recognized that governance based on these principles are difficult to operationalize in practice.

4.2 Developing Adequate Global Business System Solutions

With these conditions an increasing number of manufacturers, like the case company, are significantly reshaping their global operations configuration, including radical increases in commitments to offshore operations in scale and scope. Very often such a reconfiguration is done based on expected short term capacity and cost implications. Meanwhile, the equally important aspects of how to realise global operations and to sustain competitive positioning in the longer term get lower priority. As the example in the case shows, the company struggled to utilise global operations potential or was faced with unintended risks as it did shortly after the global economic downturn in 2009. Circumventing these negative effects requires a conscious build-up of organisational capabilities in support of global operations; which we refer to as the build-up of fitness for global operations.

When discussing the configuration of such a fragmented system configuration comprising both internal and outsourced operations, the overall system's performance should be emphasized. As systems theory suggests, any system is not just the sum of the individual parts. If an operations configuration and the relationships between units in it are not optimal, the company risks a negative synergy. The case clearly demonstrates this situation because increased performance in one factory in the network is not necessarily equal improved performance in the overall supply chain.

To tackle this, the company tried to find an optimum balance between centralization and decentralization. On the one hand, to compensate for slow response and the increased distance among their operations, the company worked on introducing a more formalized form of working. On the other hand, the company nurtured plans of upgrading its regional hubs and maintaining a high degree of responsiveness. In some instances, they compensated for the lack of direct control over the physical flow of goods by standardization and in some cases by letting go of the responsibility to suppliers. The standardization can also be observed in companies who in spite of their overall preference for direct ownership, still face the increasing distance between their HQ and subsidiaries or try to establish or utilize the economies of scale in their value chains. There is also evidence in the case to support the proposition that standardization increased the company's ability to change faster and maintain continuous improvements on a global scale.

We can conclude from this that the ownership ties that exist within the vertically integrated multinational company do not necessarily preclude the entire range of discretionary behaviors that are possible among interacting organizations that are geographically dispersed. Paradoxically, despite predominantly ownership-based relationships in the case, control was limited not only because some of the subsidiaries happen to be very physically distant and resource-rich, but also because they controlled critical linkages with key actors, such as suppliers and customers. Direct control originating from vertical integration was present in the case company, but it was limited due to its co-existence with local autonomy, inherited and diverse systems, and work cultures, which were also recognized as necessary for maintaining responsiveness to various local market demands.

In terms of explaining a particular offshoring trajectory in the case, the company specific task interdependency and the related ties between partners may be useful. For understanding why the case company experienced correlating offshoring trends across all major functions (i.e. Production, Product Development and Technology Centers), the particular relational density of a given set of activities is key. Relational density is made-up from the rate at which industries change in terms of products, processes and organizations and may be explained as the need for thickness of relational infrastructure.

It is evident that the case company has developed a high level of fitness for global operations as it advanced quite far with its global operations capability. However, the case also shows that, figuratively speaking, the company has been building the bridge while walking on it. Responding to upcoming challenges, it pushed standardization efforts, built up an integration mechanism and initiated relations building and resource pooling to build economies of scale and scope.

The case clearly demonstrated that continuous dynamics and change became inherent characteristics of the operations configurations. In this context, the old fashioned efficiency-alone-oriented global business system solutions become irrelevant. Therefore, the company faced the challenge of developing a solution which enabled it to achieve the optimum balance between local responsiveness and global efficiency. The efforts that the company instigated led to an increased systematisation of the business system and increased awareness of processes at its various levels, namely corporate management (challenging decentralisation approach e.g. through global Demand and Supply synchronization) and individual sites level (having enough autonomy for ensuring local responsiveness). The cases company carefully studied its opportunities for outsourcing parts of the operations network or otherwise extending the reach of its operations management beyond the organizational boundary as a means to focus on product development, assembly and distribution.

This systemic approach the company was developing emphasized not only short-term operational efficiency, but also increasingly longer-term strategic effectiveness.

Some of the key determinants of the system included:

- Overall system performance focus
- Limitations of direct ownership control and coordination
- Relational fitness (relational density)
 - Availability of a sourcing market driving cost opportunities and pooling of resources
 - Weak or strong ties between value chain actors
 - Types of cross-functional interdependence necessary to accomplish tasks
- Strategic reconciliation between Supply and Demand

The institutional support was also available for establishing global operations on a site-by-site basis within the organizational context as well as facilitated by the developments in the external context. However, the case also stresses how the global business system is affected beyond just the stage of establishing individual sites or contracting with an external service or manufacturing provider. It rather emerges and as an effect of this

emerging process, there seems to be a clear trajectory to the internationalization of the operations system, which over time gradually changes its center of gravity to offshore destinations and absorbs new roles and responsibilities in this process. Mature offshoring decisions are characterized by their move beyond the piecemeal type decisions. They rather initiate an organizational process, which accounts for systems effects and is not just about getting something produced in a specific location, but rather about orchestrating a network of interlinked activities, which raise multiple new demands on management capabilities and management systems.

5 Conclusion

The business system evolves over time rather than is designed from a clean slate. This in turn means that developing solutions and capabilities related to managing the evolving global business system poses a serious challenge for multinational companies. Factors influencing operations are added incrementally and mean that the system is in constant motion and that mechanisms of coordination and control are constantly challenged by diverging standards. While the operations of sites and companies have a clear agenda and set of stakeholders, the network of operations is not tended to; it is no-one's business.

The purpose of the paper has been to investigate how companies can effectively coordinate and control globally dispersed tasks which are embedded in differentiated and constantly changing organizational contexts thereby establishing fitness for global operations. The findings of the investigation show that the traditional manufacturers are significantly reshaping their global operations configurations, including radical increase in offshore production. On the basis of the existing literature and the case-based example, the study identifies key determinants of the system aimed at striking a balance between seemingly irreconcilable global efficiency and local responsiveness. Moreover, it proposes how the design of operations configurations can be improved through the development of a distinct systemic approach to control and coordination.

This paper adds to the existing literature by unfolding the aspects of organisational capability required for improving the integration of globally dispersed business system and successful development of global operations. The awareness of inherent organisational capabilities often only emerges in the situation where the company fails to establish a required level of quality, gain sufficient advantages from their global scope of operations or fail to reproduce proprietary practices at a new location. As this study demonstrated, due to the integration needs and the interdependencies between globally dispersed tasks, this challenge is persistent and reveals itself even in more experienced companies.

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