



Paper to be presented at the DRUID 2012

on

June 19 to June 21

at

CBS, Copenhagen, Denmark,

Back to the Future: A short History of Interorganizational Project Practices in Dutch Shipbuilding

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Abstract

The Dutch shipbuilding industry has a longstanding tradition in project-based production. Recently, industry actors have

acknowledged a serious misalignment between interorganizational project practices and interorganizational project demands. However, the roots of this misalignment remain unclear. Among project researchers there is a growing awareness that historical project traditions have a major influence on contemporary practices in interorganizational projects, suggesting that causes of misalignment may be rooted in the past. The goal of this paper is to study historical developments of interorganizational project practices in Dutch shipbuilding projects, in order to understand how contemporary, suboptimal project practices are rooted in the past and consequently are the result of path dependencies and lock-ins. We answer the following research question: How did interorganizational project practices and demands in the Dutch shipbuilding industry develop between 1950 and 2010 and to what extent do these developments help us understand the current misalignment between project practices and demands? Our results provide insight into the broader picture of project management history and elaborate on the notions of imprinting and fit from a historical perspective.

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Abstract

The Dutch shipbuilding industry has a longstanding tradition in project-based production. Recently, industry actors have acknowledged a serious misalignment between interorganizational project practices and interorganizational project demands. However, the roots of this misalignment remain unclear. Among project researchers there is a growing awareness that historical project traditions have a major influence on contemporary practices in interorganizational projects, suggesting that causes of misalignment may be rooted in the past. The goal of this paper is to study historical developments of interorganizational project practices in Dutch shipbuilding projects, in order to understand how contemporary, suboptimal project practices are rooted in the past and consequently are the result of path dependencies and lock-ins. We answer the following research question: How did interorganizational project practices and demands in the Dutch shipbuilding industry develop between 1950 and 2010 and to what extent do these developments help us understand the current misalignment between project practices and demands? Our results provide insight into the broader picture of project management history and elaborate on the notions of imprinting and fit from a historical perspective.

Keywords: Project history, Interorganizational project practices, contingency theory, path dependency

Introduction

Interorganizational temporary projects are an increasingly prevalent phenomenon in social and economic life (Bakker et al., 2011). They exist across different industries ranging from shipbuilding (Ahola, Laitinen, Kujala, & Wikström, 2008) to film making (Bechky, 2006) and theatre production (Goodman & Goodman, 1976). We define interorganizational temporary projects (further referred to as 'IO projects') as "goal-directed temporary systems of legally autonomous but functionally interdependent firms that coordinate their efforts for the accomplishment of a service or product in a limited amount of time" (Sydow & Staber, 2002, p. 216). They bring together a diversity of legally independent but functionally interdependent organizations for the accomplishment of often complex products and services (Jones & Lichtenstein, 2008). The involvement of multiple independent organizations sets the IO project as an arena in which multiple cultures from different organizations and professions draw closer together (Ajmal & Koskinen, 2008; McCarthy, 1998; Rooke, Seymour & Fellows, 2004). It also increases the complexity of coordinating, monitoring, and safeguarding interorganizational and interpersonal exchanges (Doz & Hamel, 1998; Glückler & Armbrüster, 2003; Park & Russo, 1996).

In the specific context of Dutch shipbuilding projects, shipyard, subcontractors, and suppliers come together to produce complex vessels. Industry actors acknowledge that contemporary IO project practices in Dutch shipbuilding projects are sub-optimal, predominantly characterized by low trust levels among organizations and rigid application of contracts and other formal arrangements. Broadly, project practices can be defined as behaviors related to "convening, designing, managing, participating in or facilitating collaboration" (Huxham, 2003). We contend that a project practice has two components (cf. Kostova & Roth, 2002): the development of patterned behaviors on how to collaborate on the production of a vessel and the development of symbolic properties attached to these behaviors. The latter implies that there is some degree of consensus among project members regarding the value of a practice. On a general level, we make a distinction between formally and informally patterned behaviors (cf. Poppo & Zenger, 2002). Using formal contracts to monitor and safeguard exchanges can be considered as an example of a formal IO project practice (Williamson, 1991). Reliance on relational norms, for example on trust, can be seen as an example of an informal IO project practice (Uzzi, 1997). We compare project practices with project demands, defined as environmental conditions (cf. Wiersema & Bantel, 1993) which render certain collaboration practices more or less effective. It is suggested by industry actors that contemporary project practices and contemporary project demands do not fit well together. Huxham (2003) underlines that outcomes of collaborative initiatives often are disappointing and accompanied by slow and painful processes, a phenomenon she terms 'collaboration inertia'. To deal with the perceived misalignment, the industry recently launched a large-scale program to improve the quality and intensity of collaboration between shipyards and subcontractors. However, the roots and causes of the misalignment between project practices and demands remain unclear. These may be found in the

history of project-based organizing in the Dutch shipbuilding industry (e.g., Engwall, 2003). However, the majority of research on collaboration in IO projects does not take into account the historical roots of current IO project practices. In other words, it does not put observed temporary practices in a historical perspective, failing to take into account that project practices are reproduced or restructured from one temporary project to another (Windeler & Sydow, 2001). If the historical dimension is left out of consideration, the implicit assumption is that IO project practices are only influenced by the current set of conditions. This type of analysis neglects organizational inertia and path dependency (Sydow, Schreyögg, & Koch, 2009). A historical perspective, as propagated in the 'historic turn' in organization studies (Clark & Rowlinson, 2004), enables researchers to capture how project practices are over time influenced by changing forces in the environment, which is considered essential as environments, firm strategies, and organizations themselves change (Jones & Khanna, 2006). Also, it enables exploring path-dependent aspects of project practices. Motivated by a strong belief in the importance of project history, scholars have recently called for the development of a history of projects (e.g., Jones & Khanna, 2006; Usdiken & Kieser, 2004). Responding to this call, we adopt a historical perspective in our examination of interorganizational collaboration practices in Dutch shipbuilding. The goal of this paper is to examine how the observed misalignments between project practices and demands in contemporary Dutch shipbuilding projects are rooted in the past and consequently are the result of path dependencies and lock-ins. We answer the following research question: How did interorganizational project practices and demands in the Dutch shipbuilding industry develop between 1950 and 2010 and to what extent do these developments help us understand the current misalignment between project practices and demands? Our emergent model on historical interorganizational collaboration can shed light on contemporary project practices and on what their historical roots are. As such it contributes to a historical turn in project research.

This paper is structured as follows. First, we will describe the major developments in project demands on interorganizational collaboration between shipyards and subcontractors in Dutch shipbuilding during the last decades. In addition, we describe what the industry perceives to be 'ideal' project practices. These 'ideals' will be used as a benchmark. In our theoretical section we draw on a contingency perspective to theorize on the fit between project practices and the demands of the task environment. We complement this contingency perspective with a historical view, focusing on lock-in effects and path dependency. Subsequently we describe our methods of data collection and analysis, followed by the description of our findings. In the following discussion and conclusion, our emergent historical model on interorganizational collaboration practices is present.

Temporary interorganizational collaboration in the Dutch shipbuilding industry

In the 1950s and 1960s there were relatively few parties to coordinate in shipbuilding projects because the shipyard performed most of the work in-house. As a result, there was less urgency

to coordinate and monitor other organizations. The other organizations that did take part in the projects mostly were acting as suppliers (“jobbers”) rather than subcontractors. This implies that they supplied pre-specified parts or components (like anchors) but they did not perform much work on the ship itself. Consequently, the interdependence between organizations was relatively low. Also, vessels in that period had relatively low levels of technical complexity. There was hardly a need for the shipyard to in-source technical know-how as the required knowledge was available in-house. Furthermore, the production time of ships was relatively long, implying that there was not much time pressure. Finally, the economy was doing well at that period. After WWII, there was a recovery period in which there were plenty of assignments for shipyards and high profit margins. The shipbuilding industry still worked according to standards of traditional crafts, i.e., a task was seen in terms of the craftsmanship attached and technology was a matter of the experience of the craftsman. The volume and number of ships constructed increased but the technical development lagged behind relative to international standards. This is in essence illustrated by the relative late transition from original riveting of steel plates (a construction method at which two workers hammer the both ends of a steel pin until it is rounded) to the general use of welding (the process of amalgamating two steel plates into one by melting the two pieces and adding a filler material). Due to its dependence for project orders on shipping companies and ship owners, the shipbuilding industry was highly sensitive to cyclical/economic fluctuations.

The present-day situation is characterized by a strong increase in the outsourcing of work to specialized subcontractors due to the fact that vessels have become technologically more complex and knowledge intensive. Time pressure has increased under the shortening of production cycles and profit margins have decreased under influence of global competition, which was spurred by the rise of Asian economies such as Japan. Shipbuilding is now characterized by a modern industrial orientation, i.e. the standardization and fine-tuning of the production cycle which is illustrated by the adoption of section-wise construction and the use of computer-aided design. The Dutch shipbuilding industry has successfully focused on niche markets and directed its efforts on specialization and innovation. In relation to European competitors, the Dutch shipbuilding industry has been able to maintain its position. However, as described in a British research report, the position of the Dutch shipbuilding industry remains precarious:

“The Netherlands nearly lost its shipbuilding industry in the late 1980s but appears to have fully recovered in the 1990s, though it saw a sharp drop-off in sales in 2003. The Dutch market was in 2005 roughly where it was in the late 1970s” (RAND Corporation, 2005).

With regard to project demands, we observe that both organizational and technological complexity of IO projects have increased through an increase of the number of project partners involved and the interdependency among them, technological developments and more intense time pressures on the production of vessels. Because of these factors, in combination with a decrease in profit margins and a continuous sensitivity of the sector to economic fluctuations, we

can state that the demands of collaboration in IO projects in Dutch shipbuilding have changed considerably over the past decades. An overview of these historical and contemporary project demands is given in table 1.

Table 1. Overview of IO project demands on interorganizational production and collaboration

Historical demands	Contemporary demands
Dealing with few partners involved	Dealing with many partners involved
Low interdependence (Especially subcontractors, only supplying components)	High interdependence (Also subcontractors, installing components on board)
Low technical complexity of vessels	High technical complexity of vessels
Low time pressure, long production cycles	High time pressure, short production cycles
High profit margins	Low profit margins
Orientation towards shipbuilding according to traditional crafts	Orientation towards shipbuilding according to industrial standards
Sensitivity to economic fluctuations	Sensitivity to economic fluctuations

Interorganizational project practices: The ideal picture

As stated before, the initiation of the improvement program in the Dutch shipbuilding industry underlines the concern among industry actors regarding the alignment of contemporary IO project practices to contemporary project demands. The participants in the program state that an improvement in collaboration is needed in order to overcome the separation between the different phases in the construction process, between disciplines, and for joint risk management towards the customer. Contemporary shipbuilding projects are characterized by the involvement of a large number of interdependent actors, who have to deal with many unforeseen contingencies, and who are working under constant time pressure. Under these environmental conditions, successful interorganizational collaboration requires a collaborative culture characterized by high trust levels between partners and flexible contracting (Blomqvist, Hurmelinna, & Seppänen, 2005; Häusler, Hohn, & Lutz, 1994). Interorganizational and interpersonal relations in such a collaborative atmosphere would be characterized as ‘embedded’ and provide fine-grained information transfer, joint problem solving, and trust between partners (Uzzi, 1997). Project participants subscribe to this viewpoint, defining ideal IO project practices as a way of collaboration characterized by an attitude of openness by and trust between all project participants. In relation with the specified goals set by the improvement program of increased information sharing, technological and social innovation, reduction of delivery times and mutually adjusted processes, this ideal set of project practices from the industry actors adheres to interorganizational collaboration according to what

Uzzi (1997) refers to as 'embedded relationships'. An overview of these characteristics can be found in table 2.

Table 2. Characteristics of relationships, adapted from Uzzi (1997)

Features and functions of exchange	Arm-length ties	Embedded ties
Uses written contracts	+	-
Personal relationship with partner matters	-	+
Trust is major aspect of relationship	-	+
Reciprocity and favors are important	-	+
Small-numbers bargaining is risky	+	-
Monitor partner for opportunism	+	-
Thick information sharing	-	+
Use exit to solve problems	+	-
Joint problem solving	-	+
Concentrated exchange with partners	-	+
Push for lowest price possible	+	-
Promotes shared investment	-	+
Shortens response time to market	-	+
Promotes innovation	-	+
Strong incentives for quality	-	+
Increases fit with market demand	-	+

The foregoing suggests a misfit between project practices and project demands when practices are characterized by high levels of distrust, fear of opportunism, and heavy reliance on formal contracts (both in terms of composing extensive, complex contracts and in terms of applying them in a rigid manner). Thus, we assume that formal project practices represent a misalignment with contemporary project demands, while informal project practices represent an alignment between practices and demands. This distinction enables us to determine the level of current fit of contemporary project practices.

Theoretical background

Environmental changes and fit

Central to contingency theory is the assumption that in order to be effective, the structure of an organization must be aligned with – or fit – its context (Drazin & Van de Ven, 1985). Based on classic work on the internal fit between the strategy of organizations and their structure (e.g., Chandler, 1962) and the external fit between the structure of organizations and their environment (e.g., Lawrence & Lorsch, 1967), Siggelkow (2001) presents a framework for discussing the relationship between fit and organizational responses to environmental changes. Within this

framework, internal fit is defined as the coherence of the configuration of activities and behaviors within an organizational unit. External fit is defined as the appropriateness of the configuration of activities of the firm, given the environmental conditions. Siggelkow (2001) distinguishes four types of environmental changes, which differ in their impact on internal and external fit: no change, detrimental fit-destroying change, benign fit-destroying change, and fit-conserving change. To a firm that is performing well (a firm that occupies a peak, in terms of Siggelkow), an environmental change is of no significance if neither internal nor external fit is affected (no change). If an environmental change lowers both internal and external fit, the change is described as 'detrimental fit-destroying'. In another scenario, an environmental change lowers internal fit, yet external fit remains intact (benign fit-destroying change). Finally, fit-conserving changes occur when environmental changes have no effect on internal fit, but decrease external fit. This type of change does not clearly decrease the logic of the activities performed by an organization, but it does erode the appropriateness of this internally consistent way of working in the new environment (Siggelkow, 2001). From a theoretical point of view, fit-destroying environmental changes would induce organizations to change behavior to bring it in line again with these changed environmental conditions (Siggelkow, 2001). The response to fit-conserving environmental changes, however, is less obvious. The problem with fit-conserving environmental changes is that although the external fit is negatively affected, the internal logic of the system of activities, as seen from the organization's perspective, continues to make sense (Siggelkow, 2001). This is problematic as it may blind an organization for the decreasing effectiveness of the configuration (Siggelkow, 2001) and consequently hamper organizational change, resulting in sub-optimal performance given the new environmental conditions.

Path dependency and lock-in effects

There are various examples of organizations that are unable or unwilling to change their practices in order to bring them in line with changed environmental conditions (e.g., Beer & Nohria, 2000; Kaufman, 1995). From a historical perspective, this inertia suggests that lock-in effects and path dependency are at work. Path dependency is a broad term referring to imprinting effects of the past on current organizational practices (Beckman & Burton, 2008): if path dependency occurs, 'history matters' (Nooteboom, 1997). Path dependency implies that prior organizational actions or behavior closes down possible future actions or behaviors (Jones & Khanna, 2006). Four self-reinforcing mechanisms can lie at the heart of organizational path dependence: coordination effects, complementary effects, learning effects, and adaptive expectation effects (Sydow et al., 2009). Coordination effects are the consequence of rule-guided behavior:

"the more actors adopt and apply a specific institution (i.e., an organizational rule or routine), the more efficient the interaction among these actors is, since the behavior of the actors is rule guided and can therefore be anticipated and reactions can be considered in advance" (Sydow et al., 2009, p. 699).

The notion of coordination effects builds on the idea that it pays off to follow routines and adopt practices that are widely shared and used by others. Through the benefits of continuous replication, practices are likely to become fixed. In a similar vein, Miller and Friesen (1984) discuss the concept of internal consistency, which points at the advantages of an internal fit among the various practices of an organization. With regard to complementary effects, interaction between separate but interrelated practices creates synergy (Stieglitz & Heine, 2007). When practices are interconnected in a way that makes it unattractive to deviate from them, these practices are likely to become fixed (Leonard-Barton, 1995). Put differently, the whole is more than the sum of its parts: repeatedly combining interrelated activities produces a surplus (Sydow et al., 2009). Learning effects revolve around the notion that organizations tend to develop more efficient ways of operating, making it less appealing to switch to other ways of operating despite their potential value. For example, a prevailing organizational culture decreases the motivation to look for new practices or to seriously question established organizational practices (Sydow et al., 2009). Finally, adaptive expectation effects can be the result of convergence towards expectations of others (Sydow et al., 2009). From an organizational perspective, while seeking legitimacy, organizational members are more willing to adopt certain practices when they expect others to follow these practices. These self-reinforcing adaptive expectations create self-fulfilling prophecies in organizations (see for example McGregor's [1960] Theory X).

The theoretical arguments discussed above have been applied to single organizations, but they are also applicable to the context of IO project practices. Combining the concept of IO project practices with the theoretical insights on fit and path-dependency, we make two arguments regarding possible causes of ineffective responses (or no response at all) to environmental changes. First, fit-destroying (either benign or detrimental) environmental changes may not be followed up by a change in IO project practices, if lock-in effects are at work (coordination effects, complementary effects, learning effects, adaptive expectation effects, or any combination of the four). Second, fit-conserving environmental changes may not be followed up by a change in IO project practices, because – though the appropriateness of the set of practices as a whole has lowered – the internal logic of IO project practices is not affected. Thus, from a historical perspective, lock-in effects and fit-conserving environmental changes may create a misalignment between contemporary IO project practices and project demands.

Methods

Research context

We chose the Dutch shipbuilding industry as the empirical setting of our study because of its long tradition in interorganizational project-based production, the high technical and organizational complexity of their projects and the important contextual changes which took place over time in this industry. In 2008 two of the leading Dutch shipyards launched a large-scale program together

with a number of subcontractors in order to improve the quality of IO project practices. The program is part of a larger maritime innovation agenda which is supported by the Dutch ministry of economic affairs. Besides the overall goal of improved collaboration, the program aims at reducing failure costs, increasing employee motivation, and improving knowledge storage and exchange. We limited our study of the Dutch shipbuilding industry to the subsectors involved in the program: offshore, navy, ocean shipping, dredging and maritime subcontractors, and excluded yachting, inland shipping, fishing, harbors and aquatic sport.

Data collection

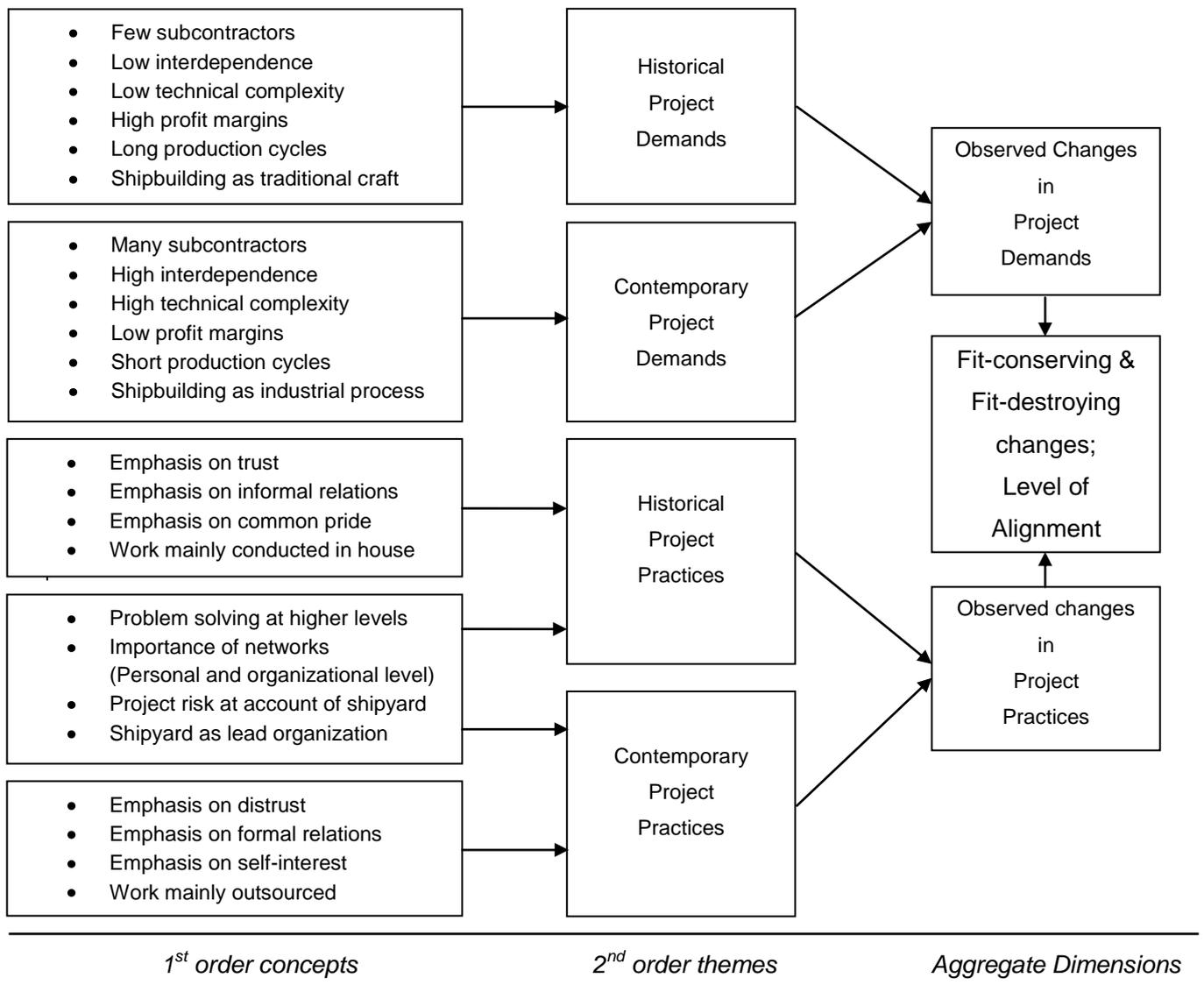
Our data consists of interviews and documents pertaining to the Dutch shipbuilding industry. Our time span of 1950 – 2010 was chosen since this period allowed using oral sources. The importance of oral sources to gain a valid understanding of practices is considerable since practices are rarely written down. We conducted fifteen interviews with respondents currently involved in the Dutch shipbuilding industry and seven interviews with respondents formerly engaged with this industry. Interviews lasted on average 60 minutes and were all audio-recorded and transcribed verbatim. Respondents were or had been employed by both shipyards and subcontracting organizations. For the interviews with retired shipbuilders we relied on purposeful sampling followed by a snowball technique, asking each informant for his recommendations as to who could best explicate the processes of interest (following Corley & Gioia, 2004). Both series of interviews were semi-structured and relied on an interview protocol focusing on key events and issues within the Dutch Shipbuilding industry.

We collected data through documents related to the history of Dutch shipbuilding from 1950 onwards. Based on an extensive documentation list (produced by a historical researcher and checked by another historian) we selected those documents that were useful for our study, i.e. that link to collaboration between shipyards and subcontractors. These documents take the form of, amongst others, anniversary books, dissertations, official investigation reports and biographies. The intended audiences of these documents were internal and external to the Dutch shipbuilding industry.

Data analysis

We analyzed the data using constant comparison (Glaser & Strauss, 1967), which means that the analyzing process begins during and also influences the next stages of data collection. We followed Corley and Gioia (2004) in their approach of coding. During the execution of the research we identified initial constructs in the data from our interviews and our documents and grouped them together into first-order concepts. From this open coding we started to search for second-order themes between these concepts. Our axial coding allowed for the construction of aggregate dimensions. Our final data structure is depicted in figure 1. This process of analysis was iterative in nature until we had a clear understanding of the relationships in our data and further interviews and documents could not provide new insights.

Figure 1 – Data structure



Findings

In order to evaluate changes in IO project practices, we put historical and contemporary project practices next to each other. This is shown in table 3. In table 4 we present evidence for our interpretations on project practices and demands. Next to describing the changes in project practices, we compare these changes in project practices with the set of ideal project practices defined by the participants of the maritime improvement program and how these changes meet these aspiration levels.

Table 3. Overview of IO project practices

Historical practices	Contemporary practices
Emphasis on trust	Emphasis on distrust
Emphasis on informal relations	Emphasis on formal relations
Emphasis on common pride	Emphasis on (financial) self-interest for some participants, lasting pride for other participants.
Shipyard as lead organization	Shipyard as lead organization
Shipyard conducts most of the work inhouse (work distribution shipyard – subcontractor: 70-30)	Shipyard outsources much of the work (work distribution shipyard – subcontractor: 30-70)
Informal networks (personal and organizational level) are important	Informal networks (personal and organizational level) are important
Financial responsibility / Risk sharing at the account of the shipyard.	Financial responsibility / Risk sharing at the account of the shipyard.
Solve problems at higher levels	Solve problems at higher levels

Changes in interorganizational project practices

Our data imply that earlier project practices were partially different from the contemporary project practices. Collaboration in shipbuilding projects in the Netherlands in the second half of the twentieth century can be characterized by flexible contract application and by relations of trust. This was also noted by a maritime researcher:

“They saw each other often in the church on Sunday. Trust developed there. The contract is a document, you need to have it, but it is only for emergencies. You do not use it in every-day practice.”

There was a high communal pride in the work being done and the shipyards tended to conduct most of the project work in house and applied strict hierarchical relationships emphasizing status differences. The type of relationships, the hierarchy within them, and the way this was perceived is illustrated by the quote from one of the retired shipbuilders:

“I used to drive a Volvo. It happens to be that the chairman of the board of site X also drove a Volvo at that time. Exactly the same. Well, within two weeks I was told that I had to get rid of that car.”

In addition to this, whenever problems appeared, those were solved on higher management levels.

According to the objectives of the maritime program which was mentioned in the introduction, interorganizational collaboration requires a collaborative culture characterized by an open minded attitude and transparent communication. One aspect of the communication between project partners is the formulation and application of formal contracts. Contemporary project practices in shipbuilding projects can generally be characterized by heavy reliance on formal contracts, both in terms of writing contracts and in terms of applying contracts during the project. Nowadays, these contracts are more detailed and fine-grained. Currently, there is a strong emphasis on informal personal and organizational networks in which participants involved in the IO project enhance their communications, direct their efforts and observe their attitudes. Shipyards and subcontractors tend to write extensive and elaborated contracts and apply them in a rigid manner. This does not fit well with a relationship of trust and openness, and also seems to hinder communication between IO project participants. Shipyards and subcontractors tend to lose their collaborative stance when market conditions change the project circumstances. Support for our interpretations is given in the following table. Changes in project practices and demands are based on our previous tables 1 and 3.

Table 4

Data supporting interpretations of project practices and demands	
Theme	Representative quotations
	Changes in IO project demands
Historical project demands	<p>Traditional orientation on shipbuilding: <i>“The most important thing is that in that time the yard wanted to do everything on its own. They had their own painting companies, own electrical division. They controlled everything by themselves.”</i> (-retired shipbuilder)</p> <p>Low economic sensitivity/long production cycles: <i>“And my boss said to me ‘there’s a bunch of papers, good luck’. Those were all specifications for ships. In that period economy was doing so well that shipping companies stood in line for shipyards. We simply couldn’t find the time to handle all the customer requests.”</i> (-retired shipbuilder)</p> <p>High economic sensitivity: <i>“In times of economic decline, one had to fire employees on a large scale to keep one’s head above water.”</i> (-formal commission of inquiry report)</p>
Contemporary project demands	<p>High time pressure: <i>“The pressure of work is quite high. You’ve got a time-limit that is just very tight. We work with schedules from which you know beforehand: well, I hope we’re going to make that.”</i> (-Technical manager, Shipyard)</p>

High interdependence/High technical complexity: *“Who is designing something? Who is delivering something? Who is connecting it? Who is commissioning it? And it was very clear from the start so every time we had a discussion, we just opened the demarcation: no, it is yours. You have to sort it out. And it saved a lot of discussions. And I know on project X, they did not get the demarcation right. And that caused a lot of conflict between Z and Y. Demarcation was not good enough. (-Project manager, electrical company)*

Many partners involved: *“Subcontractors became more and more important because the entire functioning of the vessel is dependent on the performance and quality of the subparts. So their importance and influence with regard to profit and risk grew immensely.” (-maritime researcher)*

Changes in IO project practices

Historical
project
practices

Strong emphasis on trust/Importance of personal networks: *“There was only one supplier, for electrical installations, that was important. That is called subcontractor right? I don’t believe he cheated us. We had a very good relationship with him. Besides, we had very capable people of our own.” (-Retired shipbuilder)*

Emphasis on common pride: *“Currently, I see how lawyers fasten their teeth in contracts, that they are nitpicking each other. That is nothing but distraction from the real goal: building a ship together. That used to be much more goal-driven. Everybody was glowing with pride at the moment of a ship sailing away for the first time. It has changed from a shared, common pride of that ship sailing away to how can I write my contracts in such a way that it is to my own advantage. It all has become less open. ” (-Retired shipbuilder)*

Importance of informal networks/problem solving at higher levels: *“Whenever the board of directors of site X came over to talk to the board of directors of site Y, they always dropped by at our department and said: you guys work together, we’ll fight at the top. You maintained good relations with those guys.” (-Retired shipbuilder)*

Importance of informal networks: *“I think that between yard and subcontractor there were always informal arrangements, it is always a matter of give and take. That one says ‘ok, if you do this task for me then I won’t bother you about that other thing’. It is often the most efficient way to get a result.” (-Retired shipbuilder)*

Emphasis on informal relations: *“The rivalry between the Dutch shipbuilders in those days was legendary. In the eyes of outsiders they were bitter rivals. Behind the written contrasts institutionalized cooperation was hidden.” (-de Voogd, 1993)*

Contemporary
project
practices

Emphasis on (financial) self-interest: *“Everyone is fighting for his own purse. And that is not unhealthy, I think. But the atmosphere is quite different. Because the atmosphere is no longer about how we are going to solve it but more about: if you want me to do something it will cost you.”* (-Head project management, electrical company)

Shipyard as lead organization/ Emphasis on distrust: *“We are seen as the trouble-some subcontractor, who tries to keep things covert, something we have to do because as soon as we tell something they take it to the competitor, and then we are left empty-handed. That just happens. Drawings are copied and given to the neighbors. What is your price? (...) Then you don’t put everything on drawing.”* (-Contract manager, electrical company)

Emphasis on formal relations/ Emphasis on (financial) self-interest: *“It is much easier if you can arrange your stuff on the production floor, much and much easier. But today that is no longer possible. Today everything needs to be confirmed by email and backed up with pictures. That is really a trend that has become visible over the past few years. You can make informal arrangements with a person but it can have major consequences when these commitments are not met. Because when the work is not done, it costs us time and money.”* (- Production manager, painting company)

Shipyard as lead organization/ degree of outsourcing/ Emphasis on formal relations: *“The contracts from shipyard to subcontractor go pretty far, because they spell down in detail a subcontractor’s functionality and supply magnitude, but also a demarcation list with activities. And they do that for every subcontractor. And the structure of the contract and the purchasing conditions are written down in a way that you as a subcontractor have no saying in the overall picture. The shipyard outsources 70% of the entire vessel to subcontractors, but these subcontractors have no influence on the building process. (...) No matter for what reason, if there are problems with the planning that cause you to start your work later, can deliver later, and hence need to put more time and effort in your job, you cannot call the shipyard to account for that extra time and effort.”* (-Head project management, electrical company)

IO project practices and the self defined ideal set of practices

Although project practices have changed to some extent, these changes did not always increase the alignment with the demands set by the task environment. There are also practices that have remained more or less the same over the period of 1950 - 2010. First, project practices that have changed are compared to the ideal set of practices. Second, the practices that remained the same are compared to this way of collaborating by embedded relationships (Uzzi, 1997).

The stronger emphasis on distrust and formal relations is seen as a move away from the desired project practices defined by the improvement program. As stated before, ideal IO project practices, as defined by the shipbuilding community itself, are illustrated by an attitude of openness by and trust between project participants. However, the emphasis on distrust and formal relations relates to characteristics of arm-length ties, i.e., the usage of written contracts and the diminishing of reciprocity and trust as major aspects of the relationships. This stronger emphasis on distrust shows from the following quote of one of the retired shipbuilders when describing the current situation:

“Those boys [subcontractors] are riled that they are played off against each other by the shipyard and the shipyard is riled when they have the feeling that they are peeled off by those subcontractors”.

The increased outsourcing of project work to subcontractors is seen as a move toward the ideal practice of co-makership since it adheres to an industrial orientation on shipbuilding, aids in achieving shorter production cycles and provides a solution to the increased time pressure. The increased outsourcing was also driven by the need for cost reduction due to price competition in the Dutch shipbuilding industry. However, while outsourcing more and more work, the shipyards have clung to their central role in the process, which possibly explains the arms' length, formal and not very trustful nature of their relations with subcontractors which is illustrated in the following quote:

“Those alleged reliable partners of ours had the market so nailed up that every attempt to involve third parties was nipped in the bud. That's where we pay extra. They just paid them to either don't tender or just above theirs. They received a fee for that which was on-charged to us.” – Purchase manager Shipyard

Nevertheless, the shipyard has been and still is the central actor in the project. They coordinate and monitor the actions and efforts of subcontractors, communicate directly with the end customer, and also bear most of the risk on the project. It is this risk that is the major source of problems between shipyards and subcontractors, as put by one of the retired shipbuilders:

“When the yard’s project manager and the subcontractor’s project manager share the responsibility, you can get improvement. But that discussion never came to a good end. Nobody wanted to make concessions. Then it stops. As long as responsibility resides with one party, that party takes the decisions. Because he is responsible for profit and loss. When the time comes that profit and loss are shared, then you can speak of real collaboration. That is the key.”

We like to draw special attention to the erosion of the common pride that formerly characterized the Dutch shipbuilding industry. The enduring pride expressed by some of the contemporary actors is in line with the ideal set of practices from the improvement program and attunes to the characteristic of embedded relationships as discussed in the introduction. Others however place more emphasis on self-interest, either financial or otherwise. Enduring pride in IO projects adheres to the pursued practice of shared support among project participants since it functions as a tool for creating a shipbuilding community and coping with the increased number of partners involved. However, stressing one’s self-interest in contrast is seen as contradicting this ideal practice since it hampers management of the increased interdependence and coping with lowered profit margins. This is indicated by the following quote:

“People are more and more looking up their own alley. This part is finished within the allocated hours so I am done with it. If I have to do something to make it more efficient somewhere else, I will put in more hours and I am evaluated by that so I rather don’t.”

– Technical manager Shipbuilding

Stressing one’s self-interest decreases the likelihood of reciprocity and increases the need to monitor partners for opportunism which are both characteristics of arm-length relationships. Another characteristic of arm-length relations is pushing for the lowest price possible. This pursuing of one’s self-interest is illustrated by the following quote:

“A shipyard which accepts a price of a vessel, that’s often under pressure, will try to get that money back from the subcontractors. Well, that’s contrary to the idea of co-makership which is the decree. That was a hundred years ago a problem, it was fifty years ago a problem and it’s still a problem.” – Retired shipbuilder

What also seems not to have changed is the importance of informal personal and organizational networks. In current shipbuilding projects that *do* operate in a flexible and informal way (which is considered appropriate according to the goals of the improvement program and given the current demands of the task environment), respondents indicate that the pleasant and successful collaboration is a consequence of the long-lasting relationships between yards and suppliers. However, this is not a widespread practice in the industry.

Basically, we find that the majority of the practices were not subject to significant changes over time; such as the importance of informal networks, the financial framework of risk taking, the lead organization in the interorganizational project and the mode of problem solving. These practices are in line with the characteristics of arm-length relationships as depicted in table 2 in the introduction. Overall, the contemporary IO project practices do not align with the ideal set of practices defined by the industry actors or, in other words, collaboration according to embedded relationships.

Summarizing, in response to the changes in the IO project demands, shipyards now are outsourcing to a qualitatively different extent than they used to do in the past. However, they did not change their IO project practices accordingly. IO project practices remained to a large extent the same, leading to a decreased alignment with the task environment. Other practices changed in a direction which may be seen as congruent with the greater importance of arms' length relations (due to the increased outsourcing), but decreasing the internal fit of the IO project practices. In particular, the erosion of trust, the increased emphasis on self-interest, and the increased emphasis on formal contractual relations does not fit well with the remaining elements of the shipyard remaining in the lead and bearing all financial responsibility, with problems being solved either through informal relations, or being referred higher up the hierarchy.

Discussion

The comparison between historical project practices on the one hand and contemporary project practices on the other hand, shows that some practices have changed over time while others have proven to be more stable. Generally, project practices have shifted from a more informal way of organizing work and coordinating relations to a more formal way of collaboration. The central role of the shipyard, the importance of organizational and personal networks, and the problem solving at higher levels are examples of practices which have remained more or less the same over the past decades. The finding that some historical practices have remained stable over time, suggest that certain lock-in effects may be at work. For example, the enduring central role of the shipyard can be seen as a consequence of a combination of coordination, complementary, learning, and adaptive expectation effects (Sydow et al., 2009). The central role of the shipyard and the peripheral role of subcontractors are taken for granted in the industry. Both shipyard and subcontractor organize their work according to this division of roles. If a major subcontractor would be given the role of central actor, or if shipyard and subcontractors would operate on the basis of equality and share risks together, communication among all organizations involved – including the customer – would have to change dramatically. It is the interplay between shipyard and subcontractors that enables them to produce complex vessels under high levels of time pressure. Their skills are complementary as subcontractors deliver specialized knowledge and expertise, while the shipyard integrates all the actions and efforts made by the subcontractors. Both shipyard and subcontractor have learned to play their role in shipbuilding

projects, and it would for both be difficult to 'unlearn' their role and to develop different skills. A pipe fitter for example may find it very difficult to develop coordination skills, while for a shipyard it may prove difficult to develop specific technological knowhow and routines on pipe fitting. Finally, the perseverance of the shipyard as central actor has likely created expectations among shipyard and subcontractors that the shipyard indeed acts as the overall coordinator, and as the organization that bears most part of the risk involved in building expensive and complex vessels. Based on this example, we suggest that lock-in effects have played a role with regard to project practices that have remained stable over the past decades.

As we have shown, there are also practices that have changed over the past decades. From a theoretical point of view, this adaptation of practices can be ascribed to fit-destroying environmental changes (Siggelkow, 2001). The increase in outsourcing to specialized subcontractors can be seen as a reaction to the increasing complexity of vessels. Complexity had to grow in order to compete with emerging economies that produced more simple vessels against lower prices. Shipyards lacked the required specialized knowledge to produce more complex vessels, so subcontracting took a boost out of necessity, rather than as the strategy of choice. As such, increasing complexity can be seen as a fit-destroying environmental change to which shipyards adopted their project practices to regain fit. The collaboration between shipyard and subcontractors can initially be described as of an informal nature. In general, shipyard and subcontractors cooperated on the basis of trust. Contracts served more as a last resort rather than enforcing mechanisms. Over the past decades this has changed into more heavy reliance on contracts, and decreasing levels of trust between shipyard and subcontractors. Interestingly, if we compare historical project practices to environmental changes in the industry (more subcontractors, higher technical complexity, and higher levels of time pressure), we can say that these environmental changes can be described neither as fit-destroying nor fit-conserving. After all, the informal nature of collaboration seems to become even more important when time pressure increases or when projects become more complex. In other words, informal collaboration is expected to thrive when complexity increases. Thus, project practices seem to have changed in the opposite direction of what one would expect given the changing environmental demands.

The most likely explanation seems to be that while the shipyards had no other choice than to rely more on subcontracting (and hence restore the fit between the demands of the task environment and the configuration of activities), they did have degrees of freedom in shaping project practices to be used in the new subcontracting setup. The shift to a situation dominated by arms' length relationships was accompanied by more emphasis on formal contracts and self-interest. Paradoxically, this can be seen as a move to increase internal fit because, as suggested by transaction cost theory (Williamson, 1991), an increase in outsourcing justifies heavy reliance on formal contracts and rigid contract application to curb opportunism. The continued use of informal networks and the referral to higher hierarchical levels, which have remained unaltered, can be

seen as safety valves in the new, too rigid formally contractual system. These elements decrease internal fit, but apparently are necessary to get the job done. But this repositioning also deteriorated the external fit, as evidenced by the plea for more trust-based relations in the current maritime improvement program. This suggests that actors in a complex organizational field like shipbuilding can in case of changes in the environment easily move in a direction that seems internally coherent, but which in the end fails to respond to the new set of challenges.

Conclusion

The starting point of this paper is the acknowledgement of industry actors in Dutch shipbuilding that contemporary project practices do not fit well with contemporary project demands. In this paper we have explored historical explanations for this misalignment, focusing on environmental changes and lock-in effects. On the one hand, Dutch shipbuilding projects have seen a shift from a low to a high proportion of subcontracting, which can be seen as a change to restore external fit. However, with this there was also a shift from informal collaboration to a more formal way of collaboration. Although increasing internal fit, at least from a perspective like transaction cost economics, which seems to correspond largely with the outlook of the shipyards, this shift to more formal collaboration goes counter to the requirements of the evolving task environment. There are also project practices which have remained stable over time, like the use of informal networks and referral to higher levels in the hierarchy to solve conflicts. We interpret these elements as safety valves in a new system of arms' length formal contractual relations that would otherwise be too rigid. All in all, our analysis suggests that the current way of collaboration has at least partially been shaped by historical developments and is consequently the result of path dependency and lock-ins. However, the pattern of change and stability that we observe defies any mechanical explanation. Attention to the role of actors (in this case in particular the shipyards), with their interests and perspectives, which may incompletely reflect both internal and external realities, must be taken into account.

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