

Integration as a project management concept: A study of the commissioning process in industrial deliveries

Johanna Kirsilä^{a,b,*}, Magnus Hellström^{b,1}, Kim Wikström^{a,b,2}

^a *Laboratory of Industrial Management, Åbo Akademi University, Biskopsgatan 8, 20500 Åbo, Finland*

^b *PBI – Research Institute for Project-Based Industry, Slottsgatan 10, 20100 Åbo, Finland*

Received 14 February 2007; accepted 20 February 2007

Abstract

This paper presents and analyses integration as a project management concept in industrial system deliveries. Attention is given to the aspect of integrating products and services as a functional whole, i.e. a solution. The study is based on interviews regarding the commissioning process in a number of different project companies. Commissioning is well representing integration as it is the part of the project life-cycle where earlier integration efforts are put into action, and can therefore be evaluated. Combining a literature review with our empirical observations we stress the importance of integration by managing and utilizing relationships throughout the project life-cycle. The outcome of the paper is a framework pinpointing the technical and social dimensions of integration.
© 2007 Elsevier Ltd and IPMA. All rights reserved.

Keywords: Integration; Project management; Industrial deliveries; Commissioning

1. Introduction

This paper outlines different forms of integration and outcomes of integration as a project management concept in industrial projects. We concentrate on the distinct category of complex products and systems that differ in many regards from mass-produced goods [1]. According to Hobday [1] the term complex is used to reflect the number of customized components, the breadth of knowledge and skills required and the degree of new knowledge involved in production as well as other critical product dimensions.

This makes the issue of integration, or the “integration problem” [2], a delicate one. For one thing, companies need to master the chain of activities induced by engineer-to-order products. For another, they need to master the systems integration activity from not only a technical point of view, but also from an organizational point of view as the deliveries tend to involve a network of different suppliers and service providers [3].

The issue of integration becomes even more relevant (and complicated) due to the recent trends to offer innovative combinations of products and services tailored to each customer’s needs – the so-called integrated solutions. In many cases these integrated solutions cover a large part of the entire value stream of capital goods [4]. The need for concurrent engineering, which refers to the practice of incorporating various life-cycle related values of a product into the design at its early stages of development, asserts certain requirements on the integration process even further [2]. Increased project complexity puts pressure on project management not only to deal with the

* Corresponding author. Addresses: Laboratory of Industrial Management, Åbo Akademi University, Biskopsgatan 8, 20500 Åbo, Finland; PBI – Research Institute for Project-Based Industry, Slottsgatan 10, 20100 Åbo, Finland. Tel.: +358 50 343 5242; fax: +358 2 215 4791.

E-mail addresses: johanna.kirsila@abo.fi (J. Kirsilä), magnus.hellstrom@pbi-institute.com (M. Hellström), kim.wikstrom@abo.fi (K. Wikström).

¹ Tel.: +358 40 737 9980; fax: +358 2 233 0494.

² Tel.: +358 40 553 3289; fax: +358 2 215 4791.

management of the internal project team, but also to manage the wider inter-organizational teams, complex supply chains and relationships with several stakeholders. Most of all, project managers are in the front-line when it comes to assuring customer satisfaction [5]. In turn, companies integrating the solutions increasingly rely on partners to supply and provide them with the components of the solutions. Consequently, recent literature point out that companies have to change their focus and develop new capabilities, expand their definition of the value chain and re-consider their position in the value chain, to deliver such complex products and systems (see e.g. [6–10]). All in all, we can see a restructuring throughout the entire value stream, which is bound to influence the way projects are integrated. Integration and coordination are indeed at the heart of much research in the field of organization theory [11–13]. In this paper we want to shed light on the situation where whole project value chains are (re)structured and integrated in order to achieve the outcome. In particular, we investigate and stress the end dimension of integration as opposed to up-front and strategic driven integration.

1.1. Aim and method description

This paper aims to increase the understanding of integration as a management concept for complex industrial projects. The paper stresses the importance of integration through relationships all through the project life-cycle. Discussions concerning integration found in the literature on projects, organization and engineering is reviewed, as this paper attempts to outline a framework focusing in particular on different kinds of integration in these fields, for achieving benefits for the deliveries of industrial projects. The research in this paper initially sets out to discuss *the character and implications for integration in delivery projects under these new circumstances*. The unit of analysis is organizations delivering large-scale, complex products and systems, or considerable parts thereof.

We use a clinical research approach: theoretical reasoning combined with previous action research studies in addition with a recent exploratory study of the delivery, in particular the commissioning, process of projects. The commissioning process was chosen as the central focus of the delivery chain as it typically constitutes the end phase from a supply side point of view. It can be considered as the point in the delivery chain where all the parts of the project come together and should be verified as a working whole [14]. From a concurrent engineering point-of view it, however, often becomes a problem solving task rather than merely a handing over of the project to the customer. Therefore, the whole chain of activities – ranging from sales and design to handing over and warranty – has been addressed. The empirical study was carried out as a two-step exploratory study based on interviews on routines, attitudes and ideas of the commissioning process with several persons representing different

positions and functions in industrial, project-based companies.

1.2. Outline of the paper

The paper is organized in four sections. In Section 1, the background to the study was presented and the research question was defined. Section 2 is a literature review that serves as the theoretical foundation, presenting the origins and perspectives from which the concept of integration is studied. The section begins with a short introduction on recent trends in project business. It proceeds with issues regarding the themes posed above, and ends by discussing the trend towards delivering large engineering projects relying on integration in the management process (which are central to our argument). Section 3 presents the empirical data we draw on in this paper, illustrating the cases and the results from the study through a thorough analysis. Section 4 summarizes and concludes, as well as outlines some directions for future research and development on the presented framework.

2. Theoretical foundation – delivering projects relying on integration

Managing large, multi-task projects is a complex phenomenon, and constitutes a major challenge to the entire project network. In this paper we argue that project management, in order to be able to do this, has to consider the concept of integration in several contexts as a means for successful deliveries and transformation. The sections below present some remarks and theoretical frames of integration concepts and its relation towards the business of projects and deliveries of larger industrial solutions.

2.1. The concept of integration

The concept of integration, which derives from the Latin word *integratus*, is current in many different fields where it appears in a variety of shapes, such as for instance in: business; mathematics; electronics; programming; process design; psychology, the theory of evolution etc. (e.g. [15–18]). These areas may serve as a base for further discussing integration, as they reveal the multitude of the concept.

Below is one of the general definitions of integration, which Webster's revised unabridged dictionary [15] and The American heritage [19] provide us with:

“Integration is the act or process of making something whole and entire”.

Additionally, analogous words to integration found in the literature are for instance to unite, combine, unify, consolidate, concentrate, organize and systematize. By referring to integration, we thus mean bringing or joining together a number of distinct things so that they move, operate and function as a harmonious, optimal unit.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات