Win-Win Situations by Partnering Project Delivery Forms – Case studies conducted in Switzerland

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ABSTRACT: The competition for the contractors in the EU market can be characterized as purely price-based with on the one side profit margins dropping dramatically mainly due to the traditional project delivery models; on the other side a soaring number of claims by the contractors lead to considerable investment budget overruns by the employers / investors. The consequences are often that the investors' anticipated profit margins are not reached during the life cycle use of the facility. This situation calls for new approaches on project delivery forms.
The conference paper points out the necessity of a lifecycle orientation by the construction companies as well as orientation towards project delivery and competition models that support partnering. After illustrating relevant partnering models, the paper presents the concept of the construction system provider as an integrative framework. The aim is to implement overall lifecycle-oriented optimization back in the planning phase that also includes the utilization/operation phase, whilst at the same time taking into consideration both appropriate incentive systems and attaining a win-win situation.
Moreover, the paper reports on case studies conducted by the Institute for Construction Engineering and Management at the Swiss Federal Institute of Technology Zurich in Switzerland, that investigated the success factors regarding to attain a win-win-situation between the customer and the building company. The management of partnering-oriented success factors is an important task within the project management. Whoever takes a more open stance on competition among system providers today will have a great opportunity to be a leader tomorrow.

1 BARRIERS HINDERING CONVENTIONAL MODELS OF PROJECT DELIVERY

1.1 Fragmentation of conventional construction processes

The fragmented composition of construction processes no longer meets the requirements of today's socio-economic conditions. The processes, which are still less than optimal, are, in part, based on the conventional methods of completing projects, which comprise fragmented phases and the subdivision of works, and on the increased outsourcing to subcontractors with project control lacking any direct system leadership.
This leads to unresolved interface problems, and to only parts of the project being optimized, instead of the overall project completion (Figure 1). Moreover, generally speaking, very few innovations are implemented that encompass the entire project and generate customer benefits across all works and phases; this is because of the fragmented interests of the various individuals involved in the project. The resulting product is frequently less than optimal for the customer in terms of return (maintenance, rentability), value conservation, etc. during the operation phase.

1.2 Lifecycle orientation

Our economic environment is undergoing dramatically dynamic changes. Market characteristics and corporate strategies are becoming ever shorter-lived. Invested capital has to produce a quick return. This situation is also placing new demands on the realization of construction projects.
Developers focusing on the return and long-term conservation of the value of their facilities have realized that the conventional approach to tackling projects often does not produce the desired results. The orientation towards return and value conservation can only be achieved using a lifecycle approach (Girmscheid 2000).

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Unlike mass or consumer goods, lifecycle orientation cannot be achieved by comparing products. Instead, incentive systems need to be developed to ensure that traditional companies, which are only involved in certain phases of a construction project, take an interest in the commercial success of the subsequent phases. This could result in the following consequences for construction companies from both a customer and market perspective:

- less fragmentation of individual phases and works,
- a more innovative overall approach encompassing the planning, construction and – where possible – utilization/operation phases.

1.3 New challenges and opportunities for companies

This creates new opportunities for companies to develop new markets by offering lifecycle-oriented product and service innovations. By integrating planning and execution expertise, these develop into system products and services and generate new market shares by squeezing out the traditional suppliers of individual products and services (Girmscheid 2000).
New approaches to cooperation in the construction industry are needed to ensure that a construction's optimization and innovative potential, which is inherent in the overall system, is exploited across the entire spectrum of value creation phases. This includes both horizontal and vertical forms of cooperation with providers of complementary products and services on the one hand, and new approaches to partnering between developers and the providers of products and services in the construction industry on the other hand.

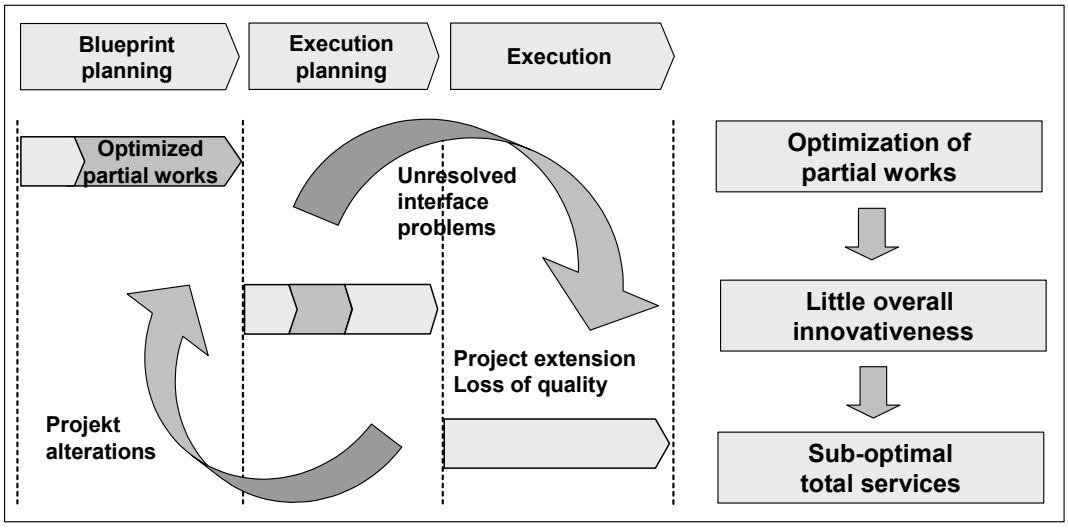

FIGURE 1.
Traditional construction processes and their sub-optimal impact

2 THE PROPERTY OWNER'S CONTRIBUTION TOWARDS ENSURING THE EFFICIENT EXECUTION OF A PROJECT

The key to rapidly executing a project lies in the hands of the property owner. It is his responsibility to ensure that a target-oriented, trouble-free (as far as possible) and efficient execution of the project is possible. To achieve this aim, he must have clarified the following questions (Brandenberger and Ruosch 1996).

Objective and decision

- clear preliminary clarification of requirements and general conditions
- clear objectives and decisions regarding functionality, quality, costs and the time frame
- clear targets
- efficient decision-making structure

Permission and financing

- permissibility or even permission must be clarified
- the permit procedure and time frames must be defined
- the conditions for a permit must have been complied with
- the financing must be in place

Project structure

- clarification of the types of project execution, tender and contract award needed to ensure the rapid realization of the project
- suitable project management structures

It is crucial that the property owner realizes the contribution that he must make to guarantee the rapid and, where possible, trouble-free completion of a project. As such he should already have developed clear and understandable ideas during the pre-project phase with the help of a consultant or professional project manager. Furthermore, all hurdles that lie on the way to the permits being awarded for the project must have been overcome. Shortening the permit award and decision-making processes is a crucial objective. The financing of the project must be based on a reliable estimation of the costs with appropriate leeway guaranteed.

3 TAKING TRANSACTION COSTS INTO CONSIDERATION WHEN SELECTING THE PROJECT DELIVERY MODEL

Surveys (Blecken and Gralla 1998) indicate that the delivery of projects using individual providers of products and services frequently does not result in the lowest overall investment costs, including ancillary costs, in spite of the “purely” price-based competition – although the proponents of this approach tend to make this claim. Often, the reasons for this are as follows:

- The danger of supplementary costs is more acute than with other project delivery methods offering a higher degree of integration (Girmscheid 2003a).
- The transaction costs (project management, measuring and billing expenses, no resp. few standard details, etc.) are higher than for other project delivery methods or, in positive terms, integrated project delivery models offer considerable potential for reducing transaction costs.

Transaction costs include those expenses incurred in initiating, agreeing, processing, controlling and retroactively adjusting work-related processes for the provision of products and services (Kleinaltenkam and Plinke 2000). In addition to the costs of the object of the contract, this concludes that even the process of selecting the appropriate project delivery model is dependent on and linked to costs and benefits for all parties involved.

For developers, the overall investment costs therefore comprise both the contracted price and the transaction costs.

Transaction costs, in particular, can be influenced by the various project delivery models, whereby we can assume that those project delivery models focusing on the provision of a complete product (general contractor, total service contractor, system provider) offer developers the following benefits in respect of transaction costs, compared with the provision of individual products and services, even if the developer is represented by a proficient project manager:

- Lower project management costs
- Lower planning costs
- Lower construction costs due to standard details
- Lower measuring and billing costs
- Lower costs for supplementary amendments
- Increased utilization value
- Increased risk premiums

4 PROJECT DELIVERY AND COMPETITION MODELS THAT SUPPORT PARTNERING

4.1 Definition of partnering

The term partnering is used to describe the largely symbiotic collaboration of the parties involved in the project to achieve the targeted performance goals by defining contractually agreed incentive systems. This partnership should encompass all phases of the project, where possible.
Whilst the partnership between developer and service provider is particularly important, the relationship between the service provider and his cooperation partners must, equally, be taken into consideration (Bennett and Jayes 1998).

4.2 Partnering models

Partnership on the basis of competition can be attained using the following partnering models (Girmscheid 2003b):

- Construction management (CM) combined with a guaranteed maximum price contract (GMP contract + value engineering)
- Public-Private-Partnership (PPP) models (Akintoye, Beck and Hardcastle 2003).

Cost-conscious developers are increasingly also using target costing concepts, which have a close affinity to the GMP model.
In addition to the range of services and products focusing on the construction and renewal of facilities, professional developers - for whom securing the returns and conserving the value of their constructions are of foremost importance - increasingly expect the construction industry to offer products and services that not only include securing the operating contract for the utilization phase but also actually open these overall services to competition during the award phase.

4.3 Construction Management (CM)

The construction management method has been gaining in popularity as a new form of project organization, especially in the USA, since the beginning of the 1970's. It is named after the construction manager (CM) who plays a decisive role within the project organization in shaping the success of the project (Halpin and Woodhead 1998). A distinction is made between two alternative forms of construction management in project delivery, which differ in terms of the contractually agreed assumption of the risks connected with adherence to the construction time and cost schedules (Haltenhoff 1999).
In the USA construction management services are offered by firms of architects, engineering companies and construction companies. Construction companies who act as construction managers often have their roots in general contracting. Mostly they have been converted into specialized construction management organizations, or they continue to offer general and total service contracting in addition to construction management.
Generally, firms of architects and engineering companies offer construction management only in the form of management services, without assuming any of the risks, whereas construction companies offer construction services in addition to the management services: "Construction Management at Risk" (Konchar and Sanvido 1998).

4.4 GMP and value engineering

The guaranteed maximum price (GMP) contract with or without "glass pockets" is a variation on the conventional global or lump sum contract. The GMP form of contract can be applied in one of the following alternatives (Gralla 2001):

- The top price or GMP is determined, i.e. billing takes place on the basis of the agreed unit prices and the products and services that have been supplied up to the maximum amount agreed. The entrepreneur bears the risk of these costs being exceeded. This type of GMP agreement is common for contracts awarded directly by the developer to the contractor.
- The top price or GMP is determined in line with the principle of billing by "glass pockets". It makes sense to apply this type of GMP agreement if the developer's contractor takes over the entirety of products and services at a very early stage in the construction process. In these early stages the optimization potential has often not yet been fully exploited, given the lack of

any great planning depth, in spite of the competition surrounding the award of the overall products and services, nor has the real market price been fully evaluated. An agreement such as this enables the developer to secure a maximum cost guarantee at an early stage, whilst at the same time an appropriate incentive system allows him to participate in the profits arising from the contract award and cost savings from optimization measures.

The fundamental concept of this second GMP form of billing by “glass pockets” makes it suitable for complex construction projects where the execution is planned parallel to the construction following the conclusion of the contract. Such a GMP agreement should be put out for tender in conjunction with a value engineering incentive agreement (Gralla 2001).

Value engineering distinguishes between at least two causes of cost savings:

- planning savings from optimization measures
- savings arising from the award process

4.5 PPP-model

The term Public-Private-Partnership (PPP) can be defined as follows: Construction and/or management of public assignments by private companies with control and/or investment by the public sector to guarantee the “political” quality and ensure adherence to public requirements.

For political reasons, and given the responsibility of the public sector for ensuring the availability of traffic routes, utilities and waste disposal, awarding purely private contracts or concessions without municipal involvement is frequently out of the question. Which is why the public sector wants to be involved in any privatization in order to influence or be a part of the decision-making process relating to the strategic objectives. The PPP project company then assumes responsibility for the operative realization (Akintoye, Beck and Hardcastle 2003).

Municipalities use such PPP-models, for example, for the following tasks:

- Urban development: for the rapid and financially interesting development and marketing of undeveloped land or for the redevelopment of existing buildings and industrial zones.
- Constructional maintenance of municipal traffic, supply and disposal networks.
- Operation of municipal traffic, supply and disposal facilities to lower costs and increase earnings.

5 CONCEPT OF THE CONSTRUCTION SYSTEM PROVIDER (SYSBAU) AS AN INTEGRATIVE FRAMEWORK

The construction system provider research approach (SysBau)® of the Institute of Construction Engineering and Management at the Swiss Federal Institute of Technology in Zurich focuses on integrating (Figure 2):

- Total construction management
- Integration of operating services (Performance)

The aim is to implement overall lifecycle-oriented optimization back in the planning phase that also includes the utilization/operation phase, whilst at the same time taking into consideration both appropriate incentive systems and attaining a win-win situation.

The term system provider (SysBau) is used in the construction industry to describe those companies that actively offer lifecycle-oriented all-round solutions from one source in a specific market segment. They are distinct from total service contractors in that system providers base their customer-oriented all-round solutions, which are tailored completely to the customer’s needs, on both a functional and an optimally designed and/or engineered lifecycle-oriented system (Girmscheid 2000).

The system leader brings his core competencies to bear in the system concept and continues to develop the same (cross-project) on an ongoing basis. Since system providers focus on particular market segments, or even only offer specific constructions, they will succeed in developing innovative system concepts for these constructions. Such system concepts should aim to largely preserve the scope for architectural design.

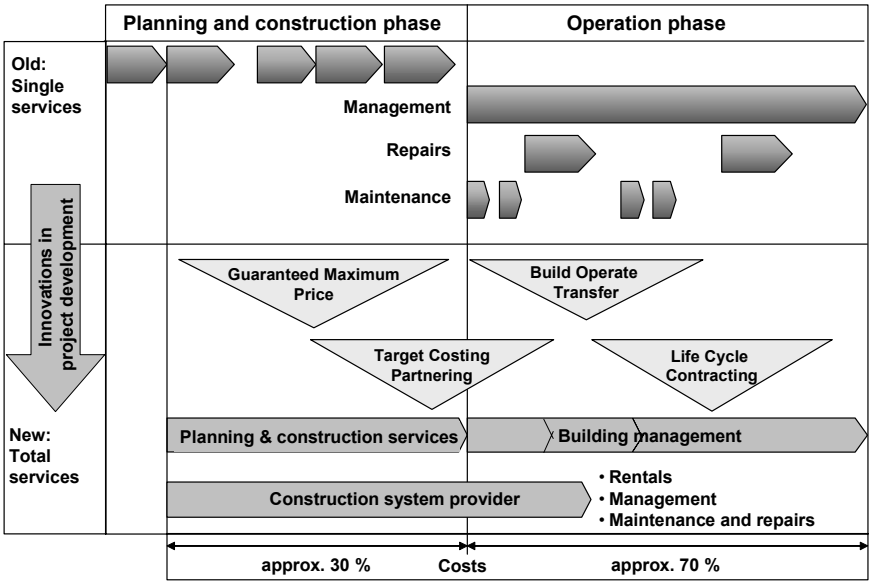

FIGURE 2.
Approach of the construction system provider

6 SUCCESS FACTORS OF PARTNERING – RESULTS OF CASE STUDIES

The relevant success factors were identified on the basis of several case studies of projects executed on a partnership basis (Girmscheid 2003b), with explanation of the following practical examples:

- Case Study 1: Construction of a new football stadium – Total service contractor responsible for project development
- Case Study 2: CM project delivery with GMP as a fast-track project
- Case Study 3: Project delivery as a Public-Private-Partnership (PPP)

6.1 Case Study 1: Construction of a new football stadium – Total service contractor responsible for project development

The old football stadium in Bern, Switzerland, was opened in 1954. From 1990 onwards a construction company started developing a project for a new football stadium on its own initiative. The project development is based on the fundamental concept and idea of being able to attract private investors to finance the project by designing a multi-purpose complex offering a range of various uses, such as shopping center, school, football stadium, etc. In doing so the investors would split the investment volume of 350 million Swiss Franks between themselves, thus ensuring that the public sector would not have to provide any substantial financial support itself.
The concept incorporates a multi-purpose complex comprising the following elements:

- Football stadium with covered seating for 32,000 spectators, VIP boxes and a business floor
- Large shopping center together with 43 further shops
- 3 restaurants
- Office space, schools, medical training center
- 8 apartments
- Parking for 700 vehicles

As this plot of land was designated as a sports field in the previous zone plan, an alteration of the same was necessary to enable the multi-purpose usage. Following the development of the project, consultations regarding alterations to the zone plan and an architectural competition, the total service contractor started approaching potential investors whilst the planning phase was running, and was able to attract a group of investors comprising three companies. This investor group then acted as the property owner for the construction of the new football stadium from this point in time onwards.

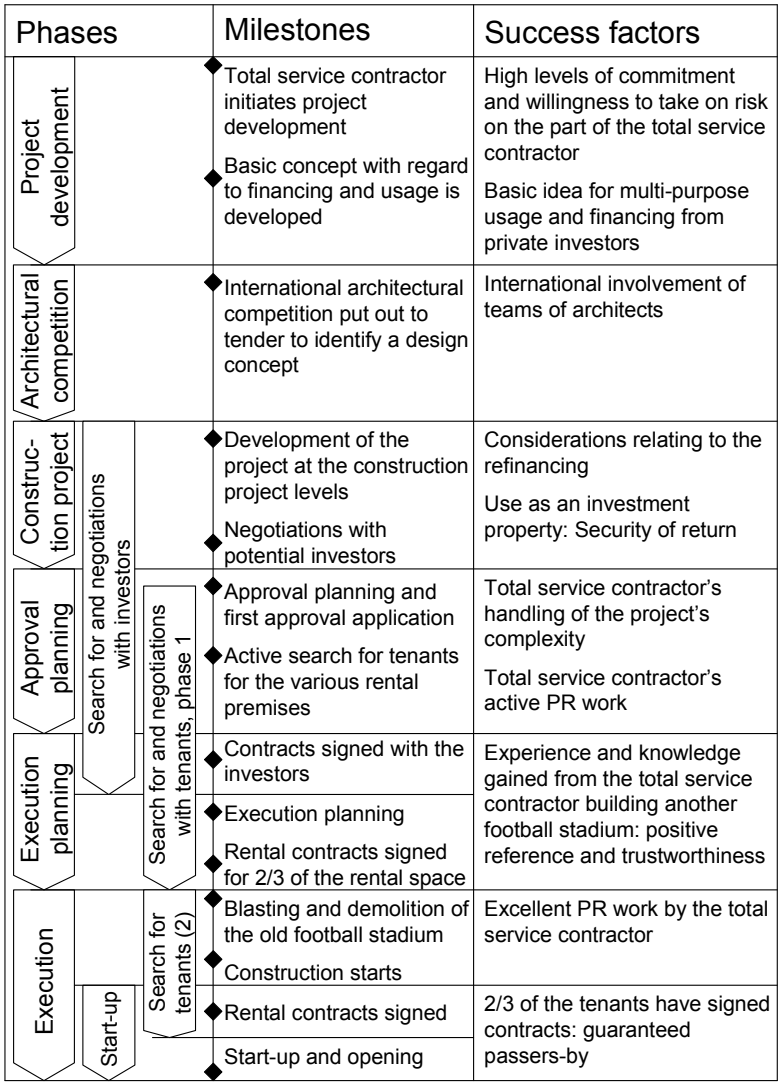

FIGURE 3.
Milestones and success factors on Project 1

6.2 Case Study 2: CM project delivery with GMP as a fast-track project

The developer of this project is a technology company active in the chip industry. It needs a new production facility for its ongoing chip development. In view of the competition prevailing in the chip industry it is essential that the production facility be put into operation as soon as possible (time to market).

In order to ensure compliance with the tight schedule stipulated for the completion of this fast-track project, the developer decides to run the project as a construction management (CM) project and with a GMP contract.

As the contractor receives a share of any cost savings, he has a valid interest in optimizing the project (win-win situation). In order to reduce the overall duration of the project, schedule optimization and parallel triggering of the planning and execution measures (simultaneous engineering) are absolutely crucial.

For this case study the success factors illustrated as examples in Figure 4 were identified during the individual project phases.

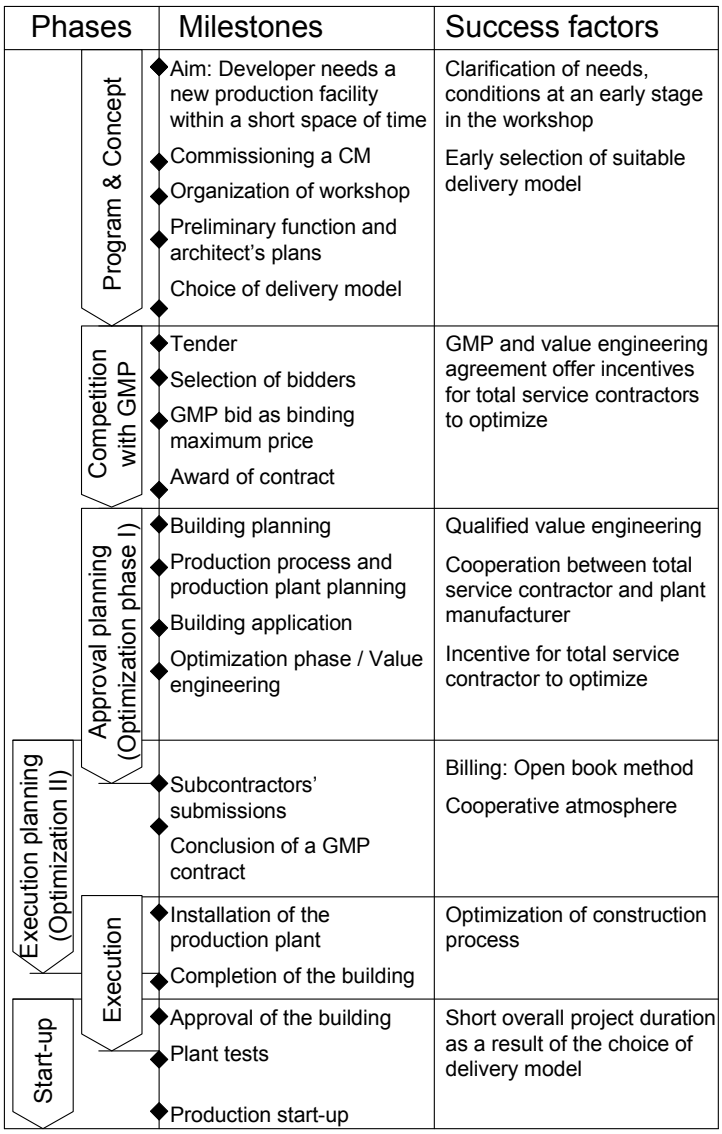

FIGURE 4.
Milestones and success factors on Project 2

6.3 Case Study 3: Project delivery as a Public-Private-Partnership (PPP)

In 2000, a Danish community decided to contract out the maintenance and repair of the municipal waste water network as a Private-Public-Partnership (PPP).
The community aimed to ensure that the public supply and sewage networks were rendered highly efficient in terms of cost minimization, supply and disposal reliability, and lifecycle-oriented maintenance. It was decided that a proprietary maintenance and repair department for investigations, planning and works was out of the question for reasons of efficiency and capacity. Moreover, experience of the conventional sequential execution using individual providers of products and services had not led to any synergies arising between the developer, planner and contracting company. In the field of repairs, in particular, innovative developments were storming ahead at such a speed that a single specialist planner for a town / community could not keep pace.
For this case study the success factors illustrated as examples in Figure 5 were identified during the individual project phases.

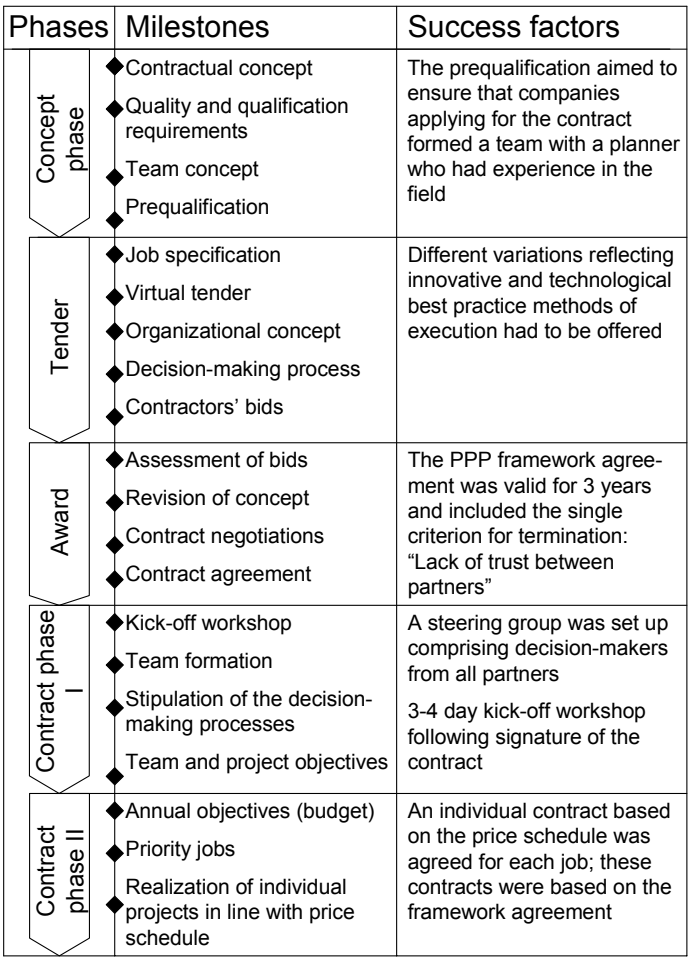

FIGURE 5.
Milestones and success factors on Project 3

7 CONCLUSIONS

Processes of change, high operating costs and fragmented construction processes necessitate:

- Risk-based selection of the project delivery method, taking into account the investment, transaction, operating and maintenance costs
- Project delivery and competition models that support partnering
- Lifecycle integration, for example using the SysBau approach

Developers on the one side, and planners and entrepreneurs on the other, can secure sustainable advantages for themselves by selecting the most-efficient type of delivery and contract for a specific project and by applying professional project management and information logistics to control the processes in order to optimize the coordination between all parties involved in the project. Developers, planners and entrepreneurs are understandably reticent when it comes to new approaches to project delivery. Everyone involved in the process is now faced with the challenge of abandoning the well-known project delivery models, role distributions and areas of responsibility with all their benefits and drawbacks and, instead, venturing into new and, in places, unknown territory. Not all projects will be immediately successful on this route to increased efficiency. Nevertheless the potential elements of success that are inherent in new forms of cooperation offering a fair distribution of risk should be exploited. Research and practice must work together to develop and test optimal conditions and process flows.

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