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Incentive agreements and long lasting partnerships as a road for continuous improvement

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ABSTRACT

Incentive agreements or bonus schemes are contractual supplements known from partnering. Contractual commitment is ensured by using on-site performance as a parameter to calculate the contractual payment. The research is conducted as a case study of a public water board. Data collection consisted of interviews with the owner and is supplemented with archived data. The contracts are turnkey contracts designed as 6 years contracts with a fixed price and an integrated yearly regulation of negative 2 % of the contractual value and supplemented with incentive and bonus schemes in relation to economics, quality, energy and environment, and customer satisfaction all regulated with 2 % pr. year to ensure continuous improvement. The effect of the incentive and bonus schemes is followed revealing a positive result; in 2012 82.5 % of the possible bonuses were released. Moreover, the long lasting partnerships are ensuring a positive environment for professional discussion and learning.

INTRODUCTION

Incentive agreements (IA) are add-ons to a traditional contract implemented in an attempt to increase on-site efficiency. There are different types of incentives, the most common types includes time, cost, and quality (Bubshait 2003; Bower *et al.* 2002). Contrary to incentives are disincentives, which is very common in the construction industry. Incentives focus on rewarding good behavior while disincentives focus on penalizing bad behavior (Bubshait 2003).

IA's and bonus schemes are known from partnering where the IA's are used to foster team spirit (Bayliss *et al.* 2004) and aligning behavior (Love *et al.* 2011) and by offering an financial reword IA's creates an unified motivation to work both harder and smarter (Sliwka 2003). Thus, an IA is an instrument which aligns the objectives of the client, contractor and subcontractors and can be an encouragement for cooperation (Rose and Manley 2010) and a tool to foster motivation which reduces the waste of capabilities and possibilities in the production system (Lindhard and Wandahl 2012). Even though IA's most often is used in interaction with partnering IA's can be used as an add-on to traditional contracts (Rose and Manley 2010).

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The reasons to implement IA's can be many, and the IA has to be designed to support and measure performance to promote the desired behavior. Contrary, if not designed carefully IA's have the potential to support undesired behavior which oppose the greater good for the project (Kadefors 2004). The risk of undesired behavior increases when the contract contains multiple incentives (Bower *et al.* 2002).

Several research has been documenting the positive effect of IA's and bonus schemes. For instance did Jaafari (1996) found by simulation that IA's has a significant potential for addressing performance problems by releasing savings related to cost and time.

Bayliss et al (2004) did in a case study a small questionnaire survey including 16 participants find Incentive Agreements (IA) as the most useful instrument both in relating to instilling, fostering and maintaining a partnering spirit where it in all categories scored maximum on a 5 point scale.

Chan et al. (2008) followed an Underground Railroad extension product and find that IA's to be an innovative tool which ensured that the subcontractors were committed to the project and thus had a key role in ensuring project success.

Meng and Gallagher (2012) combined the results from questionnaire survey and a case study and found that IA's align the expectations of the client with the objectives of the contractor.

Only a few empirical studies regarding usage of IA's and bonus schemes exists (Meng and Gallagher 2012; Rose and Manley 2010). In this empirical case study the application of IA's, bonus schemes and long lasting partnerships is examined in a public water board.

METHOED

The research is conducted as a qualitative research and consists of a one case study of a public water board. The strength of a qualitative approach is the increased depths and richness of the information and by placing the data into the outer context, which forms and influences the results this ensures a better understanding to the obtained data (Hartley 2004).

The selected construction case was followed with focus on how IA and bonus schemes were applied in and the related outcomes. Data collection includes interviews and archived data.

The interview is based on Kvale and Brinkmann's (2010) first 4 steps. By following a structured and thorough process the replicate ability and trustworthiness of the data collection is increased. 1) Thematization, the interview is regarding results and experience in relation to the usage of IA's and bonus schemes. 2) Design, the interview is designed as a semi-structured interview with an expected duration of 3 hours. To support the interview relevant topics and open questions is prepared on

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beforehand. The questions served as a checklist to ensure that all relevant topics were covered. 3) Interview, the interview was carried out as a face to face interview. It is important that the responded is directing the conversation. Due to the open question and the semi-structured design the direction of the conversation cannot be predicted thus the open questions has to be followed up by additional questions to ensure clarification. 4) Transcription, the interview has afterwards been transcribed.

The case

A public water board has besides the responsibility of delivering tap water to private households and businesses a major task in maintaining and developing the supply network. Because the public water board is public financed, the water board is every year given a fixed amount of money at disposal to which the water board has to get the most value out of. Therefore, the contracts are designed as long-lasting partnerships covered in a framework agreement. A framework agreement consists of a pool of tasks which had to be conducted within a given period of time and at fixed costs but the actual quantities within each task is not fixed.

The first partnering contract within a framework agreement was signed in 2003 it was a 3 year agreement regarding no-dig solutions. The agreement was supplemented with single partnering projects regarding planning, digging, and pumping stations. Due to success of the first framework agreement, a new and now 4 year long framework agreement were signed in 2006, now including both planning, digging and no-dig projects. In 2010 the current framework agreement was signed. The framework agreement has continuous been extended and prolonged, the current framework agreement which is a 6 year agreement is shown at Figure 1. The framework agreement is divided into three regions where different counselors, contractors, and suppliers manage projects regarding planning, digging, no-dig, and pumping stations. Finally, the public water board has expressed a desire to make a new framework agreement from 2016 when the current agreement expires.

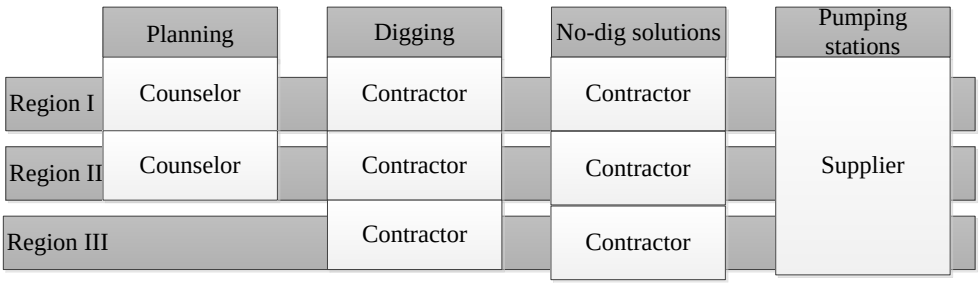

Figure 1: The total framework agreement consists of several contracts in total does the agreement include two technical counsellors, six contractors and one supplier.

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The different parts of the framework agreement have been put to tender as turnkey contracts. Thus, the contractor is choosing his own technical consultant and subcontractors. The process proceeds as follows. A number of contractors are being prequalified to the project and subsequent has the option to make a tender. The offers are followed by a round of negotiations after which the bidders get a chance to revise the tender. Every tender is evaluated in relation to economy (40%) quality and development (30%), and organization, quality assurance, and safety (30%).

The design of the IA

The framework agreement consists of one IA's concerning economical performance and one bonus scheme concerning the achievement of predefined goals.

The IA concerning economical performance is structured around a fixed target price where the difference both positive and negative is evenly split (50/50) between the owner and the individual contractor.

The bonus scheme concerning the achievement of predefined goals includes a pool of 75.000 USD which is allocated in relation to the fulfillment of the goals. In total four predefined goals are included in the bonus scheme. The bonus scheme has a build-in requirement of continuous improvement; thus, to foster continuous improvement the four goals has a predefined yearly regulation. For instance, the fixed price is having an integrated yearly regulation of negative 2 % of the contractual value in total a 10% improvement during the entire contract period. The goals and the regulation are shown in Table 1. Once a year all parties from the framework agreement are calculating the overall achievements. Each predefined goals can release between 1 and 5 points; thus, the four predefined goals can at maximum release 20 points which induce that the complete pool of 75.000 USD is paid out.

Table 1: The four predefined overall goals in the bonus scheme

Year	Economical performance	Quality	Environment	Customer satisfaction
2010	0% price reduction	100 year lifespan	0% CO_2 reduction	Min 75%
2011	2% price reduction	100 year lifespan	2% CO_2 reduction	Min 77%
2012	4% price reduction	100 year lifespan	4% CO_2 reduction	Min 79%
2013	6% price reduction	100 year lifespan	6% CO_2 reduction	Min 81%

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2014	8% price reduction	100 year lifespan	8% CO_2 reduction	Min 83%
2015	10% price reduction	100 year lifespan	10% CO_2 reduction	Min 85%

Table 1 is showing the key performance goals, some might be measured differently; the actual measurements and allocation of points can be viewed from Table 2.

Besides the four measurements which are included in the bonus scheme an extra performance goal regarding the satisfaction with the collaboration between the parties in the framework agreement is also measured. Initially, the goal is 80% satisfaction, the goal is yearly regulated with plus 2%; thus, in 2016 the goal is 90% satisfaction. The performance goal is not included in the bonus scheme since it is the participating parties which themselves is reviewing the collaboration. Hence, a financial bonus is expecting to impact the reviews by which the measurement no longer is accurate.

Finally, the contract includes a collaboration agreement to which all the participating parties (crosswise regions) has agreed to once a year meet to share experiences and ideas to how they can improve the performance in relation to the five mentioned goals.

Supporting and reaching the goals

To ensure that the key performance goals are reached the public water board has two focus areas a) by obtaining continuous improvement and efficiency improvement and b) by creating development and innovation.

Continuous improvement and efficiency improvement is ensured by working towards: Continuity in the work, using the same work crew, optimizing process flow (minimizing stops and errors), influence on technical solutions and execution methods, implementing a project pool, create a common file sharing platform, a joint communication: info letters, public meetings, presentations, questionnaire surveys, a joint project manual, and a joint development toolbox: Lean.

Development and innovation is ensured by working towards: Joint IT development: Servers for photo registration, project evaluation, questionnaires, joint asphalt tender to the 3 contractors, development of a new plug-machine to the digging projects, a new renovation practice going from whole to separate sewerage, pumping stations: reduction of energy consumption, and counselling to the commoners.

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Results

A fair measurement of performance is important. Thus, to every area an indicator, a scale and how the indicator is measured are determined. Based on the fixed scale the performance can be calculated and points can be allocated. Afterwards, based on the allocation of points the earned bonus can be calculated. The actual allocation of points in 2012 is shown at Table 2.

Table 2: Allocation of points 2012, the blue shading marks the achieved results.

		Measurement	1 point	2 points	3 points	4 points	5 points	Result
Economy	Planning	Development of work tool	Initiated	Stage 1	Stage 2	Stage 3	Stage 4	Ok
	Digging	Reduction of target price	<2%	2.5%	3%	3.5%	4%	5.2%
	No-dig solutions	Reduction of target price	<2%	2.5%	3%	3.5%	4%	4.1%
	Pumping stations	Reduction of target price	<2%	2.5%	3%	3.5%	4%	4.7%
	Average							5 points
Quality	Planning	Update renovation criteria	Not started	Initiated	Stage 1	Stage 2	Stage 3	Ok
	Digging	Unacceptable observations	>3	3	2	1	0	5
	No-dig solutions	Deviations pr. km	>7 pr. km	7 pr. km	6 pr. km	5 pr. km	<5 pr. km	3.7 pr. Km
	Pumping stations	Number of flaws and deficiencies	>3	3	2	1	0	0.88
	Average							3.75 points
Environment	Planning	Work with CO_2 applied	Initiated	Stage 1	Stage 2	Stage 3	Stage 4	Ok
	Digging	CO_2 Reduction	<50 ton	60 ton	70 ton	80 ton	85 ton	85 ton
	No-dig solutions	CO_2 Reduction	<10 ton	10 ton	15 ton	20 ton	25 ton	34 ton
	Pumping stations	Reduced electricity usage	5%	10%	15%	20%	25%	22%
	Average							4.75 points
Cust	Planning	Planning support satisfaction	Initiated	Stage 1	Stage 2	Stage 3	Stage 4	Ok

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Digging	Questionnaire	75%	76%	77%	78%	79%	81.5%
No-dig solutions	Questionnaire	75%	76%	77%	78%	79%	89%
Pumping stations	Commoner complaints	>3	3	2	1	0	1
Average							4.75 points
Total							18.25 points

Additional to the measurements presented in Table 2 was the collaboration measured to 84%. In total 18.25 point out of 20 points were allocated resulting in a bonus of 60,500 USD corresponding to 82.5 % of the possible bonuses. The bonus is calculated as by omitting the first ten points and dividing the bonus in relation to the remaining points.

In relation to the economical requirement in the bonus scheme focusing on price reduction the IA was structured as an economical agreement based on a fixed target price. In 2012 two out of the three regions were under budget releasing, in relation to the IA, a profit which was split 50/50.

One key argument for implementing IA's and bonus scheme is that they foster continuous improvement. The actual improvement in relation to the four predefined overall goals can be seen at Table 3. Table 3 indicates a slow but constant improvement. Finally, customer satisfaction is phased out as a measurement in 2013.

Table 3: The achieved results 2010 - 2012. The intervals refer to best and worst results in the 3 regions.

Year	Economical performance	Quality	Environment	Customer satisfaction
2010	0-0.5% price reduction	-	-	74-79%
2011	3-3.9% price reduction	-	92 + 19 ton reduction	79-88%
2012	4.1-5.2% price reduction	-	85 + 34 ton reduction	81-89%

Discussion

The public water board has a positive experience regarding application of IA's and bonus schemes. The results presented in Table 3 reveal a continuous improvement process which follows the predefined goals included in the bonus scheme, the goals are presented in Table 1. Even though the size of the bonus (75,000USD) can seem

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insignificant in relation to promoting the desired behavior it has at the case followed proven successful. Off cause the improvement may be caused by the related Hawthrone effect (Landsberger 1958); the performance gained due to a motivation increase among the project participants cased by showing an interest. Nevertheless all improvement is positive; the improving gained might just be the tip of the iceberg. The question which remains is whether the incentive is larger if the bonus is larger.

In the case, the duration of the contracts has been steadily increasing from 3 to 6 years. According to the project manager the reason to extend the contract length is that from experience they learned that more time was necessary in order to reap the benefits from the improvements in working procedures. To get the optimal benefit out of the collaboration the project manager emphasize the importance of avoiding changes in the staff of employees of all participating companies. The strengths of a long lasting partnership are that learning's and accumulated knowledge is kept within the project group, and that the social relationship and mutual trust between the project participants are increased. Therefore, by making changes, especially in management positions, an important part of these gaining's are lost.

Despite the importance of long lasting partnerships, the project manager underlines that IA's will result in positive outcomes both on continuous and individual projects because IA's promote development. The project manager's experience and the results from this case study indicate that an economical incentive for economical efficiency can increase the yearly economical efficiency. It is important to state that like a good design of the IA can benefit the project a bad design of the IA can damage the project. Especially how gaining's are measured and shared is of importance and of great influence to the behavior. Goldratt (1990) put it like this "tell me how you measure me, and I will tell you how I will behave."

One of the biggest challenges regarding the IA has been the needs for open accounts. Open accounts has been necessary in order to calculate any possible positive or negative variation in cost. Thus, trust is essential. Moreover, it is important to select a business partner with the right attitude towards open accounts and IA's and bonus schemes. Without the right attitude it can be very difficult to achieve the full benefits of the long term partnership.

Conclusion

The IA's and bonus schemes are found to have a positive influence on performance and can be used as an instrument for continuous improvement. The positive findings are supported by the fact those project participants were allocated 18.25 out of 20 points within the four performance measurements: economical performance, quality, environment, and customer satisfaction. The performance released 82.5 % of the 2012 bonus which corresponding to 60,500 USD.

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To reap the benefit from the long lasting contracts the duration has been steadily increased from a 3 year contract in 2003 to a 6 year contract in 2010. By extending contract length the learning's and accumulated knowledge is kept within the project group, and that the social relationship and mutual trust between the project participants are increased.

One great obstacle to overcome is the need for open accounts. To overcome this challenge trust between the project participants is essential, which underlines the importance of avoiding replacements in staff and ensure that all members in the project has the right attitude.

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