# PROJECT FEEDBACK AS A TOOL FOR LEARNING

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## ABSTRACT

In construction, project feedback has often been seen primarily as a means to measure customer satisfaction. Even though the measurement of customer satisfaction is an important factor, feedback information also has other purposes, for example, it highlights the frailties of the operations. With the help of the feedback information, companies can uncover development targets and develop their own competencies and co-operation competencies. Thus feedback information is also a vehicle for sharing knowledge about experiences and good solutions and thereby operates as a part of knowledge mechanism and learning.

Construction can be characterized as a specific type of project industry, with specific features concerning production, such as temporality, bounded location and one-off products. From the point of view of learning, the uniqueness and temporality of the project organization bring their own challenges and difficulties. In this article we concentrate on how those challenges and difficulties can be overcome with the help of feedback information. The questions of this paper are defined as follows:

- How does the uniqueness and temporality of a project organisation affect the learning processes?
- How can feedback be used to intensify knowledge transfer and learning for the parties of the construction project?

## KEY WORDS

Feedback, customer satisfaction, learning organization

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## INTRODUCTION

Growing competitive pressure and the introduction of many initiatives aimed at improving productivity, quality and efficiency are causing many construction organisations to rethink their construction processes. The aim is to use technology and re-engineer construction processes to achieve superior quality and minimum lead times at an optimum price. If the challenge is to be met by the construction industry, any number of management tools, which help identify the vision of the future have to be adopted. The organisations need a method for gathering information, which helps them to be awake and to find operational problems and conflicts, as well as to realise new development ideas and identify the customer's needs. This requires the use of techniques such as project feedback to assist in defining critical success factors from the core areas. Typically, project feedback is seen as a metrics for customer satisfaction and it is one of a project's success factors (e.g. Maloney 2002; Yasamis et al. 2002; Chan and Chan 2004; Sanvido et al. 1992).

Measuring customer satisfaction has several benefits for organisations, for example, in improving communication between parties, enabling mutual agreement, evaluating progress towards the goal, and monitoring accomplished results and changes. It is also one important attribute of TQM, which construction firms are adopting in their quality improvement efforts (for example Arditi and Gunaydin 1997).

Project feedback information also has other purposes. Feedback can be seen as a tool for development of the construction process. It is also a management tool, rooted in the business environment, used to identify changes needed in production processes to achieve better performance. In brief, it involves analyzing an existing situation, identifying and measuring factors critical to the success of the production process, comparing them with the success factors of other companies, analysing the results and implementing an action plan to achieve better performance.

Project feedback can be seen as a vehicle for learning at the organisational level. The learning of an organisation can be seen as the constant circulation of functions, which contain the sensing of the operational capability of the company, comparison with the operational capabilities of the competitors, interpretation of the significance and importance of the comparison and the evolving of suitable developing methods based on the interpretation. However, feedback is not alone enough. Essential is an ability to connect feedback with the learning of the organisation (Choo 2000: 198, 202). When building sites receive feedback from the construction process, the creativity of the employees is also stimulated and incremental innovations and learning are enhanced (Bertelsen 2004).

There are a number of factors hindering the use of project feedback in construction. Firstly, the nature of the construction industry is such that the number of variables it has makes it more difficult to compare directly with other industries. Location, size and type of projects and level of technology are such variables. The realization of most construction projects involves the bringing together of many separate parties including the client, consultants, contractors, suppliers, and subcontractors. Therefore, the learning process taking place inside the project is influenced by the transient co-operation between various trades.

Additionally, construction project teams brought together solely for one project, including people with cultural backgrounds further, hamper the efficiency of the team. These fundamental characteristics of construction projects also complicate the evaluation

of the project outcome. Every project is unique, but there are, to some extent, general characteristics, which could be used to categorise the problems and experiences. Thereby, the experiences can be used in later projects when similar problems arise. Therefore it is necessary to construct a standard method for project feedback. If project participants can predict the probability of success better, they can take steps to 1) avoid unsuccessful projects, 2) identify good projects worth pursuing, 3) identify problems of current projects and take corrective action.

This paper examines how project feedback can be utilised to intensify the project participants' learning. This paper is based on incipient research, which is a continuation of earlier studies (Kärnä 2004; Kärnä et al. 2004; Kärnä and Junnonen 2005) in relation to customer satisfaction in the Finnish construction industry by using the Construction Quality Association's, RALA's, project feedback data. The objective is to further develop RALA's feedback system. Its aim is to develop the existing Finnish feedback system in the direction, which enables parties in the construction supply chain to give feedback to each other, both during the project and after the completion of the project. Therefore, the viewpoint of this paper is theoretical. The structure of this article is as follows: first we review how value generation and customer satisfaction are related, and then we examine the purpose of project feedback and its connection to learning, especially to organizational learning.

## VALUE GENERATION AND CUSTOMER SATISFACTION

In this section we outline the background of and theoretical approaches to developing a mutual feedback system for the needs of the construction supply. We also try to bring new insight into the value-concept in the Lean Thinking discussion.

Koskela (2000) has found three theoretical models of production: production is a transformation of production factors into the product, production is a flow of material through the production system and production is value generation, fulfilling the customers' needs and wishes.

Lean construction and lean thinking lack an adequate conceptualisation of production, which has led to imprecise concepts, such as "value". In the lean construction field there seems to be two approaches for conceptualising value. Value for the customer is considered as a product value and value for the project participants and workers is termed process value. Bertelsen (2004) proposes that value should be considered as value for the customer only and value for the project participants should be seen as part of labour relations, which can have a great importance in improving the construction process.

Koskela's third model of production, *production is value generation*, is near the concept of customer satisfaction, which has emerged from service marketing literature. Customer satisfaction in construction could be determined by the extent to which the completed facility meets or exceeds the customer's expectations. Despite the fact that customer satisfaction determination emphasises the result of the construction process (product), the customer is also influenced by how he receives and perceives the transformation process from resources to the constructed facility (see e.g. Grönroos 2000). For example Yasamis and associates (2002) refer to this process as the contracting service.

According to earlier studies based on RALA´s feedback data (Kärnä et al. 2004), factors of quality and co-operation have a strong effect on overall satisfaction. In addition, public clients were found to be less satisfied with the contractors' performance than private ones in all areas (Kärnä 2004). Kärnä and associates (2004) have also found

that factors related to co-operation, quality assurance and handover have the strongest effect on the customer's overall satisfaction. Factors related to co-operation also seem to correct deficiencies of quality assurance and handover. This finding is similar to those of Torbica and Stroh (2001) who confirmed that it is the "total offering" that generates the total degree of customer satisfaction.

This distinction between product and process has also been noticed by other authors in the construction industry. For example, Arditi and Gunaydin (1997) found that product quality refers to achieving quality in the materials, equipments and technology that go into the building of a structure, whereas process quality refers to achieving quality in the way the project is organized and managed in the three phases of design, construction, and operation and maintenance. Kärnä (2004) has created a framework assessing the dynamics of customer satisfaction, customers' expectations, construction process and product. Thomson and associates (2003) have explored value and quality in design. They propose that the role of stakeholders in defining project values influences product quality expectations as well as the designers' expectations of meeting these goals. All in all, these determine the functional, physical and symbolic product characteristics that are necessary for achieving customer satisfaction.

Grönroos (2000) has stated that value is created in customer's value generating processes. He notes that the *value is perceived by the customers in their internal processes and in interactions with suppliers or service providers when consuming or making use of services, goods, information, personal contacts, recovery and other elements of ongoing relationships.*

Customer satisfaction surveys provide information about the customer's value generating process, because customers evaluate a contractor's performance on their own subjective basis. By exploring customer feedback, it is possible to learn from different kinds of customers and understand which factors create value to customers. This could be explored, for example, by analysing which are the customers' basic requirements, "must-be" factors, which always cause dissatisfaction or which have a positive effect on customer satisfaction. This kind of analysis could also constitute the criteria for segmentation instead of traditional segmentation approaches.

Despite the difficulties in conceptualising value in construction, the role of the all project participants is emphasised in delivering the value to the customers. Project organisation usually has complex goals. Each project member (owners, designers, consultants, contractors and sub-contractors) look at the project from their own perspective and also have their own criteria for measuring success (Chan and Chan 2004). Attaining project goals requires systematic evaluation of the organizations' performance in providing feedback for guiding the participants' behaviour (Liu and Walker 1998).

Love and associates (2000) suggest that each firm in the construction supply chain is both a customer and a supplier, and that the value that is created by them is a fundamental factor in the project success. Because the performance of each participant in the construction project coalition is interdependent, participants should assess each others' performance. In other words, when evaluating co-operation between parties in the construction supply chain, it is essential to exploit mutual feedback.

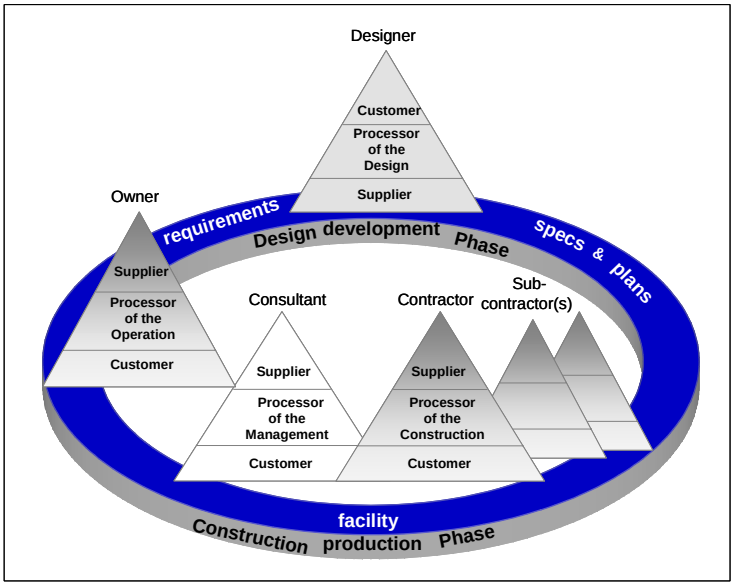
Ultimately, the end-user's satisfaction, the client's satisfaction, the design team's satisfaction and the construction team's satisfaction has become essential part of KPI's (key performance indicators) in the construction, in contrast to traditional project success measures as time, cost and quality (Chan et al. 2002).

For example Barret (2000) has argued that quality in construction projects can be seen as the fulfilment of expectations (i.e. the satisfaction) of the participants involved. He

highlights the importance of harmonious working relationships between the participants to achieve quality. Also, the customer's input has considerable implications for the outcome of the construction project. Pocock and associates (1996) have examined the relationship between project interaction and performance indicators. They found that the projects with a low degree of interaction have expansive cost and schedule growth and include a number of modifications, while projects with high degree of interaction tend to have better and more consistent performance indicators.

Burati and associates (1992) emphasise that strong customer orientation is achievable in construction by using the "market-in" concept, which recognizes that each work process consists of stages. Customer feedback is obtained to improve the contractor's performance during each stage of the process. Burati and associates (1992) have also examined the roles of the parties in construction by using Juran's "triple role" concept, which is illustrated in Figure 1. According to the concept, every party in the construction process has three roles: supplier, processor, and customer. The architect is the customer of the owner. The architect translates the owners' requirements into specifications and plans and processes them for the contractor who is his/her customer. Owner and construction management consultant are customers for a general contractor and subcontractors. The owner receives the constructed facility from the contractor. The owner is also a customer of the construction management consultant, who guards the owner's interests in construction management.

Figure 1. Construction value chain and the parties' roles. Adapted from Burati et al. (1992).




## PURPOSE OF PROJECT FEEDBACK

In the construction sector, inter-organization systems characterised by steady relations of contractors are more and more frequent. In these systems, partner reliability and efficiency is particularly crucial. As a consequence, for the owner, the decisions process concerning the evaluation and the choice of contractors, architect and engineers to carry out specific project activities is of considerable importance.

There are two main strengths of project feedback. Initially, it can focus on an organization's core areas of business to help in achieving the greatest added value for any improvement strategy. Secondly, having identified how the production processes stands when compared to others, it can focus on investigating rather than assuming how those performing better achieve their performance rates. Other benefits for contractors, subcontractors, and suppliers are as follows:

- The CF-system is a tool for improving service quality and competitiveness.
- Enables customers more sophisticated and diversified comparisons when preselecting partners in co-operation.
- Improves knowledge of the dynamics of customer satisfaction and service quality in the construction supply chain.
- Denotes areas in need of improvement in the whole branch of industry.
- On the project level, helps to perceive black spots in the process.
- Companies can position their performance on comparison with the competitors.
- In the long run improves the image of the company and whole construction industry

Figure 2 depicts the feedback flows between the parties in the construction supply chain. The arrow describes feedback flows during/at the completion stage of the project and the direction of the feedback flow. For example, the contractor gives feedback to the subcontractor only during the project because typically subcontractors change during the progress. They may also take part in the project only for a limited time. On the other hand, all other feedback flows go in both directions.

Figure 2. Feedback flows in the construction supply chain

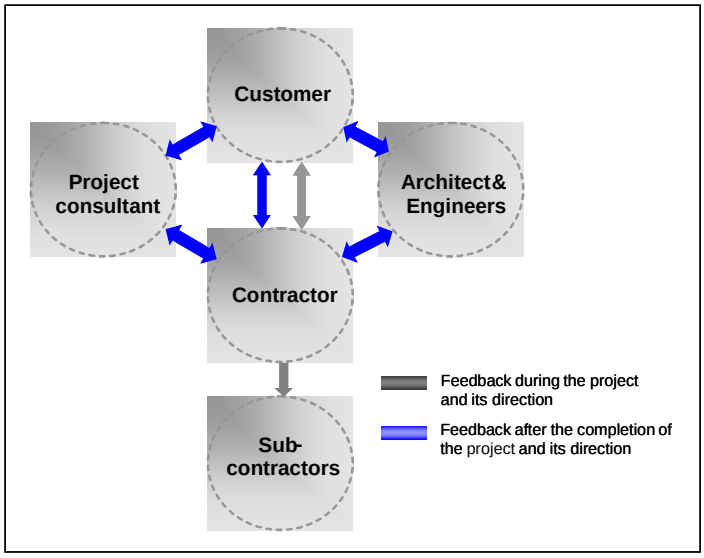
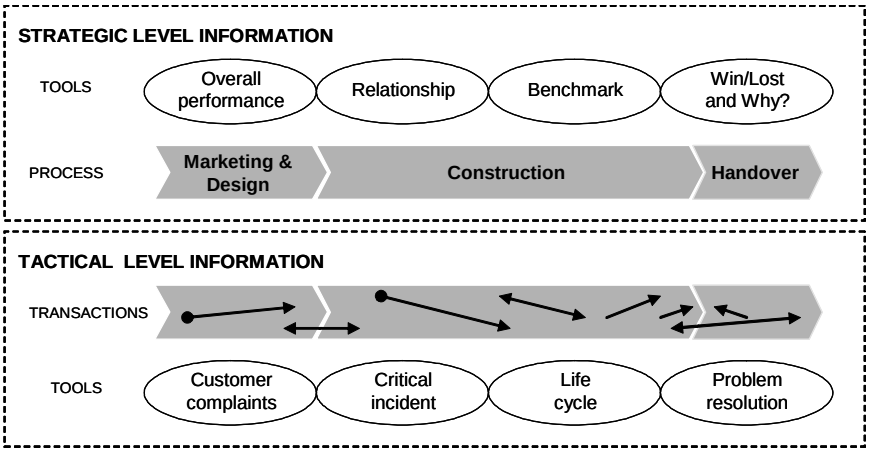



Figure 3 illustrates the theoretical framework, which can be used as a basis for improving implementation of the feedback data in order to improve a contractor's performance. The tactical level presents a transaction specific approach to customer satisfaction, which is the customer's satisfaction or dissatisfaction with a discrete service encounter. On the tactical level, customer listening tools provide information, which can

be directly linked to improving the contractor's internal processes. On the strategic level, satisfaction is the result of the all encounters and experiences with that particular organization.

In a construction project, feedback is usually collected and the customer's overall satisfaction is measured after the completion of the project. Customer listening tools can be used at the strategic level, for example, in developing strategic initiatives such as customer relationship management, benchmarking and Won/Lost and Why? -analyses. On the tactical level, customer feedback data can be used, for example, in solving customer complaints and analysing critical incidents. Transaction studies and overall satisfaction analysis are not distinct constructs. Furthermore, they can be seen as complementary in developing a company's customer feedback processes. Finally, companies should pay attention to linking customer satisfaction programs with actionability. According to Barnes (2003), many customer feedback systems are doomed to fail before they begin. He argues that customer feedback systems can be successful only when that vital information is linked, aligned and deployed within the organisation. "When customer satisfaction data is integrated and becomes a strategic direction for the organization, improved decision making results."

Figure 3. Application of the feedback information applied to construction.




## FEEDBACK AND LEARNING

As stated earlier, feedback is a one important basis for learning. Simply stated, feedback is a prerequisite for learning in construction both at the project level and on the company level. By well-timed feedback it is possible to prevent problems from developing or at least enable quick problem solving. Through effective feedback systems organisation can foresee changes in the business environment and could also adapt to these changes beforehand. This also requires various attributes from the organizational culture, for example transparency…

In addition, functional communication channels at the company and communication skills at the individual level are needed. This is challenging in construction due to the nature of construction. It is hard to give feedback and also allocate it to right party. This also hinders the fulfilling of the continuous learning objective.

A feedback system is part of company's communication system and no organisation can perform without communication. Every company makes mistakes and in all

likelihood mistakes recur without an effective feedback system. An organisation could receive feedback sporadics inside the organisation (organisation's initial feedback) and from customers, but it is important and warranted to organise a way to collect feedback.

The customers' experiences of the company's performance could be retrieved from various sources. Usually customer feedback systems are divided into (1) customers' direct feedback and (2) customer feedback sources. Usually, a company receives direct feedback information from the various different channels. The problem is that the information could be scattered in the different levels of an organisation or the nature of the information could be too average for further analysis.

## ORGANISATIONAL LEARNING

A learning organization and organizational learning are complicated and multifaceted phenomena, which are difficult to define unambiguously (Table 1). If they are defined too broadly, there is a danger that they will be used as a substitute for other forms of behaviour. If defined too narrowly, they will encompass only the content of everyday discourse. According to Senge, learning organizations place emphasis on “generative learning”. “Generative learning” emphasizes continuous experimentation and feedback in ongoing examination of the very way organizations go about defining and solving problems. To achieve this learning, Senge suggested the use of five “component technologies”: systems thinking, personal mastery, mental models, shared vision and team learning. According to Garvin (1993) learning organizations are skilled at five main activities: systematic problem solving, experimentation with new approaches, learning from their own experience and past history, learning from the experiences and best practices of others and transferring knowledge quickly and efficiently throughout the organization. Each is accompanied by a distinctive tool kit and pattern of behaviour. By creating feedback systems and processes that support these activities, companies can manage their learning more effectively.

***Table 1.*** *Summary of some researcher's views on organizational learning*

| Authors | Definition of organizational learning |
|---|---|
| Stata Ray 1989. | Organizational learning occurs through shared insights, knowledge and mental models…[and] builds on past knowledge and experience – that is, on memory |
| Argyris Chris 1977. | Organizational learning is a process of detecting and correcting error |
| Foil C.M. and Lyles Marjorie A. 1985. | Organizational learning means the process of improving actions through beret knowledge and understanding. |
| Garvin David A. 1993 | A learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insights. |
| Leonard-Barton D. 1992. | A learning laboratory is an organization dedicated to knowledge creating, collection and control |
| Senge Peter M. 1990. | Learning organizations are places where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together |
| Nonaka Ikujiro. 1991. | [Knowledge-creating companies are places where] inventing new knowledge is not a specialized activity --- it is a way of behaving, indeed, a way of being, in which everyone is a knowledge worker. |

Organizational learning occurs when an organization learns about its environment and processes and how to make these better. The central purpose of organizational learning is the creation of a comprehensive continuous improvement mechanism to create knowledge, values, and processes to deal with uncertainties. The majority of continuous improvement programs fail because most companies fail to see the basic truth: continuous improvement requires a commitment to learning. Without learning, companies and managers simply repeat the old practices under a new name.

Incremental process innovations in a stable organization can be created through "adaptive" learning. But a continuously learning organization uses generative learning to create in a concerted way new processes, remaining also efficient in day-to-day operations. The challenge for management is to create the necessary conditions for continuous organizational learning through incremental process innovations. In addition, constant improvement requires a commitment to learning (Garvin 1993).

For sound continuous learning from experience, unambiguous feedback about the change actions is essential. If new innovations are developed before feedback from the previous action has been gained and comprehended, the innovations are likely to lead to random drift rather than improvement (Levitt and March 1995, pp. 28-30). There is the risk that the "detail complexity" of the system is being solved by adding to the complexity, rather than by simplifying the systemic pattern and interrelationships of the problem, i.e. solving its "dynamic complexity" (Senge 1990, also Drucker 1990). Also Senge (1990, p. 114-115) recommends the use of the principle of "economy of means": the best results (in change) come not from large scale efforts but from small, systemically correct, well focused actions. This supports the idea of a continuously learning organization.

The greatest need is for a developed learning cycle, where the use of project experiences is maximised into the learning of all of the partner organisations. Reflecting on the process of work will become a second nature to the learning managers of the

future, and communicating the outputs of such reflections will be central. Projects have a restricted learning content because they exist for a single purpose and the project teams are dissolved when the goal has been reached. However, organisational learning literature stresses a continuous process of improvement. The way in which project organizations capture their learning is therefore a central issue, which requires greater attention. Continuous improvement coupled with organizational learning is a powerful way to improve business results. However, learning organizations cannot be built overnight.

## CONCLUSIONS

In this paper we have examined the connection between project feedback and learning. There is strong evidence that project feedback can support learning also at the organisational level. Feedback can also be used to focus an organization's development activities to the core areas of business to achieve the greatest added value. Having identified how the production processes stands when compared to others, the focus should be placed on investigating rather than assuming how those performing better achieve their performance rates.

As a conclusion, we present a framework to explore how mutual feedback system can improve project participants learning in the construction project at different facets. It also presents a way for linking vital information, aligned and deployed within the project organizations. In using project feedback as a method for learning in the construction industry, it is useful to divide learning into four dimensions; individual learning, construction team learning, organizational learning and relationship learning, which is illustrated in Figure 4 by vertical arrows. Horizontal arrows depict main the patterns by which feedback is collected on the project level.

It is important to note that the usage of the feedback information and the learning aspects differs in all four dimensions. For example, at the individual level, the main objective of learning is increasing professional competence, at the construction team level it is improving the teams' internal co-operation, at the company level it is the development of organizational competence and at relationship level it is the enhancement of co-operation and customer satisfaction.

Different benchmarks enable organizations to monitor customer perceptions of their performance and to improve their performance in various areas. They also enable to position organisations performance in comparison to the competitors and help to perceive black spots in the process on project level. Reference groups for benchmarks could develop, for example, according to the type of building, contractual relationship, line of business or nature of the project. This can only be achieved if the project feedback system is generally accepted in the industry and the terms are agreed within the industry.

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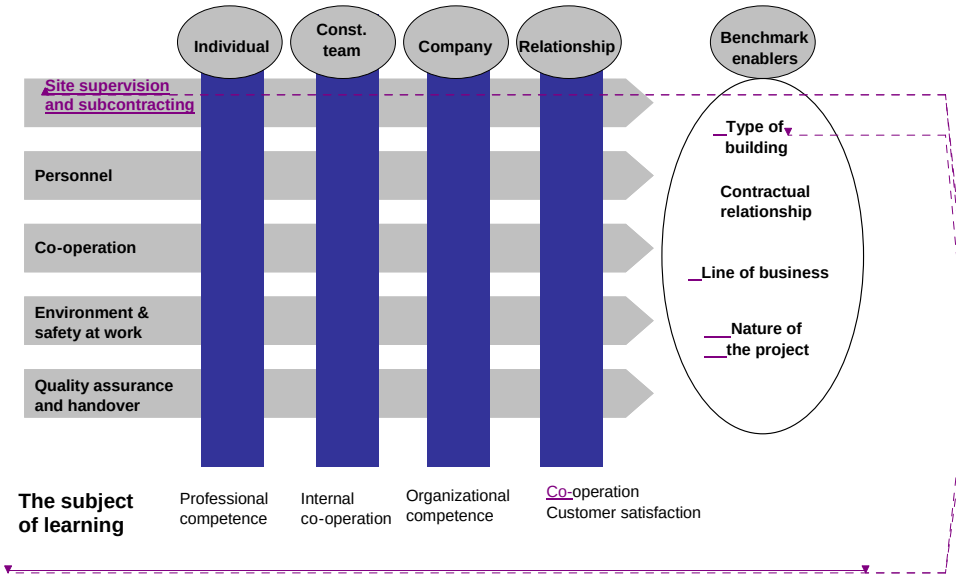
Figure 4. The relationship between learning and customer feedback.

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