Evaluating the Competence and Emotional Intelligence of Members in a Software Development Project

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Abstract

In this study, a method for evaluating the Competence and Emotional Intelligence (EI) of project members was investigated. A web-based system for collecting competence and EI data was developed for this study. By using this system, it is possible to visualize the subjects' characteristics in a 3-dimensional figure. An investigation at an IT company was conducted to confirm the effectiveness for management. Based on this study, we will propose proper ways of presenting information on human behavior, such as competence and EI, to project managers.

Introduction

For effective project management, it is necessary to know each member's ability, such as their business skills, knowledge level, and so on. Moreover, it is also important to know their competence and Emotional Intelligence (EI). Competence is a new concept for evaluating a high-performance person's characteristics and is an action tendency which is a factor in increasing achievements and results from the average of such people's actual actions. EI is a form of capability that adjusts feelings in order to grasp one's feelings exactly and to take a suitable action according to the situation. This kind of information is helpful for project managers to plan business strategies. However, simply showing a vague evaluation to a project manager is useless, because disorderly information is difficult to recognize at the same time. Evaluations of members should be recognized by the project manager inclusively to achieve good human resource management.

In a series of research projects, an effective way to present this information to a project manager is discussed. In this study, the evaluation methodology for competence and EI was investigated. Based on this study, we will propose a proper way to present information on human behavior, such as competence and EI, to a project manager. Even if the technical skill of the manager is high, his or her productivity is not always high. Improved business performance is created by human skills, such as communication, leadership, coaching and so on. It is important to grasp such abilities to make a good project team. These kinds of abilities tend to vary within the group that the members belong to. In this study, the evaluation focuses on the relation between members.

Kijima(2003) pointed out that each person is influenced from other people and the influence would make the characteristic of the organization. But they din not describe a method for analyzing the influence.

This paper deals with the factors those affect the EI and the competence, and give methodology to investigate the effectiveness of method.

Objectives

The main objectives of this study are as follows:

1) To suggest a method for evaluating the Competence and Emotional Intelligence of project members.
2) To develop a web-based system for collecting and analyzing the competence and EI.
3) To visualize the characteristics of project members based on organizational circumstances.
4) To investigate the effectiveness of the method.

Method

A questionnaire for Competence and Emotional Intelligence was made based on a previous study (Liang and Konosu, 2004). A total 95 software development engineers (30 Project Managers and 65 Programmer) were used as subjects. Effective answers were received from 94 of the subjects. Figure 1 shows an image of the web-based data analysis system developed in this study.

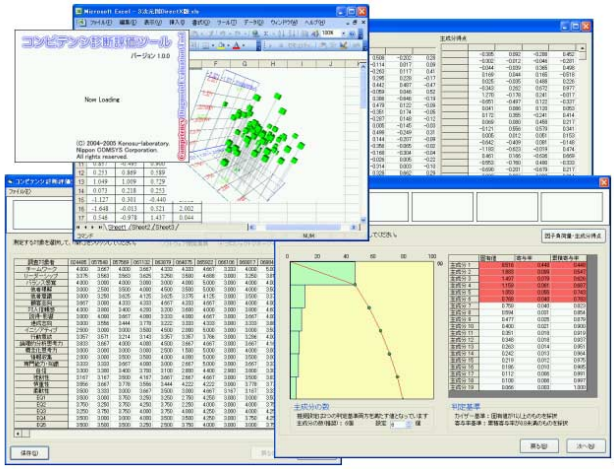

Figure 1: Image of the web-based data analysis system.

A Definition of Competence and Emotional Intelligence

In this study, competence was defined by abilities in 24 categories, such as accountability, initiative, self-control, and so on.

Emotional Intelligence is also defined as follows based on a previous study.

1) To know self-feelings: The ability to recognize and control their own emotions.
2) To know the emotions of another person: The ability to recognize the feelings of another person.
3) To create ideal feelings depending on the situation of the place: The ability to understand the situation and create suitable feelings.
4) To predict a future result: The ability to predict how a result will become.
5) To reflect the created emotion in their lives: The ability to reflect controlled feelings in their actions.
6) General ability of Emotional Intelligence: The sum of the above-described abilities.

In this study, these abilities were evaluated using a rating scale of 1-5.

Results

It is possible to analyze the characteristics of project leaders and members by using the web-based system developed in this study. A total of 24 categories for competence were analyzed by principal component analysis. Figure 2 shows the competence map for an IT company. From the figure, the relation of competence between members can be discerned.

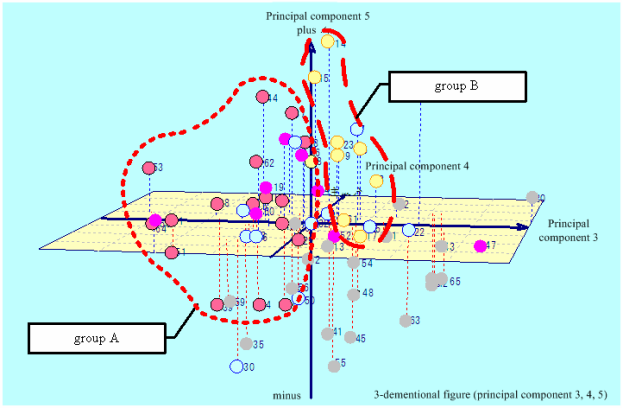

Figure 2: Competence mapping

By using the web-based system, the following results were found. The subjects could be divided into three groups according to the non-hierarchical cluster analysis of subjects, for high, middle, and low average scores of Emotional Intelligence. The tendency for their ability can be seen by classifying the group. In addition, self-development can be promoted by having the subjects recognize their own characteristics.

It was also proposed that there was a difference between project managers and programmers (Figure 3). The standard deviation of the project manager is higher than that of the programmer. From these results, it is supposed that the EI scores of project managers tend to be more variable than those of programmers. Table 1 shows a correlation matrix of project managers. A project manager has a strong correlation in all items. An excellent project manager must have a high ability in all categories of EI scores.

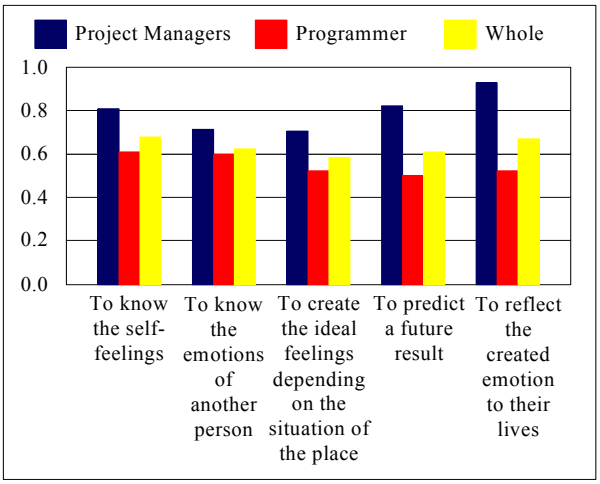

Figure 3: Standard deviation of each EI Category

All the EI subjects could be divided into two groups according to the hierarchical cluster analysis. The first group contains the persons who have a high ability to recognize their own emotions and are able to act according to their ideal emotions. The second group contains the persons who have a high ability to recognize the emotion of others and are able to predict the results caused by their actions.

Table 1: Correlation matrix of project manager.

Variables	(1)To know the self-feeling	(2)To know the emotions of another person	(3)To create ideal feelings depending on the situation of the place	(4)To predit a future result	(5)To reflect the created emotion in their lives
(1)	1.000	0.806++	0.882++	0.884++	0.836++
(2)	0.806++	1.000	0.786+	0.905++	0.788+
(3)	0.882++	0.786+	1.000	0.870++	0.893++
(4)	0.884++	0.905++	0.870++	1.000	0.883++
(5)	0.836++	0.788++	0.893++	0.883++	1.000

Conclusion

It is possible to collect and analyze competence and EI data more easily and quickly than before. By using the system developed in this study, it is possible to visualize the characteristics of project managers and project members in a short time. This will be helpful for building business strategies.

References

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