Understanding the Influence of Individual Values on Management of Software Development: Thai IT Professionals

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Abstract. The management of software development is a vital factor for the success of the software project. The most important component involved in the project is the team members. Individual values of these Thai IT professional should affect the software development management practices. In this research, we found that self-direction is the individual value that influences every practice. Mixed individual values are required for the smooth software development management practices. Moreover, Thai IT professional are influenced by professional culture and national culture.

Keywords: Individual Values, IT Project Management, Software Development Management

1. Introduction

Software development industry in Thailand has become an important role in both business organizations and government agencies. Nevertheless, most software development projects still have faced the failure problem. According to the report from the Standish Group in 2009 [1], the rate of successful IT projects was 32% of all projects. In this report, the experienced project manager is a success factor. As a result, effective project management is significant to any software development project. In case of the software development, a work team is a significant component as it is a primary mechanism for developing software. There have been few studies on individual values of IT professionals. In social sciences, individual values play an important role in explaining how work values and other aspects of [2, 3, 4]. Hence, the values of each member of software development project typically influence the way he/she works on the project.

In this study, we explore influence of values of Thai IT professionals on the practices of software development management that contribute to the successful delivery of a software product. For this purpose, we adopt a theory of the structure and content of the basic values distinguished by individuals [5] and employ the software development management practices used in the survey in the European countries [6, 7] modified by Leung [8].

2. Individual Values and Management of Software Development

2.1. Individual Values

To identify individual values, a measurement is required. The most popular scales for measuring values are those of Rokeach [9], Inglehart [10], Schwartz [5], Hofstede [11] and O'Reilly, et.al [12]. Rokeach identified two kinds of values which are instrumental values and terminal values. Terminal values refer to end-states of existence while instrumental values are defined as modes of behavior used to arrive at end-states. Terminal values focus on 2 groups: personal and social. Instrumental values are subdivided into moral versus competence value classifications. Another individual values measurement is Materialism/Postmaterialism (MPM) proposed by Inglehart [10]. The results from his research showed

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bipolar. The negative pole contained five materialist items while the opposite group included five of six postmaterialist items. Inglehart and Baker [13] illustrated two dimensions (1) Traditional/ Secular-rational and (2) Survival/Self-expression values. The researchers discussed a shift from traditional to modernization, and a shift from survival to well being called postmodernization, a replacement of material goals. Hofstede [12] identified four dimensions of national culture: power distance, individualism versus collectivism, uncertainty avoidance, and masculinity versus femininity. O'Reilly, et.al [12] developed an instrument called "Organizational Cultural Profile" (OCP) to measure person-organization fit. Their research provides a based definition of the pattern of values. The individual values include eight dimensions which are innovation, attention to detail, outcome orientation, aggressiveness, supportiveness, emphasis on rewards, team orientation, and decisiveness. Schwartz [5] defined values as conceptions of the desirable that guide the way individual to select actions, evaluate people and events, and explain their actions. From 21 questions, Schwartz grouped them into 10 basic values. Then, he organized these basic values into 2 dimensions. The first dimension is openness to change (self-direction and stimulation) versus conservation (security, conformity, and tradition). The second dimension is self-enhancement (universalism and benevolence) versus self-transcendence (power and achievement). Hedonism is related both to openness to change and to self-enhancement.

2.2. Software Development Management Practices.

There are many researches regarding to software development practices. However, there were a few studied researches that cover various aspects of software development management. Dutta et.al [7] conducted a survey on software management practices in European communities. In the survey instrument, they divided software development practices into 5 areas which are organizational and management practices, standards and procedures, metrics, control of development process, and tools and technology. The questions of the survey were influenced by the previous researches, such as Capability Maturity Model (CMM), Europe's Bootstrap Model and Process Improvement and Capability dEterminator (SPICE). Leung [8] adopted practices from Dutta, et.al. as a starting point for studying the situation of software development management in China and Hong Kong. He selected only those practices with average adoption rate over 50% and arrived at 20 practices for his study. Although Verner and Cerpa [14] provided a set of software development practices, the practices focused on five areas of project management. These practices are different from the study of Dutta, et.al and Leung which covered more aspects of the management practices. Furthermore, the survey questionnaire was conducted in wide range of countries in Europe.
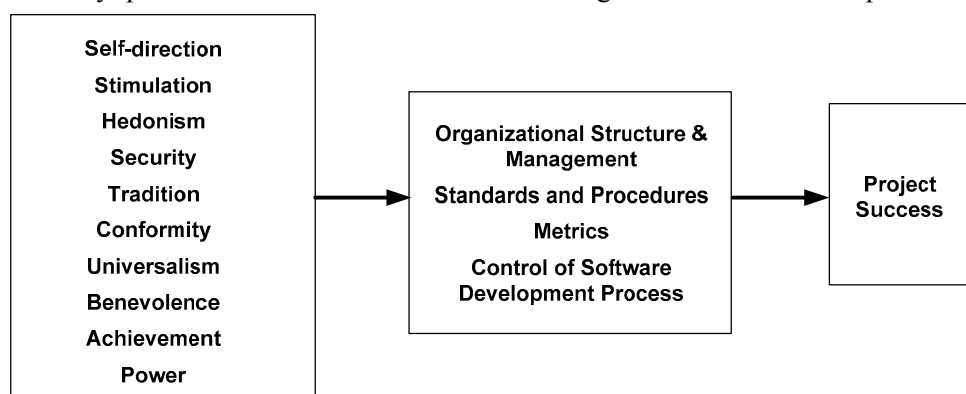

Figure 1: Research Framework

3. Research Methodology

We adopt the set of software development management practices provided by Leung [7] as the independent variables and Schwartz's individual values as dependent values in our research model depicted in Figure 1. A questionnaire consisted of 3 parts is used to collect data: general information related to the responder and his/her organization, 21 questions related to his/her values, and twenty software management practices. For the questions in the second and third section, we employed five Likert scales to represent the level of the respondent's opinion. The questionnaire was translated from English into Thai by a Thai IT academic professor. The questionnaire was pretested and Cronbach's Alpha is .922. The target respondents

are the persons who work for software development project in the Thai IT outsourcing companies. The sample size is 384 calculated with 95% confident from unknown population. The survey used the drop-off, pick-up method to collect data [15]. We sent the questionnaires organized by an IT business analyst to 400 Thai IT professionals working in twenty IT outsourcing companies sampled from the list of software and IT firms provided by the National Software Industry Information Mining. There are 384 responses which equal to 96%.

4. Findings

Most respondents were female, quite mature employees, graduate bachelor degree from university in Thailand in Information Technology, and Computer Science. They work in current company as programmers or systems analysts with work experience between 1 to 5 years. However, they have experienced related to software project divided into 2 groups: 1-5 years and more than 10 years. This means that the respondents consist of experienced IT professionals and less experienced. Most IT projects that they involved include trading, banking and finance, government and manufacturing.

Table 1: R^2 and Coefficients

		b	SE b	β	t	Sig.	Tolerance	VIF
Organizational Structure and Management	(Constant)	1.424	.348		4.096	.000		
	Self-direction	.326	.064	.256	5.132	.000	.775	1.291
	Conformity	.306	.057	.283	5.407	.000	.708	1.413
	Tradition	-.157	.047	-.155	-3.344	.001	.900	1.111
	Benevolence	.167	.063	.126	2.662	.008	.861	1.162
R = .517, R^2 = .267, R^2_{adj} = .259, SEE = .55235, F = 34.522, Sig. = .000								
Standards and Procedures	(Constant)	1.103	.261		4.231	.000		
	Self-direction	.456	.061	.368	7.437	.000	.779	1.284
	Conformity	.157	.053	.148	2.950	.003	.753	1.328
	Achievement	.153	.053	.142	2.912	.004	.803	1.246
R = .526, R^2 = .277, R^2_{adj} = .271, SEE = .52887, F = 48.502, Sig. = .000								
Metrics	(Constant)	1.264	.288		4.382	.000		
	Self-direction	.413	.063	.344	6.584	.000	.728	1.374
	Universalism	.403	.066	.310	6.086	.000	.768	1.302
	Stimulation	-.102	.043	-.124	-2.363	.019	.719	1.390
R = .494, R^2 = .244, R^2_{adj} = .238, SEE = .53431, F = 40.965, Sig. = .000								
Control of Software Development Process	(Constant)	1.134	.378		2.998	.003		
	Self-direction	.443	.070	.336	6.365	.000	.708	1.413
	Universalism	.285	.083	.200	3.442	.001	.586	1.706
	Tradition	-.134	.048	-.128	-2.812	.005	.952	1.051
	Benevolence	.257	.076	.187	3.369	.001	.638	1.567
	Stimulation	-.131	.049	-.145	-2.691	.007	.679	1.472
R = .506, R^2 = .256, R^2_{adj} = .246, SEE = .57903, F = 25.955, Sig. = .000								

The results provided by stepwise regression analysis in Table 1 illustrate the influence of individual values on the software development management practices. There are 4 individual values effecting the organizational structure and management with R^2 equal to .267. It means that 26.7% of variation in this practice can be explained by self-direction, conformity, tradition and benevolence. The organization structure and management includes lines of authority and available resources. According to Schwartz [5], self-direction belongs to openness dimension while conformity and tradition are values in conservation

dimension. This means that contrary individual values may be needed. Self-direction provides Thai IT professionals to be independent and to make their own decision related to their responsibilities. At the same time, conformity accepted from Thai people [3,5] allows members of software team to obedient and to respect the elder or their leader. As software project requires creative thinking and teamwork, people with benevolence are welcome to the team. Although, the tradition value has a little negative effect on this practice, it should be concerned because it may prevent the members of the software team to think out of box.

In case of the standard and procedures practice dimension, there are self-direction, conformity and achievement included in the model for explaining this practice. The model contains R^2 equal to .277. Self-direction not only allows creative people like Thai IT people to show a strong achievement but also allows them to demonstrate their independent thinking and exploring risk, benefits and viability of project [16]. To improve quality of software development, Thai IT professionals will accept and follow standard and procedure established by the organization. Moreover, the achievement value indicates their capability and successful and will certainly receive acknowledgement from the team.

The metric practice covers the collecting and utilizing statistics to improve error prevention and project estimation. The individual values related to the metrics include self-direction, universalism, and stimulation with which R^2 is .244. Again, self-direction carries highest regression coefficient. Of course, this value is compatible to the characteristic of the metrics practice as it requires Thai IT professionals to examine data and statistics in order to effectively improve their works. The universalism value indicates that Thai IT professionals prefer justice, listen to other people and have broadminded. This value supports metric establishment. However, negative regression coefficient of stimulation value opposes to the metric practice. Managing the project with the members of the team who love exciting and challenging may be a problem. Thai IT professionals do not like boring job such as maintenance of records and feedbacks and tracking the problems.

The last practice of software development includes procedures for testing and for controlling changes which can be explained by 5 individual values about 25.6% (R^2 = .256). These values involve self-direction, universalism, tradition, benevolence and stimulation. However, tradition and stimulation receive the negative regression coefficient. Although IT professionals are independent, prefer freedom of thinking; do not like using power or controlling [17], the self-direction value of Thai IT professionals should not be an obstacle to the management practice. This is because the activities for this practice aim at controlling to achieve quality and closing the project, not for preventing their creative. For the universalism and benevolence values, Thai IT professionals concern with social, people around them, equality, honest, and responsibility. Therefore, these individual values should promote this practice because Thai IT professionals will devote themselves for the success of the project, not just for their satisfaction. On another hand, tradition and stimulation negatively explain this practice. In case of the stimulation, the effect of this value on the control of development process is similar to the metric practice. For the tradition value, Thai IT professionals respect for what traditional culture or religion provided. They prefer smooth interpersonal relationship [18]. Hence, controlling changes, verifying functions and estimating may produce conflicts and unpleasant to people around them. The consequence is that Thai IT professionals try to avoid this situation which may result in serious performing this practice.

5. Summary

The results from the research illustrate that self-direction is the value that explains variation of every dimension of the practices. This is because this kind of management is the difficult works. Complex jobs typically require employees who have a high level of self-direction and self-control. At the same time, hedonism, security and power are excluded from the research model.

There are three management practices explained by individual values which have conflict characteristics (self-direction VS tradition and conformity). These are organizational structure and management, standards and procedures, and control of software development process dimensions. This result indicates that Thai IT professionals are influenced by professional culture and national culture. Sometimes national cultures promote required behaviors at the same time they prevent that behavior. Although, the metric practice

dimension contains individual values which is explained by unconflicted characteristics (self-direction and stimulation), one of them does not promote Thai IT professional to perform this kind of practice.

According to the discussion above, we can conclude that to manage Thai IT project, a project manager should be aware that Thai IT professionals are bounded with different culture: IT professional culture and national culture. Moreover, mixed individual values are required for the smooth software development management practices. Therefore, if IT organizations need to encourage these management practices, they have to balance the conflict of individual values and to promote supported values.

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