Talent Analytics System for UMP Lecturer Performance

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A thesis submitted in fulfillment
of the requirement for the award of the degree of
Bachelor of Computer Science
(Graphics & Multimedia Technology)

Faculty of Computer Systems & Software Engineering
University Malaysia Pahang

June 2013

ABSTRACT

Talent analytics is a concept of taking effective ways of analysing employee data in order to enhance workforce performance. This concept will be adopted in University Malaysia Pahang (UMP). The currently applied system, E-pat, is an instructional evaluation system that able to evaluate lecturer performance. This system has some limitation in analysing lecturer performance. For instance, in the E-PAT evaluation system, those questions do not group for evaluation of lecturer skills and do not show up any report in response to skills of lecturers. Lecturer could not obtain a clear idea from the E-PAT for their decision making to improve their skills. Hence, this study was aimed to develop a Talent Analytics System (TAS) for analysing of UMP lecturer performance. In this system, the report of lecturer performance was improved in order to help in them identifying skills they need to be improved. In the improved system, the data from E-PAT student evaluation data would be processed into useful data for assisting lecturer in analysing their skills. Along with an investigation of the literature, an idea is taken that E-PAT's questions will be divided into 4 groups to determine skills of lecturer such as personality, communication, technical and teaching. In the development, three modules is developed such as lecturer module, faculty module and CAIC module. Each module consists of three function, there are visualize, analyse and generate report. Besides that, information visualization technique will be incorporated into the system so that lecturer can easily understand the report by looking at the presentation graph. In this project interview session was selected to address the requirement for the development of the system. The system was developed using Google tools and some programming language such as PHP and HTML5. Water fall methodology was chosen in this project that incorporated from the starting of the development system to end of the project. At the end of the system development, there were 83% of users satisfied with the TAS.

Keywords: Talent Analytics, Data visualization

ABSTRAK

Talent analytics adalah satu konsep yang mengambil cara-cara yang berkesan dalam menganalisis data pekerja untuk mengningkatkan prestasi pekerja-pekerja. Konsep ini akan digunakan dalam Universiti Malaysia Pahang (UMP). Dalam system yang ada sekarang, E-PAT adalah system penilainan pengajaran dapat menilai pretasi pensyarah. Walaubagaimana pun, E-PAT mempunyai batasan dalam menganalisi pretasi pensyarah, contohnya, soalan E-PAT tidak dibahagikan kepada kemahiran –kemahiran pensyarah. Oleh itu kajian ini akan membangunkan system Talent Analytics untuk pensyarah-pensyarah di UMP. Objektif projek ini adalah memvisualisasikan pretasi pensyarah-pensyarah untuk membantu dan miningkatkan kemahiran-kemahiran meraka. Pensyarah-pensyarah dapat menganalisasikan pretasi kemahiran mereka berdasarkan dalam range rujukan kemahiran. Dalam penyiasatan di literature, satu idea telah diambil bahawa soalan E-PAT aka terbahagi kepada 4 kumpulan untuk menentukan kemahiran pensyarah seperti personality, komunikasi, teknikal dan pangajaran. Selain itu, teknik visualisasi maklumat akan diguna dalam sistem supaya pensyarah dapat memahami apakah yang ditunjukan dalam graf persembahan. Dalam pembagunan system ini, tiga modul telah dibina seperti pensyarah, faculty dan CAIC. Dalam setiap modul mempunyai tiga fungsi seperti visualasasi, analisis dan menjana laporan Sesi temuduga telah diplih untuk memdapat kehendakan yang akan membagunkan system ini. Peralatan Google dan beberapa bahasa programming seperti HTML5 dam PHP telah digunakan dalam membangunkan system ini. Model air terjun telah dipilih dalam projek ini dari permulaan projek sampai penamatan projek. Pada akhir, terdapat 83% pengguna berpuas hati dengan TAS.

Kata kunci: Talent Analytics, data visualisasi

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CHAPTER 1

INTRPDUCTION

1.0   Introduction

Talent is a natural ability; analytic is a process, technology that turns input data to the knowledge and information (Rashmi Mathur, 2010). So, talent analytics is a concept that mentioning organizations should take effective ways of analyzing employee data to enhance workforce performance (David Andrews, 2011). Talent analytics focus on evaluating and optimizing human talent in order to improve workforce environment which match with organizational objectives. In another word, talent analytics help employee professionals improve their practices, and always keep employees improved their skills and motivated (Thosmas, 2010). Besides, the performance of recruitment and training programs can be accessed by decision making of talent analytic system (Susy Ndaruhutse, 2005). In this study, talent analytic concept will be used to analyze and evaluate lecturer's performance based on their skill during each semester.

Nowadays, there have been a lot of organizations around using talent analytics to manage their workforce analytic. Big performance data of employee will be analyzing to discuss workforce analytics. It provides an opportunity for the employees to push in their work performance and enable them to get a great treatment in their organization (Talent Analytic, 2012). The decision making of talent analytic is better intuition because it is more advance to the business it serves (Dashboard Insight, 2012). Besides, Data information can help employee to improve decision making. They can use the data to evaluate who need more practice and skill to improve their skill. (Talent Management. 2012). Furthermore, Roberts stated that talent characteristics highlight employee value; he

mentioned "Numbers are the language of business" and "people are also numbers — but not only numbers. We have a weight and a height; Employees as our asset" (Analyze this: Talent analytics quantifies you, 2012).

According to Economist Intelligence Unit (2006), most CEOs definitely agreed that talent analytic very important to keep it for human resource in an organization. Boston Consulting Group (2007) illustrated that talent analytics is a critical challenges for human resource in the world. The concept of talent analytic is widely to be used in the organization beyond human resource. The specific contribution of the system in this chapter is in developing an obvious strategic talent analytic. In this project, a technical system will be develop of strategic talent analytic. Therefore Talent analytic system is essential and need to be carried to analyze and evaluate UMP lecturer performance and how to enhance their skill with this system.

1.1 Statement of Problem

E-pat is an instructional evaluation system in which UMP students can evaluate lecturers who taught in their registered subject. But somehow, there is a limitation in analyzing lecturer performance through the E-PAT student evaluation data. The current E-PAT system just shows the scaling mark for student to evaluate lecturers without data analysis. The questions E-PAT system showed without grouping according to the skills of lecturers, such as communication skill, technical skill, learning skill and personality. Lecturers were unable to obtain info related to the skill they have when to refer to the result. Hence, lecturer cannot make decision making to improve their skill based on the result showing to them. Whenever lecturers get a report about their performance, the report just shows the raw data without showing any strength and weaknesses of lecturers. Since, the current system does not show up the skills for lecturers, hence there is no realistic visualization to help the UMP lectures in analyzing their performance.

Thus, Talent Analytics System (TAS) for UMP lecture performance will be proposed to solve the weakness of the system. In this system, questions from the E-PAT system will be grouped based on the lecturer's skill; data from the E-PAT will be used to

visualize the performance of lecturer. The outcome of TAS would enable lecturers in UMP to have obvious view to their own skills after the report is generated.

1.2 Objective

i. To develop Talent Analytics System for UMP lecturer performance using information visualization technique.

ii. To analyse lecturer performance based on E-PAT student evaluation data.

iii. To visualize lecturer performance in order to help them which skills they need to improve.

iv. To generate report for UMP staffs so that they can visualize their performance by viewing report.

1.3 Scope of study

i. There are three modules involved in the system which are lecturer module, faculty module and CAIC module.

ii. The system will be performed in to three functions which consist of analysis function, generate result function and visualize function.

iii. Information visualization technique will be used in the TAS

iv. The system will be performed as a prototype.

v. Analyse lecturer performance based on the grade reference of lecturer.

vi. Grouping the E-PAT questions in to 4 categories such as personality, communication skill, and technical skill and teaching skill.

1.4 Thesis organization

There were a total of six chapters in this thesis. Chapter 1 contained the introduction that discussing about the concept of TAS. Chapter 2 is covered the literature that researching on previous work. Chapter 3 is describing methodology which included the methods used in the development of the system. Chapter 4 showed the design of the system interface and how to implement the system with algorithm. Chapter 5 contained the result based on the module test and user test. Lastly, Chapter 6 contained recommendation for future work and overall TAS conclusion.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

In this chapter, literature review is focused on studies related to current system application. This is to gain more knowledge and better understanding of the problem and opportunity, as well as the advantages and disadvantages that existed in the current system, which is driving development of the new system.

2.2   Talent Analytics

Talent analytics is a concept that related to the aspects in human resource analytics such as human capital, human resource analytic, human resource behavior. Although most of the organization are using this concept, but there are differences between the method that they used. Some of the researcher described that the strategic importance of analytic key individuals in the organization (Lewis & Heckman, 2006; Collings & Mellahi, 2009) while others emphasized on the strategy of talent is important to develop the right people with the right skills at the right time in the organization (Cappelli, 2008; Tarique & Schuler, 2010). Lewis and Heckman (2006) identified three key lines of thought around the concept of talent analytics. First, for those who study the talent analytic regarding human resource. The studies follow the tradition ways focus on HR practices such as leadership performance, recruitment and succession planning. The dedication of this knowledge is relatively to the strategic human resource literature, as it largely amounts to have a strategy of human resource   analytic.   The   second   line   of   strategy   underline   the

development personnel training focusing on "projecting employee/staffing needs and managing the progression of employees through positions" (Lewis & Heckman, 2006).

Studies in this field generally develop on earlier research in the manpower planning. Besides, while adopting a specific tradition knowledge, degree of differentiation needs to provide as to what talent analytics is strategy of human resource management. The third line points on the analytic of talented people. This field mentions that all roles within the company necessary to filled with "A performers", referred to as "topgrading" (Smart, 1999) and underlines the analytic of "C players", or consistently poor performers, out of the organisation (Michaels et al., 2001). This is establishing with an specific recognition that degree of differentiation should be exist of roles within organizations (Becker & Huselid, 2006). This is in comparison to the extant circumstances in many companies where over-investment in non-strategic roles is common. (Huselid et al., 2005).

2.3   Existing System on Talent Analytics

2.3.1   Establishing talent management for company's succession planning through analytic network process: Application to an MNC semiconductor company in Taiwan

This research is to build a leadership development plan for a company's succession planning which is preparing for the future competition (F.C. Hora, 2009). A semiconductor assembly and testing multinational corporation (MNC) in Taiwan was selected for interviews of its high level management to address the business strategy and challenge. This research focuses on the experiences and leadership competencies which is necessary for those who are in leadership position. There are several of intangible factors to build major strategy leadership development program, as well as dependent relationship among experiences and leadership competencies. In this research, analytic network process (ANP) approach will be used to solve the difficulty via pairwise comparisons by experts. (F.C. Hora, 2009) A weight system will be develop focus on leadership competencies and experiences for designing the leadership development program, also touch to the decision basis of leadership selection.

According to the development program, the system is search for people in leadership position based on their leadership competencies and experiences. Cameron, B.

(2007) argues that succession planning is one of the feature and progress of leader of the future, so company need to develop the right people with the right skills at the right time for leadership position.

Based on Ibarra statement, several critical aspects necessary for effective succession planning in an organization as follows:

    (i)   Leadership competency models that provide a blueprint for high performers.

    (ii)   A functioning performance management system that measures individuals against the leadership competency models.

    (iii)   An individual development planning process that helps narrow the present gap between current competencies and current performance and the future gap between future competencies and the potentials that are required.

    (iv)   A measurement method that assesses how well the succession program is functioning over time meaning that whenever there is a vacant leadership position, there are one or two suitable candidates within the organization who are prepared or qualified for a leadership position. Most people who have been promoted or have taken up a new assignment will perform well. Nevertheless, there are a few among them who are bound to fail in delivering the expected results. (F.C. Hora, 2009)

This study describes the relationship between the competence and environment, meaning what type of leadership competenancy and experience shpuls perform in an organization. This research interviewed with management teams and summary as four leadership experiences and five leadership competencies. There are four experiences as followings: managerial experience, consistent good performance, cross function experience, and cross site experience. There are five leadership competencies: leadership, operational management, personal character, getting-things-done, and communication Each of the leadership competencies include 3 sub-leadership competencies with 15 items in total.
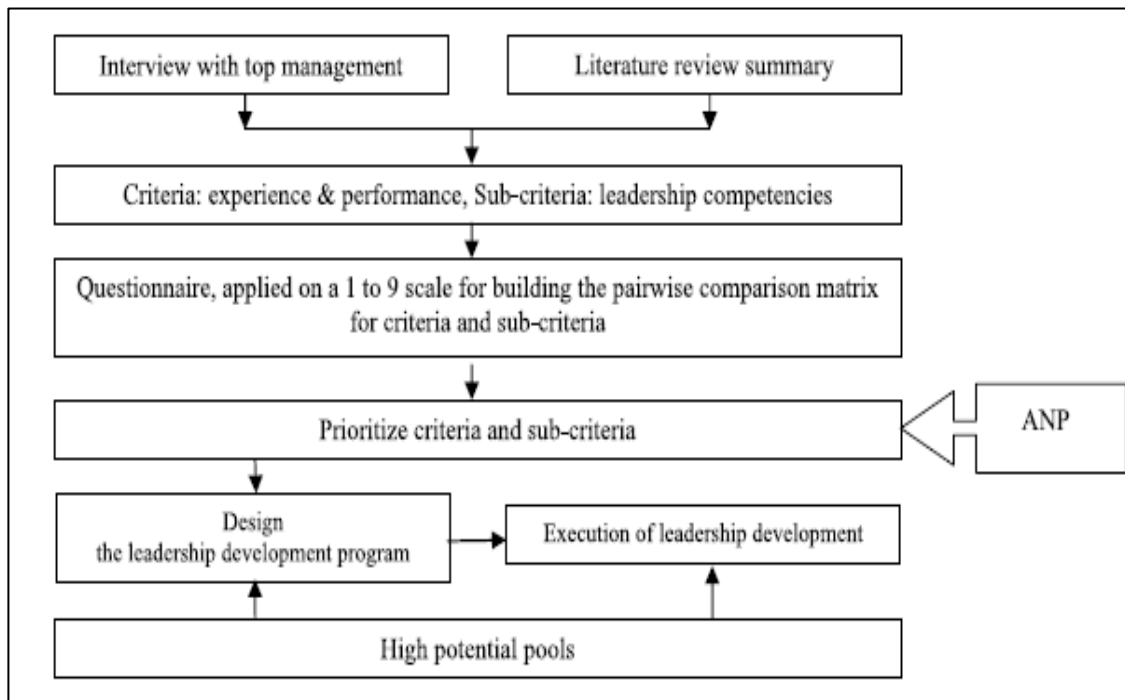
Figure 2.1   The framework of the study. (F.C. Hora, 2009)

The formulation of business strategy and goal should be based on leadership competency which to promise their execution and performance. The leadership competency model includes both needed experiences and leadership competencies. Experience has four dimensions of consideration: management experience, consistent good performance, cross site experience, and cross function experience.

Figure 2.2   The relationship structure of the leadership development program
(F.C. Hora, 2009)

In the leadership competency, it includes experiences and leadership competencies. Experience has four dimensions of consideration: management experience, consistent good performance, cross site experience, and cross function experience. While there are 5 categories for leadership competence and each of them includes 3 detailed descriptions: leadership (leading change, inspiring commitment, managing diversity), operational management (cost management, risk management, strategy deployment), personal character (creative thinking, demand top performance, flexibility), gettingthings- done (organizing, problem & decision making, project management), and communication (language, managing conflict, negotiation).

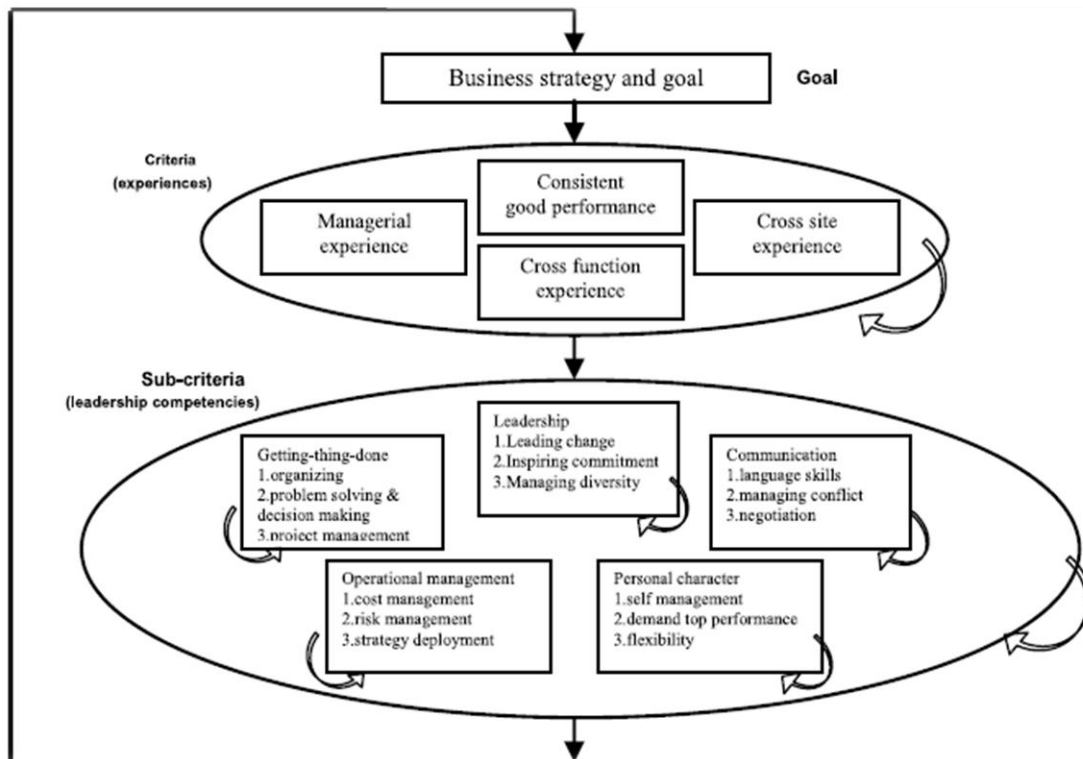
Figure 2.3   **Structure model of the leadership development program based on ANP.** (F.C. Hora, 2009)

A leadership competence is the main model to a succession planning. In the future it supplies profiles of ideal performers. Besides, it supplies a method to arrange how people are choosed and how people are built along with the organization's planning objectives. A

company should know what is necessary nowadays and be flexible about what it necessaries under dynamic changes business climate particularly in a technology-driven organization.

2.3.2 A Benefit-Cost Analytic Framework for Selection of Human Resource Measures

This paper applies BCG matrix technique to the choice of HR measures strategically and every measure was supplied by the framework for the cost-benefit analysis. The general method, presentation and process are suggested for human resource professional choosing human resource measures for their own personal firms.

Relative market share on the x-axis represents the strategic business unit's market share relative to that of its major competitor in the sections, market growth rate on the y-axis represents to the annual growth rate of the market in while the business is operate, and bubble's size refers to the current size of the business. The association of three properties defines which groups (cells) the business falls into and what plans are suitable to the current business.
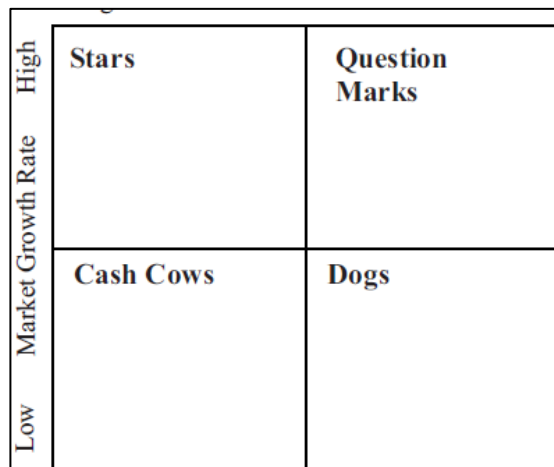
Figure 2.4 **BCG Matrix** (Morrison & Wensley, 1991)

In the research, BCG matrix visualization will be used and it is associated with empirical assessment of the benefit cost of HR measure adoptions. The x-axes and y-axes are to determine the plan relevance and implementation difficulty. The bubble's size which indicates human resource measure which represents the frequency of usage of the concerned human resource measure in practices.

Figure 2.5   **HR Measure Analytic Matrix** (Morrison & Wensley, 1991)

Lastly, the main point of this research aspires to provide for human resource professionals is not the ordinary conclusions, however the process it applies to arrive at the various conclusions. It is the interests of human resource managers to survey an suitable sample of employees of their company and use the data for according analysis.

2.3.3 A New Approach To Welders' Performance For Increasing Steel Structure's Safety via Talent Management
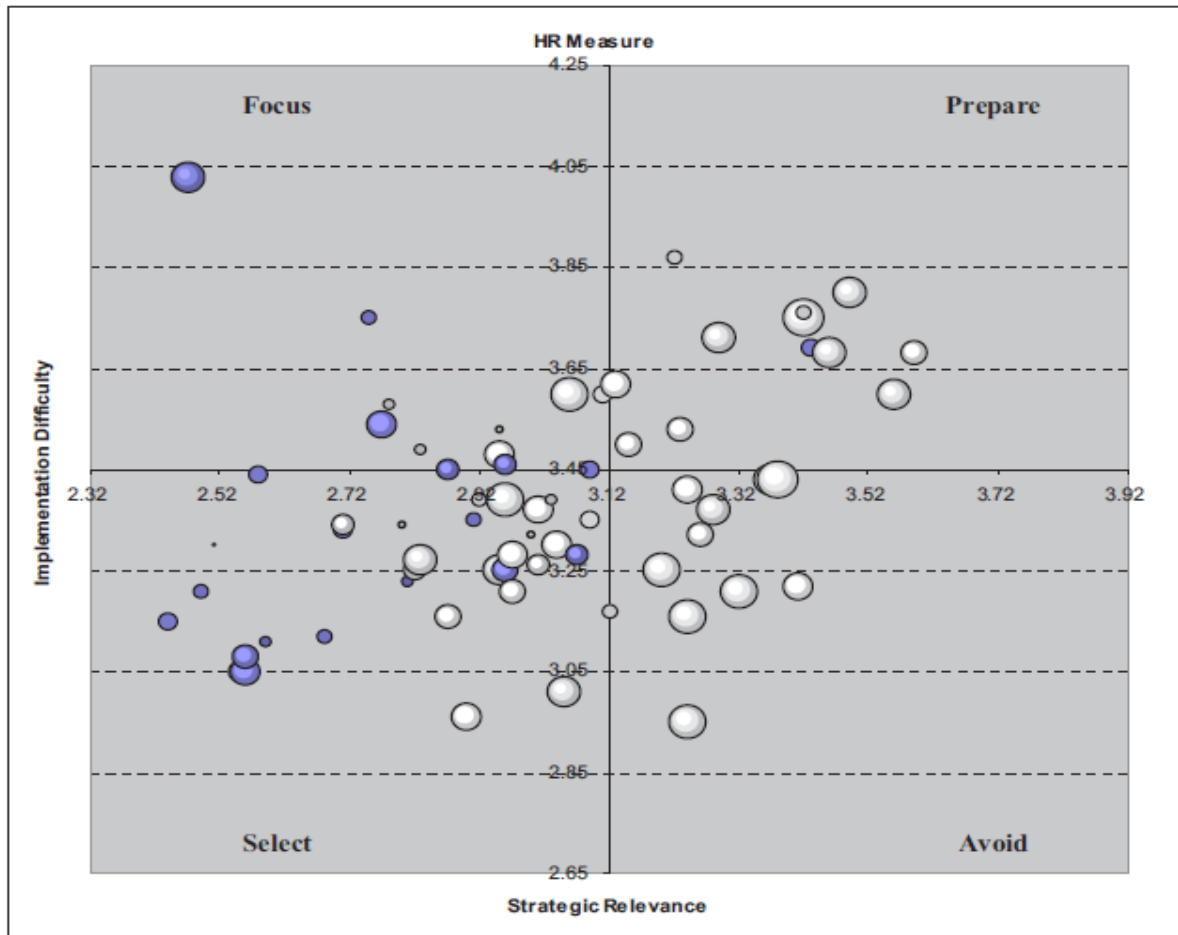
In this research, the main objective is to discover the important talent management's requirement which may affect welder capability to heighten the weld quality and list systematically them based on Internal and external development of talent. Security and safety in welding process should be used proper tool of welders, supplying suitable device or machine has large amount of cost for firms. Firms must know that the value of founding transform in global market which there is a transform from 62% for tangible assets in 1982 to 10% in 2004.
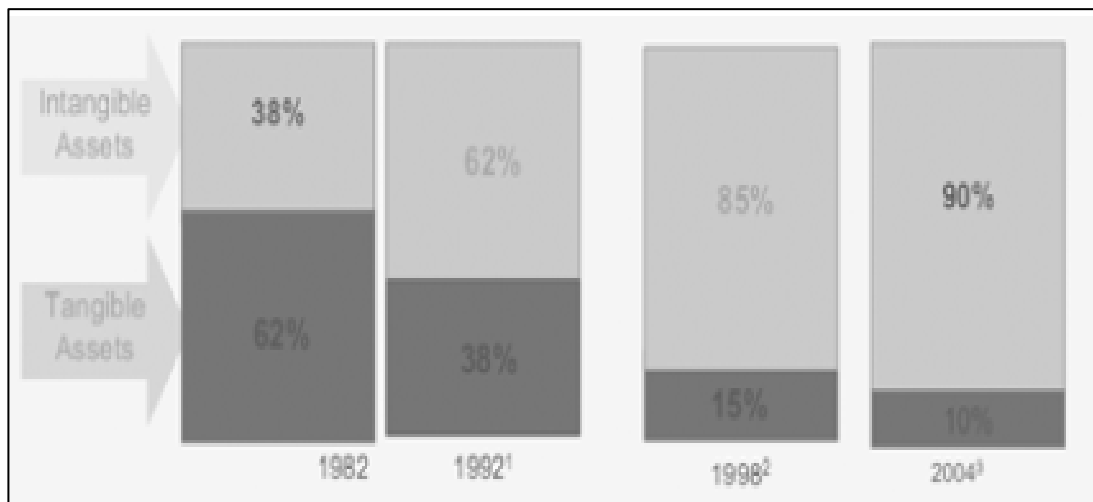
Figure 2.6   global shifts in value (Morrison & Wensley, 1991)

Although there is existing codes and regulations, major of the constructions do not have the appropriate detailed execution process in both design and construction. Because of the nature of construction industry, the project development time, cost, and safety most depends on workers. In this research, principal component analysis (PCA) was used as a statistical method for data reduction. Lastly, 4 major groups such as work environment, flexibility, balance, and accessibility which including 12 independent factors were obtained.

Importance Priority	Talent Development (External/Internal)	Factor	Category
1	Internal	The effect of job satisfaction on weld quality	Balance
2	External	The effect of balance between work and life on choosing work time	Balance
2	External	The income satisfaction	Work Environment
3	External	The Worker knowledge about technology and new tools and their usage to increase welding quality	Balance
4	Internal	Fault acceptance of the welder when he has welded incorrectly or distractedly	Flexibility
5	External	Experience gaining or job promotion (like promotion a simple worker to joss) in worker's view	Accessibility
6	Internal	Vision of the welder about future of his job	Accessibility
6	External	Welder insurance	Work Environment
7	Internal	Contractor tendency to find the ways to increase quality of welding	Flexibility
8	Internal	Skill welder tendency to share their experience	Flexibility
9	Internal	Contractor and welder tendency to change the tools and welding methods	Flexibility
10	External	Job opportunity to upgrade worker skill for increasing the welding quality and performance	Accessibility
11	External	Time flexibility (specifying necessary time of welding but welding in the voluntary period)	Flexibility
12	Internal	The welder tendency to teamwork	Flexibility

Figure 2.7   **Influencing Factors on Welding Quality and Their Importance Priority and Category** (Morrison & Wensley, 1991)
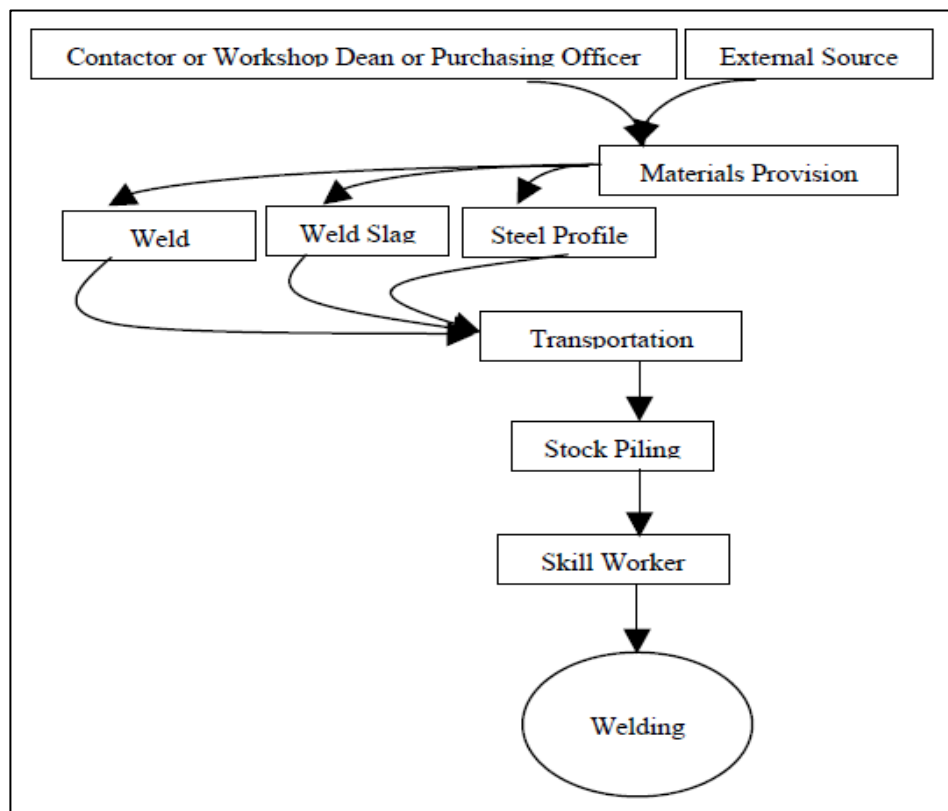

Figure 2.8   **Welding process in Iranian construction firms**

(Morrison & Wensley, 1991)

As a conclusion, this article emphasized that talent management competences to increase the steel structure safety regarding welders. Finally, the 12 main factors were found to satisfy the 4 mentioned categories. HR department can use these main factors to develop their TM strategies to attract, develop internally and externally, and retain professional welders.

2.3.4 E-PAT System in UMP

In UMP, E-PAT (Instructional Evaluation) System is used to evaluate lecturer performance. There are twice per semester for student to evaluate lecturer performance: first session at week 7 and second session at week 12. The result of the first session will be delivered directly to the academicians for further improvement after the verification by CAIC. However, the result of the second session will be the Official Result and follow the standard process before delivering to academicians & Dean of Faculty. From the system, there are two categories to evaluate a lecturer performance in E-PAT, the first category is lecture and the second category is lab. For both categories, there is divided into two part, the first part is regarding to scale of lecturer performance which consists of 30 questions, while the second part is regarding to opinion of student to their course lecturer. In the system questionnaire method will used to evaluate lecturer performance. All the students in UMP are invoke to evaluate lecturer through the E-PAT question with the scale of (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree). The interface of E-PAT student evaluation question (Refer to **Appendix B**). After the session of evaluate lecturer performance had been closed, evaluation's mark will be processing by getting the average mark from the data given by UMP students. While the result already presented and is approved from the meeting Mesyuarat JKTS Pengajar & Pembelajaran, final result will be show to lecturer with their own performance.

2.4   Limitation

In the E-PAT system, so far the current system does not show to lecturer regarding to their skills information such as teaching skill and communication skill. Questions in E-PAT without doing any analysis by grouping the question related with lecturer skill