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The Most Important and Recommended Criteria to Select Programmer Applicant

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Abstract: ***Selecting the best software programmer applicant is a challenging task because the number of graduates from information technology department has increased rapidly due to the advancement in information and communication technology (ICT). This increase has resulted in severe competition between programmer applicants for jobs. companies that are in need for employees has no specific criteria to select amongst the candidates. When the company chooses the best applicant, the performance of company will be increased. This research aims to present a most recommended criteria to select the programmer, and these criteria namely; (1) GPA, (2) Continuous Learning Skills & Information Management, (3) Teamwork Skills, (4) Communication Skills, (5) Thinking and Problem–solving Skills, (6) Leadership Skills, (7) Professional Ethics and (8) Entrepreneurial Skills. Moreover, it describes these criteria with all details and definitions.***

Keywords: GPA, Soft skills, Programmer, programmer criteria

1. Introduction

In the current situation many of programmers are not in the right position, because most of companies in their hiring system they use the traditional way which is the interview(Harper, 2015). worded differently, the impact of two-hour interview with applicant will not lead to hiring the right applicant in the right position (Kianto, Vanhala, & Heilmann, 2016).

Wherefore, the idea that introduced in this study, to select the best programmer is to hiring him\her using the long term data by two perspectives which are the GPA and soft skills(Kianto et al., 2016). Selection the best programmer from competing programmers is a complex decision making process, which often requires a comprehensive evaluation of the programmer's performance depending on multiple criteria based on GPA and soft skills of the applicants, these criteria represent the core subjects related the programing that the programmers studied in their bachelor study (Altunok, Özpeynirci, Kazançoğlu, & Yılmaz, 2010; Stal-Le Cardinal, Mousseau, & Zheng, 2011).

In this context, a multi-criterion should be simultaneously considered in order to select the qualified and the best programmer. To select a subset of alternatives considering not only the performance of the alternatives evaluated on multiple criteria but also the performance of programmer as a whole, on which balance over alternatives on specific attributes is required by the decision makers (Kelemenis & Askounis, 2010).

In order to describe the specific problems in term of issues for selecting the best programmer among others. In addition, core courses of programming major which the programmer studied in his bachelor represents an important factor for choosing best programmer, in the other side the soft skills and GPA for programming major should take in consideration. Thus, the process of selection regarding with multi-attribute (core courses) with respect to the proper weight assigned for each attribute is considered a multi-attribute decision matrix, and this considered the first issue (Deni, Sudana, & Sasmita, 2013).

The problem emerged when the programmer was selecting by using several criteria (including GPA and soft skills) (Aggarwal, 2013; Deliktas & Ustun, 2015). Each programmer from competing has several attributes, and each decision maker has different weights for these attributes. Thus, selecting the suitable programmer is difficult. On one hand, users who aim to use one kind of programmers may prioritize structured programming features rather than other features, whereas researcher who intend to select this programmer in actual education environments would probably target different attributes, and this considered as the second issue of the specific problem. Programmer selection in particular is a multi-criteria decision-making (MCDM) problem where each applicant is considered an available alternative for the decision maker (Velasquez & Hester, 2013). In other words, MCDM problem refers to making preference decisions over the available alternatives that are characterized by multiple and usually conflicting attributes which include data variation (Leyva López, 2005).

In this study, there is a variation of data generated because all data from the same scale but there are differences between the result, that show a clear variation between the data. the process of selecting the applicants of programming student involves the simultaneous consideration of multiple attributes to rank the available alternatives and select the best one. Thus, the selection process of the programmer can be considered a MCDM problems (Mavrotas & Rozakis, 2009). This study presents a new framework to ranking and selection programmers based on their soft skills and GPA of programming major core using multi-attribute decision making.

2. Literature Review

This section about the most suitable criteria for selecting the best applicant. Therefore, this section describes each criterion in details with a brief definition.

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2.1 GPA

The GPA is important attribute to evaluate and select the programmer student and its reflect student effort for whole years of study, according to (Baker, Tucker, Raynes, Aitken, & Allen, 2016) The cognitive factor of cumulative undergraduate GPA provides reviewers with concrete data that indicate a student's abilities to succeed in the academic environment. And according to (Arockiaraj & Sathiyaseelan, 2014) The practice of assigning grades or marks to measure the amount a student has learnt is very common. Students are given different letter grades in different subjects and the overall performance or class rank is calculated by taking grade point averages of these subject grades. Alternatively, class rank is done on the basis of total marks scored in different subjects. But both the methods are not totally accurate. For many students may subject wise have a wide range of grades, which show that average grades may not show what a student really knows. This is true also in the case of marks. Again, a proper careful assignment of grades to individual student is very important simply because, hindering a student's performance with a bad grade in the middle of the year can make them give up for the rest of the year. Once a student has received a bad grade they might lose faith in their academic ability. By giving a student poor grade does not always reflect their academic ability and their bad grades are not always based on what they have learned. Therefore, the standard grading system should be scrutinized (Arockiaraj & Sathiyaseelan, 2014).The typical grades awarded for participation in a course are (from highest to lowest) A, B, C, D, and F. Variations on the traditional five grade system allow for awarding A+, A, & A- ; B+, B, & B- ; C+, C, & C- ; D+, D, & D- ; and F. in this case, the high grade in GPA is acceptable more than the middle and the low grade ,for instance, the applicant who has a high grade is acceptable and most recommended than the applicant who has lower grade.

2.2 Continuous Learning Skills & Information Management

Graduates should be able to independently perform self-regulated learning in the process of gaining skills and knowledge. They must have the skills to seek for applicable information from a number of sources and have the capacity to efficiently manage them. The Ministry of Higher Education of Malaysia (2006) stated that graduates should also be receptive to fresh ideas and develop an enquiring mind (Hassan, 2015).

In (Bakarman, 2011), learning was defined as the process in which knowledge is generated through experience transformation. This process results in comprehensive agreements that the creation of knowledge necessitates experience. Educators view that a key graduate outcome comprises the development of learners of these critical and reflective learning skills (Carroll, 2013).

2.3 Teamwork Skills

Team work skills comprise the capacity to work and cooperate with people from numerous social and cultural backgrounds for reaching a common goal. Graduates must be respectful towards the attitude, behaviour and belief of others to create a sound working relationship with their peers.

According to the Ministry of Higher Education of Malaysia (2006), graduates are expected to be a leader and a group member interchangeably (Hassan, 2015). Teamwork comprises the concept of people cooperatively working together, as in sales team and sports team. Teamwork is considerably valued that large corporations have constructed specific tests for measuring teamwork capacity.

A balanced scorecard model for software project management of teamwork of students was proposed in (Kazi & Radulovic, 2011). During the education process, the team has to organise, monitor and evaluate the work of the members until results are completed and sent to teaching staff. As shown by the proposed balanced scorecard model, a web-based information system allows teaching staff and teams of students to monitor the progress and approximate the success of students' teamwork in realising software projects. The authors also demonstrated that, within the university education process, students must be prepared for future professional environment, where intangible assets are highly crucial, particularly teamwork skills.

2.4 Communication Skills

Students must have the fluency and ability to effectively communicate using Bahasa Malaysia and English languages. They also must clearly and confidently deliver their thoughts orally and in writing. At the same time, these graduates must actively listen and generate responses, as necessary. As stipulated by the Ministry of Higher Education of Malaysia (2006), graduates should be able to confidently give and use technologies during presentations (Hassan, 2015).

In the meantime, software engineers should possess the soft skills necessary to allow them to communicate with clients, analyse problems and generate solutions. As indicated in (Carter, 2011), communication skills are not as crucial as computer-programming skills; therefore, tasks that fall under this category are outsourced easily.

Communication skills, however, appear to be evaluated more than ethics and equity. As stated in (Ingram, Cicek, & Sepehri, 2012), communication skills include three parts: written, oral and visual. Students must comprehend one another. Students majoring in software engineering must also comprehend and write using the English language. The English language is currently the world's language, and thus, everybody has to have the ability to communicate using it.

2.5 Thinking and Problem–solving Skills

Graduates who possess these skills can think critically, creatively, innovatively and analytically. This aspect comprises the capacity to use knowledge. Within this aspect, the elements that graduates must have include the capacity to perform identification and analysis on complex situations

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and justifiable evaluations. The Ministry of Higher Education of Malaysia (2006) requires students to possess the capacity in expanding and improving their thinking skills to enable the generation of ideas and alternative solutions (Hassan, 2015).

Students must have the capacity for information gathering via reasoning, observation, experience and/or communication and then analyse that information, create alternatives, resolve problems and assess the process and solution.

As stated in (Dray, Lowenthal, Miszkiewicz, Ruiz-Primo, & Marczynski, 2011), critical thinking is underpinned by intellectual values that go beyond subject matter. This aspect comprises evidence, clarity, accuracy, fairness, precision and numerous perspectives.

2.6 Leadership Skills

Leadership skills are about the capacity to lead in numerous activities. Graduates should possess the knowledge on the fundamental theories of leadership. Such knowledge will allow them to lead a project. Graduates must also comprehend the role of a leader and a group member and interchangeably assume those roles (Ministry of Higher Education of Malaysia, 2006) (Hassan, 2015).

Certain departments of computer science and engineering encourage their students to take advantage of the Leadership Certificate courses that other departments at their universities offer (Epstein, Buhovac, & Yuthas, 2010). Although not technically oriented, such courses as self-leadership, group leadership, cultural competency, communication and ethics and integrity are offered to prepare employees for work setting. The benefits of these courses, however, may be restricted by the dearth of a technical setting (Carter, 2011).

2.7 Professional Ethics

Possessing skills, graduates can practice with high moral standards in the pertinent professional practice. Graduates must have the awareness of the effects of economy, environment and sociocultural factors on their corresponding professional practice. In terms of ethical issues, graduates must have the capacity of analysing and arriving at ethics-related decisions (Epstein et al., 2010). Outside of the working environment, the Ministry of Higher Education of Malaysia (2006) stated that graduates must practice good ethics whilst possessing a sense of accountability towards the society (Hassan, 2015).

2.8 Entrepreneurial Skills

Entrepreneurial skills (ES) comprise the capacity in venturing into businesses and work-related opportunities whilst having awareness of risk. They include the capacity of identifying business opportunities and preparing, building and exploring business plans, which finally leads to self-employment (Ministry of Higher Education of Malaysia, 2006) (Hassan, 2015).

3. Conclusion

This study reviewed articles related to the criteria that used to select the programmer's applicant, from these articles the study found that the GPA, Continuous Learning Skills & Information Management, Teamwork Skills, Communication Skills, Thinking and Problem–solving Skills, Leadership Skills, Professional Ethics and Entrepreneurial Skills are the most important and recommended criteria for the selection process.

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