Mapping Skills Education Through Social Media Platform For Technical Vocational Education And Training (TVET) In Malaysia

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Abstract

Web 2.0 applications have evolved significantly in producing high quality learning environments where the effects can cater for Technical Vocational Education and Training (TVET) learning pathways. In the shift to the Fourth Industrial Revolution, information and communication technology involving new media elements such as social media applications have impacted society in many aspects relating to thinking, cultural and economic diversities. As social media shows an exponential growth in our daily usage, TVET and the skills education pathways can adopt this digital trend to conform to a collaborative learning experience. This research presents a conceptual framework by adapting graph theory analytics to map specific skill sets that can conform to the National Occupational Skills Standards (NOSS) in correlation to the learning outcome domains of the Malaysian Qualifications Framework (MQF) through a personalized social media platform. Sampling only selected sub-sectors within the NOSS registry, this research aims to apply social media mechanics in enabling a strong network of collaborators to enhance the TVET learning experience. Subsequently, this research adds value in the sampling enhancement of current outdated NOSS, as well as reviewing the ability in mapping new jobs for the future.

Keywords: TVET; NOSS; Skills Education; Graph Theory Analytics; Social Media.

1. Introduction

The influence of social media have transcended into many ways of how we do things, for better or worse. At its core, social media functions to connect the people to enhance the quality of life and to ease our daily challenges. In addition, the 'social' term closely ties with education as a foundation towards the transition to a digital economic nation [1]. As the world transitions into the beginning phase of the Fourth Industrial Revolution (4IR), everything is changing, in many ways physical, biological and digital, as some governments attempts intervention into new economic model prioritizing digital healthcare and creative learning environments. Hence, the next wave of youth will undergo a different form of growth, where the meaning of education is different, and even more so with the meaning of work. The very definition of work transcends the worth of having conventional practices pour in hours of efforts and time in delivering outcomes for the embetterment of the quality of life. Henceforth in this digital age where Web 2.0 technologies enabling social media trends new behaviors amongst communities at large, the endless need of internet access on a daily basis is essential to all. Since knowledge can easily be acquired through technology, the balance now shifts to the importance of skills instead.

1.1 Impact of Fourth Industrial Revolution to Students

The Fourth Industrial Revolution is a global trend that affects all regions and walks of life, where it engages individuals in a multitude of scenarios. This intense change is rather innate within one's conscience, rather than in one's actions. Most people define this as a shift in the system, redefining the future of education, in relation to the circular economy that outlines progression and growth in terms of creativity and innovation. However, it exists certain effects not in favor leading to the massive lost of job

worldwide due to technology, particularly in automation and the labour market [5].Over the last decade, Malaysia has strategized on the development of Technical Vocational Education and Training (TVET) where the governance arm by the National Key Economic Area (NKEA) forecasted the availability of over 1.3 million TVET jobs, particularly in the clerical, service industry and operations divisions [2][3][4]. Figure 1 illustrates the economic growth sectors based on the Economic Transformation Programme (ETP) statistics which largely represents the country's gross national income (GNI) in 2016.

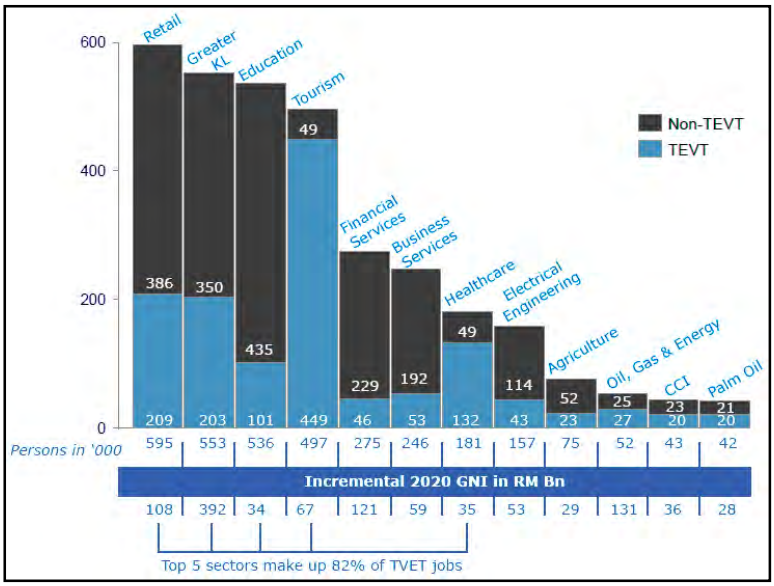

Figure 1: Economic Transformation Programme (ETP) 2016 Chart. 8 National Key Economic Areas (NKEA). *(Info in courtesy of Pemandu, BCG Analysis)*

As a result, students do not continue the trade by being only a job seeker, but having to be a job creator instead, always looking at new means of innovation that enables new source of income. Thus, the marketplace now booms with a high volume of startups and entrepreneurship programmes.

1.2 Internet and Web 2.0

The characteristics of Web 2.0 highlights the five distinctively key features as shown in Figure 2. Online education have been widely practiced by educators in every corner of the globe, in its own way and delivered in its own manner. The idea is not something new, only the mechanics that undergoes continuous innovation to always be better. In recent years, the form of an online education delivery type primarily lies in social media platforms [9].

Figure 2: Key characteristics of Web 2.0

Derived from the idea of having an online education methodology is the 'Classroom 2.0' concept, where the use of social media applications largely contributes to building a digital reservoir of knowledge. As such, most learning centers have adapted the Massive Open Online Course (MOOC) delivering content to subscribers [6].

Some other forms look at the concept of gamification as a relatively new model in learning and assessment systems [7]. This includes the concept of farming and questing to acquire some sort of a scoring system that contributes to the evaluation of each candidate. Even some of the elements within these activities require one to initiate collaboration with distinctive parties to achieve scoring outcomes. Regardless, the fundamental idea of building a personalized online learning ecosystem always refers back to how the system architecture can cater for continuous growth which allows changes and transformation as drivers in the innovation process. This allows constant new interventions by collaborators who will constantly feed new data into enhancing the impact of its properties and functionalities.

2. 21st Century Tools for Skills Education

One can easily be overwhelmed by the variety of Web 2.0 tools that are available online today. Some of the frequently utilized tools have been grouped into categories as shown in Figure 3, which are reflective of the 21st century skills.

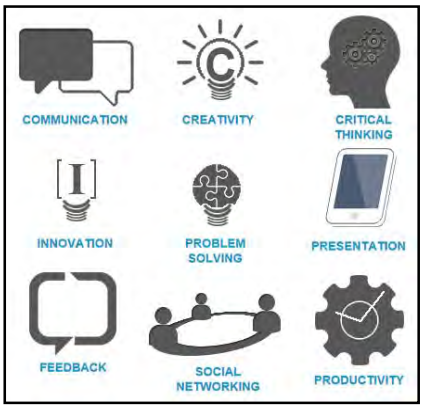

Figure 3: 21st century skills for tech savvy students

In line with the aforementioned 21st century skills, the World Economic Forum (WEF) listed a comparative

skill set deemed essential for one to thrive successfully in the shift to the Fourth Industrial Revolution [5]. Figure 4 illustrates these skill sets, also showing a slight change as time progresses.

2015	2020
Complex Problem Solving	Complex Problem Solving
Coordinating With Others	Critical Thinking
People Management	Creativity
Critical Thinking	People Management
Negotiation	Coordinating With Others
Quality Control	Emotional Intelligence
Service Orientation	Judgement & Decision Making
Judgement & Decision Making	Service Orientation
Active Listening	Negotiation
Creativity	Cognitive Flexibility

Figure 4: Skill sets Evolving in alignment with the 4th Industrial Revolution

3. Skills Education Landscape in Malaysia

There are countless social media platforms in the market today focusing one way or another on education delivery. Even some of the mainstream platforms such as Twitter and Skype now gears towards enhancing the learning experience among its global users [8]. Others such as Moodle [9] is designed specifically to cater for online collaboration in an education ecosystem based on an open source concept. What is evident is that all these solutions on social media education require a key factor which is the initialization of a pool of collaborators to work in sync with the topic at hand.

However this paper specifically focus on the TVET population, directly in correlation to skills education types in Malaysia, therefore enveloping the National Occupational Skills Standards (NOSS) structure, currently under the care of Jabatan Pembangunan Kemahiran (JPK). Figure 5 illustrates the list of NOSS sectors in comparison to the standardized economic sectors as a point of reference to showcase the different conventions between the two.

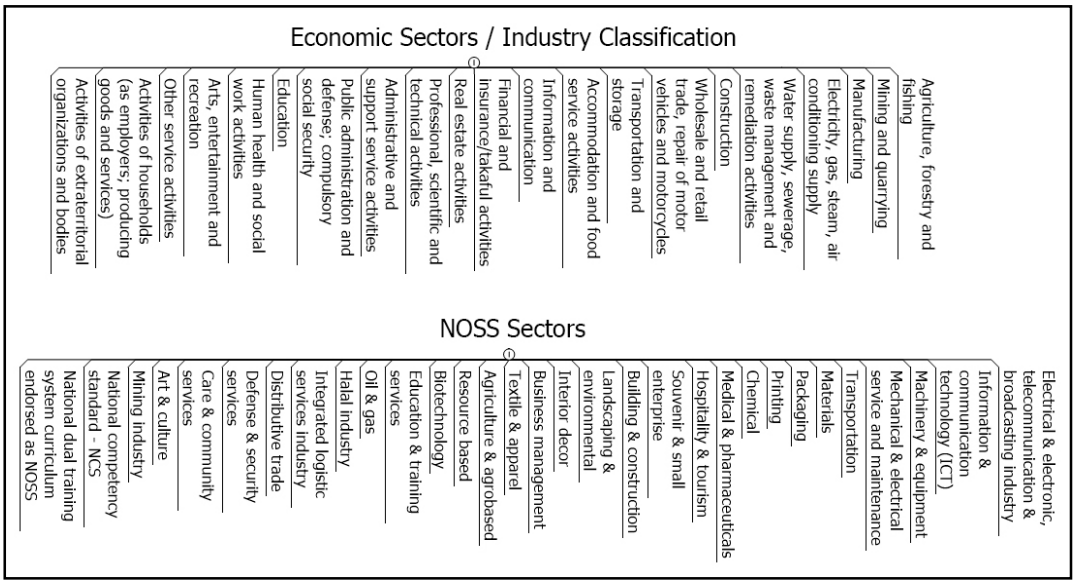

Figure 5: Comparison between the standard economic sectors against the NOSS sectors

This research closely looks at the measurement process by adapting graph theory analytics to map specific skill sets that can conform to the NOSS with the support of a social media learning platform. Limiting the scope by sampling a sub-sector within the NOSS framework, this paper specifically look at

the Sector 2: Information and Communication Technology (ICT) branch, animation subset. Figure 6 shows the mapping of the Sector 2 ICT sub-sector categories and their levels breakdown respectively.

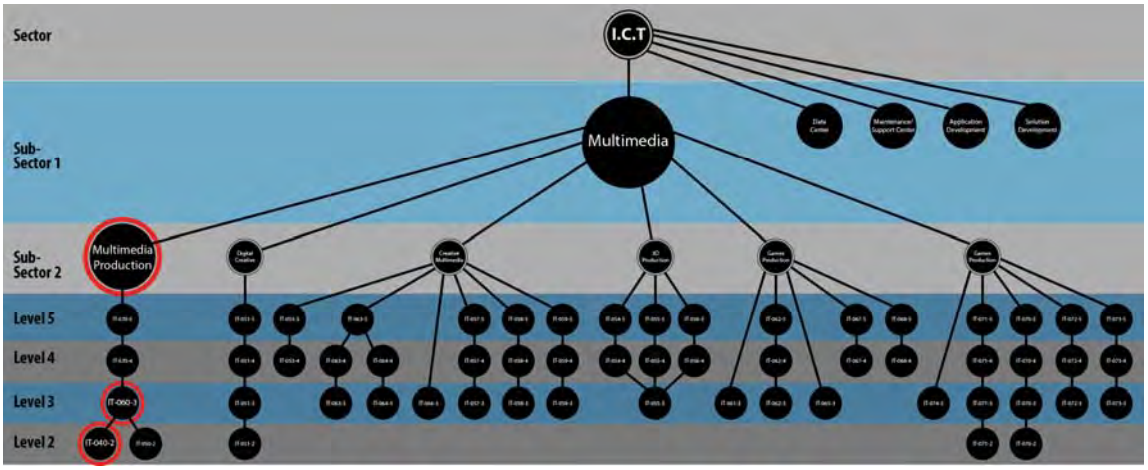

Figure 6: Animation subsector branch under the NOSS structure

3.1 Graph Theory Mapping

In Malaysia, most academic education systems refer to the conventional percentile cumulative measurement particularly looking at various formulation of the mean (μ) evaluation, mainly by calculating the mapping of credit hours. To be more precise, the mapping of the Malaysian Qualifications Framework (MQF) 8 learning outcome domains links directly to the Programme Learning Outcome (PLO) and Course Learning Outcome (CLO) of a particular programme, which only reflects on the students undertaking the programme.

Skill based education currently do not entirely follow this structure based on various complication. However, it is essential to map the skills levels to the qualifications framework (MQF) conforming to the 8 domains. This will benefit the TVET and Skills Education pathway students, thus aligning to a comparison matrix with the MQR requirements. Figure 7 shows the mapping of the skill sets derived from the WEF to the MQF learning outcome domains.

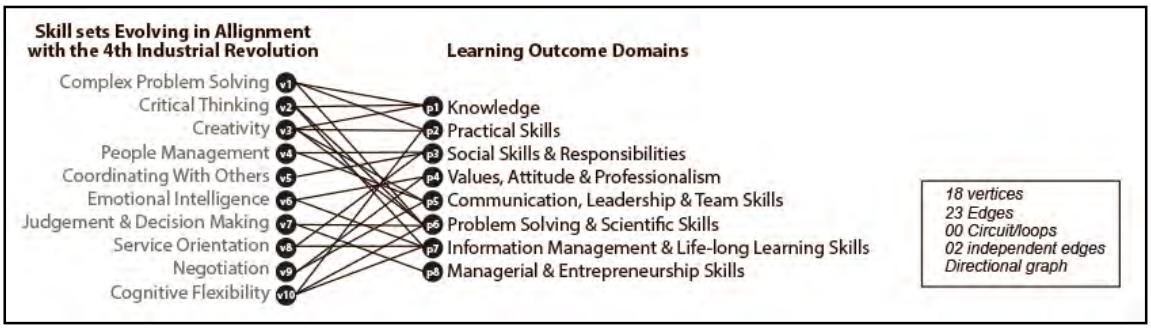

Figure 7: Skill sets mapping to MQF learning outcome domains

Subsequently, the following phase correspond to the extension of mapping the MQF learning outcomes to the NOSS levels, relative to industry classification standards. The mapping architecture correlates to the economic sector in line with the current active level. Figure 8 illustrates one particular sampling group for both level 2 and 3 of the animation subsector.

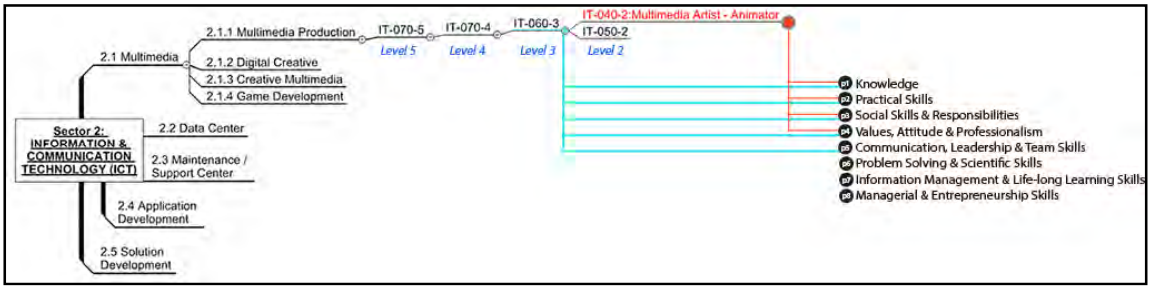

Figure 8: Sample mapping of NOSS subsectors to the MQF learning outcome domain

3.2 Personalized Social Media Platform

The 3 key collaborators involved in this equation are the trainer, the relevant leading industry arm and the governance arm. Often at times, there is a gap between the 3 parties. Through an online platform, the synchronization can be better managed effectively, eliminating constraints such as having to meet at specific time and venue among other issues. In addition, the proposed platform also serves as a progressive point of reference for the student candidate. All relevant information can be stored including personalized records and portfolios, significantly showing the growth of the candidate as he/she rises through the levels and beyond. This form of analytics prove to be more realistic compared to the conventional grade representation based on a percentile average value. The collaborating parties can also access each candidate's data sheet to review and feedback to any shortcomings or update any outdated findings. Even tracer studies data can be stored for further analytics. Figure 9 illustrates the overview of the proposed social media platform.

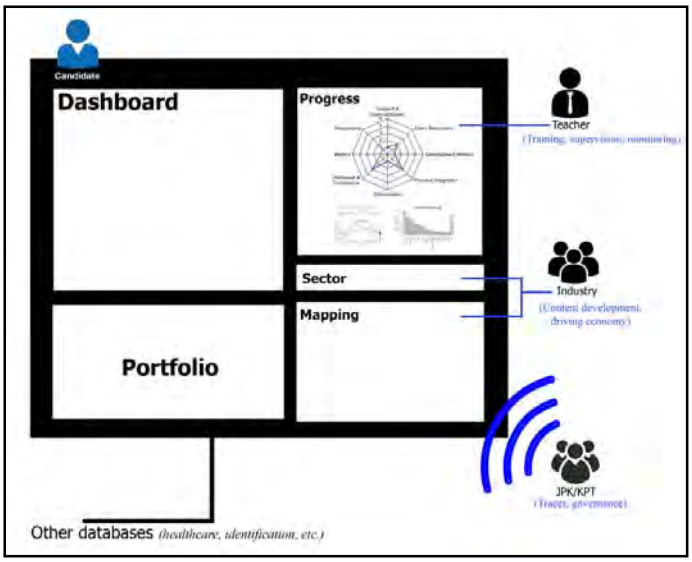

Figure 9: Personalized social media platform for TVET candidates

3.3 Network Graph of the Social Media Platform

The social media platform actually changes the network graph structure of how the collaboration functions. On a normal case scenario, the collaborators connect directly among each other. With the presence of the social media platform, the graph network type conforms to a star network where the platform resides in the middle, bridging the other parties. Figure 10 illustrates the graph network

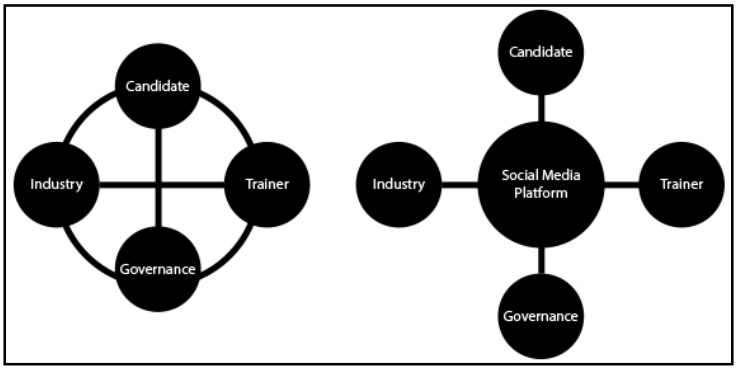

Figure 10: Graph network of collaborators with reference to the insert of the social media platform.

Although the basic shape of the graph network communicates the idea that the social media platform serves as the nucleus of the framework, each independent functions that flows through maps in a more complex manner. Figure 11 shows the extended functions within the graph network components.

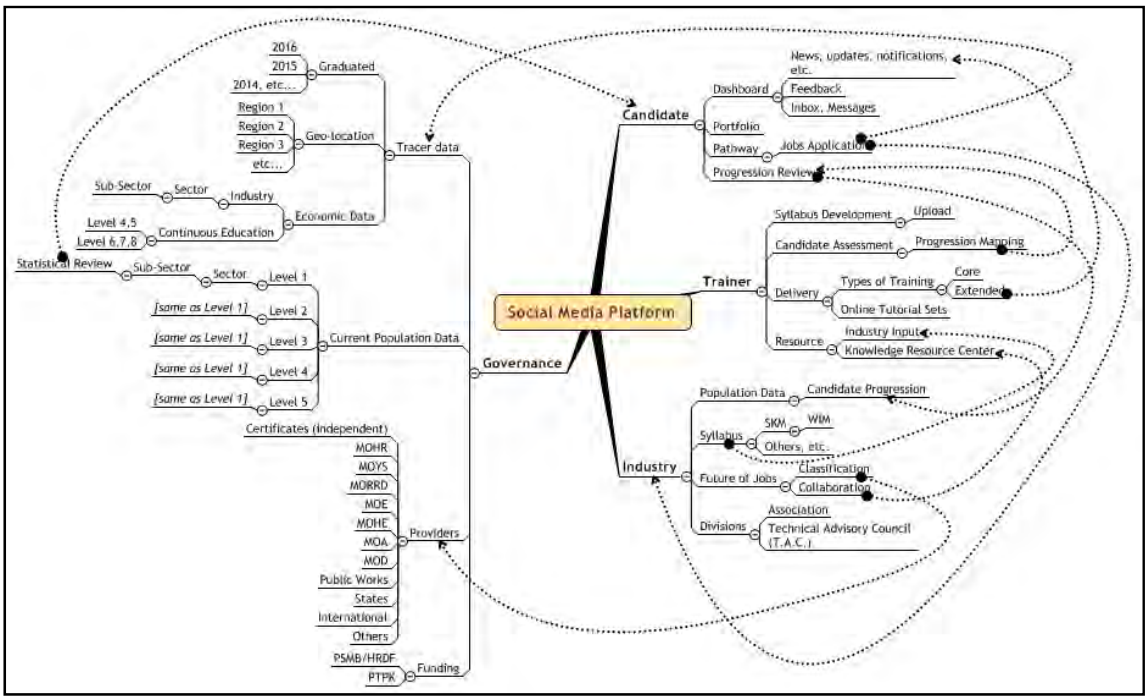

Figure 11: Extended graph network with independent functions and links

4. Conclusion

The demand for TVET is increasing rapidly over the last few years in Malaysia and shows great potential being a solid foundation in skills education. With the support of a uniquely design social media platform as the backend architecture framework, the skills learning mechanics will significantly contribute to enhance the education quality of the community at large, especially the youth. Adapting graph theory mapping initiates the means to innovate skills education development conforming to new models in engineering education. WIth the online platform as a bridge to connect through relevant collaborators, one can partake to ensure the continuous growth and development is in order, such as the updating and creation of new NOSS syllabus as well as general contribution to the resovoir of knowledge. Future

research in this area will cover the extended version of the online prototype platform into rural areas as the large percentage of TVET schools in Malaysia are located therein.

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