**Asia-Pacific
Economic Cooperation**

ANSSR: Enhancing the Quality and Relevance of Technical and Vocational Education and Training (TVET) for Current and Future Industry Needs-Phase 1

Economic Committee

June 2014

Foreword

The APEC New Strategy for Structural Reform (ANSSR), adopted by the APEC Leaders in 2010, calls on individual member economies to set structural reform priorities, and identify objectives, policies, and approaches for measuring progress over the 2011-2015 time frame. Structural reform should focus on policy reforms related to institutional frameworks, regulation and design of government policies that help minimize barriers to market-based incentives, competition and regional economic integration. The result of such reforms would boost an economy's growth potential. To assist member economies in prioritizing structural reform issues, the ANSSR focuses on five broad areas. One of these areas is directed at labour market opportunities, particularly in ensuring that workers meet industry demands in terms of skills required and quality performance through Technical Vocational Education and Training (TVET) which directly prepares and trains an individual to perform in the working environment.

Recognising the need for continuous enhancement, the Malaysian government, through the Department of Skills Development (DSD), Ministry of Human Resources (MOHR), proposed to conduct a study on identifying Best Practices to Enhance TVET for Industry Current and Future Needs. This is done by conducting research on the process involved in analysing requirements of an occupation. In Malaysia, this process encompasses Occupational Analysis and the development of the National Occupational Skills Standard (NOSS). DSD is responsible for promoting and coordinating strategies and programmes in skills training and development. Through the SkillsMalaysia agenda announced under the Economic Transformation Programme (ETP) by the Prime Minister on 11th January 2011, the government aims to achieve 3.3 million highly-skilled workers in the country's workforce by 2020. Malaysia's NOSS is the driving force in bridging between skills delivery and the nation's workforce demands. It is hoped that by observing the Best Practices in benchmark economies, an enhanced development methodology will be to serve as reference in producing a responsive, flexible and dynamic tool in recognising industry skills requirements.

This project has involved input from TVET stakeholders in Malaysia and participating economies. Many insightful experiences have been gained throughout the course of this study especially during benchmarking visits to counterparts related to TVET in Australia, Canada and Singapore. The solidarity and sharing of experiences in the development of Occupational Frameworks and Occupational Competency Standards has provided a strong foundation for the building of a sustainable community of practices in the APEC region.

Finally, I would like to express my utmost appreciation and gratitude to all those who have contributed directly and indirectly to this study, especially the economies that had hosted the Malaysian delegation in the benchmarking visits, namely Australia, Canada and Singapore. Not forgetting the local TVET stakeholders in Malaysia who had participated and shared their views as well as insight on ways to enhance TVET for the betterment of the respective APEC member economies.

Thank you.

Datuk Dr. Pang Chau Leong
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Preface

The Asia-Pacific Economic Cooperation (APEC) New Strategy for Structural Reform (ANSSR) was endorsed by Leaders in November 2010, with a target year of 2015, where economies were required to pledge and identify the most suitable and significant structural reforms, consistent with the objective of achieving strong, inclusive and balanced growth. ANSSR invites each individual economy to identify structural priorities and objectives, policies and approaches for measuring progress through 2015, using qualitative and quantitative indicators as appropriate. Malaysia's ANSSR priorities are (1) ease of doing business: trading across border; (2) enhance competitive, innovative and resilient SMEs; and (3) promoting labour market opportunities, training and education.

In alignment with these initiatives, the project "Enhancing the Quality and Relevance of Technical and Vocational Education and Training (TVET) for Current and Future Industry Needs-Phase 1" was proposed by Malaysia, under the supervision of the Department of Skills Development (DSD), Ministry of Human Resources (MOHR) of Malaysia. The project aims at assisting Malaysia and 14 other economies to implement one of the priorities of its ANSSR Action Plan which is related to "Upgrading Skills and Capabilities of Existing Workforce to Address the Needs of Industries"

Specifically, this APEC funded project had several objectives, namely (i) to undertake an analysis in order to create recommendations on improving Occupational Analysis (OA) of critical jobs to be more forward looking; (ii) to undertake an analysis in order to create recommendations on the process of developing Nationally Occupational Skills Standard (NOSS) that meet industry requirements; and (iii) recommending improvement to the stakeholders in relations to the national Skill Development and Training (SDT) system to fulfill the current and future demands of industries with regards to OA and NOSS development.

As the project overseer, we would like to acknowledge the participation and cooperation of the individuals involved in the project with tremendous contribution to its successful completion. On behalf DSD MOHR (Malaysia), we would like to express our sincere gratitude to Carrie Roche of Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (Australia), Eileen Lee of Ministry of Trade & Industry (Singapore), Tim Hunsley of Department of Employment and Social Development (Canada), and Deddy Faisal of First Secretary High Commission of Malaysia Ottawa, who acted as focal points and coordinator during the field visit study activities.

We would like to express our sincere gratitude and appreciation to the following,without whom this projectwould not be possible:

Steering Committee Chairman: Datuk Dr. Pang Chau Leong, *Director General DSD*

Steering Committee Co-chair: Nidzam Bin Kamarulzaman, *Deputy Director General DSD*

Steering Committee Members: Hjh. Norizan Binti Mohd Shahbaki, *Director DSD*
Hj. Omar Bin Jusoh, *Director DSD*
Mohd Zabidin Bin Abd. Samad, *Director ADTEC*
Hjh. Ruminah Binti Muhammad Zain, *Deputy Director DSD*
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Mohd Sukri Bin Ismail, *Deputy Director DSD*
Dr. Ir Azmi Bin Ahmad, *KP (PPK) CIAST*
Peter Cheah Hee Keong, *Principal Assistant Director MITI*
Sailanathan a/l Podian, *President FeMAC*

Special thanks to all organizations and individuals who involved directly or indirectly for their cooperation in supplying the relevant information in turning this into success.
We would also like to acknowledge the support and valuable contributions of the following individuals among DSD MOHR:

Technical Committee Chairman: Hjh. Norizan Binti Mohd Shahbaki,
Director of Planning, Research & Development Division

We truly hope that this APEC project report will contribute significantly to the implementation and the recommendations made will also be a useful reference or a replicable model for other economies to improve their occupational analysis and National Occupation Skills Standard (NOSS).

Shahlisa Cheah Binti Shihabudin   **Nurul Amin Bin Badrul**
APEC Project Overseer   **APEC Project Overseer**
June 2014   **June 2014**

Acknowledgements

Dr. Amiron Ismail,   **Evarina Amiron,**
Project Consultant   **Project Researcher**
PRITEC   **PRITEC**

ABSTRACT

This project is conducted under the monitoring of the APEC Secretariat for the Economic Committee and the Department of Skills Development, Ministry of Human Resources Malaysia. It is aimed at assisting Malaysia and other economies to implement one of the priorities of the APEC New Strategy on Structural Reform ANSSR Action Plan which is related to "Upgrading Skills and Capabilities of Existing Workforce to Address the Needs of Industries". This priority is in-line with ANSSR, endorsed by Leaders in November 2010. In many economies, Technical and Vocational Education and Training (TVET) has been gaining increased attention from policy makers and other stakeholders.

TVET is widely known to be responsible in providing competent workers equipped with technical skills, high literacy in technology and also generic skills. It is also one of the most critical drivers for a nation to transform from a middle-income nation to high-income nation. One of the major issues to be addressed is in Enhancing the Quality and Relevance of TVET for Current and Future Industry Needs which is the main objective of the project. This issue is crucial and within the scope of the project, it is analysed at earlier stages of TVET implementation which is at the TVET curriculum development stage that is based on the analysis of occupations.

The scope of the project is in analysing the development of Occupational Analysis (OA) and National Occupational Skills Standards (NOSS) to determine the suitable methodologies which will ensure the outcome of the OA and NOSS is relevant to industry needs. OA and NOSS are the terms used for Occupational Frameworks and Occupational Competency Standards used in Malaysia. When referring to OA and NOSS for other economies, the terms Occupational Framework and Occupational Competency Standards are applied. The project research was conducted via discussion groups, semi-structured surveys and benchmarking visits to three selected economies namely Australia, Singapore and Canada where the research approach undertaken was qualitative. A total of more than 119 respondents and 62 organisations were consulted throughout this project to observe and analyse the best practices implemented.

The findings in this research are presented in the form of Best Practices for both Occupational Frameworks and Occupational Competency Standards development. The Best Practices for Occupational Framework development focus on industry involvement throughout the development either as subject matter experts or validation panel, industry input for statistical data, segmentation of industries, grouping of occupational areas, overall overview of all industries that can facilitate long term planning and analysis of pertaining information such as career paths, occupational descriptions including industry overview to facilitate the readers in understanding the overall potential of an occupation in a certain trade. The Best Practices for Occupational Competency Standards Development focus on analysing an occupational area to determine the relevant competencies required for personnel or a worker to be competent in a particular occupation that result in Competency Units/Duties, formulation of Core Competencies and Elective Competencies that must be clearly defined in terms of purpose and grouping according to qualifications/occupational areas, identification of the Performance Criteria, the enabling requirements of a particular job/task/work activity that include the underpinning knowledge, related skills, tools, equipment and materials, attitude, adherence to relevant legislation and assessment criteria that must be clearly stated in certain range and context. Following this is the proposed standard methodology on developing the Occupational Frameworks and Occupational Competency Standards that embed the best practices throughout the development process. The standard development methodology proposed in this report is aspired to enhance current development methodologies, the most important aspect is in getting the industry to be more actively involved at the onset of the development process. Another major enhancement is the element of continuous improvement acquired from the public using the internet as a major form of communication.

To promote the use of the development methodologies, certain elements must be in place; nationwide consultation and enactment of acts to further strengthen the mechanisms of development, provision of funds to stakeholders involved in development and implementation of training, rebranding of TVET to show its advantages in increasing employability and worker mobility and finally, an integrated communications platform linking the governing bodies, development personnel, industry members, training providers and public with keen interest in the development of industry skills.

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LIST OF ABBREVIATIONS

ANSSR	APEC New Strategy on Structural Reform
APEC	Asia-Pacific Economic Cooperation
AQF	Australian Qualifications Framework
AQSA	Australian Qualifications Standards Authority
AWPA	Australian Workforce Productivity Agency
CMEC	Council of Ministers of Education Canada
CP	Competency Profile
CU	Competency Unit
CoCU	Curriculum of Competency Unit
DACUM	Development of a Curriculum
DSD	Department of Skills Development
EC	Economic Committee
ESDC	Employment and Social Development Canada
ETP	Economic Transformation Programme
CEGEP	*Collège d'enseignement général et professionnel* (General and Vocational College)
ILB	Industry Lead Body
ISC	Industry Skills Council
ISTC	Industry Skills and Training Council
OA	Occupational Analysis
OAA	Occupational Area Analysis
OD	Occupational Description
OS	Occupational Structure
OAS	Occupational Area Structure
OQF	Ontario Qualifications Framework
MOSQF	Malaysian Occupational Skills Qualifications Framework
MQF	Malaysian Qualification Framework
MQA	Malaysia Qualification Agency
MSC	Malaysian Skills Certificate
NASDA	National Skills Development Act 2006 (Act 652)
NOA	National Occupational Analysis
NOC	National Occupational Classifications
NOSS	National Occupational Skills Standards
NSSC	National Skills Standards Council
SKM	*Sijil Kemahiran Malaysia*(Malaysian Skills Certificate)
TVET	Technical and Vocational Education and Training
WDA	Workforce Development Agency
WSQ	Workforce Skills Qualifications

1. INTRODUCTION

1.1 Preamble

This project is aimed at assisting Malaysia and other economies to implement one of the priorities of the APEC New Strategy on Structural Reform (ANSSR) Action Plan which is related to "Upgrading Skills and Capabilities of Existing Workforce to Address the Needs of Industries". This priority is in-line with ANSSR as endorsed by Leaders in November 2010. [1]As laid out in the Joint Statement of the 5th Asia-Pacific Economic Cooperation (APEC) Human Resources Development Ministerial Meeting in September 2010, it is crucial for economies to address current and future skills shortages by providing flexible policies and responsive education and skills development. ANSSR calls on individual member economies to set structural reform priorities and identify objectives, policies, and approaches for measuring progress over the 2011-2015 time frame. This project will be helpful to strengthen the partnership between governments, industry and training institutions to ensure that employer needs are satisfied by the programmes offered by TVET training institutions.

One of the major issues to be addressed is in **Enhancing the Quality and Relevance of TVET for Current and Future Industry Needs** which is the main objective of the project. This issue is crucial and within the scope of the project. It is analysed at earlier stages of TVET implementation which is at the TVET curriculum development stage. In many economies, Technical and Vocational Education and Training (TVET) has been gaining increased attention from policy makers and other stakeholders. TVET is widely known to be responsible in providing competent workers, fully equipped with technical skills, high literacy towards technology and also generic skills. It is also one of the most critical drivers for a nation to transform from a middle-income nation to high-income nation.

TVET is used as a comprehensive term referring to those aspects of the educational process involving the study of technologies and related sciences, the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. Various terms have been used to describe elements that are now conceived as comprising TVET. These include: Apprenticeship Training, Vocational Education, Technical Education, Technical-Vocational Education (TVE), Occupational Education (OE), Vocational Education and Training (VET), Career and Technical Education (CTE), Workforce Education (WE), Workplace Education (WE) etc. Several of these terms are commonly used in specific geographic areas.[2]

Originally, the direct preparation for work was the main goal of TVET, and this remains prominent in many developing nations. TVET also refers to "deliberate interventions to bring about learning which would make people more productive (or simply adequately productive) in designated areas of economic activity (e.g. economic sectors, occupations, specific work tasks). This is the distinctive purpose of TVET. "[3]The most challenging task of TVET is to produce the right-type of skilled workforce who are able to match the needs of the industry and labour market demands. TVET stakeholders, including the industry players, education and training institutions, individual trainers, trade associations, media, employers as well as trainees need to play their roles to help overcome issues of quality and skills mismatch.[3] In order to align student outcomes with industry requirements, there is a need to standardise curriculum design in TVET. Therefore, this study aims to address the design process of TVET curriculum starting from the Occupational Framework and Occupational Competency Standards development phase that will be crucial in ensuring the relevance of TVET to the industry.

Malaysia uses the terms Occupational Analysis (OA) in regard to Occupational Frameworks that will analyse the available occupations in a certain industry or sector, the OA will then serve as

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[1]Department of Skills Development.Enhancing Quality and Relevance of TVET for Current and Future Industry Needs Proposal.

[2]UNESCO-UNEVOC Official Website. Promoting Leaning from World of Work. What is TVET?

[3]UNESCO, 'Revised Recommendation Concerning Technical and Vocational Education (2001)

reference to determine the National Occupational Skills Standards (NOSS) to be developed for that particular industry. The NOSS will be the basis of training and certification which includes the minimum standard requirements and competencies for personnel in various vocations. This also includes the standardised curriculum for each competency.Taking into account that the terms used for OA and NOSS are different in other economies, this research will regard the OA and NOSS in generic terms which will be Occupational Frameworks for OA and Occupational Competency Standards for the NOSS in later chapters of this report.This research is scoped for TVET curriculum design based on analysis of occupations as applied in the OA and NOSS development in Malaysia.

Previously Malaysia's TVET curriculum design was developed using the DACUM (Development of A Curriculum) approach, a process of Occupational Analysis and Job Analysis to identify Workplace Competencies. However, the year 2011 saw the evolution in Malaysia where a modified development methodology was used in NOSS Development that enhanced the methods used for gathering information and subsequently how the NOSS was structured and formulated. The main reason for this evolution was to ensure the NOSS would be responsive, flexible and dynamic to industry needs.

Due to the varying TVET implementations conducted in certain economies where TVET is under the jurisdiction of Ministries of Education and Ministries of Manpower/Human Resources, this research does not study TVET curriculum as conducted by Ministries of Education or academic bodies. This is because the research focuses on TVET curriculum design based on the analysis of Occupational Frameworks and Occupational Competency Standards.

1.2 Research Structure

The researcher, Professional & Technical Academy Sdn. Bhd. under the monitoring of Malaysia's Department of Skills Development and APEC secretariat, had been appointed to conduct this study between May 2013 till December 2013. Based on the Project Objectives, Project Scope and Project Outcomes, the project consists of four main phases which are elaborated as below:

- Inception Phase
  The current development process of the Occupational Analysis (OA) and the National Occupational Skills Standards (NOSS) are to be analysed by consulting the TVET stakeholders in Malaysia. TVET stakeholders comprise of OA and NOSS developers, Industry Lead Body representatives, governing body representatives and training institution representatives.

- Interim I
  The OA and NOSS development process applied in other selected economies are studied and researched via desktop research and literature review. These findings from research will be used as a guide to further understand the development processes during the benchmarking visits.

- Interim II
  The literature review and study done in the Interim I phase will be confirmed during the benchmarking visits via interviews and focus group discussion meetings with the TVET stakeholders in each respective economy. The findings from the benchmarking visits will be analysed in a comparative analysis between the similar elements of OA and NOSS development in each economy. The strong points of each development process applied in the economies will be determined and proposed as a best practice.

- Final
  In the final phase of the project there are three expected outcomes which are the best practices for OA & NOSS development, a comparative analysis of the OA & NOSS development process between the economies and recommendations of promoting a standard

methodology between the APEC economies.The four phases of the project and objectives of each phase are depicted in Figure 1.1 below:
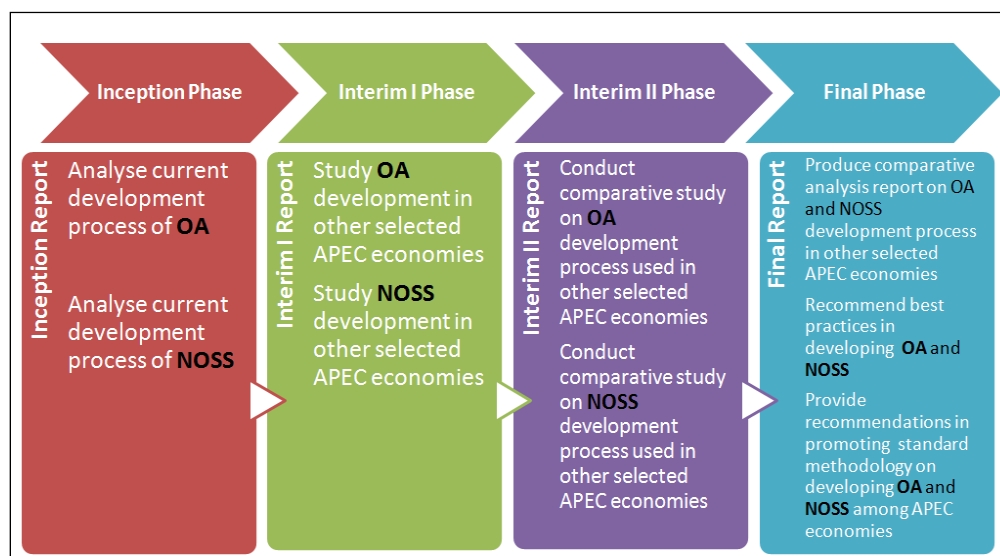
Figure 1.1: Project Phases & Research Structure

The objectives of each phase will be reflected throughout the report as topics in the following chapters. These objectives are also considered as deliverables for each project phase milestone.

1.3 Project Objectives

The key objective of the project is to assist the supply of trainees who are able to meet the needs of employers with the skills and competencies required, in the right sector and at the right time, through:

i. Undertaking an analysis in order to create recommendations on improving Occupational Analysis (OA) of critical jobs to be more forward looking;
   – Conduct analysis of the current development process of OA
   – Conduct analysis of OA development process in other selected APEC economies.
   – Conduct comparative study on OA development process that is currently being used with other selected APEC economies

ii. Undertaking an analysis in order to create recommendations on the process of developing National Occupational Skills Standard (NOSS) that meet industry requirements;
   – Conduct analysis of the current development process of NOSS
   – Conduct analysis of NOSS development process in other selected APEC economies
   – Conduct comparative study on NOSS development process that is currently being used with other selected APEC economies

iii. Recommending improvement to the stakeholders in relations to the national Skill Development and Training (SDT) system to fulfill the current and future demands of industries with regards to OA and NOSS development:
   – Propose best practices in developing OA and NOSS.
   – Present comparative analysis report of selected APEC economies in developing OA and NOSS as well as its linkages and relevancy towards industry
   – Provide recommendations in promoting for a standard methodology on developing OA and NOSS among APEC economies

1.4 Project Scope

Below is the project's scope of work:

- Review current approach of OA & NOSS development process to obtain best practices on developing OA and NOSS

  This research is scoped for TVET curriculum design based on analysis of occupations as applied in Occupational Analysis (OA) and National Occupational Skills Standards (NOSS) which are the terms used for Occupational Frameworks and Occupational Competency Standards in Malaysia.

- Consult relevant industry representatives and TVET practitioners involved in OA and NOSS to obtain additional expert input from industry

  Due to the varying TVET implementations conducted in certain economies where TVET is under the jurisdiction of Ministries of Education and Ministries of Manpower/Human Resources, this research does not study TVET curriculum as conducted by Ministries of Education or academic bodies. This is because the research focuses on TVET curriculum design based on the analysis of Occupational Frameworks and Occupational Competency Standards.

- Conduct comparative analysis on selected APEC economies specifically Singapore, Australia and Canada in developing OA and NOSS (or the respective economy's equivalent) and its relevancy towards industry

  The economies were selected based on the established TVET system implemented in their respective economy and the unique TVET landscape of each economy (Figure 1.2). Australia is known for its established and highly industry driven TVET system, Canada has an established TVET system since the year 1956 and Singapore is among the economies with the highest percentage of skilled labour force with tertiary education (as shown in Figure 1.3).
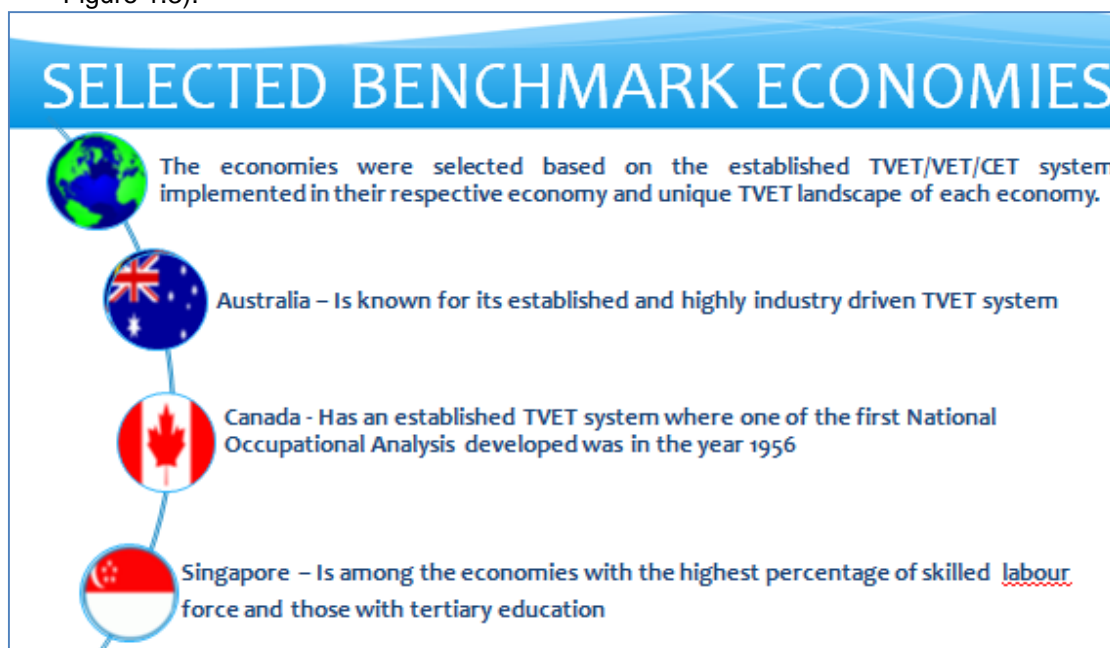
Figure 1.2: Selected Benchmark Economies
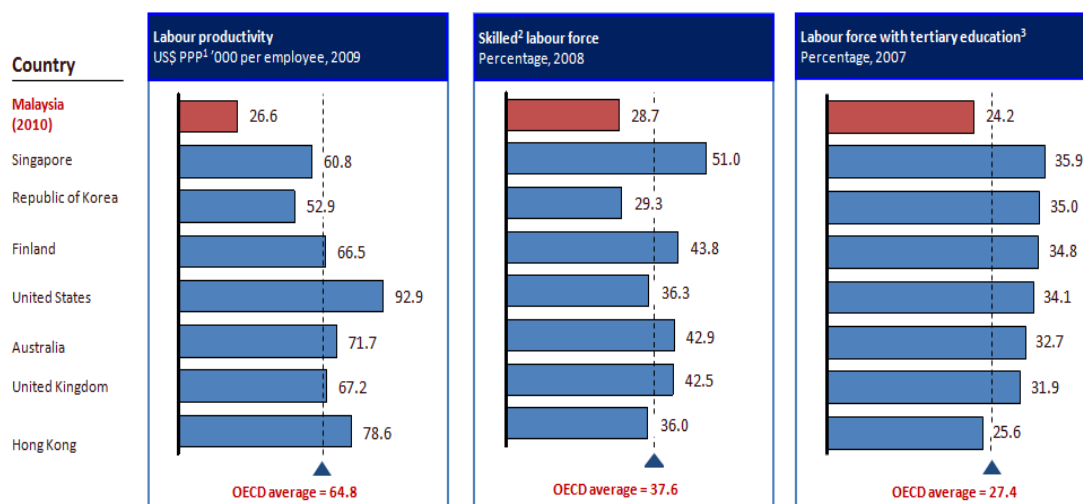
Notes:
[1] Adjusted to Purchasing Power Parity.
[2] Skilled refers to management, professional and other skilled occupations
[3] Tertiary education is defined here as the education level following the completion of secondary education (i.e. after 11-12 years of basic schooling. Colleges, Universities, institutes of technology and polytechnics are the main institutions that provide tertiary education)

(Source : World Bank Statistics, Economic Intelligence Agency, International Labour Organisation, Korea Ministry of Labour, Singapore Ministry of Manpower, US Bureau of Labour Statistics)

Figure 1.3: Retaining a First World Talent Base in Malaysia

The figures as shown above reflect the reasons of selecting the 3 economies as benchmark economies in TVET implementation.

1.5 Project Importance

Towards achieving Vision 2020 which targets Malaysia to become a developed country, it is obvious that TVET has become a vital aspect in developing its human capital. Malaysia aspires to move up the value chain to become a high-income economy, with a Gross Net Income (GNI) per capita of approximately USD15, 000 by the year 2020 as seen in Figure 1.3 This level of GNI per capita would correspond to that of a high-income economy as currently defined by the World Bank. To realise this ambitious goal, the Malaysian Gross Domestic Product (GDP) will have to grow at an average rate of 6% per annum until 2020. To realise the ambition of becoming a high-income economy, Malaysia will need to have a workforce that is equipped with the necessary skills and knowledge to support and drive the economy. The Malaysian Economic Transformation Programme expects to create up to an additional 3.3 million jobs by 2020. [4]

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[4]Economic Transformation Programme. Chapter 14. Transforming Education as An Engine Of Growth.

(Source: Economic Transformation Program)

Figure 1.4: Malaysia to Become a High Income Nation

To achieve Malaysia's aspirations, it is imperative to develop, attract and retain a first-world talent base. The talent base and workforce of high-income nations include a number of key characteristics, specifically around higher education qualifications to promote knowledge generation and innovation, high skill-levels in both technical and professional fields, and strong levels of productivity. Figure 1.2 in the previous section depicts the comparison between Malaysia's human capital with other high-income economies in terms of these characteristics. There are significant gaps to close in order to achieve a first-world talent base in Malaysia. [5]Based on the statistics shown in Figure 1.2, Singapore has the most percentage of skilled workforce at 51 %, Finland second highest at 43.8%, Australia at 42.9% with Malaysia only at 28.7 %. TVET has played a major role in national development especially when Malaysia is focusing on developing a skilled workforce. One of the important issues to focus on is to ensure that TVET graduates' skills fulfill as what is required by the industry. The TVET system must strike a balance between the skills supply and demand, or specifically put, the TVET curriculum and training must be in line with manpower skills demand of the industry. This urgency has become a key element in TVET development to adjust its flexibility so that it responds to market demand for skilled workers. It is especially important for TVET providers in Malaysia to be aware of industry needs. Focusing on training outcomes will ensure that skills inculcated from the programs are effectively mastered by the trainee. **It is important to increase the quality of the curriculum, improve alignment with latest industry requirements and to standardise the curriculum.**

Involvement of industry expertise is important to ensure the curriculum developed is precisely as what the industry needs. As a result, human capital development in Malaysia will be on the right track with proper curriculum development that in turn will be the framework of training a skilled workforce. Consequently, with a highly skilled and competent workforce, achieving Vision 2020 will become feasible. This analysis considers the extent to which TVET is responsive to labour market needs and requirements. Relevance also entails the mechanisms and available capacity to understand transition from TVET programs to the world of work as well as to capture labour market signals and to anticipate emerging skills needs. [6]Based on statistics obtained from DSD (Figure 1.4), a total of 43,143 graduates with Malaysian Skills Certificates/Diplomas/Advanced Diploma were produced in the year 2013, whereas by observing the statistics from the Department of Statistics (Figure 1.5), a total 12,900 persons were employed as at February 2013. There was a surplus of 30,243 graduates from the skills training sector alone who might be unemployed. Graduates who do not possess the qualifications and desired skills of the industry will have stiff competition in securing employment.

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[5] 10th Malaysian Plan. Chapter 5. Developing and Retaining a First World Talent Base

[6]Impacts of TVET. www.tvetipedia.org. 2010

Number of Skills Certification Graduates for 2013

■ Number of Skills Certification Graduates for 2013

Malaysian Skills Certificate Level 1	Malaysian Skills Certificate Level 2	Malaysian Skills Certificate Level 3	Malaysian Skills Diploma	Malaysian Skills Advanced Diploma
17631	14698	9461	1216	137

(Source: DSD Statistics. June 2013)

Figure 1.5 : Number of Skills Certification (SKM) Graduates for 2013

Principal Statistics of Labour Force, Malaysia, February 2013

PRODUCER OF NATIONAL STATSISTICS

Labour market in Malaysia in February 2013

Series 45 Vol.4/2013
April 2013

Indicator	Previous month			Same month of the previous year	
	February 2013	January 2013	Change (%)	February 2012	Change (%)
Labour force ('000)	13,298.9	13,296.3	0.0	12,735.1	4.4
Employed ('000)	12,900.3	12,851.8	0.4	12,332.9	4.6
Unemployed ('000)	398.6	444.5	-10.3	402.2	-0.9
Outside labour force ('000)	7,056.7	6,975.9	1.2	7,018.3	0.5
Labour force participation rate (LFPR) (%)	65.3	65.6	-0.3	64.5	0.8
Unemployment rate (%)	3.0	3.3	-0.3	3.2	-0.2
Seasonally adjusted					
Unemployment rate (%)	2.8	3.2	-0.4	2.9	-0.1

(Source: Department of Statistics, Malaysia)

Figure 1.6 : Labour Force Statistics for February 2013

Therefore the imperative of this project is to ensure that the NOSS (Occupational Competency Standards) will be according to industry demands where in turn it will further add value to the TVET curriclum. It is hoped that the ultimate outcome will be the increase of skills training graduates who are employed by the industry based on the training that is relevant to the industry demands.

1.6 Project Outcomes

The outcomes of the project are as follows:

i. Best Practices on developing OA and NOSS

    This will provide information for improvement and development of the OA and NOSS in the APEC economies and will help developing members to evaluate their existing procedures or working process.

ii. Comparative analysis report on selected APEC economies in developing OA and NOSS and relevancy to the industry

Similarities and differences between the selected APEC economies will serve as basis for improvement and harmonisation among APEC economies related to developing OA and NOSS.

iii. Provide recommendations in promoting standard methodology on developing OA and NOSS

The recommendations are presented through a seminar and the report distributed to economy members. This will allow members to enhance their curriculum development of TVET.

The post project completion is so that the outcomes of this study will allow APEC members to enhance their curriculum development of TVET.

Best Practices

- Provide information for improving OA & NOSS development
- Help developing members evaluate existing work process

Comparative Analysis

- The Comparative Analysis will be a basis for harmonisation among APEC ecenomies related to OA & NOSS development

Recommendations in Promoting Standard Methodology

- Recomendations will allow members to enhance their curriculum development of TVET

POST PROJECT COMPLETION

Enhancement of TVET curriculum development

Figure 1.7 : Project Outcomes

1.7 Chapter Summary

This chapter has elaborated on the basis of the project such as the objectives, expected outcomes, research structure, project scope and project importance. The project is conducted in order to address the elements as discussed above. The following chapters such as Chapter 2, Literature Review will present the findings obtained from desktop research and information validated during benchmarking visits. Chapter 3 will elaborate the research approach that is applied by the project researchers and Chapter 4 will present the findings and analysis of the project. Finally Chapter 5 will discuss the findings obtained, recommendations for improvement and further work relevant to the project.

2.   LITERATURE REVIEW

2.1 Preamble

This chapter presents the literature review acquired though desktop research and validation during benchmarking visits. Each economy's TVET landscape is elaborated briefly in each section in terms of the background of TVET, TVET qualifications, organisations and acts relevant to TVET and Occupational Framework and Occupational Competency Standards equivalent development. As described in the previous chapter the generic terms Occupational Framework will be instead of OA and Occupational Competency Standards is used for the NOSS to avoid confusion of terms in each respective economy.

2.2 Overview of TVET in Malaysia

The sections below describe the overview of TVET in Malaysia.

2.2.1 Background of TVET in Malaysia

In the context of Malaysia's education and training system, 'skills training' has often been used synonymous with 'vocational training' within the wider notion of 'vocational education and training (VET)'. As stated in the 10th Malaysian Plan, in order to enhance standardisation and recognition of TVET certification, the Malaysian Skills Certificate is adopted as the national certification for TVET. [7]

The Department of Skills Development is designated as the single agency to develop and standardise TVET curriculum starting in 2011. The Department of Skills Development has ensured that the TVET curriculum developed meets the minimum standard required and is fully aligned with national economic priorities. The development of TVET curriculum should be harmonised in order to enhance the quality of the curriculum, reduce curriculum development costs, improve alignment with latest industry requirements and to standardise the curriculum.

TVET curriculum in Malaysia is developed starting with the development of the Occupational Analysis (OA) and National Occupational Skills Standards (NOSS). The development of OA and NOSS are industry-driven. At this current moment, there are about 2000 NOSS that have been developed by DSD and by the year 2015, DSD has targeted to develop 5000 NOSS.

The National Occupational Skills Standard (NOSS) has been defined under Part IV of the National Skills Development Act 2006 [Act 652]. Under the new Act, for the first time ever, NOSS development in the country has been provided for by the country's legislative framework. The Act contains provisions specifically for the establishment of NOSS (Section 20), its review and variation (Section 21) as well as the use of NOSS for curriculum development, assessment and certification (Section 22). In Malaysia, skills training based on NOSS is today offered by a wide variety of public and private training institutions.

The NOSS is currently supported by various development plans, policies and National Acts such as the Malaysian Budget 2011, NASDA 2006 (Act 652), and the Economic Transformation Programme , to name a few. The DSD has also taken the initiative to introduce the Industrial Lead Bodies (ILB) that are involved in ensuring the NOSS is developed in tandem with the respective industry's standards and requirements. This move will also forge more relationships between the DSD and the industry to enable double certification with cooperative Licensing Bodies.

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[7] 10th Malaysian Plan. Chapter 5. Developing and Retaining a First World Talent Base

The history of TVET curriculum development in Malaysia has started since the 1990's with the adoption of the DACUM approach that originated in Ohio State University. A group of Malaysians comprising mainly of Government officers involved in TVET studied the DACUM approach in Humber College, Canada and brought back the approach for the NOSS. The concept of DACUM is the use of visualisation as the basis of analysing occupations that result in Duty and Tasks.

In 2005, Malaysia introduced the National Dual Training System (NDTS) based on the German Dual Training Approach. This approach uses the work process methodology. In 2010, DSD merged the above approaches to improve the National Occupational Skills Standards (NOSS) development methodology and at the same time adopted the Work Function Analysis Approach used in Australia and the UK. The adoption of all three approaches is used in the modified development methodology.

DACUM	Work Function Analysis	Work Process
• Originates in Ohio State University and used in Canada and North America • Uses the Display Thinking method (DACUM Card) to come with the task carried out by a particular skill worker)	• Used in Australia, UK and NZ to develop Competency Standards (Aus) and NOS (UK) • Uses the Work Functional Analysis • Breakdown the work function of a particular skill worker	• Used in Germany for the Dual Training certification • Uses the Lernfelder Work Process analysis • Uses the Hacker's complete work cycle • Breakdown the work process of a particular organisation
❑ Duty ❑ Task	❑ Unit of Competency ❑ Elements	❑ Core Work Process ❑ Core Work Activities

Modified Development Approach

• Developed in Malaysia taking into account approaches of DACUM, Work Function Analysis and Work Process Analysis.

❑ Competency Units
❑ Work Activities

(Source: Courtesy of working group panel member, TVET consultant)
Figure 2.1: Evolution of TVET Curriculum Development in Malaysia

The modified development methodology is applicable throughout the NOSS development phase.[8]
Below is a list of the possible methodologies for development:
a)   Literature Review
b)   Solicit A Curriculum (SACUM)
c)   Compile A Curriculum (CACUM)
d)   Observation
e)   Brainstorming Session

Figure 2.2 below shows the TVET training implementation in Malaysia. It depicts the sequence of the TVET implementation that is currently practiced in Malaysia which includes identifying the Needs Analysis by referring national development policies such as the 10th Malaysian Plan, Industrial Malaysian Plan (IMP3), and Economic Transformation Programme (ETP) and Labour Market Analysis. Then this will lead to the OA development that will identify the occupational structure, then will be the development of NOSS that will define the occupational standards of an industry and in turn the implementation of TVET training and delivery, finally is the certification of a trainee as a k-worker in the relevant industry.

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[8] Department of Skills Development. NOSS Development Guidelines. Dynamic, Flexible, Responsive. 2012.
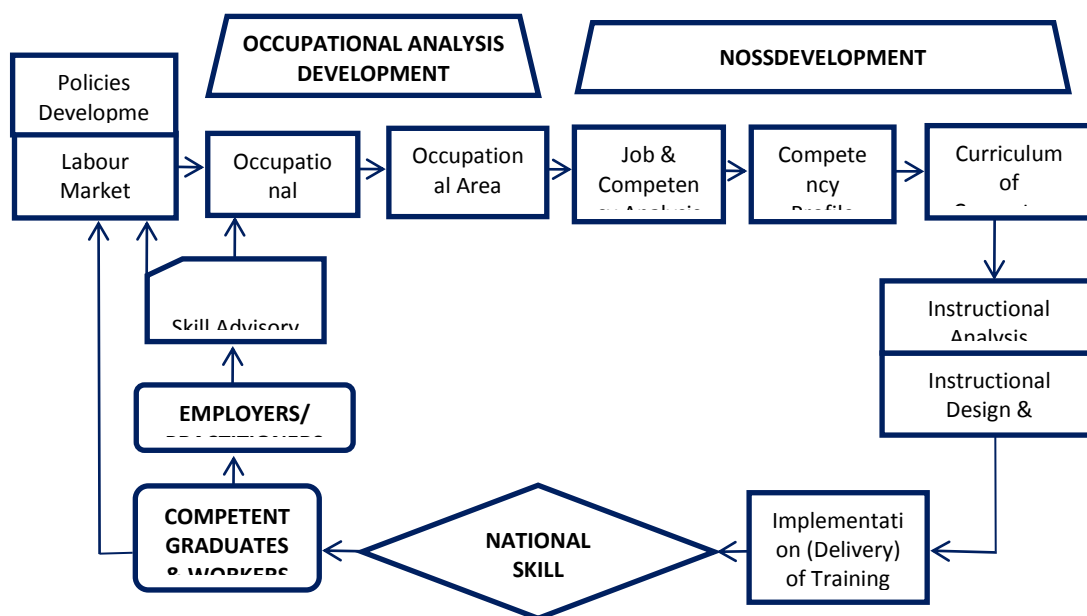
(Source: Department of Skills Development)

Figure 2.2: TVET Implementation in Malaysia

2.2.2 Relevant Governing Bodies and Organisations

i) Department of Skills Development, Ministry of Human Resources

The DSD was initially known as the National Industrial Trade Testing & Certification Board (NITTCB) and was established in 1971. The National Vocational Training Council (NVTC) was established through re-organisation of the National Industrial Trade Testing & Certification Board (NITTCB) on 2nd May 1989. The name of NVTC was changed to Department of Skills Development (DSD). The main purpose of DSD is to formulate, coordinate and promote strategies and implementation of skills training in Malaysia. There are eight divisions under the DSD such as below:

- Project Monitoring Office Division
- Planning, Research and Development Division
- Malaysian Occupational Skills Qualification Division
- Development of Strategic Cooperation Division
- National Occupational Skills Standard Division
- National Dual Training System Division
- Human Resources Management Services Division
- Centre for Instructor and Advanced Skills Training (CIAST)

ii) National Skills Development Council (*Majlis Pembangunan Kemahiran Kebangsaan*)

The role of the National Skills Development Council is as follows:
- Evaluate and recommend the current and future trends for skilled and semi-skilled workers.
- Identify and assess the implementation of current vocational training programmes and their operations by public training institutions. Also to ascertain that they are being implemented and that they meet the standard requirements of vocational training with recommended relevant amendments and changes.
- Evaluate and determine the need for advancement of existing training programmes or to develop and carry out new vocational training programmes by public training institutions.
- Advise the government on matters pertaining to the suitability of vocational training programmes proposed by public training agencies aimed at prioritising vocational training requirements.

- Assist and encourage the development of training programmes at plants.
- Set up the national occupational skills standard programme and to create a training syllabus.
- Manage and implement the national occupational skills standards competency tests and certification.
- Assist trainers to update their knowledge in technological developments for industries.
- Conduct and encourage studies and research in vocational training in general or in any specific field and to analyse and publish these findings.

iii) Industry Lead Body

Since the year 2011, the DSD has taken the initiative to engage with the industry in the form of Industry Lead Bodies. An Industry Lead Body will be appointed by the DSD based on the ILB capacity to coordinate, develop and monitor activities related to skills training such as the development of the OA, NOSS, research on the industry and promotion of skills training to members of the industry.

iv) SkillsDevelopment Advisory Committee (SDAC)

The SDAC's role is as validation panel are responsible for the endorsement of OA & NOSS documents and deliverables where they will evaluate these documents according to their area of expertise. Industry experts are also invited to evaluate other activities such as accreditation of new TVET training centres, apprenticeship programs and student evaluation.

v) National Industry Experts (*Direktori Pakar Industri Negara* - DPIN)

The industries are directly involved in OA & NOSS Development and function as the following personnel:
- Subject Matter Experts
- Validation Panel

Subject matter experts and human resources manager are the panel experts who are involved in the development of the OA. The expert panel will structure the occupational title based on the definition of leveling provided by DSD. Whereas, subject matter experts involved in the development of the NOSS will be asked to explain and brainstorm on their respective areas in relation to the document title. This in turn will be used as input for the content of the NOSS document. The following are the criteria of expert panel members for each document.
Criteria of OA expert panel:
a) Experienced in management of personnel in the industry.
b) Will be able to represent and elaborate on their respective sectors/areas.
c) Has insight on the requirements and emerging trends of the industry.
d) Has more than 5 years experience in the respective industry at managerial level.

Criteria of NOSS expert panel:
a) Will be able to represent and elaborate on their respective sectors/areas.
b) Has the same designation as the NOSS title.
c) Has more than 10 years experience in the respective area/NOSS title.

2.2.3 Acts Relevant to TVET in Malaysia

i) National Skills Development Act 2006 (Act 652)

The National Skills Development Act 2006 (Act 652) came into effect on 1st September 2006 after it was officially gazetted on 29th June 2006, with the mandate of promoting, through skills training, the development and improvement of a person's abilities, which are needed for vocation; and to provide for other matters connected therewith. The Act 652 is significant because for the first time in the history of skills training in Malaysia, a national legislation has been enacted solely and exclusively for skills training and development. In

addition, the meaning and scope of 'skills training' has been clarified and given a statutory interpretation that can be used to distinguish it from other components of the country's national education and training system. The Act 652 also provides for the implementation of a Malaysian Skills Certification System, leading to the award of five levels of national skills qualification, namely Malaysian Skills Certificate Level 1, 2 and 3; Malaysian Skills Diploma; and Malaysian Skills Advanced Diploma.[9]

ii)   Education Act 1996 *(Act 550)*

This act defines education to be encompassing all forms of training including skills, specialised, job-based and continuing training. This can be seen from subsection 35 (2) of the Act which stipulates that *'technical education'* includes the provision of:
(a) Skills training;
(b) Specialised training related to a specific job;
(c) Training for the upgrading of existing skills; and
(d) Such other technical or vocational training as may be approved by the Minister of Education. (Malaysia, 1996a: 26)

iii)   Private Higher Educational Institutions Act (PHEIA) 1996 (Act 555)

Private higher education institutions were officially recognised in Malaysia in 1996 with the enactment of the Private Higher Education Institutions Act (PHEIA) 1996 and the amendments made to the Universities and University Colleges Act (UUCA) 1971 and the Education Act 1961. This Act provides for the establishment, registration, management and supervision of, and the control of the quality of education provided by private higher educational institutions. The Act 555 adopts several interpretations which show its intent to treat training as a component of higher education in Malaysia.[9] The following terms in this Act include training in its interpretation. For example the term "Course of study" includes a training program (Malaysia, 1996b:11).Whereas the term "Higher education" means "instruction or training, teaching of a course of study leading to the award of a certificate, diploma or degree upon the successful completion thereof" and *"Student"* means a person receiving education, instruction, training or teaching in a private higher educational institution.

iv)   Malaysian Qualifications Agency Act 2007 (Act 679)

The enactment of the Malaysian Qualifications Agency Act 2007 established the Malaysian Qualifications Agency (MQA) which merges the National Accreditation Board (LAN) and the Quality Assurance Division, Ministry of Higher Education (QAD). The MQA is responsible for quality assurance of higher education for both the public and the private sectors. The main role of the MQA is to implement the Malaysian Qualifications Framework (MQF) as a basis for quality assurance of higher education and as the reference point for the criteria and standards for national qualifications. The MQA is responsible for monitoring and overseeing the quality assurance practices and accreditation of national higher education. The importance of this act to skills training is that it supports skills qualifications accreditation through the Malaysia Qualifications Framework.

v)   Skills Development Fund Act 2004 (Act 640)

This act established the Skills Development Fund and was enacted to incorporate the Skills Development Fund Corporation. The Skills Development fund is provided to all trainees pursuing the Malaysian Skills Certification up till the Malaysian Skills Advanced Diploma, in short, all approved skills training programs based on the NOSS under the purview of the Department of Skills Development, Ministry of Human Resources.

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[9] Datuk Dr. Pang Chau Leong. DSD. A Historical Account of Skills Training in Malaysia.

vi) *Pembangunan Sumber Manusia Berhad* Act *2001* (Act 612)

The Human Resources Development Fund (HRDF) was established under the legal requirements of the Human Resources Development Act 1992 (now known as the *Pembangunan Sumber Manusia Berhad* Act 2001). The PSMB Act provides for the imposition and collection of a human resources development levy for the purpose of promoting the training and development of employees, apprentices and trainees, the establishment and the administration of the Fund by the Corporation and for matters connected therewith. The establishment of the HRDF is part of the Government's initiative to encourage the private sector employers in the manufacturing and service sectors to retrain and upgrade the skills of their employees in line with the needs of their business and industrialisation strategy of the country. Employers who are registered with the PSMB and fulfill payment conditions are eligible to apply for training grants or financial assistance under the Human Resources Development Fund (HRDF).

2.2.4 Malaysian Qualifications Framework (MQF)

The Malaysian Qualification Framework (MQF) refers to the policy framework that satisfies both the national and international recognised qualifications. It comprises of titles and guidelines, together with principles and protocols covering articulation and issuance of qualifications and statements of attainment. Elements of qualification framework indicate the achievement for each qualification title. It will also provide progression routes for all the graduates in the respective occupational fields.

The three sectors of education in the Malaysian Qualification Framework are as follows:
• Skills sector;
• Vocational and technical sector; and
• Higher education (university) sector.

The levels of qualifications can be seen in the Figure 2.3. The Skills qualification framework as shown in the first pillar of the MQF framework reflects the skills qualifications awarded in Malaysia. It will serve as an instrument that develops and classifies qualifications based on a set of criteria that are approved nationally and is at par with international good practices at the level of learning attained by the learners. MQF also provides educational pathways through which it links qualifications systematically. These pathways will enable the individual to progress through credit transfers and accreditation of prior experiential learning, in the context of lifelong learning.[10]

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[10]Malaysian Qualifications Framework. Malaysian Qualifications Agency

MQF	Sectors			Lifelong Learning
Levels	Skills	Vocational and Technical	Higher Education	
8			Doctoral Degree	Accreditation of Prior Experiential Learning (APEL)
7			Masters Degree	
			Postgraduate Certificate & Diploma	
6			Bachelors Degree	
			Graduate Certificate & Diploma	
5	Advanced Diploma	Advanced Diploma	Advanced Diploma	
4	Diploma	Diploma	Diploma	
3	Skills Certificate 3	Vocational & Technical Certificate	Certificate	
2	Skills Certificate 2		Certificate	
1	Skills Certificate 1			

(Source: Malaysian Qualifications Agency)

Figure 2.3: Malaysian Qualification Framework (MQF)

It can be seen in Figure 2.4 the possible pathways between the different pillars that upon completing the school certificate the candidates can proceed either to academic higher learning, skills training or vocational and technical pillars of education. From the school certificate, students may proceed to completing their diploma, advanced diploma and ever

further education to academic higher learning by using credit transfer based on the university's requirements. Another method of obtaining qualifications is via Accreditation via Experiential Learning (APEL). This method enables an individual with prior knowledge and working expperience to be certified and awarded with suibale qualifications. Education at certificate level may start at Level 1 till Level 3 (depending on the trade qualification entry level), then Level 4 is equivalent to Diploma qualifications, Level 5 is equivalent to Advanced Diplomas, then from Level 6 onwards are qualifications at Degree level, Level 7 at Masters level and the highest level is at Level 8 which is equivalent to a Doctorate qualification.
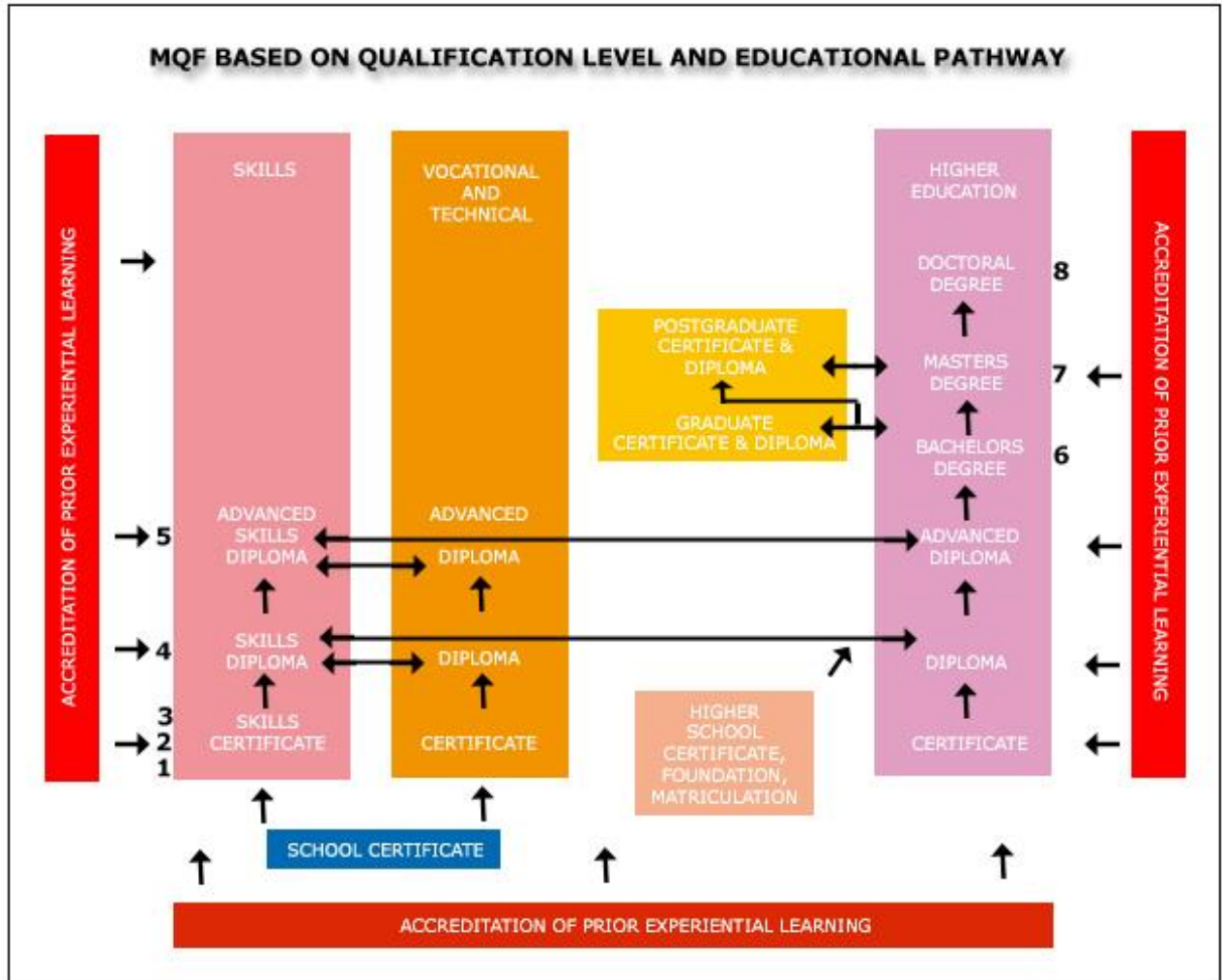
(Source: Malaysian Qualifications Agency)

Figure 2.4: MQF – Educational Pathways

The MQF plays an important role in ensuring mobility between the qualifications of the different education sectors available in Malaysia, this in turn allows for Malaysians to have accessibility to tertiary education at any level or sector. This in turn will facilitate the enriching of the educational experience in Malaysia.

2.2.5 Occupational Analysis (OA) Development

i)   Introduction to Occupational Analysis (OA)

An Occupational Analysis (OA) is a process to identify job titles and levels for skilled workers needed in the industry sector. The OA will identify sectors, sub-sectors, job areas and job titles for a particular industry in the form of Occupational Structure (OS). Job scopes of each job title will be detailed out in the Occupational Description (OD) where each job title will be identified according to its level as defined by Department of Skills

Development (DSD). The Malaysian Occupational Skills Qualifications Framework (MOSQF) describes the different levels of competency that are referred during the development of the OA.

The MOSQF serves as an instrument that develops and classifies qualifications based on a set of criteria that are approved nationally and is at par with international good practices at the level of learning attained by the learners. This includes learning outcomes achieved and thus clarifying levels of learning. The criteria is used and accepted by all Department of Skills Development (DSD) accredited centres. The MOSQF is developed in line with the Malaysian Qualifications Framework (MQF) and also based on frameworks used and referenced by other countries such as England, Wales & Northern Ireland, Australia, New Zealand and Europe. The MOSQF is also a tool to enable qualifications to be more readable and understandable across different economies. The definitions of each MOSQF level are included in Table 2.1: Malaysian Occupational Skills Qualification Framework (MOSQF) Level Descriptor.

Table 2.1: Malaysia Occupational Skills Qualification Framework (MOSQF) Level Descriptor

Level	Level Description
1	Achievement at this level reflects the ability to use relevant knowledge, skills and procedures to **complete routine and predictable tasks** that include responsibility for completing tasks and procedures subject to **direction or guidance**
2	Achievement at this level reflects the ability to select and use relevant knowledge, **ideas**, skills and procedures to **complete well-defined tasks and address straightforward problem**. It includes **taking responsibility** for completing tasks and procedures, **and exercising autonomy** and **judgment** subject to overall direction or guidance
3	Achievement at this level reflects the ability to **identify and use relevant understanding,** methods and skills to **complete task** and address problems that are well defined with a **measure of complexity.** It includes taking responsibility for initiating and completing tasks and procedures as well as exercising autonomy and judgments **within limited parameter.** It also reflects awareness of different perspectives or approaches within an sub-area of study or work
4	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to address problems that are well defined but **complex and non-routine**. It includes taking responsibility for overall courses of action as well as exercising autonomy and **judgment within fairly broad** parameters. It also reflects **under-standing of different** perspective or approaches within an sub-area of study or work
5	Achievement at this level reflects the ability to identify and use relevant understanding, methods and skills to address **broadly-defined, complex problem**s. It includes taking responsibility for **planning and developing courses** of action as well as exercising autonomy and judgment within broad parameters. It also reflects **understanding of different perspectives, approaches or schools of thought and the reasoning behind them**
6	Achievement at this level reflects the ability to **refine** and use relevant understanding, methods and skills to address **complex problems that have limited definition**. It includes taking responsibility for planning and developing courses of action **that are able to underpin substantial change or development, as well as exercising broad**

	autonomy and judgment. It also reflects an understanding of different perspectives, **approaches of schools of thought and the theories that underpin them**
7	Achievement at this level reflects the ability to **reformulate** and use relevant understanding, methodologies and approaches to address **problematic situations** that involve many interacting factors. It includes taking responsibility for **planning and developing** courses of action that initiate or underpin substantial change or development, as well as exercising broad autonomy and judgment. It also reflects an understanding **of theoretical and relevant methodological perspectives, and how they affect their sub-area of study or work**
8	Achievement at this level reflects the **ability to develop original understanding** and extend a sub-area of knowledge or professional practice. It reflects the ability to address problematic situations that involve many complexes, interacting factors through initiating, designing and undertaking research, development or strategic activities. It involves the exercise of broad autonomy, judgement and leadership in sharing responsibility for the development of a field of work or knowledge, or for creating substantial professional or organisational change. It also reflects a critical understanding of relevant theoretical and methodological perspectives and how they affect the field of knowledge or work

(Source: Department of Skills Development)

ii)   Importance of Occupational Analysis (OA)

The Occupational Analysis (OA) process is a preliminary stage for National Occupational Skills Standard (NOSS) development in which the identified job titles and job areas will be used as a basic reference. It requires inputs from all parties especially industry players, statutory bodies, training institutions among others.

An occupational analysis is used to:
• Create descriptions for new or emerging occupational areas.
• Update existing job descriptions.
• Identify new technology competencies.
• Update existing academic programs.

iii)   Elements of the Occupational Analysis (OA)

The OA will produce the Occupational Structure (OS) that is a visual representation of the industry breakdown in terms of Sectors, Areas, Levels of Competencies and Job Titles. This is done based on literature review on the industry background and input gained from discussion workshops.

The OS can be further analysed to produce its Occupational Area Structure (OAS) through Occupational Area Analysis (OAA). These OAS will be taken into consideration to be developed into NOSS areas. The OAA involves the process of merging and shrinking must be done with keeping in mind of the mechanisms of training and certification based on the NOSS. Ultimately, we are able to produce multi-skilling and multi-tasking workers required by the industry in line with the high income economy policy. Nevertheless, in certain cases, due to the requirement of industry or regulations, merging is not necessarily required. Finally is the development of the Occupational Descriptions for each identified job title describing the required job competencies and summary of the job competencies.

Table 2.2: Sample of Occupational Structure (Printing Industry)

Area/ Level	Printing Industry		
	Computer to Film (CTF)	Computer to Plate (CTP)	Computer to Press (CTP)
Level 3	Pre-Press Production Supervisor		
Level 2	Computer to Film (Pre-Press Technician)	Computer to Plate (Pre-Press Technician)	Computer to Press (Pre-Press Technician)
Level 1	Computer to Film (Pre-Press Operator)	Computer to Plate (Pre-Press Operator)	Computer to Press (Pre-Press Operator)

(Source: Printing Industry Occupational Analysis. 2012)

Table 2.3: Sample of Occupational Area Structure (Printing Industry)

Area/ Level	Printing Industry		
	Computer to Film (CTF)	Computer to Plate (CTP)	Computer to Press (CTP)
Level 3	Pre-Press Production (Operation, Supervision and Control)		
Level 2	Pre-Press Production (Operation)		
Level 1			

(Source: Printing Industry Occupational Analysis. 2012)

The OA also includes a review of the industry in terms of its definition, economic contribution, manpower supply and demand, acts, development policies and organisations relevant to the industry including benchmarking of other leading countries on their industrial practice that has made theirs a thriving and competitive industry.

2.2.6 National Occupational Skills Standard (NOSS) Development

i) Introduction of National Occupational Skills Standard (NOSS)

The National Occupational Skills Standard (NOSS) outlines the minimum requirement of knowledge and ability in terms of competencies to perform roles and functions of an expert worker according to their profession. The NOSS is used as a reference for the industry, career path of a skilled worker and for training purposes. It is a performance specification expected of competent personnel who are qualified for the profession in an

occupational area. It reflects the occupational structure for each level and the career path of the occupation.[11]

National Occupational Skills Standard (NOSS) is defined as a specification of the competencies expected of a skilled worker, who is gainfully employed in Malaysia for an occupational area and level and the pathway to achieve competencies. The NOSS is also interpreted as a Standard established under Part IV of National Skills Development Act 2006, Act 652.

The term 'National Occupational Skills Standards (NOSS)' was first introduced following the decision of the National Vocational Training Council, [Majlis Latihan Vokasional Kebangsaan, MLVK (currently known as the Department of Skills Development)] at its meeting on 9th December 1992 to agree to several measures that sought to improve the national vocational training and certification system in Malaysia.

The decision led to the implementation of two major policy thrusts:

- Adopt the accreditation approach in the implementation of the national skills certification system; and

- Enhance the competency-based training approach in the country's training system.

Consequently, a new framework and methodology was adopted for developing the skills standards which would provide the basis for accreditation. These standards became known as the NOSS. The NOSS consists of competency units identified by industrial experts and practitioners, comprising of knowledge, skills, attitude, and employability skills required in the related occupation.

ii) Importance of National Occupational Skills Standard (NOSS)

The NOSS enables the individual/personnel to comply with industrial requirements and become a multi-skilled worker. The criteria of the NOSS document are listed as below:
• Based on job requirement;
• According to career path as in industrial practice; and
• Prepared by industrial experts and skill workers.

The NOSS document can be used by training centres to conduct training by converting it into training manual documents such as Written Instructional Material (WIM) and Assessments as outlined by the Competency Based Training (CBT) methodology.

This is to ensure a candidate that has undergone training, as required by this NOSS, will be able to perform every competency of the job area efficiently and competently. With the current shortage of skilled workers in the industry, the needs for structured training are essential. The NOSS describes best practices by bringing together skills, knowledge and attitude values. National Occupational Standards are valuable tools to be used as benchmarks for qualifications as well as for defining roles at work, staff recruitment, supervision and appraisal.

Usage of NOSS includes:

a) Staff and volunteers can use National Occupational Standards to:
- Measure their performance, knowledge and understanding against a nationally agreed checklist.
- Identify where they need to develop their skills, knowledge and understanding.
- Help them decide what skills, knowledge and understanding they will need to progress their career.

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[11] Department of Skills Development. NOSS Development Guidelines. Dynamic, Flexible, Responsive. 2011.

    b) Human Resource staff and line managers can use National Occupational Standards to:

- Design fair and transparent recruitment and selection procedures.
- Design job descriptions, advertisements and interview questions.
- Design induction programmes and information packs.
- Carry out appraisals.
- Identify individual or team learning needs.
- Help with strategic planning.
- Develop resources that are benchmarked to nationally recognised best practice.
- Contribute evidence to the organisation's quality systems.

    c) Training providers can use National Occupational Standards to:

- Make training programmes more relevant to people's needs.
- Provide clear goals for structured learning.
- Design tailored training packages and assesses relevance and effectiveness of courses.
- Define the learning outcomes.

iii) Elements of the National Occupational Skills Standard (NOSS)

The NOSS comprises of the following:

a) Standard Practice (SP)

The Standard Practice (SP)is a section of the NOSS document that indicates a career path guideline for a particular profession. The Standard Practice also provides information on the occupational overview in terms of responsibilities, job description, employment prospects and overall occupational structure of the industry. The list of development panel involved in the development is also included.

b) Standard Content (SC)

The SC comprises of two main sections, the first section consists of the Competency Profile Chart and Competency Profile which is the section of the document that describes the Competency Standard, whilst the second section consists of the Curriculum of Competency Unit (CoCU), this is the Curriculum part of the document.

The Occupational Area will be analysed and relevant competencies identified becoming the Competency Units(CU) involved in the particular occupation. During this process, each CU is assessed whether it is measurable and stand alone. This will result in the clustering of the competencies in the Competency Profile Chart (CPC).

The Competency Profile Analysis (CPA) will further analyse each CU and break it down into Work Activities that will each have a set of Performance Criteria used to evaluate the work being done. The CU will be analysed based on the work activities that encompass the preparation activities till the completion of the work cycle. The CPA will result in the Competency Profile (CP). The CP consists of the CU Descriptor, Work Activities and Performance Criteria for each Work Activity (WA).

The Development of the CoCU is based on a further breakdown of the WA. The elements that are explored are the Related Knowledge and Applied Skills. For each WA will be a list of Assessment Criteria that is used to provide the range during assessment. Other important elements of the CoCU are the attitude, safety and environmental aspects that must be applied or complied by the worker of the occupational area. This is to ensure the worker has a holistic view of the job. The training hours are included in the CoCU to ensure that sufficient amount of training is provided to the candidates. The training hours will also guide the transfer of credit hours for use in when the worker wishes to map their qualifications to academic qualifications. Modes of delivery are stated to serve as reference for trainers in the many modes of delivery available and suitable to the WA.

Each CoCU is followed with a statement of relevant Employability Skills and Core Competencies that cover the skills that are integral in a job of any nature such as Information Technology (IT) literacy, Occupational Safety and Health precautions and regulations, problem solving, team work and communication in the workplace. The required Tools, Materials and Equipment required for the training and assessment to be sufficient and effective are also listed including the TEM to candidates' ratio. Another element is the sources of reference that trainers and candidates alike could search for further literature review.

The CoCU will be used as a guide by trainers or module developers in developing their training materials such as Written Instructional Materials (WIM) and Assessment Materials.

2.3 Overview of TVET in Singapore

The sections below describe the overview of TVET in Singapore.

2.3.1 Background of TVET in Singapore

Over the past 5 decades, TVET has played a key role in Singapore's economic and social development, providing Singaporeans with the skills needed to secure good jobs and upgrade Singapore's economy. Currently, close to two-thirds of each graduating secondary school cohort progress on to one of TVET institutions wheresome will enter Polytechnics and some will enroll in the Institute of Technical Education(ITE). Nine out of ten TVET graduates gain employment within six months of graduation.

Singapore had recognised the need for vocational training as an avenue for employment since the year 1960, when a Commission of Inquiry into Vocational and Technical Education in Singapore was set up. It had recommended establishing a 2-year secondary vocational education stream in schools when in the late 1960s, there was a shortage of industrial skills. A ministerial level National Industrial Training Council (NITC) was formed in 1968 to address the issue and a Technical Education Department was created within the Ministry of Education. In 1969, an industrial training system replaced the secondary vocational education stream where nine vocational institutes were created between 1969 and 1971. In 1973, the Industrial Training Board (ITB) was established to oversee the development of industrial training. One of ITB's achievements was to establish national certification systems which were the National Skills Standards and the Public Trade Test system.

By the mid 1970s, Singapore achieved full employment, and had to shift its focus to increasing manpower productivity. There was also concern that school leavers did not take up vocational training. At the same time, the Adult Education Board (AEB, established in 1960) had shifted from general academic education towards commercial courses and pre-vocational training. In 1979, the AEB and ITB were merged to form the Vocational and Industrial Training Board (VITB). The Council on Professional and Technical Education was formed to strategise measures to help manpower meet the demands of a new economic strategy that was technology intensive.[12]

By the end of the 1980s, employment figures showed that VITB graduates with secondary school education were preferred thus the government decided to provide students with at least ten years of general education before they would proceed to technical education. VITB was then upgraded and converted to a post-secondary institution, the Institute of Technical Education (ITE). Subsequently, efforts began to build, rebuild or extensively upgrade the existing ten technical institutes in Singapore.

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[12]Introduction to Vocational and Technical Education, National Library Singapore
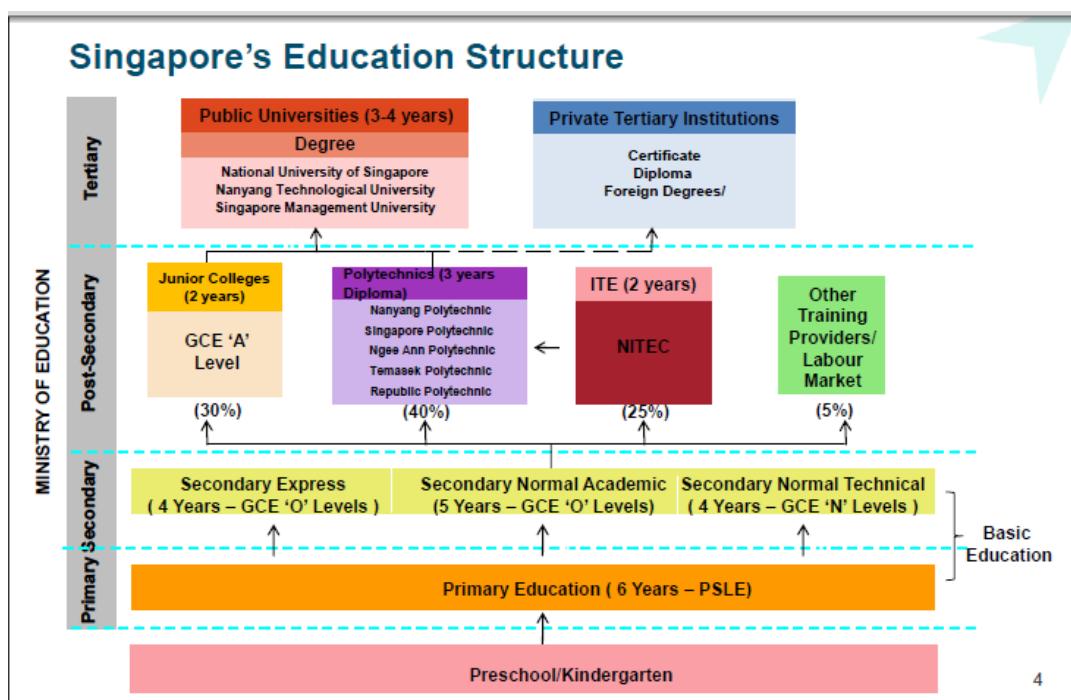
(Source: Institute of Technical Education, Singapore)

Figure 2.5: Singapore's Education Structure

As shown in Figure 2.5, all students receive at least ten years of general education in schools, comprising 6 years primary and 4/5 years secondary. Depending on their academic achievements, aptitude and interests, about 90% of a student cohort would progress to a post-secondary education and beyond. The Junior Colleges provide an academic high school education for the top 25% of a school cohort for a university education. The next 40% of school leavers would enter the Polytechnics for a wide range of practical-oriented three-year Diploma courses in preparation for middle-level professions and management.

2.3.2 Relevant Governing Bodies and Organisations

i) Workforce Development Agency

The Singapore Workforce Development Agency (WDA) was established in September 2003 to help the workforce through training and skills upgrading.[13]

WDA is responsible for enhancing the employability and competitiveness of Singapore's workforce. The agency began with three main objectives:

- Keep training relevant
- Strengthen the continuing education and training (Continuing Education and Training (CET)) infrastructure
- Help workers find jobs

In the following years, WDA significantly expanded the CET infrastructure which now includes:

- A network of five career centres
- More than 40 CET Centres offering quality training and career services

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[13]Singapore Workforce Skills Qualification System: An Introduction. Workforce Development Agency

- A national Singapore Workforce Skills Qualifications (WSQ) framework, covering close to 30 industries

WDA's current focus is to support sustainable and productivity-driven growth through CET. Beyond supporting the building of basic industry skills, WDA provides support for workers to become experts in their field through specialised skills training. WDA provides higher levels of WSQ training, such as graduate diplomas and certificates, and also supports industry scholarships as well as short executive programmes and master classes.

WDA provides special assistance for low-wage workers to help them progress into better paying jobs. Through the Workfare Training Support (WTS) scheme, WDA provides low-wage workers with enhanced support of up to 95% of course fee funding, as well as awards of up to $400 per year for attaining Statements of Attainment (SOA). In addition, WDA hosts motivational workshops and literacy training to boost confidence and prepare them for the job market.

ii)   Industry Skills and Training Council

An Industry Skills and Training Council (ISTC)has been established for each framework to help drive the development and validation of skills standards, assessment strategies and training curriculum for the industry. Each council is represented by key industry partners that include employers, industry associations, training organisations and unions where the council will collaborate inidentifying an industry competency map that captures the skills requirement in a particular industry.

Industry players, training institutions and unions work together in the ISTC in identifying the skills required and in developing an industry-specific WSQ. The ISTC also reviews learning outcomes to ensure that the developed framework is current and relevant to the industry.

iii)   The Institute for Adult Learning (IAL)

The Institute for Adult Learning (IAL) under WDA engages the CET sector to identify and develop a comprehensive suite of competencies to meet the professional needs of trainers. IAL offers a range of courses from the Advanced Certificate in Training and Assessment to advanced degree programmes which provides adult trainers a training pathway to advance their careers.

iv)   Ministry of Education

The Ministry Of Education directs the formulation and implementation of education policies. The ministry has control of the development and administration of the Government and Government-aided primary schools, secondary schools, junior colleges, and a centralised institute. It also registers private schools.

There are 10 statutory boards under the Ministry of Education, namely:

- Council for Private Education
- Institute of Southeast Asian Studies
- Institute of Technical Education
- Nanyang Polytechnic
- Ngee Ann Polytechnic
- Republic Polytechnic
- Science Centre Singapore
- Singapore Examinations and Assessment Board
- Singapore Polytechnic
- Temasek Polytechnic

The Higher Education Division (HED) under this ministry oversees the provision of tertiary and technical education in Singapore as well as registration of private schools. It oversees nine statutory boards – five Polytechnics, the Institute of Technical Education (ITE), the

Science Centre Singapore (SCS), the Institute of Southeast Asian Studies (ISEAS) and the Council for Private Education (CPE). HED also oversees the development of four autonomous universities (the National University of Singapore, the Nanyang Technological University, the Singapore Management University and the Singapore University of Technology and Design). HED also oversees the provision of publicly-subsidised places in the following institutions: Singapore Institute of Management University, Singapore Institute of Technology, LASALLE College of the Arts and Nanyang Academy of Fine Arts.

v)   Institute of Technical Education

The Institute of Technical Education (ITE) accepts students based on their GCE "O" level or GCE "N" level results and they provide 2-year courses leading to a locally recognised "National ITE Certificate." There are 10 ITE Colleges in Singapore where ITE graduates may continue their education at polytechnics and universities. ITE provides four main levels of certification:

- Master National ITE Certificate (Master NITEC)
- Higher National ITE Certificate (Higher NITEC)
- National ITE Certificate (NITEC)
- Technical Engineer Diploma (TED) (from 2007)

There are also other skills certification through part-time apprenticeship courses conducted jointly by ITE and industrial companies. Singapore's vocational and technical education has gained much international recognition for its effective training and whole person development. In 2007, ITE was conferred the international IBM Innovations in Transforming Government Award (organized by the Ash Institute of Harvard University), in recognition of its transformation of VTE in Singapore as "the world's most transformative government programme", which has "profound impact on citizens' lives" and a "model programme" with potential for global replication.

Catering to the needs of the lower 25% of a school cohort who are less academically-inclined, ITE provides full-time institutional-based courses under its "One ITE, Three Colleges" system of governance. With a wide range of 80 different courses, full-time student enrolment is 25,000. There are two basic levels of qualifications under the National ITE Certificate (NITEC) system of certification. Depending on their achievements in schools, aptitudes and interests, students may enrol at the NITEC or Higher NITEC mainly two-year courses in Schools of Engineering, Business & Services, Electronics & Info-Communications Technology, Applied & Health Sciences, Hospitality and Design & Media. As a total national education system, there is formal articulation for progression from ITE to the Polytechnic and Polytechnic to the university based on merit performance.

2.3.3 Acts Relevant to TVET in Singapore

i)   Private Education Act 2009

The Private Education Act was gazetted in October 2009 to strengthen the existing registration framework and enforcement provisions to ensure quality. The Act also provides for the establishment of the Council for Private Education (CPE) to regulate and promote the private education industry in Singapore.

ii)   Institute of Technical Education Act 1992

An Act to establish the Institute of Technical Education, Singapore and for matters connected therewith and to repeal the Vocational and Industrial Training Board Act.

iii)   Skills Development Levy Act 1979

The Skills Development Levy (SDL) Act 1979 is a statutory requirement for employers to make SDL contributions for employees who fall within the salary ceiling for levy contributions. With effect from 1 October 2008, SDL contribution is payable by employers for all employees up to the first $4,500 of gross monthly remuneration at the rate of 0.25% or $2, whichever is higher.

The SDL collections are credited to the Skills Development Fund (SDF). Under the administration of the Singapore Workforce Development Agency (WDA), the Fund provides various incentive schemes to companies to upgrade the skills of their employees. The moneys of the SDF may be applied for providing financial assistance by grants, loans for promotion, development and upgrading of skills and expertise of persons preparing to join/rejoin the workforce or persons in the workforce.

For this purpose the WDA may from time to time authorise moneys of the Fund to be paid for establishing or expanding facilities or assisting in the maintenance of facilities for full-time or part-time training courses and training programs or for the provision of grants or loans to any employer for equipment required for more sophisticated or skilled operations in the conduct of his business or for subsidising the costs incurred by the Agency or by any employer or training institution in the training or retraining of persons and for such other purposes, not in consistent with the objects of the Fund.

2.3.4 Singapore Workforce Skills Qualifications

i)   The Singapore Workforce Skills Qualifications (WSQ)

The Singapore Workforce Skills Qualifications (WSQ) is a national credentialing system. It trains, develops, assesses and recognises individuals for the key competencies that companies look for in potential employees.

Based on standards developed by the Singapore Workforce Development Agency (WDA) and various industry partners, WSQ ensures workers acquire skills needed by employers at the workplace. With clear progression pathways, workers can also use WSQ to upgrade their skills and advance in their careers. The quality of WSQ is assured by WDA, from the development of competency standards, accreditation of training providers to the award of its qualifications. WSQ is based on national standards developed by WDA in collaboration with various industries comprising industry sectoral frameworks which serve to:

- Professionalise the industry, particularly where recognition of Continuing Education and Training (CET) qualifications are lacking
- Improve labour mobility allowing companies in growing industries to easily recruit workers with the necessary skills whilst improving opportunities for workers to enter these industries

The WSQ system is designed to be a practical, accessible and affordable launching pad for individuals to take charge of their own careers and advancement. [8]

Key features of WSQ:

- An occupational and competency-based system, designed to build industry-specific capabilities
- Both singular and flexible training modules, with the option to implement as-is, or build up to full qualifications
- Assessment and certification are based on ability to demonstrate the industry's required capabilities
- Accessible to all workers and professionals
- Recognises prior learning, such as work experience and credentials
- Qualifications and certifications are based on Industry-agreed standards

- WSQ qualifications are comparable to credentials issued by international and local awarding bodies

WSQ frameworks develop skills in two different aspects: foundational and industry-specific. Foundational skills comprise a range of skills, knowledge and attributes that help every individual improve his/her employability. These skills enable workers to better adapt to new job demands and a changing work environment. Foundational skills are portable across all industries. The different types of competencies can be seen in Figure 2.6. The Singapore Workforce Skills Qualifications (WSQ) industry frameworks cover skills that equip individuals with the know-how to perform specific jobs.

(Source: Singapore Workforce Development Agency)

Figure 2.6: Types of Competencies in the WSQ Framework, Singapore

There are 35 Singapore Workforce Skills Qualifications (WSQ) frameworks, which are all recognised by the industries. The different levels of WSQ qualifications are as follows:
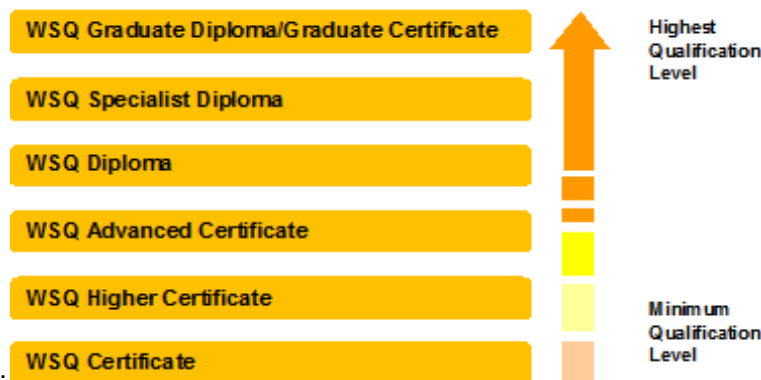
(Source: Singapore Workforce Development Agency)

Figure 2.7 : Example of Different Levels Of WSQ Qualifications

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2.3.5National Occupational Skills Standards Equivalent in Singapore – WSQ CompetencyStandards

WSQ competency standards are reference documents that capture the most relevant information about a particular job task of a job role in a particular industry setting. They are a key source of information for individuals, employers and training providers who require detailed information on work performance standards and skills and knowledge required of an individual by industry. The WSQ competency standard documents the expected work performance outcomes, the expected level of performance, the knowledge that supports the delivery of work performance outcomes and the work contexts under which the work performance outcomes are to be delivered, according to industry agreed minimum standards and expectations. A competency standard states what an individual is able to do, what an individual should know, when and where an individual would perform his job role and how well an individual would perform in his job role.[14]

The competency standards list the skills, knowledge and attributes needed to perform a job task and describe the acceptable levels of performance. WSQ competency units help us understand how work items and jobs are organised within industries. WSQ competency standards help us understand how well an employee must be able to perform at his job.

The competency units derived under a WSQ framework reflect how work is organised and jobs are defined in order to deliver the goods and services of the industry. Competency Units are the building blocks of the WSQ.

Table 2.4: Differences between WSQ Competency Standards and WSQ Competency Unit

WSQ Competency Standards	WSQ Competency Unit
• Define expected work performance outcomes • Define acceptable level of performance required of an employee to perform effectively in his workplace • Provide behavioural-based descriptors of performance • Indicate knowledge a competent employee must have • Illustrate types of evidence an employee must show to prove competence	• Consists of work items, which can be undertaken by an individual • Has credibility as a stand-alone unit for training and certification • Has economic value to an individual and to his employer, i.e. must add value to employment • Is different from all other WSQ competency units • Describe conditions and context under which the employee should demonstrate the expected level of job performance • Are endorsed by employers and validated by industry in meeting minimum standards in job performance

(Source: Singapore Workforce Development Agency)

In essence, a WSQ competency standard is the reference document of a competency unit. The relationship between a competency unit and a competency standard is similar to that between a course title and the course materials. The contents articulated in a WSQ competency standard provide the basis for an employee to be trained and certified competent in a WSQ competency unit.[15]

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[14]Interpretation of Singapore Workforce Qualifications. Singapore Workforce Development Agency.

[15] Interpretation of WSQ Competency Standards for Training and Assessment. Singapore Workforce Skills Qualification.

2.4 Overview of TVET in Australia

The sections below describe the overview of TVET in Australia.

2.4.1 Background of TVET in Australia

The Australian tertiary education includes both higher education (including universities) and vocational education and training (VET). Australia's VET sector is based on a partnership between governments and industry. VET qualifications are provided by government institutions, called Technical and Further Education (TAFE) institutions, as well as private institutions.

Australian governments (federal[16] and state/territory[17]) provide funding, develop policies, and contribute to regulation and quality assurance of the sector. Regulation and quality assurance is based around national standards which ensure that quality is built into the products and services of the VET system, thereby increasing confidence in the system by industry.

Industry and employer groups contribute to training policies and priorities, and in developing qualifications that deliver skills to the workforce.[18]

2.4.2 Relevant Governing Bodies and Organisations

The Australian TVET system is managed by a number of governmental and independent agencies that set out the national training system's requirements for quality and national consistency in terms of qualifications and the delivery of training.

The Commonwealth Government (the Commonwealth), through the Department of Industry, manages the funding agreement for Industry Skills Councils and is involved in consultation from the outset whereas state and territory governments are involved in consultation to provide implementation advice and to facilitate access to industry and jurisdictional stakeholders.

i) Department of Industry

This department consolidates the Australian government efforts to drive economic growth, productivity and competitiveness by bringing together industry, energy, resources, science and skills.

This department supports the VET sector through policies and funding for programs, including a National Partnership Agreement on Skills Reform (2012 – 2017)[19] with all states and territories across Australia.

ii) Council of Australian Government (COAG) Ministerial Standing Council

COAG is the peak intergovernmental forum in Australia, and is chaired by the Prime Minister. COAG is supported by inter-jurisdictional, ministerial-level Councils that facilitate consultation and cooperation between the Commonwealth and States and Territories in specific policy areas.

The ministerial council with high-level policy responsibility for the national tertiary education, skills and employment system, including strategic policy, priority setting,

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[16] Also referred to as the Australian Government or Commonwealth Government

[17] Australia has six states and two territories which have responsibility for setting the priorities for VET provision in their jurisdiction.

[18] Australian Government. Study in Australia official website. www.studyinaustralia.au

[19] www.industry.gov.au/Skills/National/NationalPartnership/Pages/default.aspx

planning and performance, and key cross-sectoral issues from September 2011is the Standing Council on Tertiary Education, Skills and Employment (SCOTESE).

The purpose of this ministerial council is to ensure that Australia's current and future workforce needs are met through increased participation, educational attainment, skills development and skills use to achieve greater productivity.

iii) National Senior Officials Committee (NSOC)

NSOC is the administrative arm of the COAG Ministerial Standing Council, and is responsible for implementing the decisions of the Standing Council, driving national collaboration on training matters and monitoring the effectiveness of the national education, skills and employment systems. NSOC members are typically heads of responsible government departments, or their delegate.

iv) National Skills Standards Council (NSSC) and Office of the NSSC

The NSSC was established n the year 2011 and is an expert council who develops standards for training delivery and endorses Training Packages. The NSSC includes members from the industry, regulators and government. The NSSC develops and maintains the national standards and policy for Training Packages and endorses Training Packages.

The Office of the National Skills Standards Council (Office of the NSSC) manages the Training Package Quality Assurance arrangements on behalf of the NSSC, undertakes analysis of Training Package Cases for Endorsement against the Case for Endorsement requirements set out in this document, prepares advice for members in considering such submissions, and notifies the NSSC decision to ISCs, the Commonwealth, and the state and territory governments.

v) Industry Skills Councils (ISCs)

Industry Skills Councils (ISCs) are responsible for quality of the Training Packages including industry relevance, and technical and editorial quality to publication standard. They are also responsible for uploading the draft Training Package to the National Register (TGA, see training.gov.au) prior to NSSC consideration and publishing the Training Package on TGA once endorsement has occurred.

Training Packages are a set of nationally endorsed standards and qualifications used to recognise and assess the skills and knowledge that people need to be able to perform effectively in the workplace. They consist of three components - entry requirements, assessment guidelines and competency standards. Each qualification within a Training Packages defines what competencies need to be achieved and can be used by training providers to develop teaching and assessment resources and strategies to meet the needs of learners intending to work in a given industry.

vi) Australian Productivity Workforce Agency (AWPA)

The Australian Workforce and Productivity Agency (AWPA) is an independent statutory body which provides advice to the Federal Minister for Industry on Australia's current, emerging and future skills and workforce development needs.

AWPA provides advice on a broad range of areas that affect the demand, supply and use of skills. AWPA was established on 1 July 2012, under the Australian Workforce and Productivity Agency Act 2008 which expanded the roles and functions of its predecessor Skills Australia. Through its high level expertise, industry and union leadership and collaboration, AWPA is recognised as an authority on workforce development policy and advice and directs skills funding to industry needs. The agency engages directly with

industry on workforce development issues and addresses sectoral and regional industry needs. Specifically it:

- administers the Australian Government's National Workforce Development Fund
- conducts skills and workforce research, including into the quality of jobs and future working life in Australia
- drives engagement between industry, training providers and government on workforce development, apprenticeships and VET reform
- develops and monitors sectoral skills and workforce development plans in conjunction with Industry Skills Councils and industry
- provides independent advice on sectoral and regional skills needs to support workforce planning and productivity, including in small business
- promotes workforce productivity by leading initiatives for the improvement of productivity, management, innovation and skills utilisation within Australian workplaces.

vii) Australian Skills Quality Agency (ASQA)

The Australian Skills Quality Agency was established in the year 2011 and is the national regulator for Australia's vocational education and training sector.ASQA registers and regulates training providers to ensure they meet nationally approved quality standards.

ASQA is also responsible for accrediting VET courses developed outside the Training Package development process, usually for niche markets.ASQA's functions include:

- Registering training providers as 'registered training organisations' (RTOs)
- Registering organisations for the Commonwealth Register of Institutions and Courses for Overseas Students (CRICOS) – providers that can enroll international students
- Accrediting VET courses
- Ensuring that organisations comply with the conditions and standards for registration, including by carrying out compliance audits.

viii) Australian Qualifications Framework Council (AQFC)

The AQFC is responsible for the development the Australian Qualifications Framework (AQF). The council consists of experts from education sectors, industry and government.The key functions of the AQFC are to provide policy advice to the Ministerial Standing Council and maintain, monitor and support the implementation of the AQF[20].

2.4.3 Acts and Instruments Relevant to TVET in Australia

A number of state and territory laws and instruments regulate different aspects of TVET in Australia. The most fundamental laws and agreements are listed below:

i)   National Agreement for Skills and Workforce Development 2012

The National Agreement for Skills and Workforce Development 2012 identifies the long term objectives of the Commonwealth and State and Territory Governments in the areas of skills and workforce development, and recognises the interest of all governments in ensuring the skills of the Australian people are developed and utilised in the economy.

ii)   National Partnership Agreement on Skills Reform 2012

The National Partnership Agreement on Skills Reform 2012 aims to improve outcomes in vocational education and training (VET), through the Commonwealth and State and Territory Governments working together to achieve those outcomes. This could include

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[20]http://www.aqf.edu.au/wp-content/uploads/2013/06/AQF-Council-Object-Terms-of-Reference-Effective-July-2011updated-2012.pdf

integration of innovative new technologies and delivery modes to deliver greater responsiveness to the needs of students and foster improved engagement with industry.

iii)   National Vocational Education and Training Regulator Act 2011

The National Vocational Education and Training Regulator Act 2011 established the TVET regulating body (Australian Skills Quality Authority). The Skills Australia Amendment (Australian Workforce and Productivity Agency) Bill 2012 amends the Skills Australia Act 2008 and establishes the Australian Workforce and Productivity Agency, which has replaced Skills Australia from 1 July 2012. The Agency engages directly with industry on workforce development issues and addresses sectoral and regional industry needs.

iv)   Skilling Australia's Workforce Act 2005

The Skilling Australia's Workforce Act 2005 (amended in 2010) links state and territory funding to a set of goals and conditions for training outcomes. The Skilling Australia's Workforce (Repeal and Transitional Provision) Act 2005 provides transitional arrangements for transferring responsibilities held by Australian Training Authority (which was repealed by the same Act) to the Department of Education, Employment and Workplace Relations.

Furthermore, territory laws supplement the existing national legal framework for TVET:

- Australian Capital Territory: Training and Tertiary Education Act 2003
- New South Wales: Vocational and Training Act 2005 and Vocational Education and Training (Commonwealth Powers) Act 2010
- Northern Territory: Northern Territory Employment and Training Act
- Queensland: Vocational Education, Training and Employment Act & Regulation 2000
- South Australia: Training and Skills Development Act 2008
- Tasmania: Tasmanian Vocational Education and Training Act 1994 & Tasmanian
- Qualifications Authority Act 2003
- Victoria: Education and Training Reform Amendment (Skills) Act 2010
- Western Australia: Vocational Education and Training Act 1996.

2.4.4 Australian Qualifications Framework

The Australian education system is distinguished from many other countries by the Australian Qualifications Framework (AQF). The AQF was originally established in 1995 and reviewed and strengthened in 2011. It is a national policy that covers qualifications from the tertiary education sector (higher education and vocational education and training) in addition to the school-leaving certificate; the Senior Secondary Certificate of Education.

The AQF has 10 levels and links school, vocational and university education qualifications into one national system. This allows students to move easily from one level of study to the next and from one institution to another. It allows for choice and flexibility in career planning. All qualifications in the AQF help prepare students for further study and/or working life.

The institutions are linked across the country and across the world, which makes it easy to move throughout the education system between courses or institutions and formal agreement and recognition frameworks mean every step of the path will contribute to their future no matter what they study or career goals are.

The users of the AQF span each education and training sector: schools, vocational education and training and higher education, and include the accrediting authorities and institutions providing education and training. The many AQF stakeholders include industry and its representative bodies, unions, professional associations and licensing authorities and governments. Ultimately students, graduates and employers, both Australian and international, benefit from the quality qualifications that are built on the requirements of the AQF.

The objectives of the AQF are to provide a contemporary and flexible framework that:

- Accommodates the diversity of purposes of Australian education and training now and into the future
- Contributes to national economic performance by supporting contemporary, relevant and nationally consistent qualification outcomes which build confidence in qualifications
- Supports the development and maintenance of pathways which provide access to qualifications and assist people to move easily and readily between different education and training sectors and between those sectors and the labour market
- Supports individuals' lifelong learning goals by providing the basis for individuals to progress through education and training and gain recognition for their prior learning and experiences
- Underpins national regulatory and quality assurance arrangements for education and training
- Supports and enhances the national and international mobility of graduates and workers through increased recognition of the value and comparability of Australian qualifications
- Enables the alignment of the AQF with international qualifications frameworks[21].

The Framework is structured around levels of descriptive criteria, with formal qualifications aligned to the appropriate levels. TheVolume of Learning in the AQF refers to the dimension of the complexity of the qualification. It is used with the level criteria and qualification type descriptor to determine the depth and breadth of the learning outcomes of a qualification. The volume of learning identifies the notional duration of all activities required for the achievement of the learning outcomes specified for a particular AQF qualification type. It is expressed as equivalent full-time years. Table 2.5 shows a summary of the level descriptions under the AQF.

Table 2.5: AQF Level Description

AQF Level	Description	Qualifications	Volume of learning
Level 10	Graduates at this level will have systematic and critical understanding of a complex field of learning and specialised research skills for the advancement of learning and/or for professional practice	• Doctoral degree	• Typically 3 to 4 years
Level 9	Graduates at this level will have specialised knowledge and skills for research, and/or professional practice and/or further learning	• Masters degree (Extended) • Masters degree (Coursework) • Masters degree (Research)	• 3 to 4 years • 1 to 2 years • 1 to 2 years Duration for these qualifications will vary depending upon whether qualifications are in the same or different discipline as the previously held qualification.

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[21]www.aqf.edu.au/aqf/about/what-is-the-aqf/

AQF Level	Description	Qualifications	Volume of learning
Level 8	Graduates at this level will have advanced knowledge and skills for professional/highly skilled work and/or further learning	• Graduate diploma • Graduate certificate • Bachelor Honours degree	• Typically 1 to 2 years • Typically 6 months to 1 year • Typically 1 year following or embedded within a Bachelor degree.
Level 7	Graduates at this level will have broad and coherent knowledge and skills for professional work and/or further learning.	• Bachelor degree	• Typically 3 to 4 years
Level 6	Graduates at this level will have broad knowledge and skills for paraprofessional/highly skilled work and/or further learning	• Associate degree • Advanced diploma	• Typically 2 years • Typically 1.5 to 2 years
Level 5	Graduates at this level will have specialised knowledge and skills for skilled/paraprofessional work and/or further learning	• Diploma	• Typically 1 to 2 years
Level 4	Graduates at this level will have theoretical and practical knowledge and skills for specialised and/or skilled work and/or further learning	• Certificate IV	• Typically 6 months to 2 years. There may be variations between short duration specialist qualifications that build on knowledge and skills already acquired and longer duration qualifications that are designed as entry level requirements for work.
Level 3	Graduates at this level will have theoretical and practical knowledge and skills for work and/or further learning	• Certificate III	• Typically 1 - 2 years. Up to four years may be required to achieve learning outcomes through a program of indentured training/employment.

AQF Level	Description	Qualifications	Volume of learning
Level 2	Graduates at this level will have knowledge and skills for work in a defined context and/or further learning	• Certificate II	• Typically 6 months to 1 year
Level 1	Graduates at this level will have knowledge and skills for initial work, community involvement and/or further learning	• Certificate I	• Typically 6 months to 1 year

(Source: Australian Qualifications Framework. January 2013)

2.4.5 National Occupational Skills Standards (NOSS) Equivalent in Australia- Training Packages

Training packages specify the skills and knowledge required to perform effectively in the workplace in specific job roles/occupations. They do not prescribe how an individual should be trained. Trainers and supervisors develop learning strategies - the 'how' - to support an individual learners' needs, abilities and circumstances.

The development and endorsement process for Training Packages ensures the specifications are developed to an agreed quality standard and are highly responsive to industry's existing and future demand for new skills.

The following key principles underpin the development and endorsement processes:
▪ Open and inclusive industry-driven maintenance, validation and endorsement of training packages
▪ Strong and clear key stakeholder roles with critical points of intervention and consultation
▪ Continuous improvement, with full training package reviews where required
▪ Highly responsive process capable of meeting industry's needs and priorities for new skills
▪ Industry skills councils' responsibility and accountability for the quality and relevance of training packages

Each Training Package:
▪ Provides a consistent and reliable set of endorsed components - endorsed by the national quality council which is representative of industry, unions, the Australian government and states/territory state governments
▪ Enables nationally recognised vet qualifications to be awarded through direct assessment of workplace competencies
▪ Encourages the development and delivery of flexible training which suits individual and industry requirements
▪ Encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

Training packages are made up of five (5) components:
▪ **Units Of Competency**: the specifications of knowledge and skill, and the application of that knowledge and skill to the standard of performance required in the workplace. Units of competency cover a range of functions, relevant to the workplace and appropriate to either an enterprise, industry or cross-industry application.

- **Qualifications Framework**: created by packaging units of competency into meaningful groups for occupations/job outcomes, and aligned to the Australian Qualifications Framework (AQF)

- **Assessment Requirements:** specify the evidence and required conditions of assessment for each unit of competency.

- **Credit arrangements**: Credit arrangements existing between Training Package qualifications and Higher Education qualifications are listed in a format that complies with the credit arrangements template.

- **Companion Volumes**: A quality assured companion volume implementation guide produced by the Training Package developer is available at the time of endorsement and complies with the companion volume implementation guide template. Training Package developers produce other quality assured companion volumes to meet the needs of their stakeholders as required.

The NSSC will consider endorsing a Training Package based on:

- Evidence of industry need and a direct link back to the Continuous Improvement Plan
- Whether the Training Package meets the Standards for Training Packages
- Evidence that industry involvement in development and that of key stakeholders has been commensurate with the scope and impact of the proposed Training Package components
- Evidence of industry support
- Evidence that state and territory governments have been advised on the implications for implementation.

The Industry Skills Council is responsible for the development of their respective industry's Training Packages. The Commonwealth Government, through the Department of Industry contributes to the costs of developing the Training Packages. Industry contributes to the development process by providing technical input into the development of the Training Packages.

 In Australia, education and training is a shared responsibility of all Commonwealth, State and Territory governments. In 2011, under the leadership of the AQF Council, the AQF was revised to ensure that qualification outcomes remain relevant and nationally consistent, continue to support flexible qualifications linkages and pathways and enable national and international portability and comparability of qualifications.

A small team of specialist advisors is employed by the Industry Skills Councils to work with these industry personnel to develop the Training Packages.To gain national endorsement for the Training Packages, evidence of extensive consultation and support with industry must be provided. This means that employers, trade unions, training providers, regulators and other industry stakeholders must be consulted on the development of Training Packages.

On completion of a quality assurance process, the Training Packages are endorsed by the National Skills Standards Council (NSSC) and placed on the official website (www.training.gov.au.).

Training.gov.au is the official national register on VET in Australia and is the authoritative source of information on training packages, qualifications, accredited courses, units of competency, skill sets and Registered Training Organisations and their approved scope of service provision. Information on this site is maintained by VET Regulators Industry Skills Councils (ISCs) and the Department of Industry.

2.5 Overview of TVET in Canada

The sections below describe the overview of TVET in Canada.

2.5.1 Background of TVET in Canada

The country of Canada is made up of 10 provinces and 3 territories. The provincial/territorial governments work in partnership with the Government of Canada to ensure that all Canadians can participate in the programs and services they need to be successful in their pursuit of post-secondary education and training and participation in the labour market.

Canada is an industrialised, trading nation and its economy is dominated by the resources extraction and service industries. The Canadian service industry employs about three quarters of Canadians. The service sector includes storage services, truck drivers, rail carriers, legal and financial services, as well as nearly every aspect of government activity from health care to national defence. Canada also relies heavily on resource extraction as well as manufacturing, agriculture, and construction.

For postsecondary Education in Canada, the provincial/territorial governments have jurisdictional responsibility for education from Kindergarten to Grade 12 (K-12) and postsecondary education and the federal government supports provincial direct support in specific areas (e.g., student financial assistance, research).VET is not a term that is often used in the Canadian context, where terms such as professional education, apprenticeship, applied learning are commonly used, and generally refer to a portion of VET.

VET is a program or a series of courses providing specialised instruction in a skill or a trade primarily at the postsecondary level with programs offered at both the apprenticeship and the college level which offer students an entry point into the labour market or further postsecondary education. VET programs are characterised by direct industry involvement and flexibility which reflects regional differences. [22]

VET is offered in secondary schools and at the postsecondary level in public colleges and institutes, private forprofit colleges, and in the workplace, through apprenticeship programs. At the secondary level, vocational programs may be offered at separate, specialised schools or as optional programs in schools offering both academic and vocational streams.

The secondary school programs prepare the student for the workforce, a postsecondary program, or an apprenticeship. Private colleges may be licensed by provincial governments and may receive some public funding but are largely funded through tuition fees and offer programs in such areas as business, health sciences, human services, applied arts, information technology, electronics, services, and trades. Programs usually require one or two years of study, although some private career colleges offer programs of shorter duration.

2.5.2 Relevant Governing Bodies and Organisations

i) Council of Ministers of Education, Canada (CMEC)

The CMEC provides a forum to discuss matters of common concern, explore ways to cooperate, share information, and coordinate education activities internationally. It is important to note that CMEC consists only of provincial and territorial representatives. No one representing the Government of Canada sits at the CMEC table, although the federal government does provide funding to CMEC for specific projects. [23]

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[22]Vocational and Education Training in Canada. Council of Ministers of Education, Canada (CMEC).October 2013.

[23] Education In Canada. Council of Ministers of Education (CMEC), Canada. 9th October 2013.

In Canada, the provincial/territorial governments have exclusive responsibility for all levels of education. The federal government provides indirect support through fiscal transfers to the provinces/territories and by funding university research and student assistance. To increase the collaboration and consistency throughout the country, each province and territory has a Minister in charge of education and/or post-secondary education who participates in the Council of Ministers of Education, Canada (CMEC). All 13 provinces and territories are members.

The Council of Ministers of Education, Canada (CMEC) is an intergovernmental body founded in 1967 by ministers of education to serve as:
- a forum to discuss policy issues
- a mechanism through which to undertake activities, projects, and initiatives in areas of mutual interest
- a means by which to consult and cooperate with national education organisation and the federal government
- the prime vehicle for coordinating leadership and agenda-setting, and for establishing terms of engagement with the federal government for international forums on education

CMEC is the collective voice of Canada's ministers of education and through CMEC, the provinces and territories work together on common objectives. It provides leadership in education at the pan-Canadian and international levels and contributes to the fulfillment of the constitutional responsibility for education conferred on the provinces and territories.

ii) Employment and Social Development Canada (formerly known as Human Resources and Skills Development Canada (HRSDC))

Employment and Social Development Canada (ESDC) under the Government of Canada is responsible for developing, managing and delivering social programs and services.[24]
ESDC's mission is to build a stronger and more competitive Canada, to support Canadians in making choices that help them live productive and rewarding lives, and to improve Canadians' quality of life.

ESDC is responsible in:
- Developing policies that make Canada a society in which all can use their talents, skills and resources to participate in learning, work and their community;
- Creating programs and support initiatives that help Canadians move through life's transitions from families with children to seniors, from school to work, from one job to another, from unemployment to employment, from the workforce to retirement;
- Creating better outcomes for Canadians through service excellence with Service Canada and other partners; and
- Engaging employees, establish a healthy work environment, nurture a culture of teamwork, and build our leadership capacity.

iii) Canadian Council of Technologists and Technicians

The Canadian Council of Technologists and Technicians (CCTT) is involved in issues such as pan-Canadian standards, national and international mobility, and national accreditation of technology programs. CCTT's provincial associations are responsible for issuing these highly regarded credentials, which are recognised by provincial statute in many Canadian provinces. Once certified, technicians and technologists may use one of the following professional designations: PTech (Professional Technologist), CET (Certified Engineering Technologist); AScT (Applied Science Technologist); CTech (Certified Technician); and TP (*technologue professionnel*).

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[24]Employment and Social Development Canada (ESDC) Official Website.http://www.hrdsc.gc.ca.2013.

iv) Canadian Council of Directors of Apprenticeship

The first National Conference on Apprenticeship in Trades and Industries held in Ottawa in1952, recommended that the federal government be requested to cooperate with the provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources and Skills Development Canada (HRDSC) sponsors a program, under the guidance of the Canadian Council of Directors of Apprenticeship (CCDA). The CCDA assesses requests for designation made by its members. Upon receipt of a request, it will conduct a national survey to validate the information in the request to provide a basis for an informed decision. All CCDA decisions are consensus-based.

The Canadian Council of Directors of Apprenticeship is an organisation comprised of:

- One official from each province and territory who is responsible for managing and directing apprenticeship programs within their jurisdiction; and
- Two federal government representatives from Employment and Social Development Canada (ESDC).
- The Council's member jurisdictions have agreed to work together to facilitate the development of a certified, competent and mobile skilled trades workforce in Canada. CCDA members are accountable to the provincial/territorial jurisdiction they represent.

2.5.3 ActsRelevant to TVET in Canada

i)   Technical and Vocational Training Assistance Act 1960 (TVTA Act)

Under this act, significant federal funding was made available for training and employment related programs. While most of the funds were intended for the post-secondary level, the following six years saw an increasing number of secondary school technical-vocational programs across the country. Thus, for the first time since Canada was 'united' under Confederation, federal money would be available to assist with secondary level schooling in the provinces, related to the expansion of technical and vocational (distinguished from academic) education. The TVTA act effected significant change on the structure and composition of Ontario secondary schooling.

ii) National Training Act 1982

The 1982 Act had been enacted to ensure a qualified Canadian labour force. The evolving Canadian economy and the changing world of work have required a federal role varying from financing to direct training involvement. The basic difference between the National Training Act (1982)and its predecessor was that the new act increased federal control. Thisprogram targeted specific occupations to meet employers' anticipated needs.

iii) The Private Career Colleges Act, 2005

Last updated in 2010, the Private Career Colleges Act 2005 (Act) states that all institutions that provide trainingin vocational programs must be registered under the Act and their programs must be approved.

2.5.4 Ontario Qualifications Framework

Ten provincial and three territorial departments or ministries of education are responsible for the organisation, delivery, and assessment of education at the elementary and secondary levels, for technical and vocational education, and for postsecondary education. There are 13 different education systems in Canada.

The Ontario Qualifications Framework (OQF), developed and produced by the Government of Ontario, is the first complete framework in Canada that includes all postsecondary credentials and apprenticeship certificates. The OQF includes apprenticeship certificates, the qualifications for private career colleges, the qualifications awarded by publicly-assisted colleges of applied arts and technology (CAATs) and degrees offered by publicly-assisted universities and other authorized providers.

The OQF describes the main purposes and features of each credential; it outlines the knowledge and skills expected of holders each type of qualification; and it shows the relationship and differences between qualifications. Each qualification can be seen as a reference point along a continuum. Please refer to Figure 2.8 below which shows that Canada's education system is different between the different provinces. All colleges and universities offer certificate programs of variable length. Continuing and Adult education programs while not shown in the figure below may be offered at all levels of instruction. British Columbia's colleges also offer associate degrees.

Vocational and Technical Training is conducted at post-secondary level and known as Apprenticeship training that may be conducted between 1 to 4 years. Then they may proceed to a college degree before pursuing a Bachelors degree. Under the province of Quebec there are four qualifications for Vocational & Apprenticeship Training level as stated below:
- PTC – Pre-work training Certificate
- TCST – Training Certificate for a Semi-skilled Trade
- DVS – Diploma of Vocational Studies
- AVS – Attestation of Vocational Specialisation

After obtaining these qualifications they may proceed for Diploma of College Studies either for Pre University or Technical before proceeding to a Bachelor's Degree. The higher qualifications are the Master's and Doctorate which is the same for each province.

	In all jurisdictions, a secondary school diploma is issued upon successful completion of the secondary school curriculum.
1	
2	Selected institutions in Alberta, British Columbia, Manitoba, Ontario and Prince Edward Island offer applied degrees
3	The Northwest Territories and Nunavut have no degree-granting institutions. Some degrees are available through partnerships. Students may also access degrees directly from

Notes:
1-PTC:Pre-work Training Certificate (3 years after Secondary II)
2-TCST: Training Certificate for a Semi-skilled Trade (1 year after Secondary II)
3-DVS: Diploma of Vocational Studies(600 to 1,800 hours depending on program)

(Source: International Centre for International Credentials, Council of Ministers of Education Canada, CMEC. 2010)

Figure 2.8 : Canada's Education System

2.5.5National Occupational Standard (NOSS) Equivalent in Canada- National Occupational Analysis

The National Occupational Analysis (NOA) is a foundational standards document which maps out the scope of the trade, and identifies the common tasks and sub-tasks. The Red Seal Program promotes labour mobility in the skilled trades through the development of national standards and exams with industry input: and represents a standard of excellence for the skilled trades valued by employers.[25]

High Quality standards, assessment and tools are developed for the red seal trades where the main products developed with industry input are:

- The Interprovincial (IP) examination, or Red Seal exam – developed from the common elements of the trade identified in the NOA
- The Interprovincial Program Guides (IPG) which list validated technical training outcomes based on common sub-tasks in the NOA
- IPG's promote consistency and provide updated curriculum resources for apprenticeship technical training essential skills tools and resources the program is managed and delivered by the CCDA, comprised of the P/T apprenticeship authorities and two representatives from ESDC. The red seal program currently has 55 trades designated red seal which cover approximately 80% of all registered apprentices.

2.6 Chapter Summary

This chapter has presented the findings based on desktop research where the sections of this chapter have been divided according to the different economies analysed in this study which are Malaysia, Australia, Singapore and Canada. Findings obtained in earlier literature review were confirmed with personnel of the respective organisations visited during the benchmarking visits. Several content have been amended based on recent findings to ensure continuity and to avoid contradicting facts in Chapter 2, Literature Review and Chapter 4, Findings & Analysis. It can be summarised that the economies have very distinct systems mainly because of the various geographic and structure of government administration. For example, Australia and Canada have given much autonomy to the states/provinces especially on education and training that is mainly driven by the localised economic activities, whereas Malaysia and Singapore centralise the education and training implementation. The next chapter, Chapter 3 will elaborate on the methods of research and analysis applied in this study.

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[25] Red Seal. National Occupational Analysis (NOA).http://www.red-seal.ca.2013

3.   METHODOLOGY APPLIED INSTUDY

3.1 Preamble

This study is focused on reviewing TVET curriculum development that includes Occupational Analysis (OA) and National Occupational Skills Standards (NOSS). The study will also compare OA and NOSS equivalent document development conducted in selected APEC economies namely Singapore, Australia and Canada.

Input is acquired through focus group discussions and interviews with TVET stakeholders. This study and its conclusions are conducted on a best-effort basis to help draw a more accurate and comprehensive picture of TVET curriculum development among APEC economies. Various approaches of analysis were used in the study, to determine the elements that are critical to ensuring that the analysis of occupations were accurately translated into Occupational Competency Standards to be used as reference for training and assessment. The analysis conducted and responding results are depicted in Figure 3.1 below.
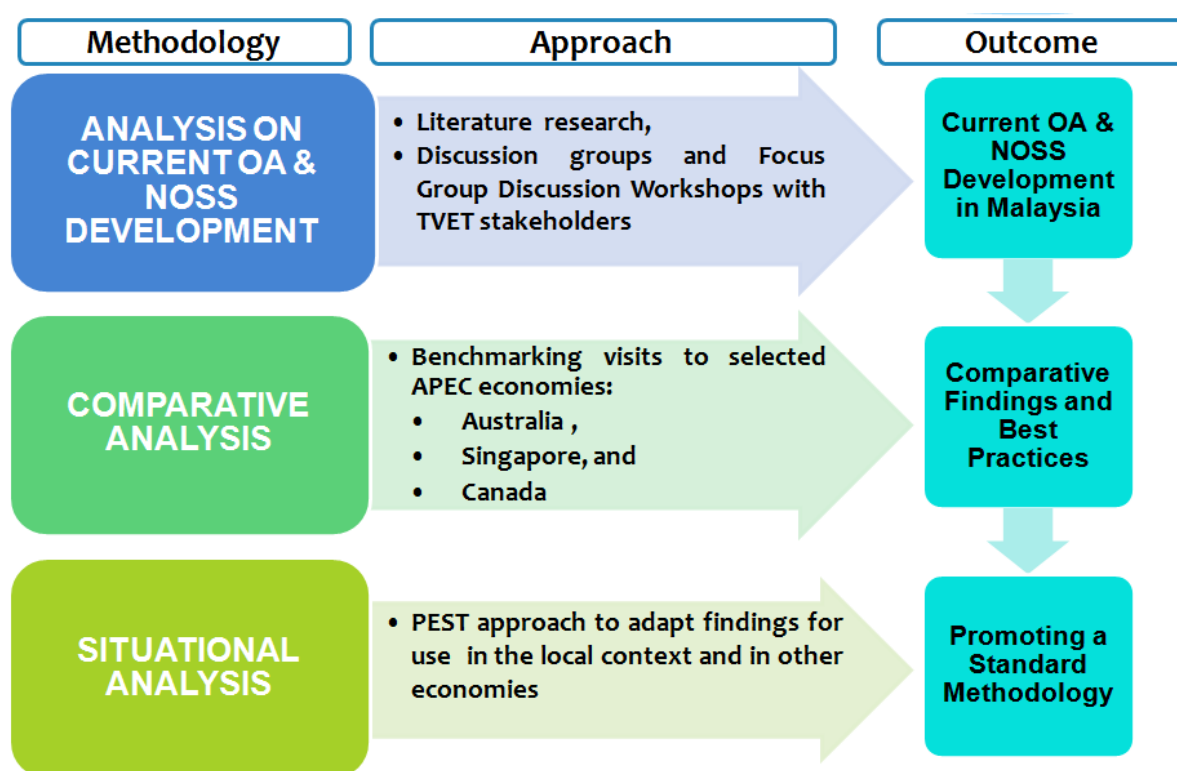
Figure 3.1 : Analysis Conducted and Key Results

3.2 Research Design

Research is focused on the analysis of available information on the OA & NOSS development process, followed by direct contact with NOSS & OA developers, government officials and TVET related experts in the field. Qualitative research was selected due to the nature of the study that will observe the best practices for OA & NOSS development processes. The comparative analysis and situational analysis were also conducted qualitatively.

Qualitative research investigates the why and how of decision making, not just what, where, when. Hence, smaller but focused samples are more often used than large samples. It focuses on unique themes that illustrate the range of the meanings of the subject matter rather than the statistical significance of the occurrence. This process uses inductive reasoning, by which themes and categories emerge from the data through careful examination and constant comparison.

Research instruments used were focus group discussions, semi-structured surveys, interviews. Information was initially obtained from available material such as OA & NOSS development guidelines, samples of OA & NOSS documents and input from OA & NOSS development stakeholders. This information was then analysed and used as the basis for the initial working group workshops. During the initial working group workshops, the information was analysed and grouped into four key theme areas which were:
• OA & NOSS development methodology
• TVET implementation
• Industry Acceptance
• TVET Project Management & Control

These key theme areas were then used as a guide and checklist to obtain information through focus group discussions with relevant TVET stakeholders in Malaysia. The feedback and input obtained from the focus group discussions were then analysed to determine the current OA & NOSS development process applied in Malaysia.

In order to obtain information on the development process implemented in the benchmark economies, the semi-structured surveys were distributed to the respondents who were representatives of the relevant organisations. The questions in the survey were also posed during the discussion groups and interviews at the benchmark economies. The input acquired from the meetings, interviews and survey responses were then reviewed. The findings were tabulated to ease the comparative analysis in order to determine the similarities and differences between the economies practices in development. Findings from the benchmarking visits also provided input for the situational analysis that looks at the political (legislative) economical, social and technological aspects of TVET implementation in each economy and analysed using situational analysis techniques. Each of the research instruments are elaborated in more detail in the following sections.

3.3 Research Instruments

This section elaborates on the different research instruments used throughout the project and participating respondents. The instruments and methods utilised were semi-structured surveys, interviews, focus group discussions and the initial Working Group discussion workshops.

The locations consisted of four economies which were Malaysia, Australia, Canada and Singapore. Below are elaborations of each activity conducted with respondents.

i)   Working Group Discussion Workshop

Several Working Group Discussion workshops were held in order to define the areas of research and analysis. The first two workshops that were held comprised of 9 Working Group members (Refer Annex 1 for list of Working Group members) that represented a sample of TVET stakeholders which included:

- Industrial Lead Body Representative
- Armed Forces Competency Based Training Centre Representative
- Private Accredited Skills Training Centre Manager
- Department of Skills Development NOSS Facilitator
- Department of Skills Development Project Management Office Representative
- International TVET Consultant
- TVET Practitioner

The panel members were selected based on their experience in the TVET system and most had twenty over years of experience. Their input and insight proved to be accurate as panel members in the consequent workshops showed that they had the same issues and challenges when implementing TVET.

The panel members were selected based on their impact on the TVET system such as the ILB representative that had an impressive track record of contributing to 5 NOSS and OA development in the span of 2 years and 6 completed in the year 2013. Others in the group had been involved since the advent of the NOSS back in the year 1993 and were involved during Malaysia's consultation with Australia and Canada. TVET consultants in the group had also assisted in promoting Malaysia's TVET system at International level. The representative from the Armed Forces had been involved in the implementation of Competency Based Training and Assessment (CBTA) in the armed forces by ensuring that training in the army was conducted in tandem with the Malaysian Skills Certification system. This had incredibly increased the armed forces personnel employability after being released from duty and returning as civilians.

Initially in the project, several research questions were developed in order to guide the research to arrive at certain hypotheses. These questions were important to ensure that the research focus was focused, not broad-based. A well-thought-out and focused research question leads directly to the hypotheses. Therefore, the questions below had been formulated and used as a guide during this initial working group discussion.

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1. What are the important factors that contribute to ensuring TVET is relevant to the industry?
2. What are industry needs and how may TVET be relevant to those needs?
3. How must the contributing factors be enhanced in order to ensure relevancy to industry needs?

The qualitative approach was applied through mind mapping sessions to obtain areas of discussion. Using mind mapping as a visual tool, the areas of discussion were identified and refined. The areas were defined through brainstorming with the members to determine certain aspects that impact the relevance TVET for the industry. The areas of discussion or key themes identified are as below:

- OA & NOSS development methodology
- Application of OA & NOSS
- Project Management & Control in OA & NOSS development
- Industry Acceptance

The sample of the overall mind mapping results can be referred in Annex 2. By utilising mind mapping, the important areas of discussion and relationships between the different elements are more easily visualised. Thus, allowing for the members to confirm the relationship between elements in a holistic view.

ii) Focus Group Discussions with TVET Stakeholders in Malaysia

Areas of discussion identified in the earlier workshops were further discussed in a focus group discussion involving TVET stakeholders such as OA & NOSS facilitators, governing bodies, industry personnel and TVET training centre personnel. This focus group involved many more participants as to discuss the areas in more detail. The focus group participants were selected by the consultant based on the participant's extensive experience in Malaysia's TVET field and those who play an important role in shaping the TVET system in

Malaysia. The participants were reviewed and approved by the DSD where several DSD officers were appointed by the department to represent the relevant units in the focus group discussions. DSD officers were also invited to observe the implementation of the focus group workshop.

The Focus Group Discussion Workshop was held on 11 June 2013 and was officiated by the Deputy Director General of the Department of Skills Development. The Focus Group Discussion workshop was a unique opportunity for around 40 professionals to jointly discuss the issues of Malaysia's TVET implementation and curriculum development. The members were mostly those that had been in the Malaysian TVET industry for more than 20 years and had in depth knowledge and extensive experience in the implementation of TVET and development of TVET curriculum.

The FWG members included representatives from the following;
- DSD Malaysian Occupational Standards Qualifications (MOSQ) Unit
- DSD NOSS Unit
- DSD Project Management Office Unit
- DSD Planning, Research and Development Unit
- DSD Centre for Instructors and Advanced Skills Training (CIAST)
- Accredited Centre Top Management Personnel
- Industrial Lead Bodies Representatives
- Armed Forces Competency Based Training Centres personnel
- DSD appointed Standards Technical Advisory Committee Members (*Jawatankuasa Teknikal Penilaian Standard* - JTPS)
- OA & NOSS development outsource contractors
- OA & NOSS development facilitators
- TVET Consultants
- Technical & Vocational Division, Ministry of Education

In the breakout sessions, groups of six to ten (6-10) participants worked together to discuss the issues faced in implementing TVET and developing TVET curriculum in Malaysia. The areas of discussion were derived from the initial Working Group meetings. Inputs from participants were obtained to formulate and further refine the recommendations. After the breakout session, the facilitators developed consolidated recommendations on improvements and enhancements of the current TVET curriculum and TVET implementation. The set questions used to guide the discussion sessions are included in Annex 4 of this report. The resulting output was then endorsed by the project's Working Group and then presented to the Steering Committee. The responses from the interviews are presented in Chapter 4, Findings.

iii) Semi-structured Survey/Interview Questions

Based on the four main key themes, a semi-structured survey was formulated to address each of the areas of discussion that will ultimately lead to the objective of the project which is to enhance TVET relevancy for industry needs. The survey comprised of 43 questions which were divided into 5 sections revolving the four key themes identified during the focus group discussion. A sample of the interview/survey questions is included in this report in Annex 5.

The first section covered topics on TVET implementation to obtain specific information on an economy. These questions served to obtain a general understanding of the TVET implementation in each economy that will also later be used as input in the situational analysis in Chapter 5.

The second section on OA development comprised of questions to determine the methodologies applied when developing the OA and identifying the key components of the OA study. The responses to these questions will then be compared between the economies to determine similarities and differences. The requirements of the OA developer were asked

in order to ensure the reliability of the OA that is developed in terms of standards content and data reliability

The questions in the third section served to determine the methodologies applied when developing the NOSS including the key components of the NOSS document. The requirements of the NOSS developer were asked in order to ensure the reliability of the NOSS that is developed in terms of standards content and data reliability. The outcomes and usage of the NOSS were asked in the responses to determine Industry Acceptance of the NOSS and how it facilitates TVET implementation.

The questions in the fourth and fifth section address the relevancy of the NOSS to the industry and the overall impact it has to the economy. These initial questions request members to provide insight on problems and countermeasures faced in TVET curriculum development in the respective economies. Strategies and initiatives in promoting and enhancing TVET are also determined through this group of questions.

As most survey questions were also addressed during the benchmarking visit interviews, it can be summarised that all the organisations had answered the surveys. However, as not all sections were applicable to all organisations (i.e. questions on OA & NOSS development may not be suitable for training organisations), therefore there were some sections that were not answered. The respondents generally forwarded the response to be referred to more suitable organisations.

iv) Interviews with TVET Stakeholders in Benchmark APEC Economies

A total of 23 organisations were visited throughout the visits to the three benchmark economies. (Please refer Annex 6). The organisations represented a group of stakeholders such as below:

- Governing Body (at Federal or State/Province level)
- Regulatory Body(at Federal or State/Province level)
- Industry Council
- Industry Association
- Training Institution

Interviews were conducted with TVET stakeholders in each economy. The semi-structured survey was provided to the corresponding organisations prior to the visit. However, certain issues or topics that were not covered by the respondents in their responses were asked during the interviews and focus group discussions. Generally during each meeting the main topics of discussion revolved around the topics in the questionnaire.

In each benchmark organisation that was visited, the researchers highlighted topics and issues relevant to the study which is to understand how each organisation played a role in OA or NOSS development directly or indirectly either as a developer, governing body or industry advisor. Meeting attendees comprised of experts and personnel with vast experience in the field and held senior positions in their organisations.

One-on-one interviews with relevant personnel were conducted concurrently during the meetings where each individual was allocated a certain time slot to be interviewed. Other meetings consisted of a more collective discussion of pertaining issues. Material and samples of relevant documentation were provided for further comprehension during the meetings whereas web links and material were emailed to the researcher by the corresponding organisations.

Table 3.1 shows the details of the research done such as location, respondent, instruments or methods used and the related annex where the relevant documents can be referenced.

Table 3.1: Qualitative Data Sampling Method

Research Location (Economy)	Respondent	Organisation	Location	Instrument/ Method	Related Annex
Malaysia	11	10	Negeri Sembilan Melaka	Working Group Discussion Workshop	Annex 1: List Of Working Group Members Annex 2: Mind Mapping Results
	32	29	Kuala Lumpur	Focus Group Discussion	Annex 3: List Of Focus Group Discussion Participants Annex 4: Checklist Of Group Discussion Questions
Australia	34	13	Sydney Melbourne Canberra	Semi-structured Surveys, Interviews, Focus Group Discussion	Annex 5 :Sample Of Survey Annex 6 :List Of Organisations And Personnel Visited During Benchmarking Visit
Canada	33	8	Quebec, Ontario Ottawa Toronto	Semi-structured Surveys, Interviews, Focus Group Discussion	Annex 5 :Sample Of Survey Annex 6 :List Of Organisations And Personnel Visited During Benchmarking Visit
Singapore	7	2	Workforce Development Agency, Marina Boulevard Ministry of Education	Semi-structured Surveys, Interviews, Focus Group Discussion	Annex 5 :Sample Of Survey Annex 6 :List Of Organisations And Personnel Visited During Benchmarking Visit
Total of representatives and organisations visited	**119**	**62**	**-**	**-**	**-**

It can be summarised in Table 3.1 shown above that there were a total of 119 representatives in the 62 organisations visited. Please refer to the related annexure for relevant details of the Qualitative Sampling activities.

3.4 Data Analysis

Analysis was conducted on the data acquired through mind mapping, synthesis of discussion group findings, comparative analysis of benchmarking data and situational analysis between the economies as elaborated below.

3.4.1 Analysis on Working Group Discussions

The analysis on the data and information obtained during the working group and focus group brainstorming session used mind mapping as a tool. Mind maps can be used to generate, visualize, structure, and classify ideas, and as an aid in organising information, solving problems, making decisions, and writing.Mind-mapping software was used to organise large amounts of information, combining organisation and hierarchical structuring.

The Working Group workshops had been conducted with 8 participants representing the Department of Skills Development officers (DSD), OA & NOSS development facilitators, Industry Lead Body Representative, TVET training centres personnel and personnel from the Armed Forces implementing Competency Based Training and Assessment. Based on the first two workshops conducted with the working group, the results were obtained and presented in mind mapping as shown in Annex 2, Mind Mapping Results.

The findings from the Working Group discussion obtained were clustered and refined into the following four main areas, which are:

- Occupational Analysis (OA) & National Occupational Skills Standard (NOSS) Development

This area discusses on the focus of the project which is how OA & NOSS development processes and methodologies can be improved so that the resulting TVET training and certification based on the NOSS is relevant to industry needs.

- Application of Occupational Analysis (OA) & National Occupational Skills Standard (NOSS)

This area explores the ways of applying OA and NOSS for the industry through proper translation of documents and dissemination of information. Training and assessment is the main form of application discussed in this area.

- Project Monitoring & Control of Occupational Analysis (OA) & National Occupational Skills Standard (NOSS) Development

This area revolves around how Project monitoring and control of the OA & NOSS development facilitates that the content and outcome are accurate and responds to industry needs. Project management includes elements such as the selection of developers, control of timeline, assurance of input reliability and quality of assurance according to governing bodies' policies.

- Industrial Acceptance of Skills Qualification

This area discusses the methods of gaining industry acceptance of the OA or NOSS and methods to promote TVET. The important aim is to increase buy in from the industry in order for TVET to be widely accepted.

3.4.2 Analysis of Findings from Focus Discussion Group Workshop

Following the Working Group workshops, a Focus Discussion Group was conducted that comprised of 40 participants representing TVET stakeholders in Malaysia such as Department of Skills Development officers (DSD), OA & NOSS development facilitators,

OA & NOSS development contractors, industry representatives, TVET training centres such as DSD Accredited Centres.

The group was divided into 4 groups that discussed each theme in detail and based on a prescribed checklist relevant to their theme (Please refer Annex 3 for the list of focus group discussion participants and Annex 4 for the checklist of focus discussion group questions). The main aim of the discussions were to explore the pertaining issues that contribute to enhancing TVET implementation in Malaysia and recommendations on suitable improvements to the development of OA & NOSS, OA & NOSS application, Project Monitoring & Control and Industry Acceptance.

Each of the key theme area findings were analysed and summarised together with the Working Group members. The summary of the findings are elaborated in Chapter 4 of this report.

3.4.3 Comparative Analysis between Selected Benchmark Economies

A "benchmark" is a comparative measurement. It is a standard or point of reference used in measuring and judging quality or value. "Benchmarking" is the process of comparison. The process of continuously comparing and measuring an organisation against other countries/economies to gain information that will help the organisation take action to improve its performance. In practice it is the process of undertaking benchmarking that generates most benefits because it challenges current norms.

Benchmarking data was obtained from international, regional, and national sources. In order to develop a quality and relevant TVET curriculum, a comparative analysis must be done against other countries in order to identify current best practices and methodologies used in other developing and advanced countries. A comparative analysis is an item by item comparison of two or more comparable alternatives, processes, products, qualifications, sets of data, systems and etc.

In order to obtain an overall perspective on the best practices on OA and NOSS development, a comparative analysis was done to compare between the different methods used between the selected APEC economies which were Malaysia, Singapore, Australia and Canada. The above mentioned economies were selected based on the established TVET/VET/CET system implemented in their respective economies. The landscape of each economy that is unique for example Australia and Canada that have different jurisdiction and regulations between the states/provinces compared to Malaysia and Singapore that are centralised in terms of education and training.

For the benchmarking visit in Australia, the hosting department which was the Department of Industry had coordinated the visits to 3 different states. This was done so that the researchers would have the chance to compare between the implementation between the different states. The states visited were Canberra (Australian Capital Territory –ACT), Melbourne (Victoria – Vic) and Sydney (New South Wales –NSW). In each of the states, the research team was brought to meet with Industry Skills Councils, trade association, training institutes and government agencies such as the National Skills Standards Council and Department of Industry.

Canada which consists of 10 provinces and 3 territories, delegates the training and education governance to the provinces resulting in a more geographically dispersed training and education system. Therefore for the purpose of this study, the province of Ontario was selected as a sample of TVET implementation in Canada. One of the other main determinants of selecting Ontario was because the available qualifications framework is currently the Ontario Qualifications Framework. (Please refer details of the qualifications framework in Chapter 2, Literature Review.) The research team visited the federal authority monitoring the development of OA & NOSS equivalent documents which was Employment Social Development Canada (ESDC), governing agency of education and training in Ontario (Ministry of Training, Colleges and Universities), NOSS equivalent document developer, associations and colleges running apprenticeship programmes.

Given the advantage of Singapore's geography and that the administration of TVET was mainly under the jurisdiction of the Ministry of Manpower (Workforce Development Agency - WDA) and Ministry of Education (Higher Education Division) , the research team had visited the WDA and the Higher Education Division during the visits.

The most important step during analysis was to first determine the term used for the OA & NOSS equivalent documents in each economy. The next step was to observe the difference in terms of development and elements of each document. This eventually led to the comparison of OA & NOSS development between the different economies. The involvement of the industry throughout the development process is also compared as keeping in line with the focus of the study in enhancing TVET for industry needs. The comparison between each economy's OA & NOSS equivalent documents can be referred in Chapter 4, Findings.

3.4.4 Situational Analysis

A situational analysis is a key foundation for any sound change to current norms. It helps to ensure a reform's relevance and to find out the best course of action (e.g. strategies, entry points, partnerships) by learning about community attitudes and practices and who might be important to engage. In addition to ensuring the appropriateness of the recommended reforms to the local context, carrying out a situational analysis will help avoid duplication of efforts. Below are the objectives of a situational analysis:

- Define the nature and extent of the problem in the local context;
- Map the perceptions and experiences of key stakeholders in relation to the problem;
- Identify existing strategies and activities which address the problem;
- Identify the actors and organisations that are already active in the area;
- Identify the actors and organisations that could be important partners; and
- Identify gaps in existing strategies and activities

The PEST approach was applied in this analysis which consists of the analysis of external factors. These factors are:

- Political
  Laws, global issues, legislation and regulations which may have an effect either immediately or in the future.

- Economic
  Economic aspects such as financial support available, tax incentives, subsidies available and consumer confidence.

- Social
  The changes in lifestyle and buying trends, media, major events, ethics, advertising and publicity factors.

- Technological
  Innovations, access to technology, licensing and patents, research funding, global communications.

PEST can also be known as PESTEL which includes other factors such as:

- Legal
  Legislation which have been proposed and may come into effect including any passed legislations.

- Environmental
  Environmental issues either locally or globally and their social and political factors.

Therefore, the situational analysis in this study analyses the different aspects of TVET implementation such as Political (legislation, relevant acts) Economic, Social and Technological. The input for the situational analysis was collected through literature review methods and during the benchmarking interviews. The findings of the situational analysis are presented in Chapter 4 and Chapter 5 of this report.

3.5 Chapter Summary

Several methods were used to obtain input and analyse the data throughout this study. Due to the nature of this study that studies processes and underlying methods and best practices, therefore the qualitative method was selected. Data analysis was done using comparative analysis and situational analysis methods. A total of 23 organisations in four different economies had participated in this study. A total of 119 respondents were met throughout the duration of this study. The list of organisations visited in each economy is included in Annex 6.

4. FINDINGS AND ANALYSIS

4.1 Preamble

This section presents the findings obtained throughout the project. The following are presented in this chapter;

- Current Development Process of Occupational Analysis (OA) and National Occupational Skills Standards (NOSS) in Malaysia;
- Comparative analysis between Malaysia and selected benchmarking economies such as Australia, Canada and Singapore;
- Best Practices in developing Occupational Framework and Occupational Competency Standard; and
- Situational Analysis.

4.2 Current Development Process of OA & NOSS in Malaysia

This section will elaborate on the findings obtained through Working Group and Focus Group discussions conducted during the Interim I phase. This section discusses enhancements to the current development process of OA and NOSS in Malaysia.

4.2.1 Occupational Analysis (OA) & National Occupational Skills Standard (NOSS) Development

During the discussion workshops, several elements were identified as being crucial in ensuring that the OA and NOSS documents were relevant to industry. The elements are the quality of facilitators, the selection of subject matter experts, content of development guidelines in ensuring that the documents adhere to policies including editorial format and finally the planning of the overall development of standards for a particular industry. Each of the findings are summarised in the sub sections below.

4.2.1.1 Facilitators

Some may argue that the skills of a facilitator may make or break the process of developing the OA & NOSS documents. However there are several factors that may determine the quality of the facilitators and their facilitation skills.

One of the main determinants is their level and control of language, specifically English as the main language used in development. This is due to the semantics used in these documents that may allow the continuity and easier translation of the content from the OA, NOSS right to Instructional Manuals. This skill can be acquired through a structured and comprehensive training process. Before pursuing facilitation training, the candidate may have to fulfill certain requirements such as experience in the TVET Education System and possess a high level of language proficiency.

Currently all facilitators must undergo training pertaining to the development of the NOSS conducted by the Centre of Instructors and Advanced Skills Training (CIAST) prior to developing any NOSS. The training consists of training and Industrial Placement fulfilling all the phases in NOSS development. The training conducted for facilitators is currently considered to be adequate, however the Industrial Placement for the training of the facilitators is recommended by experienced facilitators to be enhanced in terms of extending the short time frame and facilitate more exposure to real life facilitation 'situations'. Facilitators must also be trained to carry out comprehensive literature study and research prior to development. It is the role of the facilitator to be resourceful and equipped with knowledge on national policies, occupational classifications and such. They must also be adept at handling development issues and panel attitude. The tables below (Table 4.1 and Table 4.2) show the list of requirements for OA and NOSS development facilitators.

Table 4.1 : Facilitator Requirement for OA Development

No.	Facilitator Requirements
1	Competent in researching subject matter and industry background prior to development sessions
2	Competent in handling panel members in terms of gaining input
3	Possess fluency in English and has good communication skills
4	Competent in conducting Occupational Structure Analysis
5	Competent in conducting Occupational Area Analysis
6	Competent in constructing Occupational Descriptions

Table 4.2 : Facilitator requirement for NOSS Development

No.	Facilitator Requirements
1	Competent in researching subject matter and industry background prior to development sessions
2	Competent in handling panel members in terms of gaining input
3	Possess fluency in English and has good communication skills
4	Competent in conducting Occupational Structure Analysis
5	Competent in conducting Occupational Area Analysis
6	Competent in constructing Competency Profile according to industry requirements
7	Competent in constructing Curriculum for Competency Unit according to requirements

4.2.1.2 Subject matter experts

Subject matter experts are the panel experts that are involved in the development of the OA and NOSS. The expert panel will be asked to explain their respective job scope and responsibilities in relation to the document title. This in turn will be used as input for the content of the OA and NOSS. Currently subject matter experts are suggested by the developers of the OA and NOSS, be it independent facilitators, consultants or Industry Lead Bodies. Industry Lead Bodies (ILB) haveproven to provide reliable subject matter experts due to the ILB role in the industry either as regulatory body, governing agency, corporations or trade association.

There are instances where the inaccurate selection of panel has led to the mismatch of expertise in regard to content. Their level of language proficiency either verbally or in written form may also affect the process of formulating the name of the sectors, job titles, competencies and activity statements. The panel may also face difficulty in explaining their job scope to the facilitator.

Depending on the type of industry, especially those in niche or highly production dependent industries, panel members might have minimal opportunity to participate in the development workshops due to work commitments. This may also affect the overall development process due to inconsistency of panel input. The minimum number of expert panel members at each NOSS development session is 8 people or more, whereas OA Development sessions require the sufficient number of panel members that can represent the different sectors in the industry.

The Subject Matter Expert's commitment also plays a crucial part in ensuring consistent input throughout development. However, by offering a certain allowance to be given to panel experts, this may increase their commitment and good will to join the development sessions.

4.2.1.3 Development Guidelines

Recommendations have been made to enhance the consistency and cohesiveness of the guidelines. Iissues regarding the documents stem from not conducting enough sampling starting from the process of converting the content in the Curriculum of Competency Unit (CoCU) to the Instructional Manuals to be used at the training centres, including the migration process from previous standards usage to newly reviewed standards. The guidelines for these scenarios are required for developers to have in hindsight the usage of the NOSS and how it will be applied.

The process of document validation influences the outcome of the document where facilitators may have to amend the documents according to the evaluation panel recommendations and suggestions. However, there may be instances where evaluation panel members are not familiar with the document and the scope of evaluation such as semantics and formatting. This can be lessened by providing evaluation panel members a guideline of evaluation items and quality policies. Table 4.3 and 4.4 below describe the elements required in the guidelines.

Table 4.3 Items to be updated in OA Guidelines

No	Items to be updated in OA Guidelines
1	**Guidelines on Sector and Area Segregation** The guidelines should be updated to explain sector and area segregation which may vary between industrial requirements and practice compared to the Occupational Structure as defined by DSD. When determining the segregation, the needs of the industry and standardisation of the Occupational Structure must be harmonised.
2	**Techniques of shrinking and merging of occupational areas** Explanation on the techniques and basis of analysing the Occupational Area Structure would provide to be helpful when determining the process of shrinking and merging of job areas that carry the same job responsibility.

Table 4.4 Items to be Updated in NOSS Guidelines

No	Items to be updated in NOSS Guidelines
1	**Competency Analysis** The definition between the Core and Elective Competency Units identified during job analysis must be explained explicitly in the guideline. A very clear guideline specifying the process of developing the descriptor, the work activity and the performance criteria can enhance the consistency of the Competency Profile content.
2	**Curriculum of Competency Unit** Guidelines should explain on the development of Assessment Criteria more explicitly. Assessment criteria must reflect the performance criteria to avoid mismatch of competency requirement.

4.2.1.4 Development Planning

The importance of determining job areas in OA/NOSS development requires the continuity of the confirmation process from OA to NOSS development. Any changes in the OA structure will result in a mismatch of the NOSS title development. The continuity from the OA to the NOSS must be ensured and any improvements must be updated in both documents.

4.2.1.5 Summary

Figure 4.1 shows that in order for OA and NOSS development to be effective in developing a TVET curriculum that is relevant to the industry, the main factors shown below must be improved in areas such as facilitators competency, selection of subject matter experts, updating of development guidelines and development planning of OA & NOSS.

Figure 4.1: Summary of Findings - OA and NOSS Development

4.2.2 Application Of Occupational Analysis (OA) & National Occupational Skills Standard (NOSS)

The OA is usually referred by the NOSS division in planning the development of NOSS and also by industry stakeholders on obtaining a clearer view of the industry in terms of the occupational structure and industry background. However, during the development of the NOSS, the development panel members must review the Occupational Structure defined in order to see its currency to the industry.

The NOSS is used as reference on the competency requirements of a particular occupational area and used when developing Written Instructional Materials (WIM) which are training and assessment materials. The development of the WIM is carried out by the Accredited Centres (AC). The AC personnel are responsible for translating the NOSS into effective training instructional manuals in order to produce the needed learning outcome. The areas which need attention are translating CoCU into WIM based on related knowledge and skills. The assessment criteria should be clear when translating them into knowledge and performance assessments and implementation of assessment based on assessment criteria must be based on the actual job requirement.

The NOSS is also referred to when developing training materials for the National Dual Training System (NDTS) which is an apprenticeship system in Malaysia that allows candidates who are school leavers or working adults to be trained on the job in actual working environments. These candidates will be guided by NDTS coaches at the workplace and trainers at the AC when going for theoretical classes. It is imperative that the training is in line with industry practices. Accredited Centres are audited before being able to provide training programs to the candidates. Areas to be audited are trainers qualifications, training materials and facilities. The NOSS may serve as a checklist of training requirements in the ACs.

Another application with reference to the NOSS is certification viaRecognition of Prior Acheivement. This is implemented by recognising individual skills by checking against the occupational competency standards for the particular occupation and competency level in the NOSS. Individuals who have evidence to prove their experience fulfils all the required competencies, will be recognised as competent and shall be awarded the Malaysian Skills Certification respective of their level of competency

4.2.3 Project Monitoring & Control of Occupational Analysis (OA) & National Occupational Skills Standard (NOSS) Development

OA and NOSS development are usually conducted internally by facilitators within the DSD or by tendering to consultant facilitators. Another recent improvement is the development is carried out by Industry Lead Bodies (ILB) which are representatives of a particular industry.

The development projects are funded and monitored by the DSD where most projects are to be completed in the range of 6-8 months. DSD officers monitor the development process and sit in during development sessions to ensure that the panel members are sufficient and development approach taken by facilitators are according to DSD policy. The endorsement process requires the document to be presented at each milestone where the deliverables usually consist of certain accumulation of developed components of the document. The endorsement committee is appointed by the DSD and comprises of industry experts and DSD officers to chair the endorsement sessions and obtain a consensus in the meeting.

Pre tendering is the process that involves the needs analysis that will specify the area for NOSS and OA development. This is a critical factor that will enable a smooth process of Standards and Curriculum development. This is because issues such as duplication of job titles and areas of duplication can be minimised. In order to maintain the professionalism of vendors and facilitators, it would be a good mechanism to have a rating implementation to rate the performance of vendors & facilitators.

4.2.4 Industry Acceptance of Skills Qualification

An element in the NOSS which is considered as value added to the graduate is the employability skills stated for each competency. The employability skills will vary according to the job-role requirements of each industry. Employability skills must be both explicit and embedded in the competency and should be an integral part of the training. Trade associations should also be responsible for setting the standards required by their industry. For clarity and consistency there should be only one body with licensing responsibilities. There have been many success stories regarding the acceptance of the NOSS in industries such as through spa ratings by the Ministry of Tourism based on NOSS certification, and mapping of the NOSS with the International Standards Organisation (ISO) by the Non Destructive Testing (NDT) industry.

Currently the industries are directly involved in OA & NOSS Development where their role are as Subject Matter Experts and Validation Panel. A visual representation in Figure 4.2 shows the role of the industry that is involved in all aspects of the TVET system. Starting from the Needs Analysis phase where the industry provides input in Labour Market reports, in the OA phase where they may contribute during the development of OA or evaluate it during evaluation sessions, then they will also be able to contribute in NOSS development or act as the evaluation committee. Industry representatives are also involved in the verification and certification phase as assessors of the TVET students during examinations and assessments or during TVET training.
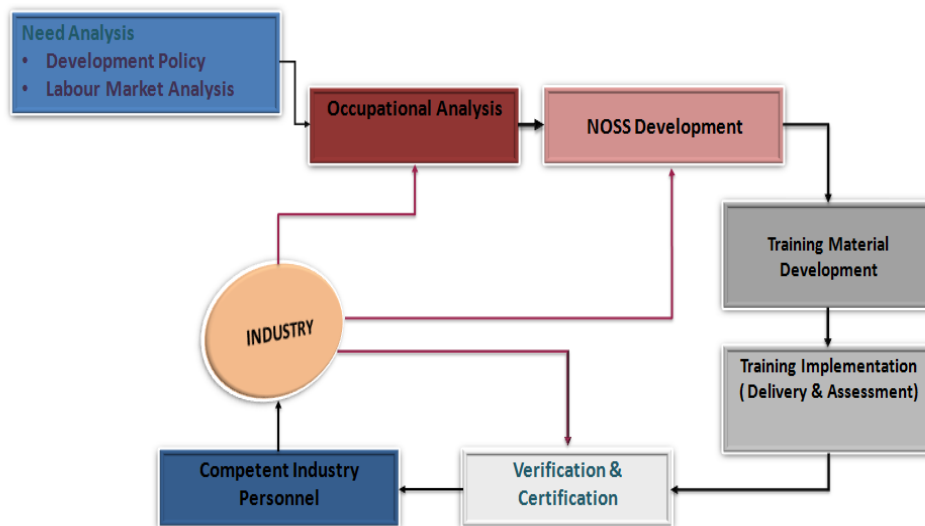
Figure 4.2: Role of Industry Representatives in the TVET System

Figure 4.3 summarises the findings on industry acceptance of skills qualifications which has an impact on industry standards and individual recognition.
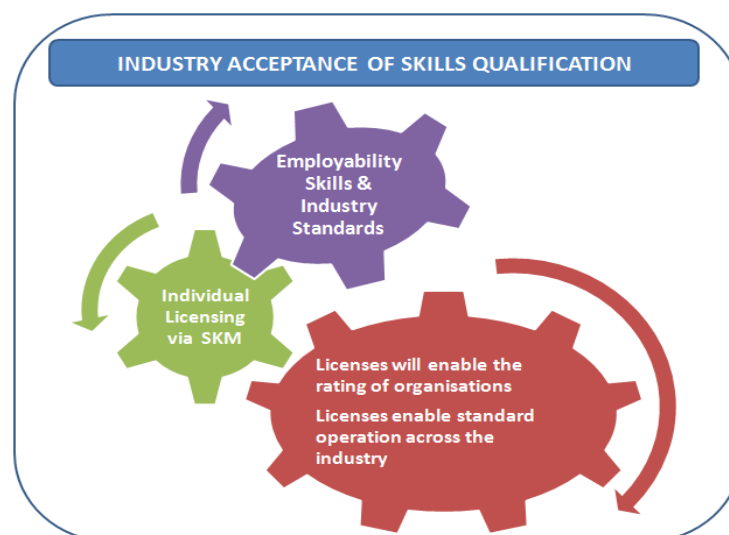
Figure 4.3: Summary of Findings - Industrial Acceptance of Skills Qualification

It can be seen that with the development of industry standards that embed employability skills will enable individuals to be certified and in certain industries licensed via the Malaysian Skills Certificate (*Sijil Kemahiran Malaysia* – SKM). This in turn will enable the rating of organisations' standards in enhancing performance, productivity and competitiveness economically. Licensing will also enable standard operation across the industry.

4.3 Occupational Frameworks & Occupational Competency Standards Development in Australia, Canada and Singapore

This section describes the findings acquired during the benchmarking visits to the selected economies. As described in previous sections, the term Occupational Framework is used in regard to OA as its generic term and Occupational Competency Standards is used in regard to the NOSS as its generic term.

The elaborations are based on the key themes which are Occupational Frameworks and Occupational Competency Standards Development, Industry Acceptance, Application of OA & NOSS (now renamed to Training and Assessment to focus on the application of Occupational Frameworks & Occupational Competency Frameworks in training) and Project Monitoring and Control. It can be seen that in this section there are elaborations on the Occupational Framework development that were not elaborated in Chapter 2, since information acquired during literature review could not confirm which documents were considered to be the respective economies' Occupational Framework, therefore this section will elaborate those findings and other information acquired during the visits.

4.3.1 Singapore

Based on the benchmarking visits to Singapore, the most distinctive feature is how education and training is divided into Pre-Employment Training (PET) and Continuing Education and Training (CET). CET is the main focus of the research as it directly analyses occupations in developing skills standards. The Singapore CET system's key components comprise of Skills Standards, Quality Trainers, Quality Training Providers, Career Centres and Tripartite Partnerships. CET is enhanced through the Singapore Workforce Qualifications (WSQ) Framework and ensures the existing workers have relevant skills and continually acquire new skills and knowledge to remain employable.

Under the jurisdiction of the Workforce Development Agency (WDA), the Workforce Skills Qualifications Framework is recognised by the government and industry bodies. Through the use of standards, qualifications are designed with the input and endorsement from the industry as they will provide input in terms of duration required to train workers, modules and what kind of training is suitable such as classroom training, simulation and so forth. Development is closely consultative and involves the industry.

4.3.1.1 Occupational Framework and Occupational Competency Standards Equivalent Development

i) Singapore Workforce Skills Qualification Framework (Occupational Framework equivalent)

The WSQ is represented in the industry competency map that captures the type of competencies needed in the industry. The competencies are expressed as Competency Units and grouped into competency categories and pegged to occupational levels. The Competency Units are classified into Employability skills, Occupational skills and knowledge and Industry skills and knowledge.

There are a total of 35 Singapore Workforce Skills Qualifications (WSQ) frameworks currently developed. WSQ frameworks build up skills in two aspects which are foundational and industry-specific:

- Foundational Skills
Foundational skills comprise a range of skills, knowledge and attributes that help every individual improve his/her employability. These skills enable workers to better adapt to new job demands and a changing work environment. Foundational skills are portable across all industries.

- Industry & Occupational Skills

The Singapore Workforce Skills Qualifications (WSQ) industry frameworks cover skills that equip individuals with the know-how to perform specific jobs well. The types of analysis are used in the development of various WSQ frameworks as described below:

Table 4.5: Types of WSQ Frameworks Analysis

Types of Analysis	Descriptions	Frameworks
Value-chain analysis	The analysis is based on the full value-chain of industry operation.	Manufacturing, Tourism, Food & Beverage, Logistics
Functional analysis	The analysis is based on a typical organisation's function units.	Retail, Precision Engineering, Human Resources, Service Excellence
Job-family analysis	The analysis is based on key occupational groupings within the industry sector.	Financial Services, Landscape, Healthcare Support
Occupational analysis	The analysis is narrowly focused on one particular occupational group.	Aerospace non-license aircraft technician
Proficiency level analysis	The analysis is based on expected proficiency level of mastery.	ESS English and Chinese Workplace Literacy & Numeracy

(Source: Interpretation of WSQ Competency Standards for Training and Assessment. Workforce Development Agency)

The Figure 4.4 below is an example of a qualifications framework. It can be seen that the following elements are included in the framework:

- Industry Key Purpose

Describes the main purpose of the industry described in the framework

- Industry Sectors

Lists the sectors under the specific industry

- Typical Job Titles

Lists the common job titles relevant to the qualifications

- Qualifications Titles

The title of qualification and shows the level of qualification such as Certificate, Diploma and etc.

- Competency Categories

Describes the competencies according to the type of categories and defined in the industry

- Core Units

List of Core Units that are compulsory to be competent by a candidate

- Elective Units

List of Elective Units according to the competency categories that will be competent by the candidate

Industry Key Purpose

To meet customer needs and expectations for excellent product and service delivery through a vibrant, competitive, efficient and effective retail sector supported by a well trained, motivated and committed workforce

Industry sectors covered

Department stores	Furniture
Supermarket	Jewelry
Clock & Watches	Fashion & Apparel
Petroleum Retail	

Typical Job Titles

MANAGERIAL LEVEL	SUPERVISORY LEVEL	OPERATIONS LEVEL
Shop Manager, Merchandising Manager, Operations Manager, Chain Store Manager, Department Manager, Commercial Manager, Area Manager, Store Manager	Supervisor, Foreperson, Forecourt Captain, Team Leader, Senior Sales Assistant, Retail Supervisor	Cashier, Retail Sales Assistant, Retail Assistant, Sales Associate, Service /Pump Attendant, Sales Promoter

CORE   COMPETENCY CATEGORY   ELECTIVE

Qualification Titles

- Diploma in Retail Management
- Advanced Certificate in Retail Supervision
- Certificate in Retail Operations

Competency Category Descriptor

Merchandising & Marketing
Consists of all the activities involved in acquiring classifying promoting and presenting appropriate quantities of goods and services at times prices and places that enable retailers to attain their goals

Support Services
Comprises the group of activities and underpin and sustain the success of major frontline retails activities such as sales and customer service store operations merchandising and marketing. These underpinning activities include office practices retail information technology services accounting and finance human resource planning and organizational policy and advice

Sales & Customer Services
Includes activities associated with maximizing customer satisfactory through a combination of personal selling techniques customer communication strategies knowledge of products and services and improvement of products and services

Store Operations
Involves all of the activities that ensure the appearance, safety, comfort and convenience of the retail store. These activities include maintaining the appearance of all interior and exterior facilities and equipment stock movement pricing and storage security risk management physical resource planning and control and performance measurement

Generic Skills
Involves all of the activities that enhances the customer experience of customers in a retail environment.

DIPLOMA IN RETAIL MANAGEMENT
7 Core + 2 Electives
with max 1 *Elective* from *Generic Skills*
Manage merchandising and store presentation (40hrs)
Manage finance for retail operations (40hrs)
Manage marketing strategies (40hrs)
Manage teams (40hrs)
Retailing and the economy (16hrs)
Manage service operations (40hrs)
Manage human resources to achieve service excellence (40hrs)

ADVANCED CERTIFICATE IN RETAIL SUPERVISION
5 Core + 4 Electives
with max 1 *Elective* from *Generic Skills*
Provide marketing and promotion support (24hrs)
Control and maintain stock (32hrs)
Monitor visual merchandising presentation (24hrs)
Supervise retail operations (32hrs)
Supervise retail staff (40hrs)

CERTIFICATE IN RETAIL OPERATIONS
3 Core + 5 Electives
with max 1 *Elective* from *Generic Skills*
Maintain personal presentation (8hrs)
Sell products and services (32hrs)
Interact with customers (24hrs)

LEGEND

Current Unit
- Maintained Unit
- Rewritten Unit

New Unit
- Imported Unit
- Proposed Unit

Service Excellence Units
ESS Units

MAP SUMMARY

Core Units: 15
Elective Units: 62
Total Units: 77

Map updated as of 19th February 2008

Diploma in Retail Management — CORE / ELECTIVE

Competency Category	Core	Elective
Merchandising & Marketing	Manage the buying function (32hrs) / Buy merchandise (40hrs)	Control Inventory (32hrs) / Manage promotional activities (32hrs)
Support Services	Manage retail office operations (24hrs) / Manage the training and assessment system (32hrs)	Manage customer relationships (CRM) in a retail environment (40)
Sales & Customer Service	Manage an online retail business (32hrs)	Manage sales operations (32hrs)
Store Operations	Manage and maintain store facilities (32hrs) / Manage compliance with food and beverage safety and hygiene policies and procedures (24 hrs)	Set up a retail business (32hrs) / Manage store security (16hrs) / Manage workplace safety and health systems (24hrs)
Generic Skills max 1 *Elective* from *Generic Skills*	Service Excellence Framework (other than units already imported into the retail competency map)	Employability Skills System units

Advanced Certificate in Retail Supervision — CORE / ELECTIVE

Competency Category	Core	Elective
Merchandising & Marketing		
Support Services	Apply legal legislation related to the retail industry (16hrs) / Conduct competency-based assessment (14hrs)	Prepare and Facilitate On-The-Job Training Programme (21hrs) / Prepare and Facilitate Classroom Training Programme (21hrs)
Sales & Customer Service	Coordinate interaction with customers (24hrs)	
Store Operations	Supervise petroleum retail operations (24hrs) / Supervise housekeeping standards (24hrs) / Conduct food and beverage hygiene audit (24hrs)	Perform wet stock (fuel) inventory and tanker discharge duties (16hrs) / Maintain store security (16hrs) / Maintain workplace safety and health policies and procedures (24hrs)
Generic Skills max 1 *Elective* from *Generic Skills*	Service Excellence Framework (other than units already imported into the retail competency map)	Employability Skills System units

Certificate in Retail Operations — CORE / ELECTIVE

Competency Category	Core	Elective
Merchandising & Marketing	Handle merchandise display (24hrs)	
Support Services	Working in the retail industry (12hrs)	
Sales & Customer Service	Perform colour and silhouette coordination (16hrs) / Perform point of sale operations (24hrs) / Handle retail after sales service (16hrs) / Perform product demonstration (24hrs) / Provide advice on furniture products (16hrs) / Provide advice on clocks and watch products (16hrs) / Provide advice on electrical and electronic goods (16hrs) / Provide advice on fashion and apparel (16hrs) / Provide advice on lingerie (16hrs) / Provide advice on footwear (16hrs) / Apply colour theory (8hrs) / Provide advice on wines (24hrs) / Provide advice on baby products (16hrs)	Provide advice on make-up (16hrs) / Provide advice on skin care (16hrs) / Provide advice on body care (16hrs) / Provide advice on fragrances (16hrs) / Provide advice on deli products (8hrs) / Provide advice on dairy products (8hrs) / Provide advice on seafood products (8hrs) / Provide advice on meat products (8hrs) / Provide advice on precious metals (24hrs) / Provide advice on diamond (24hrs) / Provide advice on gemstone (24hrs) / Provide advice on jadeite (24hrs)
Store Operations	Handle product storage operations – fresh produce (24hrs) / Handle product storage operations – fresh meat (24hrs) / Handle product storage operations – seafood (24hrs) / Perform stock control operations (16hrs) / Perform petroleum retail station duties (24hrs)	Respond to petroleum retail station emergencies (24hrs) / Demonstrate first aid/ cardio-pulmonary resuscitation (CPR) Skills (24hrs) / Follow food and beverage hygiene policies and procedures (12hrs) / Apply security practices (16hrs) / Comply with workplace safety and health policies and procedures (16hrs)
Generic Skills max 1 *Elective* from *Generic Skills*	Service Excellence Framework (other than units already imported into the retail competency map)	Employability Skills System units

(Source: Interpretation of WSQ Competency Standards for Training and Assessment. Workforce Development Agency)

Figure 4.4: Sample of WSQ Competency Framework

ii)   WSQ   Competency   StandardDevelopment   (Occupational   Competency Standards Equivalent)

A WSQ competency standard states performance standards that are validated and endorsed by industry to be the minimum performance standards for the industry. A WSQ competency standard document expected work performance outcomes, expected level of performance, knowledge that supports the delivery of work performance outcomes and work contexts under which the work performance outcomes are to be delivered. It is the reference document of a competency unit. The relationship between a competency unit and a competency standard is similar to that between a course title and the course materials.

The WSQ competency unit that the competency standard is written for is indicated on the cover page of the competency standard. The WSQ breakdown and information that is included in a Competency Standard is shown in Figure 4.5 below.
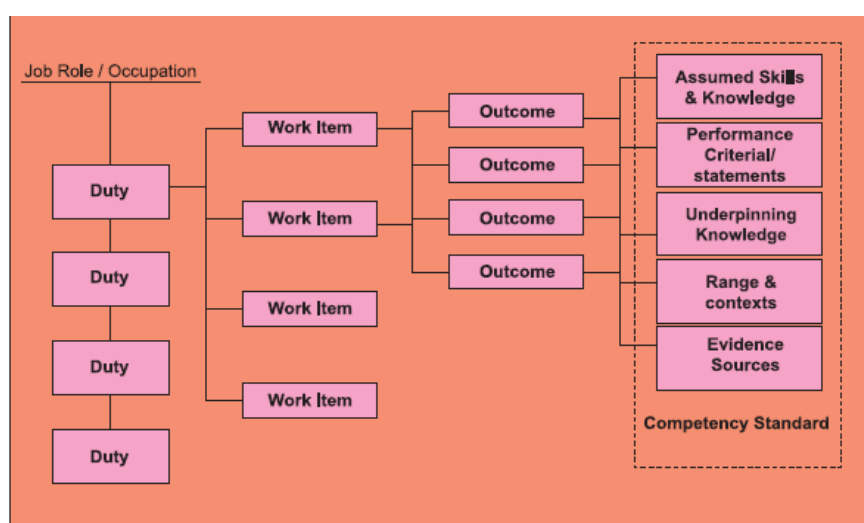
(Source: Interpretation of WSQ Competency Standards for Training and Assessment. Workforce Development Agency)

Figure 4.5 : WSQ Breakdown and Information in A Competency Standard

The contents of a WSQ competency standard are derived from task analysis, whereas WSQ competency units are derived from analyses of the occupations, functions and work processes of an industry. Types of analysis include occupational analysis, functional analysis, value-chain analysis, job-family analysis, proficiency level analysis.

The documentation of the information gathered from task analysis in a WSQ competency standard is guided by the following:
- Work items are completed by one individual employee
- Work items have clear start and end points
- Performance standards are stated clearly and explicitly so that employers, employees, individuals and training providers know exactly the expected performance outcomes and levels of performance
- Observable and measurable behavioural and / or product outcomes that can be readily assessed are provided
- Changing technologies and processes are taken into account
- Performance standards are benchmarked against international standards
- Knowledge, skills and performance standards can be delivered in 'bite-sized' training sessions
- Knowledge, skills and performance standards stated are appropriate to the WSQ competency level selected for the competency unit. These WSQ

competency levels are pegged to occupational hierarchy and differentiated by range and complexity of work items, accountability and autonomy.

The five competency dimensions are addressed and shown in Figure 4.6 below:
- ✓ Task skills *(skills, knowledge and attitudes (KSA) directly relevant and attributable to a work item)*
- ✓ Task management skills *(KSA in relation to managing different aspects / sub-tasks of a work item simultaneously and/or sequentially)*
- ✓ Contingency management skills *(KSAs required to handle non-routine and unexpected situations that would arise with the execution of a work item)*
- ✓ Role and job environment skills *(KSAs required for individual to relate a work item with his or her job role in entirety)*
- ✓ Transfer skills *(KSAs required for individual to execute the work item in more than one work context or situation)*
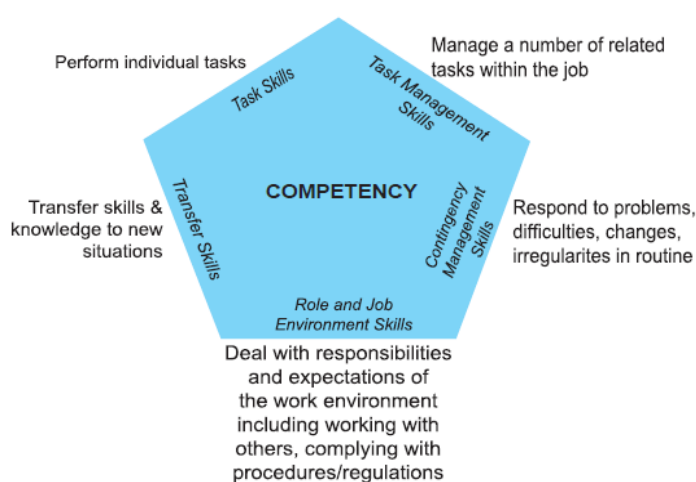
(Source: Interpretation of WSQ Competency Standards for Training and Assessment. Workforce Development Agency)

Figure 4.6 : Five Competency Dimensions in A Competency Standard

A unique aspect of the WSQ competency standards is that it may be written in different formats depending on the needs of the industry. There are two main different formats - one that documents performance outcomes as 'Competency Elements' and 'Performance Criteria' and one that documents performance outcomes as 'Performance Statements' . The format that uses 'Performance Statements' was developed for documenting work performance outcomes of professional occupations and competency units that are pegged to WSQ Diploma and above levels. The work performance outcomes tend to be less micro because the work items are less procedural in nature; such that it is difficult to standardise minute work performance outcomes across the industry. WSQ Frameworks that have used this format are Creative Industries, InfoComm Technology and Wafer Fabrication.

Comparatively, the performance outcomes of work items at lower WSQ competency levels can be more easily standardised since the work procedures can be easily generalised across industry; work performance outcomes can be further grouped into competency elements that correspond to major sub-tasks. WSQ Frameworks that have used this format are Precision Engineering, Aerospace, Retail, Tourism and Healthcare Support.The Figure 4.7 below depicts the key components of a WSQ competency standard.

WSQ Competency Standard (CS) Cover Page		
	WSQ Framework	WSQ Framework which the competency standard was developed for
	Competency category	Classification of CS based on type of industry activities
	Competency level	WSQ level of complexity of tasks (Appendix B)
	Competency title	Competency unit title which reflects contents of CS.
	Competency code	Unique identification code of competency unit
	Recommended Training Hours	Estimated average duration for an employee to acquire skills and knowledge in CS
	Recommended Assessment Hours	Estimated average duration required for assessment
	Credit value	Derived from recommended training and assessment hours. Indicative of 'size' of competency unit.

WSQ Competency Standard (CS) Key Contents		
	Overview	Summary of contents
	Occupations / Target Group	Personnel who perform work items described in CS
	Assumed skills & knowledge	Skills and knowledge that learner should possess prior to training for CS
	Underpinning knowledge	Knowledge to support performance of tasks
	Performance criteria / statements	Performance standards / level required of learners
	Range & contexts	Situations under which work items are performed
	Evidence sources	Activities, materials and documents that can determine competence of learner

The above components of the key contents may be grouped into competency elements that denote the sub-tasks or key activities of a work item.

(Source: Interpretation of WSQ Competency Standards for Training and Assessment. Workforce Development Agency)

Figure 4.7 : Key Contents in A Competency Standard

If the contents of a competency standard are not accurately identified, there is a serious risk that training will produce individuals who cannot perform their work at a required level of proficiency (standard). However, it is important to acknowledge the potential limitations of documenting work performance outcomes and KSA into competency standards:

o   In order to cater for multiple workplace contexts, the information included (performance criteria / statement, underpinning knowledge, etc) is usually based on general practices. Thus, it may not be applicable to all workplace contexts with unique requirements.
o   The attempt to chunk job tasks into bite-size units may be done at the expense of not being able to present a holistic view of a particular job function / role.

65

o The explosion of new knowledge and technologies pose challenges to the maintenance of the currency of competency standards.

4.3.1.2 Project Monitoring & Control

The development of WSQ frameworks and Competency Standards are monitored closely by the WDA where they will assign officers to coordinate development sessions by appointing qualified process developers and content developers.

The Competency Standards are reviewed for endorsement according to milestones in the timeline. WSQ competency standards are validated and endorsed by representatives of the industry before release for use by key user groups. A WSQ competency standard would be reviewed at least once every three years to ensure currency and relevance to the industry. During the documentation of competencies into competency standards, due diligence is practised to ensure currency, accuracy, relevance and clarity. The validation sessions with industry representatives and internal endorsement processes by WDA's framework support group are two key measures to monitor and ensure the quality of WSQ competency standards.

4.3.1.3 Industry Acceptance

Industry Skills and Training Councils have been established for each framework to help drive the development and validation of skills standards, assessment strategies and training curriculum for the industry. Each council, represented by key industry partners who include employers, industry associations, training organisations and unions, is involved in:

- An industry competency map, which captures the type of skills needed in the industry.
- Competency standards and curriculum
- Qualifications to reflect the acquired skills and lay the foundation for career-based training, upgradingpathways and skills recognition

Industry Skills and Training Councils are formed at macro industry level and look at strategic manpower issues such as skills requirement, skills gap, and supply of workforce and manpower shortage. Under the council are the working groups and they will advise whether the competency standards are suitable.

The WSQ Development Process includes close collaboration with the industry where it starts with the industry scoping and identification of segment for development, then will be the formation of the sectoral Manpower Skills and Training Council. Next will be the development of the frameworks and validation of frameworks by the industry. Validated frameworks will be implemented using industry early adopters. In order to precisely translate the standards into training and assessment there is the capability development of the training providers. The framework will continually be reviewed and evaluated to ensure its currency and relevancy to industry practices.

4.3.1.4 Training and Assessment

In Singapore, a training organisation is considered an Approved Training Organisation (ATO) when it is accredited to provide WSQ training and assessments. There are 3 types of WSQ ATOs:

- Public ATO refers to an institution that offers training to the general public, including corporate clients and/or public walk-ins.

- Public and in-house ATO refers to an institution that offers training to the general public and its own employees
- In-house ATO refers to a company that conducts training for its own employees only

WSQ accredited training and assessment programmes provide knowledge and skills for occupations or professional knowledge and skills to enable individual employees to achieve the desired work performance outcomes stated in the WSQ competency standards. WSQ assessments refer to processes of determining and certifying an individual employee is able to achieve the stated work performance outcomes.

WSQ training and assessment are viewed as processes that help individuals to achieve the work performance outcomes stated in the competency standards, under certain work situations as defined by the range and context items, and acquire necessary knowledge as stated as the underpinning knowledge items that would support the achievement of the work performance outcomes.

The developers of the WSQ training and assessment programmes have to ensure that the strategies and contents of their programmes are aligned to the WSQ competency standards. Developers would need to study the WSQ competency standards in detail and understand the expected work performance outcomes that an individual should demonstrate in order to be certified competent.

4.3.2 Australia

Australia is looked upon as a successful, mature and integrated model for TVET and many countries are implementing similar national standards-based systems. Australia's high level of industry engagement with TVET is largely due to the introduction of national industry skills standards developed for the industry, by the industry though the leadership of Industry Skills Councils (ISC). An Industry Skills Council (ISC) is a body contracted by the Commonwealth to develop and maintain specified Training Packages.

The research team was accompanied by officers from the Department of Industry throughout the visit. The visit had coverage of three different states namely Victoria, New South Wales and Australian Capital Territory to show the TVET implementation and the relationships between the governing agencies, Industry Skills Councils, trade associations and Registered Training Organisations.

An important element of the study that was not discovered prior to the benchmarking visits was that Australia's equivalent to the Occupational Framework in Malaysia was the Environmental Scan.

The Environmental Scan includes latest industry intelligence, identified workforce needs, current impact of Training Packages, and future directions for endorsed components of Training Packages. It is developed every 12 months and annually updated according to industry changes and demands.

Another unique feature was the endorsement process that required the ISC to engage a consultant to carry out an audit check on the Training Package to see if it had satisfied the Training Packaging Standards and rules. From this evaluation, three separate reports are produced which are the Equity Report, Quality Assurance Report and Editorial Report.

This endorsement process is a good example of a rigorous and transparent implementation to ensure the Training Package meets the requirements of industry and supports consistent skills development and assessment leading to nationally recognised qualifications.

The recent aspiration of Australia is to have a unified qualifications framework across Asia to enable mobility of workers in this region with the development and application of an established set of occupational standards that meet the needs of the industry.

4.3.2.1 Occupational Framework and Occupational Competency Standards Equivalent Development

i)   Environmental Scan (Occupational Framework Equivalent)

The Environmental Scan (the Scan) is a formative document which captures and analyses the most recent grass-roots industry intelligence gathered by the ISC that identifies existing and emerging skill shortages and training requirements. Intelligence would largely be collected as part of an ISC's on-going activities throughout the preceding period. In addition to providing the NSSC with this intelligence, the Scan will also provide the Australian Workforce and Productivity Agency with up-to-date industry information to assist in its analysis of Australia's workforce development needs. The Scan also provides important context for the continuous improvement of Training Packages for the forthcoming year and is developed by each ISC on an annual basis. The Scan is a concise document with an indicative length of 20 pages that includes:

- Contemporary intelligence on industry skill needs, trends, barriers and implications which provides a shared understanding of what industry wants and why.
- Broad analysis of current and emerging skill gaps.
- Other issues impacting on workforce development that may require attention, such as specific skill shortages, skills needs, and regional requirements.
- Emerging trends across and between industry sectors.
- Impact and usage of existing training packages.
- Future directions and short to medium term priorities for endorsed components of training packages.
- Continuous improvement that has occurred to Training Packages over the preceding 12 months.

The value of the Scan, and what sets it apart from other reports in the VET system, is that it reflects the immediacy and breadth of industry feedback gained by ISCs. The Scan encompasses real-time industry views and evidence captured from across Australia on current and emerging skill shortages and skill needs. The Scan analyses how well the VET system and Training Packages are responding to those needs and provides advice on opportunities to boost skill levels to meet identified workforce development needs. These contemporary insights are translated into an analysis of what changes are required to Training Packages in order for them to respond to this emerging environment. The Scan analysis, together with other key inputs throughout the course of the year, including issues registers, industry forums and feedback from training providers, drive the continuous improvement plan for Training Packages.

The Scan involves a broad analysis of recent intelligence and the external environment to identify skill shortages and needs, changes and trends through a point in time snapshot. There are three primary environments within which this occurs- the macro-environment, the micro- and industry environment, and the market:

- Macro-environment - broad factors and emerging trends across and between industries, and global trends or changes which impact directly or indirectly on the need for and nature of skills
- Micro and Industry environment - factors impacting on enterprises, professional and industry associations and other key stakeholders, which may include

issues such as regional needs, specific occupational shortages, emerging cross industry trends and synergies

- Market - the VET environment, VET stakeholders and peak organisations.

The Scan illustrates the impact and use of existing Training Packages within industry and across training providers, and identifies trends and statistics which fall outside of the national data collections. It will also report on the uptake of Training Packages across the delivery system, the increased flexibility being built into Training Packages, and their alignment with licensing and regulation. The Scan is not a re-creation or compilation of existing data or economic analyses found elsewhere nor is it a strategic plan. The Scan provides a 'stocktake' of physical changes made to the endorsed components of Training Packages over the preceding 12 months to reflect industry's emerging needs and address identified skill shortages and gaps. It identifies the new sectors and units of competency included and any refinements to existing content. The stocktake is presented as a simple matrix as an attachment to the Scan.

ii) Training Packages Development (Occupational Competency Standards Equivalent)

Training Packages specify the skills and knowledge required to perform effectively in the workplace. They do not prescribe how an individual should be trained. Trainers and supervisors develop learning strategies depending on learners' needs, abilities and circumstances. The development and endorsement process for Training Packages ensures that the Training Package components are developed to an agreed quality standard and are highly responsive to industry's existing and future demand for new skills. The following key principles underpin the process:

- Open and inclusive industry-driven continuous improvement, validation and endorsement of Training Packages.
- Strong and clear key stakeholder roles with critical points of intervention and consultation.
- Highly responsive process capable of meeting industry's needs and priorities for new skills.
- Industry Skills Councils' responsibility and accountability for the quality and relevance of Training Packages.

Timeframes for the overall process, and its capacity to respond to industry's priorities for new skills, are dependent upon:

- Key stakeholders undertaking their role in a timely manner and in accordance with the process.
- Consultation, development and validation processes being 'fit for purpose' and commensurate with the scope and impact of the proposed training package components.
- Proposed training package components being fully compliant with the standards for training packages.
- The case for endorsement providing the NSSC with all the evidence required to make its decision.

Training Packages must be based on quality national consultations to ensure industry relevance of, and stakeholder support for, the final product. These national consultations inform the technical development of proposed Training Package components. Consultation must go beyond ISC sectoral advisory committees and working groups. The consultation will involve innovative use of the ISC website to receive and impart information to stakeholders. The website will

possess a high level of functionality and currency which includes posting of the following documents:

- Key documents to support the consultation and development process, for example, discussion papers, draft units of competency and qualification structures
- Environmental scan
- Continuous improvement plan
- Case for endorsement for each submission (for the duration of the endorsement process).

The ISC website will also feature an issues register as a constant and formal mechanism for all stakeholders to provide feedback on a training package's suitability and industry relevance. The issues register must be highly visible on the website to encourage feedback. Its functionality must enable users to provide comments on Training Package components and delivery issues, flexibility, industry trends and other aspects impacting on the relevance and effectiveness of the Training Package.

All issues are recorded and acknowledged, then feedback is progressively collected, analysed and validated by the ISC. An ISC may have one Issues Register for each Training Package under its coverage or one which spans all of its Training Packages.

The stakeholders involved in national consultation and development processes comprise of key enterprises, subject matter experts, employer and employee representatives, stakeholders identified by state and territory governments and the Commonwealth, licensing bodies and regulators, state and territory governments and the Commonwealth in accordance with their request for engagement during the formative briefing.

National consultation provides a valuable, on-going source of industry intelligence and feedback on skills related issues broader than the immediate Training Package work such as for use in future Environmental Scans.

4.3.2.2 Project Monitoring & Control

Project monitoring and control of the Training Packages and Environmental Scan involves various phases as depicted in Figure 4.8 below.

Figure 4.8: Environmental Scan and Training Package Development and Endorsement process

The initial phase which is the development of the Environmental Scan provides input on the required development. The next phase is the Continuous Improvement Plan (the Plan) that sets out the changes that need to be made to the endorsed components of Training Packages to enable them to meet the existing and emerging skill needs of industry. The principle underpinning the scheduling of changes to Training Packages is that speed to market of training products is achieved through stakeholder co-operation including

acknowledgement of the workflows of stakeholders in the development, endorsement and implementation processes. The Plan provides an open and transparent approach to the continuous improvement of Training Packages and serves as the guiding document for ISC work on the endorsed components of Training Packages. It operates as a living document and is posted on the ISC's website.

The Plan enables those involved in the delivery of Training Packages to commence formative planning. VET regulators responsible for course accreditation and considering change to scope of registration of training providers will be able to better gauge the need for the continuation of accredited courses and the regulatory resources required for assessing changes. The Plan identifies the activities for the immediate year and, as far as practicable, states the intended outcome(s) of the work and anticipated timelines for endorsement. As a three-year plan, activities for years two and three may be less well defined and subject to refinement over time as industries react to external pressures and re-prioritise their skill needs. The Plan will provide realistic goals for the resources available and prioritise competing industry demands. From time to time, ISCs may modify the Plan in response to changes to policy and regulatory environments. The Plan must be sufficiently flexible to incorporate responses within the scope of an ISC's current resources.

The Plan makes clear to stakeholders the work to be undertaken by an ISC through its funding agreement with the Commonwealth. The ISC will then brief the Commonwealth, each state and territory government and VET regulators on the scope, industry imperatives and timelines for pieces of work identified in the ISC's Continuous Improvement Plan. The briefing also requires state and territory governments to identify specific stakeholders in their jurisdictions who should be part of targeted consultations and for governments to specify their further engagement in the process.

The Training Package Quality Assurance process is ongoing throughout the development of the Training Package components. Prior to submission to the NSSC for endorsement, the Quality Assurance process provides an independent review of the Training Package components against the Standards for Training Packages. The purpose of the Training Package Quality Assurance process is to:

- Assure the ISC that it has developed a high quality product that meets the Standards for Training Packages prior to submission to the NSSC for endorsement;
- Assure the NSSC that products submitted for endorsement have met the Standards for Training Packages, are fit for purpose in meeting industry and client needs, and are ready for implementation; and
- Build stakeholder confidence that products endorsed by the NSSC are fit for purpose and ready for implementation.

Prior to forwarding the submission to the office of the NSSC, the ISC selects a quality assurance panel member from one or more provided by the office of the NSSC. The panel may comprise of ISC nominees (staff members or experts) or other individuals who are able to demonstrate that they meet some or all of the criteria established by the NSSC including expertise in Training Package policy, design, development and implementation of Training Packages.

The panel member completes a mandatory quality report on the proposed training package components. The standards for training packages form the basis of the quality report. The panel member undertaking the quality report must be independent of development and/or validation activities associated with the case for endorsement. Prior to the report being commissioned, an equity report and an editorial report are completed by panel member/s with expertise in the learning

needs of disadvantaged groups and editing/proofreading/publishing, or other ISC specified person/s with this expertise. The ISC will provide copies (of the editorial report, equity report and Companion Volume Implementation Guide) to the panel member undertaking the quality report.

ISCs are responsible for managing the timing and sequence of the quality assurance process. ISCs may choose to synchronise the equity and editorial involvement throughout the development process to avoid conflicting report outcomes. ISCs may also choose to seek allocation of a panel member for the mandatory quality report prior to the end of the development process to facilitate the panel member's understanding of the development process and context, particularly as it relates to the training package quality principles.

The quality report forms part of the case for endorsement. Finalisation of the quality report can be an iterative process based on discussions between the quality assurance panel member undertaking the report and the ISC. However the products must not be submitted to the NSSC for endorsement unless the independent quality report has confirmed that all requirements have been met.

Panel members are appointed for a term of three years. The panel includes members with differing experience to the development of a training package, editing and the needs of diverse learner groups. The office of the NSSC develops and coordinates a program of support to facilitate policy currency, skills development and maintenance, and moderation for consistency in interpretation and implementation of the standards for training packages. The program will consider ISC feedback on the advice being provided and feedback from panel members on the panel's operation.

The Case for Endorsement is a concise evidence-based document of no more than 15 pages (excluding appendices) compiled by the ISC which has a dual purpose of: (i) informing NSSC's decision in relation to endorsement of the Training Package; and (ii) telling the story to a broad audience, including all users of the Training Package, about what the changes to the Training Package are, why the changes were made, and what the changes mean to them. The Case for Endorsement is forwarded to the NSSC via the Office of the NSSC.

The Case For Endorsement provides the NSSC with the clear industry rationale for the proposed changes to the Training Package arising from the continuous improvement process and tells the story about the skill and workforce development needs driving the change. There is a direct link back to the ISC Continuous Improvement Plan and the drivers for skills development identified in the Environmental Scan. It also outlines the evidence that:

- The Training Package meets the Standards for Training Packages;
- The consultation and validation process has been rigorous and transparent;
- There is widespread support from industry for the changes; and
- The impact of changes has been considered.

The Case for Endorsement must be accompanied by the Quality Report which documents the outcomes of the independent quality assurance review, incorporating equity and editorial reviews. The quality report confirms that the training package meets the standards for training packages.

It may also include a report by exception if a stakeholder or individual holds a significantly differing viewpoint from the majority during the consultation and validation process. It gives NSSC members an open and impartial view of the

issue and assures that all reasonable measures have been taken by the ISC to respond to stakeholder concerns.

4.3.2.3 Industry Acceptance

Industry Skills Councils are recognised and funded by the Australian Government, governed by independent, industries led boards and are not-for-profit companies limited by guarantee. Formal roles of Industry Skills Councils involve providing integratedindustry intelligence and advice to the Australian Workforce and Productivity Agency, government and enterprises on workforce development and skills needs. Stakeholder support is the result of the consultation, development and validation processes that ensure the proposed Training Package components being submitted for endorsement have met industry's identified needs and the Standards for Training Packages.

There are currently 12 ISCs as listed below:
1. Automotive Skills Australia
2. Manufacturing Skills Australia
3. Services Skills Australia
4. Community Services and Health Industry Skills Council
5. Agrifood Industry Skills Council
6. Construction and Property Services Industry Skills Council
7. ElectroComms and Energy Utilities Industry Skills Council
8. Government Skills Australia
9. Innovation and Business Skills Australia
10. SkillsDMC (Resources and Infrastructure Industry Skills Council)
11. Transport and Logistics Industry Skills Council
12. ForestWorks Industry Skills Council

The purpose of stakeholder support is for the ISC to finalise the outcomes of the development and endorsement processes to determine final stakeholder views. It provides the evidence base for a shared understanding of the case for endorsement, training package quality and key implications for its implementation. It can be seen that the industry plays an integral part in the development of the Training Packages and Endorsement Process. Previous sections have explained that consultation and validation of Training Packages content are conducted with industry key enterprises, subject matter experts, employers and employees to ensure that the content meets industry needs and that standards for training packages have been met. ISCs work collaboratively on a day-to-day basis mirroring the interrelationships between industries and the supply chain nature of modern economies. From time to time, ISCs also work collectively to produce consolidated, formal advice to government on contemporary issues that affect industry's skill needs.

4.3.2.4 Training and Assessment

Australia's national training system includes both publicly and privately funded training providers known as Registered Training Organisations. Training may take place in classrooms, in the workplace, off-the-job, online and through other flexible delivery methods. The VET sector provides training for Australians of all ages and backgrounds, for small and large businesses, across all industries and in many communities.

Australia has a system of publicly funded institutions and private training providers which offers courses in larger towns and cities. Additionally, individuals and companies can be accredited as a Registered Training Organisation and offer courses and modules of training.

Another popular form of training in Australia is the Australian Apprenticeships that are available in variety of qualifications levels in more than 500 occupations across Australia, in traditional trades, as well as a diverse range of emerging careers in most sectors of business and industry. The key feature of Australian Apprenticeships is a contract of training between an individual, their employer and a Registered Training Organisation. This contract specifies how, where and when the training will be undertaken. The qualifications attained through an Australian Apprenticeship are from Training Packages. Australian Apprenticeships encompass all apprenticeships and traineeships. They combine time at work with training and can be full-time, part-time or school-based. Australian Apprenticeships are available to anyone of working age and do not require any entry qualifications. Australian Apprentices are available to school-leavers, those re-entering the workforce or those wishing to change careers.Australian Apprenticeships are available in a variety of certificate levels in more than 500 occupations across Australia.

Group Training is an arrangement where a Group Training Organisation employs Australian Apprentices and hires them to other businesses, called host employers, while they are undertaking their training. The Group Training Company acts as the primary employer and manages the training, takes responsibility for all paperwork connected with wages, allowances, superannuation, workers compensation, sick/holiday pay and other employment benefits and rotates the Australian Apprentice from business to business, where necessary, to ensure that each Australian Apprentice receives a broad range of training and experience. Group Training provides a cost-efficient and administratively simple way for small to medium sized businesses to hire Australian Apprentices when this might otherwise not be possible. It also creates quality employment and training opportunities for young people and provides a breadth of experience gained in a number of different enterprises. Group Training Organisations operate across Australia. Some specialise in servicing a particular industry, while others may cater for an entire region, covering many industries.

4.3.3 Canada

The benchmarking visit to Canada had provided various information that was not readily available via desktop research or literature review methods. One of the most fundamental aspects was the National Occupational Analysis (NOA) which is the equivalent of the NOSS. Although the approaches to occupational standards did vary between the provinces based on provincial policies and economic demand, the NOA or Red Seal was a nationwide document that allowed the mobility of workers across provinces. A total of 55 NOA or Red Seals have been developed since the 1950s and are still in use till today provided with regular updating and review.

The National Occupational Classification (NOC) outlines the Major Groups, Minor Groups, Unit Groups, Skill Type and Skill Level. This serves as the reference for the list of NOA according to groups. The development of the NOC is carried out by the Employment and Social Development Canada (ESDC) to ensure standardisation between provinces.

However, the NOA varies between provinces and can be developed by a provincial agency, consultants, or sector councils as mandated by the province. One of the development methodologies applied in Canada, the DACUM (Developing a Curriculum) approach is still favourable however it has been updated in order to accommodate current trends,which is to be not only focused on specific job titles but job areas.

4.3.3.1 Occupational Frameworks and Occupational Competency Standards Development

i) National Occupational Classification (NOC) - (Occupational Framework Equivalent)

The equivalent of the Occupational Framework in Canada is the National Occupational Classification (NOC). The NOC is the nationally accepted reference on occupations in Canada. It organises over 40,000 job titles into 500 occupational group descriptions. It is used to compile, analyse and communicate information about occupations, and to understand the jobs found throughout Canada's labour market. The NOC provides a standardised framework for organising the world of work in a coherent system. It is used to manage the collection and reporting of occupational statistics and to provide understandable labour market information. The structure and content of the NOC are also implemented in a number of major services and products throughout the private and public sectors.[26]

The governing bodies, ESDC, in partnership with Statistics Canada (STC), update the NOC according to a 5-year Census cycles. Revisions are based on extensive occupational research and consultations conducted across the country, reflecting the evolution of the Canadian labour market.[27]

The NOC is a standard that classifies and describes occupations in the Canadian economy. It is the foundation for occupational statistics and labour market information. Research on occupational evolution, work skills and competencies is an ongoing process. Input is provided by labour market analysts, occupational regulatory and professional organisations, sector groups, employment and career counselors, immigration specialists, industry experts, employers and educators.

A unique aspect of the NOC development is the extensive research and consultation applied. Research analysts were assigned responsibility for NOC skill type categories to review and prioritise all of the input. Analysts also examined secondary sources of information such as occupational analyses and standards, research papers, as well as on-line information including country-wide job postings and employment advertisements in their research. Job analysis studies and contracted research were initiated for some occupational areas and data from sources such as the Census, the Labour Force Survey and other labour market studies were consulted. For many areas of the classification there was general satisfaction with the content of the occupational groups and their placement within the overall classification structure. Research conducted for non-structural changes to content, such as updating of main duties, employment requirements and inclusion of emerging job titles, was validated by occupational specialists and employers.

The NOC is designed to classify occupational information from statistical surveys. It is also used in a range of contexts to compile, analyse and communicate information about occupations. Occupational information is of critical importance for the provision of labour market and career intelligence, skills development, occupational forecasting, labour supply and demand analysis, employment equity and numerous other programs and services. It provides a standardised framework for organising the world of work in a manageable, understandable and coherent system.

The basic principle of classification of the NOC is the kind of work performed. Occupations are identified and grouped primarily in terms of the work usually performed, this is determined by the tasks, duties, and responsibilities of the

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[26] National Occupational Classification. 2011.http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/Welcome.aspx

[27] Employment and Social Development Canada. National Occupational Classifications. http://www.esdc.gc.ca/eng/jobs/lmi/noc/index.shtml

occupation. Factors such as the materials processed or used, the industrial processes and the equipment used, the degree of responsibility and complexity of work, as well as the products made and services provided, have been taken as indicators of the work performed when combining jobs into occupations and occupations into groups.

The NOC matrix which classifies the NOC major and minor groups has been developed to provide an overview of the entire classification and to show the organisation of the groups by both skill type and skill level. There are 10 skill types in the NOC identified as **0** to **9**. The vertical columns of the matrix correspond to nine of the 10 skill type categories with the exception of management. Management, the first skill type or 0, is organised across the top of the matrix and spans all nine skill types as it is found within all occupational sectors or categories. The **first digit** of each code identifies the major and minor group as belonging to one of the ten **skill type** categories, 0 to 9. The horizontal rows of the matrix correspond to the four skill level categories. Management occupations are by default included in the skill level A category. For all non-management occupations, the **second digit** of each code identifies the major and minor group as belonging to one of the four **skill level** categories. Within each cell of the matrix, the major and minor groups that belong to each skill type and skill level category are listed. Management occupations are the exception, which span all skill types. Below is the elaboration or each element of the NOC Matrix.

a) Structure of NOC
The National Occupational Classification revised in the year 2011 is a four-tiered hierarchical arrangement of occupational groups with successive levels of disaggregation.[28] It contains broad occupational categories, major, minor and unit groups.

- **10 broad occupational categories**
Each broad occupational category has a unique one digit code number and is composed of one or more major groups.

- **40 major groups**
Each major group has a unique two-digit code number and is composed of one or more minor groups. The first digit of this code indicates the broad occupational category to which the major group belongs.

- **140 minor groups**
Each minor group has a unique three-digit code number and is composed of one or more unit groups. The first two digits of this code indicate the major group to which the minor groups belong.

- **500 unit groups**
Each unit group has a unique four-digit code. The first three digits of this code indicate the major and minor groups to which the unit group belongs.

For example:
0   Management occupations
00   Senior management occupations
001   Legislators and senior management
0011   Legislators
0012   Senior government managers and officials
0013Senior managers - financial, communications and other
            business services

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[28]National Occupational Classification. 2011.http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/Welcome.aspx

0014	Senior managers - health, education, social and community services and membership organisations
0015	Senior managers - trade, broadcasting and other services, n.e.c.
0016	Senior managers - construction, transportation, production and utilities

These titles are used to describe the work performed by many individuals holding similar jobs within an occupational area. The list of titles in the NOC is not meant to be exhaustive, but covers the most commonly used and universally understood labels that identify work in the labour market.

b)   Format of unit group descriptions

Each NOC unit group description consists of several standardised sections which define and describe its content.

Lead statement

This section provides a general description of the content and boundaries of the unit group and indicates the main activities of occupations within the unit group. It also indicates the kinds of industries or establishments in which the occupations are found. The list of places of employment is not always exhaustive, but can assist in clarifying the occupations described and in differentiating them from occupations found in other groups.

Main duties

This section lists some of the tasks or duties performed in the occupations in the unit group. Depending on the contents of the unit group, one of three formats is used.

- A series of statements that can be applied to all occupations in the unit group

This format was selected for unit groups that contain a single core occupation. This format was also selected for unit groups that contain a range of related titles that nevertheless share a set of common duties, such as General office support workers and Machining tool operators.

- Two or more sub-sets of occupations with a series of statements that apply to each component

This format was selected for unit groups that consist of two or more subcomponents which, while similar enough to be in the same unit group, can be described separately. Examples of unit groups with this format are Audiologists and speech language pathologists and translators, terminologists and interpreters.

- A series of brief descriptive statements that are linked to specific occupations within a group

This format was selected for unit groups that contain a series of occupations which, while similar enough to be in the same unit group, can be described separately. Examples of unit groups with this format include By-law enforcement and other regulatory officers.

For some unit groups, a statement appears at the end of the tasks performed or main duties section, identifying specialisations that exist within the occupational area encompassed by the unit group. Employment requirements are described for the unit group.

Several types of requirements are identified and are listed in the following order.

- Type and level of formal education: for example, secondary school, college diploma, university degree. Efforts were made to be as specific as possible, though many unit groups have a range of acceptable educational requirements.
- Specific training: for example, apprenticeship training, on-the-job training, training courses specific to an occupation.
- Experience in another occupation: for example, supervisors usually require several years of experience in the occupation that they supervise.
- Licences, certificates or registration: for example, regulatory requirements to practice in a regulated profession, special licenses to operate certain kinds of vehicles.
- Other requirements: for example, athletic ability or artistic talent.

Some occupations are designated as regulated professions and trades. Regulations are subject to change and may vary across jurisdictions. The most reliable information on regulatory requirements for occupations is found on the Web sites of provincial regulatory organisations and licensing authorities.

The Employment requirements section does not attempt to describe personal suitability requirements that are assessed by employers as part of the hiring process. For reasons of brevity, in this section the term college includes the following types of postsecondary institutions: community colleges, CÉGEPS, technical institutes, trade schools and agricultural colleges. Where relevant, in some provinces, it may also include private training organisations, music conservatories and other non-degree granting institutions.

c)   NOC classification criteria

The two major attributes of jobs used as classification criteria in developing the NOC are skill type and skill level. A description of skill levels is presented first as the definitions of skill types incorporate some information related to the concept of skill level. Other factors, such as industry and occupational mobility, are also taken into consideration.

Skill level

Skill level is defined generally as the amount and type of education and training required to enter and perform the duties of an occupation. In determining skill level, the experience required for entry, and the complexity and responsibilities typical of an occupation are also considered in relation to other occupations. Four skill level categories are identified in the NOC. Each major, minor and unit group is assigned to one of the skill levels.

The skill level categories are broad aggregates, reflecting four commonly accepted educational, training or preparatory routes for entering employment. Requirements for individual unit groups or occupations may overlap between the boundaries of the skill levels. For example, some occupations can be entered with either a university degree or a college diploma. When the entry requirements for a unit group or occupation reflect a range of possible educational and training specifications, skill level placement of the group was determined by considering several factors. These include the requirements most generally demanded by employers, the minor group context, complexity of overall responsibilities and knowledge requirements as well as further training and specialisation acquired on the job. The classification describes the educational and training requirements for occupations. However, the education and experience of particular job incumbents may not correspond exactly to the level described. Individuals may be over-qualified for their work or they may work in occupations for which the entry requirements have changed after they became employed.

It is important to note that the skill level categories are not intended to designate socio-economic status or prestige. Rather they are intended to reflect actual occupational entry requirements. These requirements are expressed in terms of the formal educational system and other types of training specified by employers. The skill level categories of the NOC are outlined and defined below.

Skill level A
- University degree (bachelor's, master's or doctorate)

Skill level B
- Two to three years of post-secondary education at community college, institute of technology or CÉGEP

or
- Two to five years of apprenticeship training

or
- Three to four years of secondary school and more than two years of on-the-job training, occupation-specific training courses or specific work experience
- Occupations with supervisory responsibilities are also assigned to skill level B.
- Occupations with significant health and safety responsibilities (e.g., fire fighters, police officers and licensed practical nurses) are assigned to skill level B.

Skill level C
- Completion of secondary school and some short-duration courses or training specific to the occupation

or
- Some secondary school education, with up to two years of on-the-job training, training courses or specific work experience

Skill level D
- Short work demonstration or on-the-job training

or
- No formal educational requirements

Skill level is referenced in the code for all occupations with the exception of management occupations.

Skill type

Skill type is defined as the type of work performed, although other factors related to skill type are also reflected in the NOC. One of these factors is similarity with respect to the educational discipline or field of study required for entry into an occupation. Another factor is the industry of employment where experience within an internal job ladder or within a specific industry is usually a prerequisite for entry. The 10 skill types, 0 to 9, are also identified in the first digit of the NOC numerical code for all occupations. The ten broad occupational categories of the NOC are based on skill type.

Management occupations

This skill type category contains legislators, senior management occupations and middle management occupations. While management occupations are defined as a skill type, they are also found throughout all other skill type areas of the classification. The first digit of the code for all management occupations is 0.These occupations are considered to be at the top of the organisational hierarchy of workplaces or businesses. Decision-making that affects the organisation as a whole, or departments within organisations, is undertaken by management. As such, management is characterised by high levels of responsibility, accountability and subject matter expertise. Expertise is acquired through either formal education or

extensive occupational experience. For these reasons all management occupations in the NOC 2011 are also included within skill level A.

d)   Industry

Industry and occupation are separate variables which can be cross-tabulated to provide detailed information on employment. However, many occupations are found almost solely within one particular industry. For example, mining and automobile assembly occupations occur each within their respective industrial sectors. During the original research and development of the NOC, it was realised that in many industries, occupational mobility is determined more by internal job ladders than by functional specialisation. In consequence, some unit groups include workers of a particular skill level within a specific industry. Although the occupational categorisation resembles in part an industrial categorisation, the variables remain separate and distinct. Industry was used in the development of classification categories for senior management occupations, for occupations in natural resources, agriculture and related production and for occupations in manufacturing and utilities.

e)   Occupational mobility

In developing the NOC, an effort was made to consider mobility or transferability of skills between occupations. The objective was to develop unit groups where the potential for mobility, or substitution of workers, would be greater within the group than between groups. Movement within groups usually follows when the group is homogeneous in skill level and skill type, indicating increased potential for transferability of competencies and development of specialisation. Movement between groups, or inter-occupational mobility, usually reflects a change in skill level (e.g., vertical mobility) or a change in skill type (e.g., acquisition of new responsibilities and diversified skills). The degree of occupational mobility that exists for unit groups varies. Many unit group descriptions include a statement that indicates the potential for, and type of, mobility that characterises the unit group.

f)   Other classification considerations

In addition to the previously mentioned criteria, other factors were considered in determining the boundaries between unit groups and the contents of each group. These additional factors were the size of the unit groups and the codability or operational feasibility of the groups. Codability relates to the ease of accurately coding or assigning reported job titles from survey respondents to the occupational groups of the classification. The size (or estimated number of workers) of the unit group was considered for reasons of statistical reliability and confidentiality. Generally, unit groups which contain fewer than 1,000 Canadian workers have not been delineated. Because the NOC structure is used to code responses to the National Household Survey and other surveys, it must provide a set of unit groups that can be used for this operational application. The insufficient precision of some survey responses and ambiguities of language were given consideration in finalising the unit groups.

ii)   National Occupational Analysis (NOA) – (Occupational Competency Standards equivalent)

The equivalent to Occupational Competency Standards which is the NOA has the following objectives:

*   describe and group the tasks performed by skilled workers;
*   identify which tasks are preformed in every province and territory;
*   develop instruments for use in the preparation of interprovincial red seal examinations and curricula for training leading to the certification of skilled workers;

- facilitate the mobility of apprentices and skilled workers in Canada; and
- supply employers, employees, associations , industries, training institutions and governments with analyses of occupations.

The development includes the draft analysis developed by a committee of industry experts in the field led by a team of facilitators from ESDC. This draft analysis breaks down all tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in trade. The development team then forwards a copy of the analysis and its translation to provincial and territorial authorities for review of its contents and structure. Their recommendations are assessed and incorporated into the analysis.The analysis is sent to all provinces and territories for validation and weighting. Participating jurisdictions consult with industry to validate and weight the document, examining the blocks, tasks and sub-tasks of the analysis as follows:

Blocks	Each jurisdiction assigns a percentage of questions to each block for an examination that would cover the entire trade.
Tasks	Each jurisdiction assigns a percentage of exam questions to each task within a block.
Sub-tasks	Each jurisdiction indicates, with a YES or NO, whether or not each sub-task is performed by skilled workers within the occupation in its jurisdiction.

The results of this exercise are submitted to the NOA development team who then analyses the data and incorporates it into the document. The NOA provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for block and task weighting guide the Interprovincial Red Seal Examination plan for the trade.

This method for the validation of the NOA also identifies common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions perform a sub-task, it shall be considered common core. Interprovincial Red Seal Examinations are based on the common core sub-tasks identified through this validation process.

4.3.3.2 Project Monitoring and Control

Employment and Social Development Canada (ESDC), establishes a partnership with Provinces/Territories through the sector councils or consultants such as the Canadian Council of Directors of Apprenticeship (CCDA) or in Ontario by the College of Trades. These organisations work with industry to develop common national standards, curriculum guides and examinations. In Ontario, the Workplace Apprenticeship Training Standards are developed by the Sector Councils in partnership with the Ministry of Training Colleges and Universities and in consultation with representatives from the respective trades.

4.3.3.3 Industry Acceptance

Red Seal endorsement is recognised by employers as a standard of excellence and indicates that the certificate holder has met the Interprovincial knowledge, skills and work experience/competency standards established by industry. This credential facilitates mobility based on a recognised industry standard of competency within a company, between like companies, across different sectors, and throughout Canada. This endorsement allows the holder to work anywhere in Canada where the trade is designated without having to undergo further examinations. When a trade is designated as a Red Seal Trade, candidates in the trade who meet all eligibility requirements in a given jurisdiction may apply to go

through the Interprovincial Red Seal examination. If successful, they receive that jurisdiction's journeyperson certificate with a Red Seal endorsement affixed.

The Interprovincial Standards Red Seal Program and the designation of trades as Red Seal are the responsibility of the Canadian Council of Directors of Apprenticeship (CCDA).

Canada's First Ministers decided in summer, 2008 to amend Chapter 7 of the Agreement on Internal Trade (AIT) to grant all Canadian workers who have credentials in a province or territory the kind of labour mobility that Red Seal holders have enjoyed since 1958. The Chapter 7 changes therefore mean all workers will have the opportunity to have their qualifications recognised by all provinces and territories, whether they are in the trades, professions or occupations.

Chapter 7 of the Agreement on Internal Trade recognised the Red Seal Program as the "primary vehicle" for labour mobility in the regulated trades. This meant that a certified journeyperson with a Red Seal endorsement was provided automatic recognition to work in any province or territory whereas a person certified in a Red Seal trade without the Red Seal endorsement or a person certified in a non - Red Seal trade could be subject to a skills assessment prior to being certified to practice the same trade in another jurisdiction. The Red Seal is the only credential that grants a worker automatic recognition in each and every province and territory in Canada where that occupation is regulated. For 50 years, the Red Seal endorsement has reflected training and certification to a common interprovincial standard that is developed and recognized by industry. The Red Seal endorsement is widely recognized and respected by industry as a standard of excellence. In a Canadian labour market where all certificates of competency recognized by all jurisdictions are deemed equal under the AIT, the Red Seal provides assurance and certainty that an employee is qualified to a standard of knowledge and competency that has been defined by industry and vetted through a rigorous process with industry input from coast to coast.

4.3.3.4 Training and Assessment

Training and certification of skilled workers in Canada are responsibilities delegated to each of the thirteen provinces and territories. Each jurisdiction has its own training, certification policies, and registration policies and has the authority to designate occupations for apprenticeship in response to their unique labour market needs-in excess of 300 apprenticeship programs in a wide range of industries across Canada.

Apprenticeship systems are regulated by individual provinces in one of three ways:
▪ Collaborative effort
▪ Trades sector-led approach
▪ Government-led approach

At the request of industry the provinces/territories designate the individual trades they choose to be part of the apprenticeship systems which are over 300 trades in Canada. By working with the Industry, each jurisdiction determines which trade it regulates, the scope and definition of each trade, the jurisdictional trade name, whether the trade will be designated as voluntary or compulsory, whether the trade will participate in the Red Seal Program, the specific training and certification requirements for each trade and whether there will be a journeyperson-to-apprentices ratio. As such, qualifying criteria may vary somewhat between province or territory. Therefore the quality assurance systems are primarily the responsibility of individual institutions, professional bodies and pan-Canadian organisations that promote quality assurance for VET programs. Each jurisdiction has its own quality assurance regime. Approval processes for new programs are

carried out through internal or external reviews- industry is largely involved in the process.

Another application or usage of the Competency Standards is the translation of the standards into training and assessment materials. There are 2 main documents that are translated from the Occupational Competency Standards as described below:

a)   Apprenticeship Training Standard

The training standards identify skills required for an occupation and its related training program. These Training Standards have been written in concise statements which describe how well an apprentice or trainee must perform each skill in order to become competent. In using these Training Standards, trainers will be able to ensure that the apprenticeship or trainee is developing skills detailed for the occupation. Trainers and apprentices or trainees are required to sign off and date the skills following each successful acquisition. Sponsors participating in this training program will be designated as the signing authority and are required to attest to successful achievement by signing on the appropriate box at the end of each unit. The standard is designed to support consistency and accountability within the on-the-job training process; ensuring apprentices are developing the skills necessary for success in their trade.

b)   Curriculum Training Standard

The standard is designed to support consistency and accountability within the in-school training process; ensuring apprentices across Ontario are developing the skills necessary for success in his/her trade. The Curriculum Standard provides a standard of theoretical knowledge and practical application to complement the on-the-job experiences of apprentices. The design of the Curriculum Standard facilitates cross-referencing between in-school learning outcomes and related workplace performance objectives as defined in the Training Standard for the trade. Apprentices, therefore, are expected to complete the learning associated with these objectives by applying the prescribed in-school knowledge to the required practical experiences in the work setting.

Innovation and the use of complex equipment in trades are resulting in increasing demands for tradespersons who are not only skilled in the practical aspects of the trade, but who also have a sound theoretical knowledge. The objectives of the Curriculum Standard, therefore, are to provide a basis for:
- Sound theoretical training to meet the challenges presented by innovation and increasingly complex tools and equipment within the work environment.
- Reinforcement of fundamental proficiency in the trade through the practice of work skills as identified in specific Learning Outcomes.
- Development of a high standard of trade craftsmanship and problem-solving skills.
- Development of a desirable work attitude and a keen sense of responsibility, particularly concerning public and personal safety.

To assure maximum consistency in delivery, a time allocation has been included for each reportable subject, along with a theoretical and practical breakdown of the Learning Content. While setting out content requirements as determined by the Provincial Advisory Committee and the Industry committee and as prescribed in the Acts and Regulations for the trades, the Curriculum Standard has been designed to give the instructor every reasonable opportunity for flexibility and innovation in curriculum development, lesson planning and delivery.

In all practical learning activities, the apprentices will abide by the Occupational Health and Safety Act and all other regulations and policies relating to safety, particularly the use of personal protective equipment.

4.3.4 Summary of Benchmarking Findings

Based on the findings obtained during the benchmarking visits it can be seen that each economy has various development processes for Occupational Frameworks and Occupational Competency Standards that is generally influenced by an economy's governance structure and geographical spread. This is because consensus from industry representatives and stakeholders in the industry that is being analysed is required. For economies that are more geographically dispersed and economies that mandate training and education governance at state/province level, this task involves a consolidated approach at acquiring and disseminating relevant information throughout development. However, the core element remains the same which is industry involvement throughout the analysis of occupations in a particular industry.

Table 4.6:   Stakeholders Visited during Benchmarking Visits Vs Economies

NUM	STAKE-HOLDERS	CANADA		AUSTRALIA		SINGAPORE	
		Organisation	Subject Area	Organisation	Subject Area	Organisation	Subject Area
1	Federal Agency	Employment and Social Development Canada (ESDC)	Occupational Framework, Occupational Competency Standards	Dept. Of Industry	Occupational Framework, Occupational Competency Standards, TVET Qualification, VET Quality	Workforce Development Agency (WDA) Ministry of Education	Occupational Framework, Occupational Competency Standards, TVET Qualification, TVET curriculum TVET Qualificationand Curriculum
2	State / Province Ministry	Ministry of Training, Colleges and Universities	TVET Qualification				
3	Federal Council/Corporation/Agency	Council of Ministers of Education, Canada	TVET Qualification	National Skills Standards Council (NSSC) Australian Workforce Productivity Agency (AWPA)	Occupational Competency Standards Industry Needs Analysis		
4	State/Province Agency/Organisation	College of Trades	Occupational Competency Standards , TVET Curriculum				

NUM	STAKE-HOLDERS	CANADA		AUSTRALIA		SINGAPORE	
		Organisation	Subject Area	Organisation	Subject Area	Organisation	Subject Area
5	Industry Relevant Association /Organisation	Canadian Council of Technologists and Technicians Association of Community Colleges Canada	Industry Partnership	Construction and Property Services Industry Skills Council Auto Skills Australia Manufacturing Skills Australia Services Skills Australia	Industry Partnership, Occupational Framework , Occupational Competency Standards		
				Motor Trade Association (ACT – Australia Capital Territory) Australia Industry Group Victoria Chamber of Commerce	Industry Partnership		
6	Training Institute	Humber College Algonquin College	TVET curriculum	Canberra Institute of Technology Kangan Institute Sydney Tafe	Industry Partnership TVET curriculum		

4.4   Comparative Analysis on Occupational Frameworks and Occupational Competency Standards Development in Selected APEC Economies

This comparative analysis is elaborated according to the areas below:

- Comparison between the generic subject areas respective of the economies;
- Occupational Framework development between the economies; and
- Occupational Competency Standards development between the economies.

As described in previous sections, the term Occupational Framework is used in regard to OA as its generic term and Occupational Competency Standards is used in regard to the NOSS as its generic term.

4.4.1 Comparison between Generic Subject Areas

The analysis on the benchmarking visit findings firstly determines the common subject areas in each economy so that it would be clearer to compare between the specific elements. Table 4.7 shows the different terms used for the Generic Subject Areas in each economy. This section elaborates on each Generic Subject Area in general as to facilitate the reader in further understanding the terms used.

However, the details and comparison between the Occupational Framework development and the Occupational Competency Standards for each economy will be elaborated in the subsequent sections (section 4.4.2 and section 4.4.3) where the potential best practices will be highlighted in each section before the overall list of Best Practices are listed in section 4.5, Best Practices.

i)   Occupational Framework

The first common subject area is the Occupational Framework which is known as the Occupational Analysis (OA) in Malaysia, Environmental Scan (EScan) in Australia, Workforce Skills Qualifications (WSQ) Framework in Singapore and National Occupational Classification (NOC) in Canada. The commonality is that all these documents describe the occupational framework of an industry in terms of Occupational Groups, Job Scope, relation to Occupational Qualifications and Occupational Background. It was observed that the main difference between each document was the extensiveness of research on the manpower requirements of the industry, statistical data and impact of the occupational structure to the training that ultimately leads to qualifications. The common goal seen among the economies is the use of the Occupational Framework as a means of planning the human resource development for the industry. Certain elements of the Occupational Frameworks from each economy are further analysed in Section 4.4.2. Comparative Analysis of Occupational Frameworks and subsequently identify the best practices for Occupational Frameworks.

ii)   Occupational Competency Standards

The next common subject area is the Occupational Competency Standards known as National Occupational Skills Standards (NOSS) in Malaysia, Training Package in Australia, WSQ Competency Standards in Singapore and National Occupational Analyses (Red Seal) in Canada.

The Occupational Competency Standards in each economy are different in terms of breakdown of job tasks. The Occupational Competency Standards in Malaysia are analysed so that each unit of competency is stand alone and can be used as an individual certification. Malaysia documents the Competency Units according to the Occupational Areas that were obtained during the Occupational Area Analysis. In Singapore and Australia, the competency units are grouped according to suitable qualifications for a particular group of Competency Units. Canada analyses the specific occupation and breaks the job into tasks and subtasks.

The overall trend and current best practice in conducting the job analysis is to break it down into competencies that are flexible and may be adapted in various occupations. This trend is seen to be in tandem with the competitive labor market that requires multi-skilled personnel and also the workforce that has recognised that a promising career path should not only be vertical and catered for a specific occupational area but horizontal by allowing them to work in related industries that require their skills.

iii)   Curriculum Development and Training Institutes

Curriculum development is also another element that differentiates between the economies in terms of the reference documents that are used during the translation of Occupational Competency Standards to Training and Assessment Material. The Competency Standards state the requirements of the job that will be translated to training and assessment materials. In terms of implementation, curriculum is still audited and endorsed by relevant authorities before offered to trainees and during training.

In Malaysia, the training materials are referenced from the Curriculum of Competency Unit (CoCU) that offer a direct presentation of elements required for training and assessment. The Learning Outcomes of each Competency Unit are clearly defined in the CoCU for reference by the Accredited Centres (AC). In Australia and Singapore, the translation from the standards are done by interpreting the Performance Criteria, Knowledge and Skills requirements Range and Context statements. The NOAs in Canada state the minimum requirements for performing the job therefore they are translated by interpreting the Supporting Knowledge and Skills, Context, Trends and TEM into content for either Training Standards or Curriculum Standards that are used during training and assessment.

In terms of training institutes, the Accredited Centres (AC) in Malaysia, Registered Training Organisations (RTO) in Australia and Approved Training Organisations in Singapore share the similarities where programs are directly translated from the competency standards and regulated by single governing bodies which are the DSD (Malaysia), Department of Industry (Australia) and WDA (Singapore). In Canada, because the curriculum is delivered either in an apprenticeship or applied learning in colleges, private career colleges or polytechnics in various provinces and territories that apply differing education policies therefore they are regulated and audited according to the provinces.

The best practice identified as a combination from all the economies is the use of a Curriculum Standard that allows for a uniformed translation from Occupational Competency Standards for each Competency Unit. The concept of the Curriculum Standard and Apprenticeship Standard applied in Canada and Curriculum of Competency Units as specified in Malaysia are observed as good practices in Curriculum Development as specific elements of training are specified in the Standards document and does not allow room for multiple misinterpretations of the standards into training material. Malaysia, Singapore and Australia also ensure that the translation of the standards to training material is taught to content developers and trainers through nationally recognised and specified programs in content development. In Australia and Singapore, the Competency Units are packaged according to specific organisations' industrial needs, this feature is an added value if combined with the concept of a Curriculum Standard.

iv)   TVET Term Used

The TVET term used is mainly influenced by how an economy encourages the participation in TVET by 'rebranding' the term. The issue of public perception towards the term TVET as an alternative to education as opposed to academic pathways has required the need to name TVET as acceptable to the community. In Malaysia and Australia, Skills Training is used as the term for TVET to reflect the focus on skills required in employment and ensure employability as a skilled worker is always in demand by the industry. Singapore uses the term Continuing Education and Training (CET) as the focus is in ensuring working adults continue to upgrade their skills and for employers to recognise the importance of up skilling the workforce to ensure productivity and quality business outcomes. In Canada, the term apprenticeship, applied learning and professional education are used as it is considered as a program of education or training that prepares

a student for employment in the related field. [29] The TVET term used is respective and unique to each economy's philosophy towards TVET.

v) Industry Partnership

Industry Partnership is considered as the essential ingredient in ensuring the relevance of TVET for the industry. Therefore the economies have ensured a close relationship with the industry through various mechanisms. In Malaysia, the DSD has a structured relationship with the industry through a smart partnership with Industry Lead Bodies (ILB). Industry Lead Bodies are organisations that play a role either as a regulatory body, governing agency, trade association or corporation that monitors and facilitates the development of a particular industry. The ILB is given the responsibility of developing the OA, NOSS, conduct relevant human resource research on the industry and the certification & assessment of industry members through Recognition of Prior Achievement (*Pengiktirafan Pencapaian Terdahulu* – PPT).

Singapore has established relationships with the industry through Industry Skills Councils that assist during the review of WSQ Framework Competency Standards, through joint recruitment activities with industry players and outreach to workers through the National Trades Union Congress. Singapore also sets up Career Centres that conduct career and training advisory, provide Labour Market Information,provide training referrals and facilitation and conduct employability skills assessment and job matching.

In Canada, each province or territory works closely with industry through trade and apprenticeship committees. The development of Red Seal products such as Standards, exams, training guides are done in close collaboration with the industry who are active trades people nominated to participate in consultative workshops to drive the development.

In Australia, an established relationship with the industry is conducted through partnerships with the Industry Skills Councils. The ISCs actively support the development, implementation and continuous improvement of high quality training and workforce development products and services including Industry Training Packages plus provide independent skills and training advice to enterprises, including matching training needs with appropriate training solutions; working with enterprises, employment service providers, Registered Training Organisations and government. They also play a role in allocating training places under the Enterprise Based Productivity Places Program engaging with State and Territory Governments, State and Territory industry advisory bodies and peak representative bodies in their area of industry coverage. Industry Skills Councils also play a central coordination role in the National Workforce Development Fund.

The role of Industry Skills Councils in Australia is considered to be a good example of establishing a partnership with the industry as the implementation is structured and the role is holistic covering aspects of Training Packages development and assisting the industry in terms of training and up skilling the workforce.

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[29]An Overview of Vocational Education and Training in Canada : The OECD skills Beyond School Project . Employment and Social Development Canada

Table 4.7: Comparison of Generic Subject Area Vs Economies

NUM	GENERIC SUBJECT AREA	MALAYSIA	SINGAPORE	AUSTRALIA	CANADA (Ontario)
1	**Occupational Framework**	Occupational Analysis (OA)	Workforce Skills Qualifications (WSQ) Competency Map	Environmental Scan	National Occupation Classification (NOC)
2	**Occupational Competency Standard**	National Occupational Skills Standards (NOSS)	Competency Standard	Training Packages (TP)	National Occupational Analysis (NOA)
3	**TVET Qualification**	Malaysia Qualifications Framework (MQF) –Skills Pillar	Workforce Skills Qualifications (WSQ)	Australian Qualifications Framework (AQF)	Ontario Qualifications Framework (OQF)
4	**TVET Standards & Curriculum Guide**	Competency Profile (CP) Curriculum of Competency Unit (CoCU)	Competency Unit (CU) Curriculum, Training, Assessment Guide (CTAG)	Unit of Competency	Training Standard, Curriculum Standard
5	**TVET Term Used**	Skills Training	Continuing Education and Training (CET)	Skills Training	Apprenticeship Training Applied Learning Professional Education
6	**Industry Partnership**	Industry Lead Body (ILB)	Industry Skills & Training Council (ISTC)	Industry Skills Council (ISC)	Sector Councils, Industry Associations
7	**Training Institutes**	Accredited Centres (AC)	Approved Training Organisations (ATO)	Registered Training Organsisations (RTO)	Apprenticeship, Colleges, Institutes, Private Career Colleges

4.4.2 Comparison between Occupational Frameworks

The comparison of Occupational Framework development between the economies is shown in Table 4.8. It compares between four items of comparison which are:

- Governing/Overseeing Body & Development Personnel
- Development Methodologies
- Occupational Framework Contents
- Duration of Development and Years between Review

i)   Governing/Overseeing Body & Development Personnel

The four economies are similar in the sense that the governing body is under the ministry that oversees human resource and manpower planning as the main content of the Occupational Frameworks requires input of the overall occupational structure.

The development in Australia is undertaken by the Industry Skills Councils as the Environmental Scan requires extensive statistical data of the industry in terms of manpower requirements and usage of the qualifications and Training Packages. In Malaysia the development of the frameworks are by consultants that are qualified in developing the competency frameworks as appointed by the DSD where input is provided by subject matter experts. In Canada, the development of the NOS is jointly done by the ESDC and Statistics Canada. As described in earlier sections of this chapter the NOC is developed to give an overview of all occupations available in Canada. In Singapore, the WSQ Frameworks are developed by appointed consultants or WDA personnel together with the industry.

The best practice of development personnel comprise of the governing body most relevant to human resources collaborating with personnel from the statistics department to further strengthen the facts presented in the Occupational Frameworks report. However, in the event that collaboration between these departments is not possible, the approach to refer directly to industry based surveys is recommended. This approach is mainly driven by strong industry support and networking.

Another best practice is that consultants that will be facilitating and developing the Occupational Framework must be knowledgeable on the documents editorial format and government policies pertaining to it. The justification for this observation is to ensure the analysis and development of the Occupational Frameworks is consistent between industries and meets with the government objectives of developing the frameworks.

ii)   Development Methodologies

The methodologies applied in Australia, Singapore, Malaysia and Canada framework development consist of brainstorming discussion workshops, observations and surveys with the industry. Reference to statistical data is an important source of data to ensure that the report presents accurate manpower requirements. Developers in Singapore acquire this information from manpower planning reports and economy planning departments. Malaysia's developers analyse the information on manpower requirements and possible career paths from the panel in the discussion sessions whereas Australia carries out nationwide surveys and discussions with the industry. Whereas the development of the NOC in Canada was the joined effort of the ESDC and the statistics department combined with findings from nationwide surveys with the industry.

The approach used when identifying the segmentation of industries is reflected in the Occupational Framework. This is an interesting element that is influenced by various factors. The common determinant is the economical and workforce demand of the industry.

The segmentation of the different Occupational Frameworks or Qualifications in Australia is mainly historical and based on mutual understanding between the previous trade

advisory committees and currently still involves the communication between the ISCs in determining the relevant areas under their framework.

In Singapore, the segmentation of WSQ frameworks is determined by the economic key areas that require a skilled workforce and further confirmation with the industry and ISTC.

The OA in Malaysia applies the approach of the industry segmentation according to similar technical requirements and is also influenced by the governing bodies and economic sectors in Malaysia. For example, the Oil Palm industry in Malaysia although generally seen as to be categorised under agriculture is differentiated and recognised as a commodity governed by a separate governing body. Therefore the Oil Palm industry is recognised as an industry on its own.

The best practices in developing the Occupational Framework include the practice in Canada that provides an overall overview of all industries in a specific economy that can facilitate long term planning and avoid duplication of frameworks between different trades.

A combination of the methodologies applied in each economy may be considered as a best practice in development methodology. The most important aspect to be implemented during development and seen as the best practice is to countercheck the findings obtained with the industry. Findings such as industry background and manpower requirements must be counterchecked with the industry to ensure its currency and relevance.

Another similar approach taken by all the economies is the segmentation of industries/sectors/frameworks based on common areas of technicality/skills requirement and underlying knowledge. This consideration is to group the occupational areas and have in hindsight the impact of the grouping on the development of Occupational Competency Standards. However, another recommendation is the practice in Malaysia which encourages industry/sector/framework segmentation according to areas of regulatory bodies to further facilitate the promotion and use of the OA

iii)   Occupational Framework Content

The contents that are central to an Occupational Framework are its Occupational Structure, overview of the industry and pertaining information of the occupations in the particular industry.

The NOC in Canada shows all occupational groups and their respective industries in a single Occupational Structure or matrix. The overall structure for all the industries can be seen in the NOC and this in turn will avoid the duplication of development between several Occupational Groups. However, this approach is only possible when all the industries are clearly defined in terms of occupational groups and levels of competencies.

Singapore depicts the Occupational Framework in its WSQ Framework document and shows the relevant competency category for a particular occupational area, it also includes the typical job titles, industry key purpose, industry sectors covered and related WSQ Qualification Competencies.

Although the Environmental Scan does not show the Occupational Structure explicitly, it includes the list of qualifications for a particular Training Package. Some Environmental Scans for certain industries do show the possible career paths and job titles for a particular industry. This is because the presentation of each Environmental Scan is unique according to the Industry Skills Council's take on what is suitable for their industry. However, there are four main topics in the Environmental Scan that must be elaborated in the report such as Industry Intelligence, Current Impact of Training Packages, Workforce Development Needs and Future Directions of Training Packages.

Malaysia's OA report includes the Occupational Structure (OS) that depicts the job titles and career paths and the Occupational Area Structure (OAS) that shows the Occupational Areas in terms of job scope. The OS and OAS allow for easier interpretation of occupations and occupational areas in a particular industry.

Another difference between the Occupational Frameworks other than the representation of the Occupational Framework is the extensiveness of the supporting reports. These comprise mainly of the background or current analysis of the industry which is elaborated in depth in the OA and Environmental Scan. The WSQ frameworks and NOC focus on the Occupational Structures in the industry and do not include an extensive write up of the industry. However, the NOC and WSQ Frameworks do include a brief write up on the industry. Canada's NOC also includes the job titles, occupational descriptions, main duties and employment requirements for each of the occupational groups. The elaborations on the occupations are also provided in the relevant Occupational Competency Standards.

Australia's Environmental Scan is seen as an example for the best practice on Industry Intelligence and workforce development needs. It is based on input from the industry and is presented in statistical form to further strengthen and prove the reliability of the data. The Environmental Scan includes the analysis of the Training Packages impact on employability and training.

In comparison, Malaysia's OA has an extensive list of Occupational Descriptions for each of the Occupational Titles and does not focus on statistical data of the industry. Analysis is done on the Occupational Areas in terms of job scope and determining critical job titles that serve as a general reference for occupational areas that require NOSS development. Benchmarking with other countries is also a value added component in the OA to ensure that the occupational structures, sector segregation and job titles are abreast with global practices. Therefore the additional content in the OA is also highlighted as a best practice in which additional information such as career paths and occupational description is included in the report in order to facilitate the readers in understanding the overall potential of an occupation in a certain trade.

iv)   Duration of Development and Years between Review

The duration taken to develop the Occupational Framework for Australia is 12 months and consists of updating elements in the Environmental Scan as the report is produced annually.

The development period of the OA in Malaysia is 8 months. The development of the OA is shorter because of the centralised workshops and based on the contractual requirement undertaken by developers to complete the OA within that period of time.

The WSQ Framework's duration for development depends on the type of industry and competency required which spans from one month to one year. Estimated time to develop the full suite of a WSQ Framework (inclusive of Competency Map and Competency Standards) is about 12 to 18months, and the pace of development is dependent on the priority and pace of the industry development and needs. For WSQ Framework Review, a comprehensive review will be carried every 5 years. In between, there will be ad-hoc reviews carried out and these are driven by industry needs.

The review of the documents in Malaysia, Singapore and Canada are mostly in a 5 year cycle or earlier as requested by the stakeholders.

The best practice is to ensure that the development period is sufficient to carry out a concise analysis on the industry's Occupational Framework including elements such as manpower requirements and review of each area in the industry.

Table 4.8: Comparison of Occupational Framework vs. Economies

Num	Items of Comparison	Malaysia	Australia	Canada	Singapore
1	**Occupational Framework Equivalent**	Occupational Analysis	Environmental Scan	National Occupational Classification (NOC)	Singapore Workforce Skills Qualifications (WSQ) Framework, WSQ Competency Map
2	**Governing/Overseeing Body**	• Department of Skills Development (DSD) under the Ministry of Human Resources • National Skills Development Council	• Department of Industry • National Skills Standards Council	• Employment and Social Development Canada (ESDC) • Sector Skills Council	• Workforce Development Agency under the Ministry of Manpower • Industry Skills and Training Council
3	**Development Personnel**	Certified Facilitators, Consultants, Subject Matter Experts, Researchers, Industry Lead Bodies (ILB)	Industry Skills Council (Consultants, Subject Matter Experts, Researchers, Technical Writers engaged by ISC)	Appointed Consultants	WDA, Appointed Consultants, Process Developers
4	**Development Methodologies /Research Techniques**	• Brainstorming Workshops • Interviews • Surveys • Observations • Literature Review/Desktop Research	• Forums /Focus Discussion Workshops • Interviews • Surveys • Observations at work sites • Literature Review/Desktop Research • Statistical Analysis	• Discussion Workshops • Interviews • Surveys • Observations • Literature Review/Desktop Research	• Discussion Workshops • Interviews with workers at actual work site • Surveys • Observations at work site • Literature Review/Desktop Research

Table 4.8: Comparison of Occupational Framework vs. Economies (Continued)

Num	Items of Comparison	Malaysia	Australia	Canada	Singapore
5	**Occupational Framework Content**	- Background of Industry - Current Analysis of Industry - Relevant NOSS to Industry - Relevant Organisations/Regulatory Bodies/Acts/Policies/National Development plans - Occupations in Demand/Critical Job Titles - Benchmark Countries - Occupational Structure - Occupational Area Structure - Occupational Description	- Latest Industry Intelligence - Identified Workforce Needs - Current Impact of Training Packages - Future Directions for Endorsed Components of Training Packages	- Matrix - National Occupational Classification Structure - Unit Group Descriptions	- Industry Key Purpose - Industry Sectors Covered - Typical Job Titles - Qualification Titles - Competency Category
6.	**Duration of Development and Years Between Review**	8 months Reviewed within every 5 years	12 months Reviewed Annually	12 months Reviewed within a 5 year census	12 – 18 months Reviewed every 5 years

4.4.3 Comparison between Occupational Competency Standards

The comparison of Occupational Competency Standards development between the economies is shown in Table 4.9. It compares between four items of comparison which are:

- Governing/Overseeing Body & Development Personnel
- Development Methodologies
- Occupational Competency Standards Contents
- Duration of Development and Years between Review

i) Governing/Overseeing Body & Development Personnel

The four economies are similar in the sense that the governing body is under the ministry that oversees human resource. The development personnel vary such as in Australia is industry driven and the development is undertaken by the Industry Skills Councils. In Malaysia and Singapore, the documents are either developed in-house by the agency personnel or appoint consultants that are qualified in developing the competency standards. In Canada, the development is designated to qualified consultants that may be industry sector councils or organisations that have been mandated by the government to conduct the facilitation and development of the relevant documents.

A common element which can be considered as the best practice is that the consultants that develop the Occupational Competency Standards must be knowledgeable regarding the documents editorial format and government policies pertaining to it. It is recommended that these consultants possess a standard qualification in curriculum and standards development such as in Malaysia that require facilitators for the NOSS development to possess the NOSS Development Facilitation certificate.

ii) Development Methodologies

The Occupational Competency Standards development methodologies applied in Australia, Singapore and Canada consist of brainstorming discussion workshops, observations and surveys when liaising with the industry. Australia also includes feedback through the online portal where they post units of competency documents for public review.

Malaysia develops standards in brainstorming discussion workshops using a modified DACUM methodology approach. Observations at the workplace have also been a popular development methodology applied by facilitators in Malaysia.

The most important aspect to be implemented during development is to involve the industry throughout development. Findings must be counterchecked with the industry to ensure its currency and relevance.

The development methodologies are applied to analyse the occupations. The best practice as applied in Australia, Singapore and Malaysia are the grouping of competencies by qualification or occupational areas that will facilitate in training and to produce a skilled worker.

The best practice to be highlighted which is implemented by all the four economies is that the specified occupation must be exhaustively analysed to determine the relevant competencies required to be competent in a particular occupation. The Competency Units/Duties that are developed must be sufficient to entail all the skills and competencies required for a particular occupation.

iii) Occupational Competency Standards Content

The comparison between the contents of the Occupational Competency Standards is done at verbatim because in these documents, every line has a large impact be it the technical terms used or even the verbs used to describe the actions required. Please refer Table 4.9 for details of the contents in the Occupational Competency Standards.

After close observation and comparison of the elements between the NOSS, Training Packages and Competency Standards, these documents actually have similar components in the Units of Competency of the Training Package, CoCU in the NOSS and Competency Units in the WSQ Competency Standard but presented differently.

The grouping ofCore Competencies and Elective Competencies according to qualifications/occupational areas can be seen in the Training Packages and WSQ Competency Standards. Another important aspect that must be highlighted as a best practice is the coding of competency units/tasks to avoid the duplication of competencies and enable a more robust and flexible group of competencies. This is also implemented by all the four economies.

The common element and best practice that should be highlighted in these documents is the Performance Criteria that explain the criteria of ensuring that a particular work activity has been carried out according the requirements. Performance Criteria is the most crucial element in the Occupational Standards as it will dictate the expected outcomes of a competency.

The NOSS presents the items as part of the CoCU such as Related Knowledge, Applied Skills, Assessment Criteria, and Tools, Equipment & Materials (TEM). Whereas in the Training Packages these items are also included as the Required Skills and Knowledge and in the Evidence Guide that includes the Assessment Criteria and Range Statement that states the Tools and Equipment required during training and assessment. The main difference is that the Training Package does not include the required training hours for each Unit of Competency as this is left for the Registered Training Organisations (RTO) to consider.

The best practice is that the enabling requirements of a particular job/task/work activity should include the underpinning knowledge, related skills, tools, equipment and materials, attitude and adherence to relevant legislation must be analysed comprehensively ensuring that the content is acceptable by the industry through endorsement and feedback from the industry.

Another best practice is regarding the assessment criteria that must be clearly stated in certain range and context to enable a particular candidate to be assessed and deemed competent in a particular competency. Both of these best practices is implemented by all the four economies because this is the fundamental of Occupational Competency Standards.

Malaysia has included in NOSS's CoCU the training duration as a guide firstly to ensure uniformity between training institutions and minimises the administration of auditing training programmes offered in each Accredited Centre (AC). The training duration as stated in the CoCU also facilitates the translation of contact hours to credit hours to quantify the equivalence for a particular NOSS program to the relevant qualification and to ease mobility into academic pathways. Another best practice is that the Training hours are to be included in the competency standard and may act as a guide to ensure that sufficient training is carried out.

iv) Duration of Development and Years between Review

The duration taken to develop the Competency Standards for Australia is 18 months taking into account the consultation required to span across the many states and various phases of endorsement. The development period in Canada is 12 months and in Malaysia the development period is in 5 months. The development in Malaysia is short because of the centralised workshops and based on the contractual requirements to complete the projects within that period of time. Time taken to develop and validate a WSQ Competency Standard in Singapore is about 1 to 3 months. Review of competency standards is initiated by industry. There is no specific timeframe for review and is aligned to the WSQ Framework Review cycle

The review of the documents are mostly in a 3- 5 year cycle or as requested by the stakeholders such as the industry or training institutes if the documents have certain issues or are not current. The best practice for years between reviews is according to an economy's policy and also based on an industry's technological advancement. However, the norm is within 5 years as this is the common practice for the four economies to update the Occupational Competency Standards.

4.4.4 Summary of Comparative Analysis

Findings obtained during the comparative analysis show that each economy has various development processes and governance for Occupational Frameworks and Occupational Competency Standards. However they share many similarities between the economies in terms of the general methods of obtaining input which is consistent consultation with the industry. The governing body and development personnel involved apply similar collaborations between the governing body and qualified development personnel or consultants.

Following this section will be the list of Best Practices that will highlight the best practices identified for the Occupational Framework and Occupational Competency Standards development conducted in each economy.

Table 4.9: Comparison of Occupational Competency Standards vs. Economies

Num	Items of Comparison	Malaysia	Australia	Canada	Singapore
1	**Occupational Competency Standards Equivalent**	National Occupational Skills Standards (NOSS)	Training Package	National Occupational Analysis	WSQ Competency Standards
2	**Governing/Overseeing Body**	• Department of Skills Development (DSD) under the Ministry of Human Resources • National Skills Development Council	• Department of Industry • National Skills Standards Council	• Employment and Social Development Canada (ESDC) • Sector Skills Council	• Workforce Development Agency under the Ministry of Manpower • Industry Skills and Training Council
3	**Development Personnel**	DSD, Certified Facilitators, Consultants, Subject Matter Experts, Industry Lead Bodies (ILB)	Industry Skills Council (Consultants, Subject Matter Experts, Researchers, Technical Writers engaged by ISC)	Appointed Consultants, Sector Councils, Provincial Agencies	WDA, Appointed Consultants, Process Developers
4	**Development Methodologies /Research Techniques**	• Brainstorming Workshops • Observations • Literature Review/Desktop Research	• Forums /Focus Discussion Workshops • Interviews • Surveys • Observations • Literature Review/Desktop Research	• Discussion Workshops • Interviews • Surveys • Observations • Literature Review/Desktop Research	• Discussion Workshops • Interviews • Surveys • Literature Review/Desktop Research

Table 4.9: Comparison of Occupational Competency Standards vs. Economies(continued)

Num	Items of Comparison	Malaysia	Australia	Canada	Singapore
5	Occupational Competency Standards Content	• **Standard Practice** (Industry Introduction, Occupational Structure, Definition of Competency Level, Award of Certificate, Working Environment, Employability Prospects, Job Competencies, Advanced Training, Development Committee Members) • **Standard Content (**Competency Profile Chart, Competency Profile (Work Activities, Performance Criteria, Competency Unit Descriptor), Curriculum of Competency Unit (Learning Outcome, Work Activity, Related Knowledge, Applied Skills, Delivery Mode, Training Hours, Assessment Criteria, Learning Resources, Employability Skills, Core Abilities, Tool, Equipment, Material)	• **Qualifications** (Qualification Code, Qualification Title, Qualification Description, Entry Requirements, Packaging Rules, Qualification Mapping Information) • **Units of Competency** (Unit Code, Unit Title, Pre-requisite Unit, Unit Sector, Competency Field, Application (Licensing/Regulatory Information, Pre-Requisites), Elements and Performance Criteria (Required Skills and Knowledge), Foundation Skills (Language, Literacy and Numeracy Skills, Employability Skills*),* Range Statement of Condition) • **Assessment Requirements** (Title, Performance Evidence, Knowledge Evidence, Assessment Conditions) • **Companion VolumesImplementation Guide** (Overview Information, Implementation information, Links)	• **Analysis** (Safety, Scope of the Trade, Occupational Observation) • **Block** (Trends, Related Components, Tools and Equipment) • **Task** (Context) • **Sub-Task**(Supporting Knowledge and Abilities)	• **Competency Standard** (Unit Purpose, Assumed Skills & Knowledge, Recognition of Prior Learning, Competency Description, Review Process) • **Knowledge Requirements** (Competency Elements, Underpinning Knowledge, Cognitive Levels) • **Performance Requirements** (Performance Criteria, Range and Context)
6	Development Duration and Review Period	5 months 3 – 5 years	18 months Continuous Improvement	12 months 5 years/10 years	1 – 3 months Timeframe for review is aligned to the WSQ Framework Review cycle

4.5 Best Practices in Developing Occupational Frameworks & Occupational Competency Standards

4.5.1 Best Practices for Occupational Framework Development

The best practices for the Occupational Framework development identified in the previous section (Section 4.4, Comparative Analysis) are divided according to the areas discussed in the comparative analysis such as:

i)   Governing/Overseeing Body & Development Personnel
ii)   Development Methodologies
iii) Occupational Framework Content
iv)   Duration of Years between Review

The best practices and examples of economies that implement the best practices can be seen in Table 4.10. The justifications of the best practices selected are elaborated below:

i)   Governing/Overseeing Body & Development Personnel

The best practices for this area are divided into project development governance and document development personnel as described below:

- **Project Development Governance**

  Project development governance is carried outby the governing body involved in human resources management and manpower planning.

- **Project Development Collaboration**

  Collaborationbetween the governing body with the statistics department or an industry body further strengthens the facts and figures presented in the Occupational Framework report.

- **Document Development Personnel**

  Consultants facilitating the Occupational Framework development must be knowledgeable of the document's editorial format and government policies pertaining to it.

- **Training of Development Consultants**

  The development consultants should undergo a standard course in curriculum and standards development. This is coupled with sufficient experience in Occupational Framework development.

- **Industry Experts Criteria**

  Industry experts involved in the development of the Occupational Framework must possess vast experience in the industry being analysed. Their knowledge of industry trends and manpower needs must be current.

- **Composition of Development Industry Experts**

  Industry experts involved in the development of the Occupational Framework must represent all the sub-sectors in the industry, positions and all types of organisations such as Small and Medium Enterprises, large corporate organisations, multinational companies and regulatory/statutory bodies.

The best practices are highlighted to ensure the analysis and development of the Occupational Frameworks is consistent between industries and meets with the government objectives of developing the frameworks.

ii)   Development Methodologies

The best practices for this area are divided into the development methodologies applied in certain phases of development which include segmentation of industry sectors, defining the occupational structure and levels of competency and research of supporting information relevant to industry overview as described below:

- **Research of information relevant to industry**

  Methods of gathering and analysing information must involve direct contact with industry stakeholders (i.e. workshop discussion, surveys, interviews or observations at workplace).

- **Counterchecking of Findings**

  Findings such as industry background, manpower statistics, related industries or sectors and skills requirements are counterchecked with the industry stakeholdersand statistics agencies to ensure its reliability, currency and relevance.

- **Segmentation of Industry Sectors**

  Segmentation of industries, sectors or frameworks are based on the definition of the industry sector, common areas of technicality/skills requirement and the required underlying knowledge.

- **Segmentation According to Areas of Regulatory Bodies**

  It is encouraged to carry out segmentation of industries, sectors or frameworks according to areas of regulatory bodies to further facilitate the promotion and use of the Occupational Framework.

- **Overall Overview of All Industries to Avoid Duplication**

  An overall overview of all industries facilitates long term planning and avoids duplication of frameworks between different trades.

- **Defining the Occupational Structure**

  The occupational structure of the industry reflects the current career paths available according to either industry practice or regulatory bodies.

- **Levels of Competency**

  The level of competency for each occupational group reflects a predefined list of competency level descriptions.

- **Impact of Occupational Structure**

  The occupational structure and levels of competency should take into consideration the impact on the development of Occupational Competency Standards and ultimately, the impact on training.

Properly planned development and analysis will enable the Occupational Framework to be precise and accurate thus ensuring that it will be a reliable source of information for further analysis on the industry. The best practices for Occupational Framework development methodologies will be translated into the standard development methodology described in Chapter 5 of this report.

iii)   Occupational Framework Content

The Best Practices for this area are divided into the contents that should be included in the Occupational Framework document which are the Occupational Structure, Occupational Descriptions, manpower skills requirements and the impact of Occupational Framework as described below:

- **Occupational Structure**

  The occupational structure (i.e occupational matrix, structure, and framework) is the most important element of the report and should clearly reflect the occupational areas in an industry and potential career path.

- **Occupational Descriptions**

  Occupational descriptions should be included to facilitate the readers in understanding the overall potential of an occupation in a certain trade.

- **Manpower Skills Requirements**

  Manpower skills requirements should be highlighted such as skills gaps and demand of workforce in critical job areas.

- **Industry Intelligence**

  Industry Intelligence based on actual input from the industry should be presented in statistical form to further strengthen and prove the reliability of the data.

- **Impact of Occupational Framework**

  A write up on the impact that an Occupational Framework will have on training, employability and accessibility to certain occupations is encouraged to provide a more holistic view of the occupational area.

The contents that are central to an Occupational Framework are its Occupational Structure and pertaining information of the occupations in the particular industry. The Occupational Framework matrix, structure or framework serves as a useful visual tool to understand occupational areas and career paths for a particular occupation; therefore a clearly defined occupational structure is important. Supporting information such as manpower skills requirements, occupational descriptions and industry intelligence will allow an overall understanding of the occupational area. By taking into account the impacts of the Occupational Framework on training and employability, this will ensure that the development is carried out comprehensively.

iv) Years between Review

The best practice is to ensure that the review period is timely so that elements such as manpower requirements are current. Industries with rapid technological advancement may require a much more frequent review. The norm for years between a review is 5 years but may also depend on the economy's policy.

> - **Review of Occupational Framework**
>
>   A review is necessary to ensure the Occupational Framework isin line with industry demands. The frequency of the review should depend on the respective economy's policy and the industry's technological advancement. The norm is 5 years between a review.

The following Table 4.10 summarises the best practices and includes economies that may be referred for their implementation of the best practice.

Most of the examples of implementations relevant to the best practice for a particular subject area can be found on the governing body's official website.

Table 4.10: Best Practices for Occupational Framework Development

No.	Area	Best Practice	Example of Implementation
1	Governing/Overseeing Body & Development Personnel	• **Project Development Governance** Project development governance is carried outby the governing body involved in human resources management and manpower planning.	Australia , Canada, Singapore, Malaysia
		• **Project Development Collaboration** Collaboration between the governing body with the statistics department or an industry body will further strengthen the facts and figures presented in the Occupational Frameworks report.	Australia , Canada, Singapore, Malaysia
		• **Document Development Personnel** Consultants facilitating the Occupational Framework development must be knowledgeable of the documents editorial format and government policies pertaining to it.	Australia , Canada, Singapore, Malaysia
		• **Training of Development Consultants** The development consultants should undergo a standard course in curriculum and standards development. This is coupled with sufficient experience in Occupational Competency Standards development.	Australia , Canada, Singapore, Malaysia
		• **Industry Experts Criteria** Industry experts involved in the development of the Occupational Framework must possess vast experience in the industry being analysed. Their knowledge of industry trends and manpower needs must be current.	Australia , Canada, Singapore, Malaysia

No.	Area	Best Practice	Example of Implementation
		• **Composition of Development Industry Experts** Composition of industry experts involved in the development of the Occupational Framework must represent all the sub-sectors in the industry, positions and all types of organisations such as Small and Medium Enterprises, large corporate organisations, multinational companies and regulatory/statutory bodies.	Australia , Canada, Singapore, Malaysia
2	Occupational Framework Development Methodologies	• **Research of information relevant to industry** Methods of gathering and analysing information must involve direct contact with industry stakeholders (i.e. workshop discussion, surveys, interviews or observations at workplace).	Australia, Malaysia, Canada, Singapore
		• **Counterchecking of Findings** Findings such as industry background, manpower statistics, related industries or sectors and skills requirements are counterchecked with the industry stakeholders and statistics agencies to ensure its reliability, currency and relevance.	Australia, Malaysia, Canada, Singapore
		• **Segmentation of Industry Sectors** Segmentation of industries, sectors or frameworks are based on the definition of the industry sector, common areas of technicality/skills requirement and the required underlying knowledge.	Australia, Malaysia, Canada, Singapore
		• **Segmentation According to Areas of Regulatory Bodies** It is encouraged to carry out segmentation of industries, sectors or frameworks according to areas of regulatory bodies to further facilitate the promotion and use of the Occupational Framework.	Malaysia

No.	Area	Best Practice	Example of Implementation
2	Occupational Framework Development Methodologies	• **Overall Overview of All Industries to Avoid Duplication** An overall overview of all industries facilitates long term planning and avoids duplication of frameworks between different trades.	Canada
		• **Defining the Occupational Structure** The occupational structure of the industry reflects the current career paths available according to either industry practice or regulatory bodies.	Australia , Canada, Singapore, Malaysia
		• **Levels of Competency** The level of competency for each occupational group reflects a predefined list of competency level descriptions.	Australia, Malaysia, Canada Singapore
		• **Impact of Occupational Structure** The occupational structure and levels of competency should take into consideration the impact on the development of Occupational Competency Standards and ultimately, the impact on training.	Australia , Canada, Singapore, Malaysia
3	Occupational Framework Content	• **Occupational Structure** The occupational structure (i.e. occupational matrix, structure, and framework) is the most important element of the report and should clearly reflect the occupational areas in an industry and potential career path.	Australia, Canada, Singapore, Malaysia

No.	Area	Best Practice	Example of Implementation
3	Occupational Framework Content	• **Occupational Descriptions** Occupational descriptions should be included to facilitate the readers in understanding the overall potential of an occupation in a certain trade.	Canada, Malaysia, Australia
		• **Manpower Skills Requirements** Manpower skills requirements should be highlighted such as skills gaps and demand of workforce in critical job areas.	Australia, Malaysia, Canada
		• **Industry Intelligence** Industry Intelligence based on actual input from the industry should be presented in statistical form to further strengthen and prove the reliability of the data.	Australia
		• **Impact of Occupational Framework** A write up on the impact that an Occupational Framework will have on training, employability and accessibility to certain occupations is encouraged to provide a more holistic view of the occupational area.	Australia, Singapore, Malaysia, Canada
4	Duration of Years between Review	• **Review of Occupational Framework** A review is necessary to ensure the Occupational Framework isin line with industry demands. The frequency of the review should depend on the respective economy's policy and the industry's technological advancement. The norm is 5 years between a review.	Australia, Singapore, Malaysia, Canada

4.5.2 Best Practices for Occupational Competency Standards Development

The best practices for Occupational Competency Standards Development are divided according to the areas discussed in the comparative analysis such as:
i)   Governing/Overseeing Body & Development Personnel
ii) Development Methodologies
iii) Occupational Competency Standards Content
iv) Duration of Years between Review

The best practices and examples of economies that implement the related best practices can be seen in Table 4.11. The justifications of the best practices are elaborated below:

i)   Governing/Overseeing Body & Development Personnel

The best practices for this area are divided into project development governance
and document development personnel as described below:

- **Project Development Governance**

  Project development governance is carried outby the governing body involved in human resources management and manpower planning.

- **Project Development Collaboration**

  Collaboration between the governing body and an industry body will further facilitate the sourcing of subject matter experts to be involved in development.

- **Document Development Personnel**

  Consultants whomwill be facilitating and developing the Occupational Competency Standards must be knowledgeable of the documents editorial format and government policies pertaining to it.

- **Training of Development Consultants**

  It is recommended that development consultants undergo or are certified in a standard course in curriculum and standards development as recognised by the governing body. This must be coupled with sufficient experience in Occupational Competency Standards development.

- **Industry Experts Criteria**

  Industry experts involved in the development of the Occupational Competency Standards must possess sufficient experience and skills in the specific occupational area.

- **Composition of Development Industry Experts**

  Composition of industry experts involved in the development of the Occupational Competency Standards must representdifferent types of organisations such as Small and Medium Enterprises, large corporate organisations, multinational companies or government agencies.

The best practices are highlighted to ensure the analysis and development of the Occupational Competency Standards is consistent, comprehensive and meets with government policies regarding occupational standards.

ii)   Development Methodologies

The best practices for this area are divided into the development methodologies that are to be applied in certain phases of development which include analysis of the occupational area, formulation of occupational competency unit and analysis of Competency Units are described below:

- **Analysis of Occupational Area**

  The methods of gathering and analysing information should include direct contact with industry stakeholders (i.e. workshop discussion, surveys, interviews or observations at workplace). Always countercheck findings with industry members to ensure its currency and relevance.

- **Occupational Area Overview**

  A brief overview of the occupational area should include an occupational overview, employment prospects, pertaining Occupational Structure/Matrix and any information that may provide the reader pertinent knowledge of the occupational area.

- **Grouping of Competencies**

  Competencies that are grouped by qualification or job outcomes further facilitates the implementation of training a skilled worker.

- **Formulation of Competency Unit**

  Competency Units/Duties mustreflect all the core competencies required for a particular occupation.

- **Job Analysis of Competency Unit**

  Competencies should be analysed and broke down into measurable units or activities that must include enabling requirements and performance criteria specified for each competency unit.

- **Impact of Assessment Criteria Range and Context**

  The impact on training and regulatory requirements must be taken into consideration when specifying the range and context for training and assessment.

- **Language Usage**

  Proper use of language especially in the usage of verbs and statements allow for easier interpretation of the competency requirements and also during translation of the standards to training curriculum. It is recommended to refer to Learning Domains such as Bloom's Taxonomy.

- **Supporting Validation Process Report**

  It is encouraged that a quality report and editorial report be produced to explain the validation process of the Occupational Competency Standards document.

The most important aspect to be implemented during development is to involve the industry throughout development. Findings must be counterchecked with the industry to ensure its currency and relevance. The main objective of the development approach undertaken should be to analyse the occupational area and determine the core competencies required to be deemed competent. Proper grouping of the competencies according to qualifications or occupational areas will facilitate the implementation of skills training.

Language used in the Competency Standards must be counterchecked at verbatim as certain phrases, words or terms used could have a big impact on the actual training and assessment of candidates.

iii)   Occupational Competency Standards Content

The best practices for this area are divided into the contents that should be included in the Occupational Competency Standards document which are the Competency Chart, Competency Units, Assessment Criteria are as described below:

- **Competency Chart**

  The competency chart must clearly and visually depict all the core competencies and elective competencies according to qualifications/occupational areas.

- **Competency Unit Performance Criteria**

  The Performance Criteria statement is the most crucial element in the Occupational Standards as it will determine the expected outcomes of a competency.

- **CompetencyUnit Enabling Requirements**

  The enabling requirements of a particular competency unit should include the underpinning knowledge, related skills, tools, equipment and materials, attitude and adherence to relevant legislation.

- **Competency Unit Assessment Criteria**

  The assessment criteria or guide must be clearly stated in certain range and context to enable a particular candidate to be assessed and deemed competent for a particular competency.

- **Employability Skills and legislative requirements**

  Including theemployability skills and legislative requirements in the Competency Units will ensure that the trainees will be prepared for the working world.

- **Competency Unit Coding**

  Coding of competency units is crucial in avoiding the duplication of competencies and enable a more robust and flexible group of competencies.

The content as mentioned above is the essential content in Occupational Competency Standards where the description of the competencies in terms of enabling requirements, performance criteria, assessment range and context must be accurate and concise. Use of language is important to ensure it is easy to be understood and interpreted. A structured database of competency units will enable the sharing of similar competency units across different trades.

iv)   Years between Review

The best practice is includes the need for continuous improvement and provision of a quality and editorial report to support the validation of the standards.

- **Review of Occupational Competency Standards**

  A review is necessary to ensure the Occupational Competency Standards arein line with industry demands. The frequency of the review should depend on the respective economy's policy and the industry's technological advancement. The norm is 5 years between reviews.

The areas highlighted above are to ensure that the review is responsive to industry requirements.

v)   Curriculum Development

The best practice describes the need for a curriculum standard that may serve as a translation tool from the Occupational Competency Standards to training material.

- **Curriculum Standard**

  It is recommended to develop a Curriculum Standard that allows for a uniformed translation from Occupational Competency Standards to training material.

- **Training Content Development Course**

  The translation of the standards to training material is taught to content developers and trainers through nationally recognised programs in training content development.

- **Training Hours**

  Training hours included in the curriculum standard may be used asa guide to ensure that sufficient training is carried out.

The Competency Standards describe the requirements of the job that will be translated to training and assessment materials. Therefore it is crucial that the translation process is supported by a uniformed standard for curriculum and through training for content developers to translate the competencies to training and learning material.

This however will not restrict the creativity of packaging competencies tailored to the training institutions and industry requirements as the development of the training and learning material is done at the training institution level, the curriculum standard will mainly serve to provide the range and context for the training and assessment.

Table 4.11: Best Practices for Occupational Competency Standards Development

No.	Area	Best Practice	Example of Implementation
1	Governing/Overseeing Body & Development Personnel	**Project Development Governance** Project development governance is carried outby the governing body involved in human resources management and manpower planning.	Australia , Canada, Singapore, Malaysia
		Project Development Collaboration Collaboration between the governing body and an industry body will further facilitate the sourcing of subject matter experts to be involved in development.	Australia , Canada, Singapore, Malaysia
		Document Development Personnel Consultants whom will be facilitating and developing the Occupational Competency Standards must be knowledgeable of the documents editorial format and government policies pertaining to it.	Australia , Canada, Singapore, Malaysia
		Training of Development Consultants It is recommended that development consultants undergo or are certified in a standard course in curriculum and standards development as recognised by the governing body. This must be coupled with sufficient experience in Occupational Competency Standards development.	Malaysia, Singapore
		Industry Experts Criteria Industry experts involved in the development of the Occupational Competency Standards must possess sufficient experience and skills in the specific occupational area.	Australia , Canada, Singapore, Malaysia

No.	Area	Best Practice	Example of Implementation
1	Governing/Overseeing Body & Development Personnel	• **Composition of Development Industry Experts** Composition of industry experts involved in the development of the Occupational Competency Standards must represent different types of organisations such as Small and Medium Enterprises, large corporate organisations, multinational companies or government agencies.	Australia , Canada, Singapore, Malaysia
2	Occupational Competency Standards Development Methodologies	• **Analysis of Occupational Area** The methods of gathering and analysing information should include direct contact with industry stakeholders (i.e. workshop discussion, surveys, interviews or observations at workplace). Always countercheck findings with industry members to ensure its currency and relevance.	Australia , Canada, Singapore, Malaysia
		• **Occupational Area Overview** A brief overview of the occupational area should include an occupational overview, employment prospects, pertaining Occupational Structure/Matrix and any information that may provide the reader pertinent knowledge of the occupational area.	Australia , Canada, Singapore, Malaysia
		• **Grouping of Competencies** Competencies that are grouped by qualification or job outcomes further facilitates the implementation of training a skilled worker.	Australia, Malaysia, Singapore
		• **Formulation of Competency Unit** Competency Units/Duties mustreflect all the core competencies required for a particular occupation.	Australia , Canada, Singapore, Malaysia

No.	Area	Best Practice	Example of Implementation
2	Occupational Competency Standards Development Methodologies	• **Job Analysis of Competency Unit** Competencies should be analysed and broke down into measurable units or activities that must include enabling requirements and performance criteria specified for each competency unit.	Australia, Malaysia, Singapore
		• **Impact of Assessment Criteria Range and Context** The impact on training and regulatory requirements must be taken into consideration when specifying the range and context for training and assessment.	Australia, Malaysia, Singapore
		• **Language usage** Proper use of language especially in the usage of verbs and statements allow for easier interpretation of the competency requirements and also during translation of the standards to training curriculum. It is recommended to refer to Learning Domains such as Bloom's Taxonomy.	Australia , Canada, Singapore, Malaysia
		• **Supporting Validation Process Report** It is encouraged that a quality report and editorial report be produced to explain the validation process of the Occupational Competency Standards document.	Australia
3	Occupational Competency Standards Content	• **Competency Chart** The competency chart must clearly and visually depict all the core competencies and elective competencies according to qualifications/occupational areas.	Australia, Singapore, Malaysia

No.	Area	Best Practice	Example of Implementation
3	Occupational Competency Standards Content	• **Competency Unit Performance Criteria** The Performance Criteria statement is the most crucial element in the Occupational Standards as it will determine the expected outcomes of a competency.	Australia, Singapore, Malaysia
		• **CompetencyUnit Enabling Requirements** The enabling requirements of a particular competency unit should include the underpinning knowledge, related skills, tools, equipment and materials, attitude and adherence to relevant legislation.	Malaysia, Australia, Singapore, Canada
		• **Competency Unit Assessment Criteria** The assessment criteria or guide must be clearly stated in certain range and context to enable a particular candidate to be assessed and deemed competent for a particular competency.	Australia, Malaysia , Singapore
		• **Employability Skills and Legislative Requirements** Including the employability skills and legislative requirements for the Competency Units will ensure that the trainees will be prepared for the working world.	Australia, Malaysia
		• **Competency Unit Coding** Coding of competency units is crucial in avoiding the duplication of competencies and enable a more robust and flexible group of competencies	Australia, Singapore, Malaysia, Canada

No.	Area	Best Practice	Example of Implementation
4	Years Between Review	• **Review of Occupational Competency Standards** A review is necessary to ensure the Occupational Competency Standards arein line with industry demands. The frequency of the review should depend on the respective economy's policy and the industry's technological advancement. The norm is 5 years between reviews.	Australia, Singapore, Malaysia, Canada
5	Curriculum Development	• **Curriculum Standard** It is recommended to develop a Curriculum Standard that allows for a uniformed translation from Occupational Competency Standards to training material.	Malaysia, Canada
		• **Training Content Development Course** The translation of the standards to training material is taught to content developers and trainers through nationally recognised programs in training content development.	Malaysia, Singapore, Australia, Canada
		• **Training Hours** Training hours included in the curriculum standard may be used as a guide to ensure that sufficient training is carried out.	Malaysia

4.5.3 Summary of Best Practices

The best practices identified are hoped to serve as reference in developing Occupational Frameworks and Occupational Competency Standards based on what is seen as an effective implementation in the benchmark economies. It must be highlighted that these best practices can be adapted to the current practice and implementation in other economies but with the basic concept of the best practice in mind.

The important goal is to ensure industry involvement throughout development supported with strong governance of development processes and well written documentation that is responsive to industry feedback.

The best practices are referred and reflected in the standard development methodology presented in Chapter 5 of this report. The following section will present the findings obtained from Situational Analysis done on the benchmark economies as to discover the elements that will influence the development process of Occupational Frameworks and Occupational Competency Standards.

4.6 Situational Analysis on Enablers for Promoting a Standard Development Methodology

In order to promote a Standard Development Methodology, a Situational Analysis was conducted using the PEST approach by analysing the following enablers that may influence the viability of promoting the standard development methodology. The areas or factors that have been analysed are the Political factors that cover governance and related legislation, Economic factors such as funds, incentives and etc., Social outlook on the TVET system in general and Technological factors that may facilitate the development process and gain public acceptance. In this research these factors were compared between the economies and analysed to determine the external factors that may influence how a particular economy with similar characteristics may adopt the development methodology proposed in this report. Table 4.12 shows the comparison between the economies in terms of the Political/Legislation, Economic, Social and Technological (PEST) items. The situational analysis according to the items is elaborated below.

4.6.1 Situational Analysis Findings

- **Political**

Based on previous sections, the governance of TVET varies between economies mainly due to the geographical structure of an economy. For instance, Canada that is geographically dispersed mandates the governance of education and training at provincial level. Historically the jurisdiction was delegated to the individual provinces and territories. However, in order to provide labour mobility, the Red Seal program was introduced in 1952. The Employment and Social Development, Canada (ESDC) and Council of Ministers of Education Canada (CMEC) also play an important role in ensuring that the provinces and territories are in agreement on certain policies of training and education.

In Australia, the constitutional authority for VET rests nominally with the states, but the Australian Government has increasingly had influence to a large extent especially since funding is provided by the national government.

The Ministry of Manpower (MOM) works closely with the Singapore Workforce Development Agency (WDA) to develop a nation-wide system of continuing education and training (CET) to give everyone the opportunity to acquire greater skill proficiency, knowledge and expertise. The CET system in Singapore is highly centralised in terms of implementation and funding.

Malaysia also has the similar approach where all skills training and certification is awarded by the Department of Skills Development (DSD) under the Ministry of Human Resources.

The accreditation for training centres is also under the jurisdiction of the DSD including the assessment and verification of skills training that is coordinated and validated by the DSD.

Table 4.12 shows the legislations available in each economy that has an impact on TVET implementation in terms of regulating, coordination, standardisation and funding. It can be said that with the enactment of acts has a major impact on TVET in an economy because it ensures that TVET is regulated and according to policies. This is important due to the fact that Occupational Standards are developed and the consistency and integrity of those standards are maintained. The availability of the acts also allow for funding and establishment of regulatory or development bodies pertaining to TVET.

Another important point is to differentiate the TVET implementation highlighted in this report that is scoped for TVET mainly at tertiary or post secondary level and is under the jurisdiction of ministries of human resources/manpower/employment respective to the economy. It does not include the TVET system under the jurisdiction of Ministries of Education as it takes on the approach of practical/hands on training and direct preparation for the working environment by analysing occupations requirements.

- **Economic**

The economies that enjoy a high participation in TVET are those that have invested heavily in terms of training grants and incentives for employers. By far the most common arrangement for the disbursement of funding for entry-level training is for government departments to provide it directly to education and training institutions.

Most public funding for continuing VET follows the same model as for entry level training, i.e. recurrent funding allocated to providers based on input measures of delivery. Canada has provided various forms of financial incentives to promote participation and completion such as to offer tax measures such as Apprenticeship Job Creation Tax Credit to employers and Tools Deduction to apprentices, provide Apprenticeship Incentive and Completion Grants to apprentices, provide benefits to apprentices during their blocks of classroom training and provide benefits to assist with tuition and training-related expenses.

Singapore through the WDA provides Skills Development Fund (SDF), Lifelong Learning Endowment Fund (LLEF), and Absentee Payroll for employees who can receive 80% to 85% of their salary while attending training, Employer Grants, Workforce Skill Up incentives and Training Commitment Award.

The TVET sector in Australia is funded jointly by the national and State and Territory governments. Industry and private investment in training are also significant. Some of the funding provided through government and several Australian states are introducing 'entitlement models' where the training dollar is tied to the student and they (or their employer) can make choices on the type of training and provider they wish to use. The Building Australia's Future Workforce package has seen the establishment of the National Workforce Development Fund. This fund supports training and workforce development in areas of current and future skills need for people who are already in employment. . The fund is administered by the Department of Industry. The Australian Workforce and Productivity Agency provides advice to Government on priority industry sectors for funding.

Malaysia provides financial assistance to students undergoing full time skills training at approved Accredited Centres through the Skills Development Fund. Apprentices under the National Dual Training System (NDTS) receive allowances and their training costs at the Accredited Centre and Industry Placement companies are fully funded by the Department of Skills Development. The Skills Development Fund is also available for adult workers.

The Malaysian government also provides funding for skills training through other ministries such as the Ministry of Youth and Sports or Ministry of Rural Development which are usually targeted at students from less fortunate families or those who do not possess jobs and tertiary education. Students in public skills training institutions such as the Industrial Training Institutes receive full sponsorship. The Human Resources Development Fund is

provided for working adults but is not limited to skills training programmes and covers training for various topics.

- **Social**

Currently TVET has managed to overcome the decades old stigma of vocational education and training as an alternative to acquire qualifications and education. This has been done by the renaming and rebranding of TVET to reflect the need of skills training for employability.

All the four economies have used the model of having pilot projects to show that TVET is a feasible form of education and training that allows candidates to be absorbed in the working place and industry. Third world and developing countries are looking to TVET as another means of enabling post secondary education to be accessible for all including those that are less fortunate. Malaysia's initiative on providing skills training for the less fortunate has opened doors for other ministries to pump in funding for skills training thus increasing accessibility to skills training and ultimately attaining employability.

Singapore has succeeded in convincing its public that TVET is a useful approach in ensuring that economic and industry demands are met by developing a skilled workforce. This seen in the investments made at training centres in terms of facilities and infrastructure. Canada and Australia are driven mainly by economic demands at state/provincial level and this provides 'ownership' to the industries as they can determine training that is required at state/provincial level. The 'buy-in' in Australia is also acquired by customising training to industry requirements in the training packages.

- **Technological**

All economies are currently up to date in terms of using the internet as a means to disperse information and also liaise with relevant parties on line. Australia has gone one step further in terms of setting up web portals for each ISC to facilitate communication with the industry members and the public in general. The web portals are also used as a form of obtaining feedback during development for continuous improvement on the documents. Australia provides the public access to Training Packages on it official website training.gov.au.

Malaysia has recently started to provide the Competency Units during development online but currently is only accessible by the facilitators. Malaysia and Singapore provide public access to its Occupational Framework reports on the governing agencies website. Canada also provides access to its NOC and NOA on the ESDC website and websites of organisations that develop the Curriculum and Apprenticeship Standards.

Table 4.12: Situational Analysis (PEST) Vs. Economies

NUM	PEST ITEM	AUSTRALIA	CANADA	SINGAPORE	MALAYSIA
1.	Political / Legislations related to TVET	**The constitutional authority for VET rests nominally with the states, but the Australian Government has increasingly had influence to a large extent.** 1. National Agreement for skills and Workforce Development 2012 2. National Partnership Agreement on Skills Reform 2012 3. National Vocational Education and Training Regulator Act 2011 4. Skilling Australia's Workforce Act 2005 Existing legal framework for TVET: • Australian Capital Territory: Training and Tertiary Education Act 2003 • New South Wales: Vocational and Training Act 2005 and Vocational Education and Training (Commonwealth Powers) Act 2010 • Northern Territory: Northern Territory Employment and Training Act	**Education and training is delegated to provinces and territories but coordinated by agencies such as ESDC and CMEC to ensure agreement between provinces.** 1. Technical and Vocational Training Assistance Act 1960 (TVTA Act) 2. National Training Act 1982 3. Private Career Colleges Act, 2005 (Updated 2010)	**The Ministry of Manpower (MOM) works closely with the Singapore Workforce Development Agency (WDA) to develop a nation-wide system of continuing education and training (CET).** 1. Private Education Act 2009 2. Institute of Technical Education Act 1992 3. Skills Development Levy Act 1979	**All skills training and certification is awarded by the Department of Skills Development (DSD) under the Ministry of Human Resources.** 1. National Skills Development Act 2006 (Act 652) 2. Private Higher Education Institutions Act (PHEIA) 1996 (Act 555) 3. Malaysian Qualifications Agency Act 2007 (Act 679) 4. Skills Development Fund Act 2004 (Act 640) 5. Education Act 196 (Act 550) 6. *Pembangunan Sumber Manusia Berhad* Act 2001 (Act 612)

NUM	PEST ITEM	AUSTRALIA	CANADA	SINGAPORE	MALAYSIA
		• Queensland: Vocational Education, Training and Employment Act & Regulation 2000 • South Australia: Training and Skills Development Act 2008 • Tasmania: Tasmanian Vocational Education and Training Act 1994 & Tasmanian • Qualifications Authority Act 2003 • Victoria: Education and Training Reform Amendment (Skills) Act 2010 • Western Australia: Vocational Education and Training Act 1996."			
2	Economic	• National Workforce Development Fund. • A recent model is the 'entitlement models 'that gives power to the student to decide and obtain funding	• Tax measures such as Apprenticeship Job Creation Tax Credit to employers • Tools Deduction to apprentices, provide Apprenticeship • Incentive and Completion Grants to apprentices	• Skills Development Fund (SDF), Lifelong Learning Endowment Fund (LLEF) • Absentee Payroll for employees who can receive 80% to 85% of salary while attending training, Employer Grants • Workforce Skill Up incentives Training Commitment Award	• Funding is provided to students undergoing full time skills training and adult workers through the Skills Development Fund • Apprentices under the National Dual Training System (NDTS) are funded directly by the DSD

NUM	PEST ITEM	AUSTRALIA	CANADA	SINGAPORE	MALAYSIA
3	Social	Provide 'ownership' of Occupational Competency Standards to the industries as they can assist in determining training that is required at state level. The 'buy-in' in Australia is also acquired by customising training to industry requirements.	Provide 'ownership' of Occupational Competency Standards to the industries as they can assist in identifying training that is required at provincial level.	Attract investors from the industry on the viability of CET to ensure up skilling of workers. This is seen in the investments made at training centres in terms of facilities and infrastructure.	Malaysia's initiative on providing skills training for the less fortunate has increased accessibility to skills training and employability. Up skilling of workers and the unemployed has also been a successful initiative.
4	Technological	• Sets up web portals for each ISC to facilitate communication with the industry members and the public in general. • The web portals are also used as a form of obtaining feedback during development for continuous improvement on the documents. • Australia provides the public access to Training Packages on it official website training.gov.au.	• Provides access to its NOC and NOA on the ESDC website and websites of organisations that develop the Curriculum and Apprenticeship Standards	• Provides public access to its WSQ reports on the WDA website.	• Provides public access to its OA reports on the DSD website • Has recently started to make the Competency Units available online during development but currently is only accessible by the facilitators.

4.6.2 Summary of Situational Analysis Findings

In conclusion, based on the situational analysis done on these four economies, development of the Occupational Framework and Occupational Competency standards require an established platform of communication between the government, industry and training providers. This requires the government to set in place mechanisms that are tailored to the economy's governance and administration that will provide a clearer platform for funding and industry participation. With a strong and established relationship between the government, industry and training provider, the public will be more confident in participating in TVET. The use of technological tools such as the internet, provide a more widespread communication with industry and TVET stakeholders thus allowing them to provide input for continuous improvement. This serves as the check and balance required to ensure that TVET is currently in tandem with industry needs.

This research will propose a development methodology that is generic and not dependent on the governing system of TVET in a particular economy, but rather it focuses on the need for establishing an industry body as the main reference for industry requirements and establishing the role of the governing body regarding quality and endorsement policies to ensure the development process is in check.

4.7 Chapter Summary

The findings presented in this chapter cover the results from the discussion workshops conducted in Malaysia, benchmarking visits in Malaysia and an overall situational analysis of the implementation in economies. The best practices have been segregated according to OA and NOSS development as they are in different context at micro level. The proposed standard methodology is based on the synthesis of the best practices.

5. DISCUSSION, RECOMMENDATIONS AND CONCLUSION

5.1 Preamble

The recommended Best Practices for Occupational Frameworks & Occupational Competency Standards in the previous chapter are hoped to provide readers with insight in critical aspects of their development and in ensuring the relevancy to the industry. This chapter will recommend a standard methodology on Occupational Frameworks & Occupational Competency Standards development and discusses the enablers that will facilitate the promotion of the development methodology.

5.2 Discussion

The Standard Development Methodology that will be proposed in this chapter has been formulated by incorporating the Best Practices presented in the previous chapter. It will be used as a guide for developing Occupational Frameworks and Occupational Competency Standards. External factors or enablers to facilitate the actual application of the proposed development methodology have been identified from the Situational Analysis findings obtained from the analysis on the development environment in Malaysia and also during benchmarking activities.

Figure 5.1 below shows the flow of how the findings obtained from comparative analysis were used to identify the Best Practices for Occupational Framework and Occupational Competency Standards Development and finally used to formulate the Standard Development Methodology. The Situational Analysis findings serve as input to identify the enablers required to promote the use of the Standard Development Methodology.
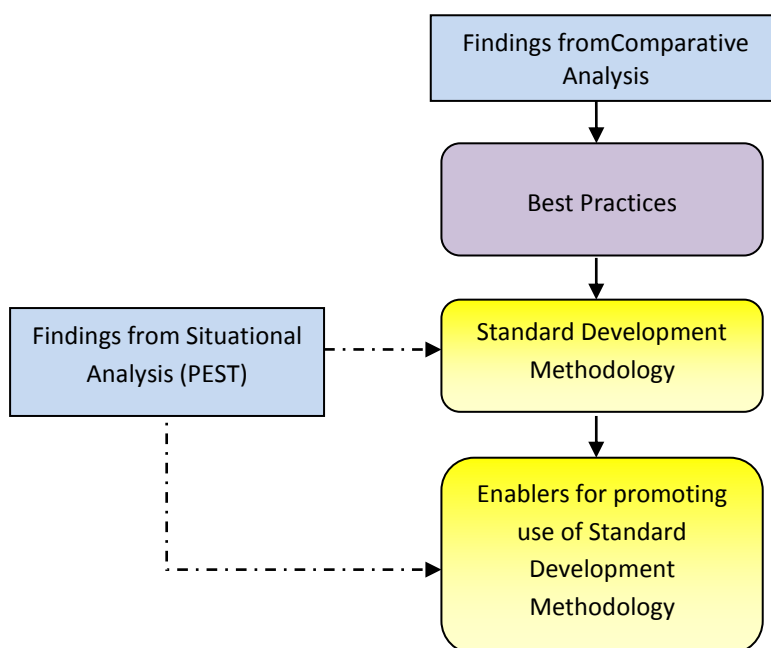
Figure 5.1: Formulation of Project Outcomes

The formulation of the Development Methodology from the Best Practices can be seen alongside the flow chart in Figure 5.2 and Figure 5.3. The Best Practices on Development Personnel and Development Methodologies were referred during the initial process of development. Then the Best Practices on Content and Methodologies were referred throughout the identification of development processes. The Best Practices on Review were referred during endorsement and review of the documents. The finalised Standard Development Methodology is further elaborated in the following section, section 5.3.

Best Practices for Governing/ Overseeing Body & Development Personnel:
- ✓ Project Development Governance
- ✓ Project Development Collaboration
- ✓ Document Development Personnel
- ✓ Industry Experts Criteria

Best Practices for Development Methodologies:
- ✓ Research of Information relevant to industry
- ✓ Counterchecking of Findings
- ✓ Overall overview of industries

Best Practices for Development Methodologies:
- ✓ Segmentation of Industry sectors
- ✓ Segmentation according to areas of regulatory bodies
- ✓ Defining the occupational structure and levels of competency
- ✓ Levels of Competency
- ✓ Impact of Occupational Structure

Best Practices for Framework Content:
- ✓ Occupational Structure
- ✓ Manpower Skills Requirements
- ✓ Industry Intelligence
- ✓ Impact of Occupational Framework
- ✓ Occupational Descriptions

Best Practices for Years Of Review:
- ✓ Review of Occupational Framework

Start

Establish development team (governing bodies, industry body and development consultant)

Confirm the industry to be analysed (Consult industry body)

Conduct brief literature review on industry sector

Engage and consult stakeholder in the sub-sectors/areas/trades relevant to industry

Identify competency areas and relevant skill

Identify relevant qualifications, legislation and pre-requisites

Obtain statistical and qualitative data pertaining to manpower requirements and impacts of Occupational Framework

Formulate Occupational Descriptions

Validate with industry body and governing body

Publish endorsed Occupational Framework for public review and usage

Requires update of content ?

Yes

No

Publish updated Occupational Framework for public review and usage

End

Figure 5.2: Formulation of Occupational Framework Development Methodology

Best Practices for Governing/ Overseeing Body & Development Personnel:
- ✓ Project development Governance
- ✓ Project development Collaboration
- ✓ Document development Personnel
- ✓ Industry experts criteria
- ✓ Composition of development industry experts

Best Practices for Development Methodologies:
- ✓ Analysis of occupational area
- ✓ Occupational Area overview
- ✓ Grouping of competencies
- ✓ Formulation of Competency Unit

Best Practices for Occupational Competency Standards Content:
- ✓ Competency Chart
- ✓ Competency Unit Performance Criteria

Best Practices for Development Methodologies:
- ✓ Job Analysis of Competency Unit
- ✓ Assessment Criteria range and context

Best Practices for Occupational Competency Standards Content:
- ✓ Competency Unit Enabling Requirements
- ✓ Competency Unit Assessment Criteria
- ✓ Employability Skills and Legislative requirements

Best Practices for Years Of Review:
- ✓ Review of Occupational Competency Standards

Start

Establish development team (governing bodies, industry body and development consultant)

Confirm Occupational Competency Standards to be developed (Consult industry body)

Analyse the occupational area

Identify both core and elective competencies

Analyse and break down competencies into measurable units/activities

Identify performance criteria for each unit/activity

Identify enabling requirements (i.e. Knowledge, Skills) for the units/activities

Specify range and context for training and assessment

Specify legislative requirements and employability skills

Validate competency standards with industry body, members of the industry and governing body

Publish endorsed Occupational Competency Standards for public review and usage

Publish updated Occupational Competency Standards for public review and usage

Requires update of content?

Yes

No

End

Figure 5.3: Formulation of Occupational Competency Standards Development Methodology

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5.3 Standard Methodology for Developing Occupational Frameworks and Occupational Competency Standards

The proposed standard methodology for Occupational Frameworks development is differentiated for Occupational Framework development and Occupational Competency Standards. The process flow charts are shown in Figure 5.4 followed by Figure 5.5. The flow charts show the proposed flow of development methodology that can be adapted to Occupational Frameworks and Occupational Competency Standards in other economies.

5.3.1 Occupational Frameworks Standard Development Methodology

The methodology (depicted in Figure 5.4) for Occupational Framework development starts with establishing the development team and then consulting the industry to be analysed by referring the industry bodies on suitability and feasibility of the analysis. It is important for the researcher to conduct a brief literature review on the industry to obtain a comprehensive view of the industry and to facilitate the research of other aspects throughout the analysis. Then will be to identify all sectors/areas/trades under that specific industry as to ascertain the relevant stakeholders and areas of research.

Through consultation with stakeholders, the occupational areas are to be identified. It is important to ensure that the findings are not only relevant to the local industry's practice but in the spirit of benchmarking with practices in other economies. After identifying the occupational areas, then only can the competency areas and levels of skills be identified.

Relevant regulations, qualifications and pre-requisites should be identified as to ascertain all pertaining aspects that will ensure those in the industry understand the requirements of the occupation.

It is then important that statistical and qualitative data pertaining to manpower requirements and impacts to training and assessment be acquired to provide an overall view of the industry manpower requirements at hand.

The Occupational Frameworks finally should be validated with the industry and governing bodies and ensuring continuous improvement of the Occupational Frameworks based on feedback from the industry.

In the event that there is input that the Occupational Framework should be reviewed, then the industry body should be referred to in terms of the content to be reviewed that will start with reviewing the competency areas and subsequently all pertaining content. Finally the updated Occupational Framework will be published for usage and review.

5.3.2 Occupational Competency Standards Development Methodology

Figure 5.5 depicts the methodology for Occupational Competency Standards that starts with confirming with the industry on suitability and feasibility of the Competency Standards development.

Then will be to identify all competencies for the occupational area exhaustively through many techniques such as consultation in discussion workshops, surveys, observations of the working environments and many other forms of acquiring information. Through consultation with stakeholders, it would be easier to analyse and break down the competencies into measurable units. These units are commonly known as competency units.

Then these competency units are further analysed and the pertaining work activities are identified. The work activities are elements that ensure a particular competency is competently carried out that has a definite starting point such as preparation or interpretation of the competency to be carried out, the execution of the competency, the assessment of the competency outcomes and finally the reporting of the competency outcomes to superiors whose feedback will allow for improvement .

The enabling requirements such as the underpinning knowledge and related skills to carry out the competency must be explored as this is the most integral element of the standards. As guidance for the process of training a candidate and assessing their competency, the range and context of the training and assessment is identified. This is important to ensure that candidates receive training that is sufficient including being equipped with the required Tools, Equipment and Material (TEM). Assessment criteria such as the frequency and mode of assessment is also another important aspect to ensure that the candidate will be properly assessed before being deemed competent for the job.

Legislative and regulatory requirements that must be adhered to by personnel in the industry must be acknowledged in the standards. Employability skills are defined for the competency, as it is important to ensure that not only technical skills are taught but employability skills are also inculcated, therefore it is critical to be embedded in the standards. This will also provide to be value added to the candidate to gain and maintain employability in the labour market that is becoming increasingly competitive due to demands of employers for skilled personnel.

The Occupational Competency Standards finally will be validated with the industry, industry body and governing bodies. An important recommendation would be to ensure continuous improvement of the Occupational Competency Standards based on feedback from the industry in the spirit of developing a flexible and responsive Occupational Competency Standards to the industry needs.

Depending on public input, if the Occupational Competency Standards should be reviewed, then the industry body should be referred to in terms of the content to be reviewed that will start with reviewing the occupational areas and subsequently all pertaining content. Finally the updated Occupational Competency Standards will be published for usage and review.

The proposed development methodologies for Occupational Framework and Occupational Competency Standards is generic and not dependent on the governing system of TVET in a particular economy because it focuses on the need for establishing an industry body as the main reference for industry requirements and establishing the role of the governing body regarding quality and endorsement policies to ensure the development process is in check.

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                              ┌─────────┐
                              │  Start  │
                              └────┬────┘
                                   │
                                   ▼
                     ┌──────────────────────────┐
                     │ Establish development     │
                     │ team (governing bodies,   │
                     │ industry body and         │
                     │ development consultant)   │
                     └──────────────┬────────────┘
                                    │
                                    ▼
                     ┌──────────────────────────┐
                     │ Confirm the industry to   │
                     │ be analysed (Consult      │
                     │ industry body)            │
                     └──────────────┬────────────┘
                                    │
                                    ▼
                     ┌──────────────────────────┐
                     │ Conduct brief literature  │
                     │ review on industry sector │
                     └──────────────┬────────────┘
                                    │
                                    ▼
                     ┌──────────────────────────┐
                     │ Engage and consult        │◄──────────────┐
                     │ stakeholder in the sub-   │               │
                     │ sectors/areas/trades      │               │
                     │ relevant to industry      │               │
                     └──────────────┬────────────┘               │
                                    │                            │
                                    ▼                            │
                     ┌──────────────────────────┐               │
                     │ Identify competency areas │               │
                     │ and relevant skill levels │               │
                     └──────────────┬────────────┘               │
                                    │                            │
                                    ▼                            │
                     ┌──────────────────────────┐               │
                     │ Identify relevant         │               │
                     │ qualifications, legislation│              │
                     │ and pre-requisites        │               │
                     └──────────────┬────────────┘               │
                                    │                            │
                                    ▼                            │
                 ┌──────────────────────────────────┐           │
                 │ Obtain statistical and qualitative│           │
                 │ data pertaining to manpower       │           │
                 │ requirements and impacts to       │           │
                 │ training and assessment curriculum│           │
                 └───────────────┬──────────────────┘            │
                                 │                               │
                                 ▼                               │
                     ┌──────────────────────────┐               │
                     │ Formulate Occupational    │               │
                     │ Descriptions             │                │
                     └──────────────┬────────────┘               │
                                    │                            │
                                    ▼                            │
                 ┌──────────────────────────────┐               │
                 │ Validate with industry body   │               │
                 │ and governing body            │               │
                 └───────────────┬──────────────┘                │
                                 │                        Yes    │
                                 ▼                               │
                 ┌──────────────────────────────┐         ◇      │
                 │ Publish endorsed Occupational │────►  Requires │
                 │ Framework for public review   │       update of │
                 │ and usage                     │       content ?│
                 └───────────────┬──────────────┘         ◇      │
                                 │                           No
                                 ▼
                 ┌──────────────────────────────┐
                 │ Publish updated Occupational  │◄───────────────
                 │ Framework for public review   │
                 │ and usage                     │
                 └───────────────┬──────────────┘
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                              ┌─────────┐
                              │   End   │
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Figure 5.4: Standard Methodology for Occupational Framework Development

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                              │  Start  │
                              └────┬────┘
                                   ▼
                    ┌──────────────────────────────┐
                    │  Establish development team   │
                    │  (governing bodies, industry  │
                    │  body and development         │
                    │  consultant)                  │
                    └──────────────┬────────────────┘
                                   ▼
                    ┌──────────────────────────────┐
                    │  Confirm Occupational         │◄──────────┐
                    │  Competency Standards to be   │           │
                    │  developed (Consult industry  │           │
                    │  body)                        │           │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Analyse the occupational area│            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Identify both core and elective           │
                    │  competencies                 │            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Analyse and break down       │            │
                    │  competencies into measurable │            │
                    │  units/activities             │            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Identify performance criteria for         │
                    │  each unit/activity           │            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Identify enabling requirements            │
                    │  (i.e. Knowledge, Skills) for the          │
                    │  units/activities             │            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Specify range and context for│            │
                    │  training and assessment      │            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Specify legislative requirements          │
                    │  and employability skills     │            │
                    └──────────────┬────────────────┘           │
                                   ▼                            │
                    ┌──────────────────────────────┐            │
                    │  Validate competency standards with        │
                    │  industry body, members of the industry    │
                    │  and governing body           │            │
                    └──────────────┬────────────────┘           │
                                   ▼                   Yes      │
                    ┌──────────────────────────┐    ◇─────────┘
                    │  Publish endorsed Occupational│  ◇ Requires
                    │  Competency Standards for    ├─►◇ update of
                    │  public review and usage     │  ◇ content?
                    └──────────────┬───────────────┘  ◇  No
                                   ▼                      │
                    ┌──────────────────────────────┐     │
                    │  Publish updatedOccupational  │◄────┘
                    │  Competency Standards for      │
                    │  public review and usage      │
                    └──────────────┬────────────────┘
                                   ▼
                              ┌─────────┐
                              │   End   │
                              └─────────┘
```

Figure 5.5: Standard Methodology forOccupational Competency Standards Development

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5.4 Promoting the Standard Development Methodology

Based on the findings obtained from the benchmarking visits and situational analysis as elaborated in section 4.6 of this report, the research team has synthesised a proposed standard methodology for Occupational Framework and Occupational Competency Standards development. Based on the situational analysis done on these four economies, development of the Occupational Framework and Occupational Competency standards require an established platform of communication and administration between the government, industry, development personnel and training providers.

This requires the government to set in place mechanisms that are tailored to the economy's governance and administration that will provide a clearer platform for funding and industry participation. With a strong and established relationship between the government, industry and training provider, the public will be more confident in participating in TVET.

However, the promotion of the methodology and effective implementation must be supported by enablers both internal and external. The internal enablers refer to the areas that can be controlled directly by the personnel involved in development, where as the external enablers mostly depend on larger areas of authority and autonomy namely at a national level. The internal enablers have been elaborated in detail throughout this report whereas the external enablers were identified during situational analysis.

5.4.1   Internal Enablers

i)   Occupational Framework and Occupational Competency Standards Development

These enablers allow for the development to be relevant and responsive to industry needs. This in turn will promote the development activities being done by increasing ownership to the industry.

- Ensure that all development and input is Industry Driven and current.
- Ensure that the long term planning for a particular industry is followed and accommodates change management.
- Facilitate continuous improvement based on public opinion through mediums such as the internet or road show forums.

ii)   Industry Acceptance

The enablers listed below will allow for industry acceptance through smart partnerships such as the establishment of an industry body or in evaluation committees. Through collaborations with the industry, the promotional efforts will increase triple fold as industry members will be able to relate with these industry bodies and vice versa.

- Establish an industry body that complies in terms of management with a structured implementation, has a relation with industry members with the focus of developing the industry, has qualified standards documentation development personnel and has the authority/influence on industry members.
- Industry bodies should ensure all sectors in the industry are represented and are members of the industry body.
- Increase the responsibility to the industry body not only on development of the Occupational Framework and Occupational Competency Standards but holistically advise the industry bodies to assist the industry members in terms of training, up skilling and fulfilling requirements for licensing (where applicable).
- Ensure that the industry and public are well informed of the advantages and accessibility to TVET.
- Establish support from governing bodies in terms of financial incentives and policies.

iii) Project Management and Control

This enabler highlights on the role of project development governance in ensuring that development is carried out according to procedures and policies.

- Establish a rigorous and high quality approval/endorsement process that must provide an equal say from the industry.
- Monetary incentives and funds provided for development is essential where a structured disbursement of funds must be established.

iv) Training & Assessment

These enablers encompass the needs of training providers and potential trainees, by meeting these needs, the usage of the framework and competency standards will be increased.

- The implementation of the Curriculum Standard where specific elements of training are specified in the Standards document and do not allow room for multiple misinterpretations of the standards into training material.
- The packaging of Competency Units according to specific industry needs adds value to training.
- Ongoing communication with training providers to impart information of development outcomes and gaining feedback on impacts of the development towards training & assessment will ensure continuous improvement hence continued development and usage of competency standards.

5.4.2 External Enablers

Throughout the project research, certain elements that are important to enable the promotion of the standard methodology were identified. One of the major issues is to convince the public and overcome the so-called stigma of TVET. The following enablers are defined according to the findings of the Situational Analysis:

i)   Political/Legislation

These enablers highlight the need for nationwide consultation and legislation that will facilitate in defining the implementation of TVET and occupational standards development in the nation's acts and policies.

- Establish nationwide acceptance of occupational standards' role in worker mobility and employability
- Define implementation of TVET and Occupational Standards role in the education and training framework through legislation

One of the observations is that the development of the Occupational Competency Standards is also influenced by the demographics of a certain economy. This is because industry acceptance of occupational standards for a certain trade involves nationwide consultation and agreement. For economies that geographically span a wide distance, the process of consultation throughout the nation will require for the development to implement several mechanisms such as road shows, on line forums, nationwide forums and the like to reach out to practitioners. Interprovincial/states consensus of the standards pertaining to state/province specific occupational licensing is also important to ensure the qualifications provide worker employability.

One of the key initiatives that can kick start the development of Occupational Frameworks or Occupational Competency Standards in economies is the enactment of acts and any legislation pertaining to TVET that enforces the use of the occupational standards as a reference for training or occupational recognition.

ii)   Economical

These enablers highlight the need for financial incentives to support the cost of TVET development and training.

- Provide funds to employees and potential trainees to undergo training
- Promote financial incentives for employers and employees to participate in TVET development and training

The provision of financial incentives is required to increase 'buy in' from the industry and is a key strategy that must be looked into immediately by each economy. Financial constraints are one of the main hurdles in TVET development and training. Some economies have overcome this by providing subsidies, funding, grants and tax incentives to employers, employees, training providers and trainees.

iii)   Social

These enablers highlight the need for promoting the advantages of TVET and its qualifications by putting forward success stories and rebranding of TVET.

- Promote success stories of Occupational Competency Standards usage where it has been recognised as a basis for education and training that allows candidates to be absorbed in the working place and industry.
- Promote rebranding of TVET and its role in increasing employability through skills training.

Based on the analysis done in Malaysia and benchmark economies, a summary of the results show that there was an overlap of improving the promotion efforts of TVET. The overlapping areas are promoting advantages of the TVET training and qualifications, involvement of the industry in the development of TVET curriculum and usage of competency standards by the industry to enhance performance of workers. The causes of this issue is that the public are still reluctant to accept that TVET or skills training is at par with academic education and the industry still has not utilised the competency standards to its full potential. The sub set of these areas of improvement lies in the responsibility of all TVET stakeholders in conducting promotional activities on the TVET system and its advantages.

Currently most economies have managed to overcome the old stigma of vocational education and training as an alternative to acquire qualifications and education. This has been done by the renaming and rebranding of TVET to reflect the need of skills training for employability. All the four economies have used the model of having pilot projects to show that TVET is a feasible form of education and training that allows candidates to be absorbed in the working place and industry.

Another approach is by putting forward a 'success story' or good model example that highlights the success stemming from industry involvement in TVET throughout the development of competency standards to training of the students either via apprenticeship or full time training and finally to the employment of TVET graduates.

iv)   Technological

This enabler highlights the need for usage of technological advancements in promoting TVET in general and for disseminating information regarding Occupational Frameworks and Occupational Competency Standards that have been developed or are in the process of development.

- The use of technological tools such as the internet, provide a more widespread communication with industry and TVET stakeholders

The use of technological tools such as the internet, provide a more widespread communication with industry and TVET stakeholders thus allowing them to access information regarding TVET and also to provide input for continuous improvement. The internet also acts as a powerful tool to engage with the industry and public through social mediums such as forums, portals and social websites as platforms of communication.

Training and assessment using technological advancements such as distance learning and online assessment that may include digitally compiled portfolios of competency evidence will further attract potential trainees of this high technology era where communications and IT are an integral part of their lives.

As shown in Figure 5.6 below the external enablers for promoting the standard development methodology for Occupational Framework and Occupational Competency Standards development consists of four main elements regarding legislation, economical, social and technological.

Political/Legislation	**Economical**	**Social**	**Technological**
•Establish nationwide acceptance of occupational standards' role in employability. •Define implementation of TVET and Occupational Standards role through legislation.	•Provide funds to employees and potential trainees. To undergo training •Promote financial incentives for employers and employees to participate in TVET development and training.	•Promote success stories of TVET candidates absorbed in the working place. •Promote rebranding of TVET and its role in increasing employability through skills training.	•The use of technological tools such as the internet, can provide a more widespread communication with industry and TVET stakeholders

Figure 5.6: External Enablers to Enable the Promotion of the Standard Methodology

5.5 Recommendation

Phase 2 (Two) of this project aims to disseminate the findings of the research and be of assistance to economies that currently do not have an established Occupational Framework and Occupational Competency Standards development process in place. This may also include APEC in providing technical assistance to interested economies in establishing Occupational Framework and Occupational Competency Standardsdevelopment in their respective economy.

Continuation from Phase 1 (where research on methodology development has been done), is Phase 2, which is proposed as follows:

    i.   To conduct a workshop to deliver the concept of Occupational Framework and Occupational Competency Standards development to fellow economies

    ii.   Representatives from each economy that participated in benchmarking visits are invited to share their experience

The proposed development methodology shown in Figure 5.4 and Figure 5.5 is a generic approach in ensuring that the development of the Occupational Framework and Occupational Competency Standards apply the best practices identified in this research. It is generic so that it can be applied by economies with various Occupational Framework and Occupational Competency Standards development processes.

5.6 Conclusion

The quality of a TVET system is largely determined by the industry partners; as they are the key drivers of the system who work in collaboration with the stakeholders of the economy's TVET system. While increasing access to the TVET system it is important to remember that there is a crucial need for standardised training. This can be accomplished by ensuring that TVET curriculum development is standardised and is relevant to industrial needs.

The utilisation of the Occupational Framework (OA in Malaysia) to analyse a particular industry in any economy is important in gauging manpower requirements and industry demands. The Occupational Competency Standards (NOSS in Malaysia) is also a powerful tool that bridges between the industry requirements of a competent worker and training & assessment of potential candidates to become workers in that particular industry. The Occupational Competency Standards clearly is the tool to further enhance the quality and relevance of TVET for industry needs.

With this in mind, it is imperative that the development of the Occupational Competency Standards be conducted according to best practices as employed by economies with an established system in place. The key element is check and balance with the industry through various mechanisms as elaborated in this report. The standard development methodology proposed in this report is aspired to enhance current development methodologies, the most important aspect is in getting the industry to be more actively involved at the onset of the development process. Another major enhancement is the element of continuous improvement based on feedback acquired from the public using the internet as a form of communication.

To promote the use of the development methodologies, certain elements must be in place; nationwide consultation and enactment of acts to further strengthen the mechanisms of development, provision of funds to stakeholders involved in development and implementation of training, rebranding of TVET to highlight its advantages in increasing employability and worker mobility and finally, an integrated communications platform linking the governing bodies, development personnel, industry members, training providers and public with keen interest in the development of industry skills.

Currently efforts are being done on developing a regional Qualifications Framework in Asia as is implemented in Europe via the European Qualifications Framework (EQF). With the advent of a regional qualifications framework, the TVET curriculum and TVET system must be in place. By adopting TVET in this manner, training can be coordinated so that all trainees receive the same training, making all trainees more marketable to employers no matter where they are within the economy or region. Uniform standards also help economies to adapt their systems to match global standards more closely, making the economy and its workforce more globally competitive.

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ANNEX 1: LIST OF WORKING GROUP MEMBERS

Working Group for First (1ˢᵗ) Discussion Group : Port Dickson, Negeri Sembilan, Malaysia

NAME	DESIGNATION/ AGENCY / COMPANY
Mr. Ibrahim Ahmad	Principal Asst. Director, PMO Division Department of Skills Development
Mr. Razalee Che Ros	DESCUM Facilitator, Senior Officer, NOSS Division, Department of Skills Development (DSD)
Lt. Kol. Hj. Md. Zamani bin Othman	Head of Skills Training Cell Unit, Institut Pengurusan Tentera Darat (IPDA)
Mr. Manjit Singh	Managing Director/TVET Consultant, Dovemaps Sdn. Bhd.
Dr. John Bosco	Managing Director/TVET Consultant
Puan Noraizah Mohamad	Manager, Multimedia Development Corporation (MDEC)
Mr. Mohd. Shukri Ali	DSD External Examiner (*Pegawai Pengesah Luaran*)
Dr. Amiron Bin Ismail	Chairman/TVET Trainer/DESCUM Facilitator/TVET Consultant Professional & Technical Academy Sdn. Bhd.
Observed by: Puan Shahlisa Cheah Shihabudin Principal Asst. Director, Research, Planning and Development Division Department of Skills Development	

Working Group for Second (2nd) Discussion Group: Melaka, Malaysia

NAME	DESIGNATION/ AGENCY / COMPANY
Mr. Ibrahim Ahmad	Principal Asst. Director, PMO Division Department of Skills Development
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Dr. John Bosco	Managing Director/TVET Consultant
Mr. Mallow Butha	CEO, DESCUM Facilitator, MRZ Training Centre
En. Faisal Abd Rahman	Managing Director/TVET Trainer/DESCUM Facilitator Empire Putra Sdn. Bhd. Panel member JTPS/JPPK
Ms. Christine Tearne (Nelson)	International TVET Consultant, Australia
Dr. Amiron Bin Ismail	Chairman/TVET Trainer/DESCUM Facilitator/TVET Consultant Professional & Technical Academy Sdn. Bhd.

ANNEX 2: MIND MAPPING RESULTS

BEST PRACTICES ON DEVELOPING OA & NOSS

1. Implementation

1.1 OA & NOSS development
- 1.1.1 Subject Matter Experts
- 1.1.2 Document Validation
- 1.1.3 OA & NOSS Documentation/Guidelines
- 1.1.4 Facilitation
- 1.1.5 Monitoring

1.2 Training Centres
- 1.2.1 Translating CoCU
- 1.2.2 Training Delivery
- 1.2.3 Implementation of Assessment → Quality Assurance (QA)
  - PPL Licensing
  - Instructors Licensing
  - PPB Licensing (VTM)
- 1.2.4 Portfolio Development
  - Enhancing training portfolio
  - Migration from old NOSS to new NOSS format

1.3 Licensing
- 1.3.1 Trade Licensing (ST, CIDB)
- 1.3.2 Facilitators Licensing

1.4 Certification
- 1.4.1 Recognition
- 1.4.2 Professional Institute

2. Legislation

2.1 Acts related to Education & Training
- 2.1.1 Policy Matters
  - guidelines
  - procedures
  - Procurement
- 2.1.2 Enforcement
  - Awareness of the governing acts
- 2.1.3 Relevant Acts
  - NASDA 652
  - MQA 685

2.2 Acts related to Industry
- CIDB
- OSHA
- ST
- SEDA

2.3 International policies, rules & regulations
- International Cyber Acts
- IMO

3. Procurement

3.1 Procurement process
- 3.1.1 Lengthy
- 3.1.2 Beaucratic

3.2 Interpretation of contract by relevant parties

3.3 Duplication of Job Titles
- 3.3.1 Job titles with existing NOSS
- 3.3.2 Inter sector duplication

3.4 Costing of NOSS
- 3.4.1 Facilitators
- 3.4.2 Panel Fees
- 3.4.3 Logistics
- 3.4.4 Documentation
- 3.4.5 Presentation
- 3.4.6 Other Engagement
- 3.4.7 Project Management

3.5 Contractors
- 3.5.1 Roles
- 3.5.2 Responsibility & Accountability
- 3.5.3 Feedback (Short Coming)
- 3.5.4 Selection process
  - Consultation
  - Request For Proposal (RFP)
  - Request For Tender (RFT)
- 3.5.5 Financial capabilities

4. Development of Methodology

4.1 OA
- 4.1.1 Literature Study
- 4.1.2 Continuity from OA & NOSS
- 4.1.3 Sector/Area Segregation
- 4.1.4 Occupational Area Analysis (OAA)
- 4.1.5 Levelling

4.2 NOSS
- 4.2.1 Literature Study
- 4.2.2 Identify Job Area
- 4.2.3 Occupational Area Analysis
- 4.2.4 Selection of Subject Matter Experts
- 4.2.5 Analysis & Development Workshop Session
- 4.2.6 Validation & Approval

5. Industry Acceptance
- 5.1 Employability
- 5.2 NOSS Content
- 5.3 International Policies & Standards
- 5.4 Industrial Standards
- 5.5 Revision of NOSS
  - 5.5.1 Policies of Revision

6. APEC Economies
- 6.1 Comparative Analysis
- 6.2 Field Study Visit to selected APEC Countries (Canada, Singapore & Australia)
- 6.3 Field Study Visit to other APEC countries (Optional, Thailand, Philippines, Vietnam)

ANNEX 3: LIST OF FOCUS GROUP DISCUSSION PARTICIPANTS

ASIA-PACIFIC ECONOMIC COOPERATION (APEC)

APEC NEW STRATEGY ON STRUCTURAL REFORMS (ANSSR) PROJECT

"Enhancing the Quality and Relevance of Technical and Vocational Education and Training (TVET) for Current and Future Industry Needs – Phase 1"

FOCUS WORKING GROUP (FWG) WORKSHOP

ON

ISSUES AND CHALLENGES IN DEVELOPMENT & IMPLEMENTATION OF TVET IN MALAYSIA

DATE: 11th June 2013

VENUE: De Palma Hotel, Ampang

**LIST OF PANEL FOR FOCUS WORKING GROUP (FWG) WORKSHOP ON
ISSUES AND CHALLENGES IN DEVELOPMENT & IMPLEMENTATION OF TVET IN MALAYSIA**

It must be highlighted that the members of this working group were approved by the DSD prior to the workshop to ensure their expertise and relevance to the project.

Below are the representatives of DSD that were present at the workshop as Project Overseer and Observer:

1. Puan Hajah Norizan Binti Shahbaki

2. Puan Shahlisa Cheah Binti Shihabudin

3. Puan Norisniwati Binti Ab Rahim

GROUP 1:
OCCUPATIONAL ANALYSIS (OA) & NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) DEVELOPMENT METHODOLOGY

FACILITATOR/CO FACILITATOR:

NAME	DESIGNATION/ AGENCY / COMPANY
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6.	En. Yamin Abd Wahab	DESCUM Facilitator Arena Watan Sdn. Bhd.
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GROUP 2:

PROJECT MONITORING & CONTROL OF OCCUPATIONAL ANALYSIS (OA) & NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) DEVELOPMENT

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Cik Noorasikin Binti Othman	TVET Trainer/DESCUM Facilitator, Professional & Technical Academy Sdn. Bhd

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7	En. Yusof Bin Sarnawi	Director, Sinar Exotika Sdn. Bhd.
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GROUP 3 :

APPLICATION OF NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS)

FACILITATOR :

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Panel :

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5	En. Faizal Aboob Bin Hareez	Trainer, TNB Integrated Learning Solution Sdn. Bhd. (ILSAS)
6	Mejar Mohamad Bin Mahmood	Perbadanan Hal Ehwal Bekas Angkatan Tentera (PERHEBAT)
7	En. Yusri Bin Yaakub	Academic and Training Manager, Akademi Pelancongan Melaka (APM)
8	En. Mohd Yusof Bin M. Aji	Chief Executive Officer Noble School of Engineering
9	En. Marwazi Bin Abu Bakar	Senior Manager, Noble School of Engineering

GROUP 4 :

INDUSTRIAL ACCEPTANCE OF SKILLS QUALIFICATION

FACILITATOR :

NAME	DESIGNATION/ AGENCY / COMPANY
En. Faisal Abd Rahman	Managing Director/TVET Trainer/DESCUM Facilitator Empire Putra Sdn. Bhd. Panel member JTPS/JPPK
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Panel :

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5	En. Fadzly Bin Zulfadzly	Head of Training Unit, Perbadanan Filem Nasional (FINAS)
6	En. Mohtee Bin Kimi	Principal, STI College
7	En. Mohammad Farid Bin Samsudin	Managing Director/TVET Trainer/DESCUM Facilitator Millennium Impress Sdn. Bhd.
8	En. Shukri bin Ali	Senior Manager/PPL, Exponential Consulting Sdn Bhd

ANNEX 4: CHECKLIST OF FOCUS GROUP DISCUSSION QUESTIONS

FOCUS GROUP DISCUSSION CHECKLIST

NUM	ITEM	RESPONSE
1.	**OCCUPATIONAL ANALYSIS (OA) & NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) DEVELOPMENT**	
1.1	**Occupational Analysis (OA) Development**	
1.1.1	**Pre-development stage of OA**	
	(i) Identifying Occupational Sector of an industry	
	(ii) Supply and demand analysis	
	(iii) industrial awareness	
	(iv) Literature review / study	
	(v) Identifying & selecting development panel	
1.1.2	**Occupational Analysis**	
	(i) Identifying job title	
	(ii) Identifying job description	
	(iii) Validation of occupational structure	
1.1.3	**Occupational Area Analysis (OAA)**	
	(i) OAA Development Methodology	
	(ii) Identifying Occupational Area	
1.1.4	**Validation & referencing session**	
	(i) Industrial and regulatory body requirements compliance	
	(ii) NOSS Document Development requirements	
1.2	**National Occupational Skills Standard (NOSS) Development**	
1.2.1	**NOSS development methodology**	
	(i) NOSS Development Methodology	

1.2.2	**Job analysis & competencies analysis**	
	(i) Review on clustering of job area	
	(ii) Analysis on identifying core competencies and elective competency	
1.2.3	**Competency profile analysis (CPA)**	
	(i) Identifying CU / the major function, activities or skills group for the job	
	(ii) Identifying the Performance Criteria / Competency Standard	
	(iii) Writing the CU descriptor	
	(iv) Identifying assessment criteria.	
1.2.4	**Standard Practice (SP) development**	
	(i) Developing SP	
1.2.5	**COCU development**	
	(i) Listing of related knowledge	
	(ii) Determining Related Skills	
	(iii) Determining Attitude/Safety	
	(iv) Identifying Assessment Criteria	
	(v) Listing Tools, Equipment and Materials	
	(vi) Listing of References	
1.2.6	**Proofreading& validation session**	
	(i) Industrial and regulatory body requirements compliance	

NO.	ITEM	RESPONSE
2.	**PROJECT MONITORING & CONTROL**	
2.1	Procurement process	
2.2	Interpretation of contract by relevant parties	
2.3	Duplication of job titles	
2.4	Costing of NOSS Development	
2.5	Contractors	
2.6	Monitoring by JPK	
3.	**APPLICATION OF NOSS**	
3.1	Application of new NOSS format and contents in Accredited Centre (AC)	
3.2	Implementation of CoCU	
3.3	Training assessment methodology	
3.4	Work & Skills Standard	
3.5	Policy and regulation compliance on application of NOSS	
4.	**INDUSTRY ACCEPTANCE OF NOSS AND MALAYSIAN SKILLS CERTIFICATION**	
4.1	Alignment of industrial requirements with NOSS document	
4.2	Awareness of NOSS in industry	
4.3	Licensing, rating and certification	

ANNEX 5   : SAMPLE OF SURVEY

ASIA-PACIFIC ECONOMIC COOPERATION SURVEY

Project No.: S EC 08 12A

ANSSR: Enhancing the Quality and Relevance of Technical and Vocational Education and Training (TVET) for Current and Future Industry Needs-Phase 1

This survey is designed to learn about the methodology and best practices applied by APEC members' in Technical and Vocational Education and Training (TVET). This project is aimed at assisting Malaysia and other economies to implement one of the priorities of the ANSSR Action Plan which is related to "Upgrading Skills and Capabilities of Existing Workforce to Address the Needs of Industries". [30] One of the major issues to be addressed is in **Enhancing the Quality and Relevance of TVET for Current and Future Industry Needs** which is the main objective of the project. This issue is analysed at earlier stages of TVET implementation which is at the TVET curriculum development stage namely during Occupational Analysis and Occupational Standards development. [1]

Various terms have been used to describe elements that are now conceived as comprising TVET. These include: Apprenticeship Training, Vocational Education, Technical Education, Technical-Vocational Education (TVE), Occupational Education (OE), Vocational Education and Training (VET), Career and Technical Education (CTE), Workforce Education (WE), Workplace Education (WE) etc. Several of these terms are commonly used in specific geographic areas.[2]

In order to align student outcomes with industry requirements, there is a need to standardise curriculum design in TVET. Therefore, this study aims to address the design process of TVET curriculum that will be crucial in ensuring the relevance of TVET to the industry.

The consultant/author, Professional & Technical Academy under the monitoring of Malaysia's Department of Skills Development and APEC secretariat, has been appointed to conduct this study. The results of this survey will be analysed together with the benchmarking visit findings to produce a comparative analysis. There will be further communication with survey respondents in order to verify our findings.

The completed questionnaire should be emailed to:

evarina@pritecacademy.edu.my

pritec_academy@yahoo.com

Postal address if required:

Professional & Technical Academy

No. 1, Jalan PM 15, Plaza Mahkota,

Banda Hilir, Melaka, 75000, Malaysia.

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[1]Enhancing Quality and Relevance of TVET for Current and Future Industry Needs

Economy:_____

Name of Contact:_（Mr./Ms/Miss）_____

Position: _____

Affiliation:

Email:

Tel:

Fax:

This survey comprises of 5 sections, 43 semi structured questions and 14 pages including the front page. Please add pages if necessary.

SECTION 1. TVET IMPLEMENTATION

These initial questions request members to provide an overview of TVET implementation in your respective economy. There are 12 questions in this section.

Q1a. Which governing body/authority/agencies/organisations are responsible and involved for the implementation of TVET in your economy? Please include a brief explanation of their roles.

Q1b. Please describe your economy's Education System in general, at which level is TVET accessible? (e.g.: secondary, post-secondary)

Q1c. Please describe the Qualifications Framework in your economy?

Q1d. How is TVET implemented in workforce training? (E.g. Adult Learning/Recognition of Prior Learning/ Continuous Education Training)

Q1e. Are there possible pathways of continuing education between the TVET qualifications in the education system and qualifications obtained in workforce training?

Q1f. Which acts or legislation in your economy are relevant to TVET and have impact on the implementation of TVET? Please state the act that stipulate the coordinating body for TVET?

Q1g. How has TVET evolved since its initial introduction in your economy? Please list any countries that have been benchmarked for their TVET implementation. (If applicable)

Q1h. What is the funding provided for those pursuing TVET qualifications in your economy? Which authority provides the funding and what are the payback terms?

Q1i. How are TVET trainers assessed and trained in TVET curriculum development at the education/training institution level   in your economy?

Q1j. How is TVET curriculum defined in your economy? What are the components?

Q1k. Is TVET curriculum standardised in your economy? If so, which authority is responsible for the TVET curriculum development?

Q1l.Please state any reference or URL suitable that elaborates the topics discussed in this section.

SECTION 2. OCCUPATIONAL ANALYSIS DEVELOPMENT

These initial questions request members to provide an overview of occupational standards/competencies development in your respective economy. There are 9 questions in this section.

Q2a. Is an Occupational Analysis conducted on the industries in your economy when planning for the overall competency/standards framework for that particular industry?

Q2b. Is the Occupational Analysis for an industry done explicitly or implicitly in a labour market analysis/manpower planning? If so, please include or state sources of an example Occupational Analysis in your economy.

Q2c. Which parties are responsible for conducting the Occupational Analysis? How are they selected?

Q2d. Are there any special qualifications or requirements of those that will conduct the Occupational Analysis? How are these qualifications acquired by the developers?

Q2e. How long is the duration taken to conduct an Occupational Analysis?

Q2f. What are the mechanisms to ensure that the Occupational Analysis is reliable and is according to industry requirements? How are the industry /sectors identified?

Q2g. What are the processes, components and contents involved in an Occupational Analysis?

Q2h. How is the Occupational Analysis applied or used as reference prior/during Occupational Standards/Competencies development?

Q2i. What other forms of application of the OA is used with reference to?

SECTION 3. OCCUPATIONAL STANDARDS/COMPETENCIES DEVELOPMENT

These initial questions request members to provide an overview of occupational standards/competencies development in your respective economy. There are 13 questions in this section.

Q3a. What are the Occupational Standards/Competencies named in your economy?

Q3b. Are Occupational Standards/Competencies considered part of the TVET curriculum? If so, how are the Occupational Standards/Competencies used as reference during TVET curriculum development.

Q3c. Does your economy have Occupational Standards/Competencies that are linked to academic qualifications?

Q3d. Does your economy have Occupational Standards/Competencies that are mapped to industry competencies/professional certification/licenses? What mechanism or methodology was applied when conducting the mapping?

Q3e. When the occupational standards/competencies are periodically revised? What mechanism/procedure can trigger the revision?

Q3f. What is the time frame that new Occupational Standards/Competencies is developed and what are the procedures involved in developing the National Occupational Standard

Q3g. Which parties are responsible for conducting the Occupational Standards/Competencies development? How are they selected?

Q3h. Are there any special qualifications or requirements of those that will conduct the Occupational Standards/Competencies development? How are these qualifications acquired by the developers?

Q3i. What are the mechanisms to ensure that the Occupational Standards/Competencies are reliable and according to industry requirements?

Q3j. Are there any specific processes or methodologies applied when conducting the Occupational Standards/Competencies? Please kindly elaborate

Q3l. Have the development/processes evolved throughout the years since its introduction? Please elaborate or include references available.

Q3m. Are the Occupational Standards/Competencies development guidelines available in a document or website? If so please provide the URL or attachment.

Q3n. How do the Occupational Standards/Competencies cater to the needs of the industry/employers in terms of responsiveness and flexibility? Are there funds available, if so please state the source of funds.

SECTION 4. INDUSTRY ACCEPTANCE OF STANDARDS

These initial questions request members to provide an overview of industry acceptance of standards in their respective economy. There are 5 questions in this section.

Q4a. Are TVET qualifications -?

	Column 1 : Please answer with the following options (all/some/none/never)	Column 2 : Please state the sector/trade of the recognized qualification, if applicable

Recognised by academic educational institutes for transfer/enrollment		
Recognised by employers		
Necessary qualification to secure employment		

Q4b. Do the following parties lead/participate the development of TVET standards and assessments?

	Column 1 : Please answer with the following options (Major Role/Ordinary Participation/Minor Role/No Role)	Column 2 : Please state the lead/participating sector/trade if applicable
Public agency		
Private businesses, industries or organisations		

Labor or trade unions		
Professional organisations or associations		

Q4c. What is the industry's role in the development of TVET standards and assessments? (e.g.: development panel, subject matter experts, evaluation panel, advisory committee)

Q4d.What is the mechanism applied so that industry players support the development and usage of standards?

Q4e. How is the industry implementing the standards developed? Please give an example of the implementation if applicable.

SECTION 5. PROBLEMS AND COUNTERMEASURES

These initial questions request members to provide insight on problems and countermeasures faced in TVET curriculum development in your respective economy. There are 6 questions in this section.

Q5a. What is the major government and industry based programs, if any, to support TVET development in your economy in the last 5 years?

Q5b. What are the challenges or difficulties facing your economy in TVET?

No	Items	Please mark (√) for the factors existing in your economy	Please list all the challenging items in sequence (from the most challenging to the less challenging, i.e. 1 – most challenging to 9 – least challenging)
1	Traditional mindset and discrimination held by society towards TVET		
2	Lack of strong govt. support or policy backup		
3	Funding difficulties		
4	Shortage of qualified teachers and trainers		
5	Difficulties for the TVET graduates to get employed		
6	Curricula do not match industry needs, reform direly needed		
7	Lack of Occupational Standards/Competencies relevance to their business		
8	Lack understanding of the Occupational Standards/Competencies and how they are used		
9	Lack of accessible tools to apply the Occupational Standards/Competencies		

Q5c. How does the Occupational Standards/Competencies development ensure that it will be competent, flexible to drive the growth of a productive globally competitive and sustainable economy? What are the strategies involved?

Q5d.What role does the government play and what type of funding is provided in developing the Occupational Standards/Competencies to meet the standards and requirements of the industry.

Q5e. What are the measures/initiatives your economy is going to take to meet the above-mentioned challenges or difficulties?

Thank you for your time.

Should you have any questions or inquires concerning completing this survey,

please contact:

Evarina Amiron: evarina@pritecacademy.edu.my

or

pritec_academy@yahoo.com

ANNEX 6: LIST OF ORGANISATIONS AND PERSONNEL VISITED DURING BENCHMARKING VISITS

ORGANISATIONS VISITED AT CANADA – 7.10.2013 till 10.10.2013		
Num	**Item**	**Contact Person**
1	**Employment and Social Development Canada (ESDC)**	**Mr. Tim Hunsley,** Sen. Advisor, International Relations **Mr. Andrew McQueen,** Manager, Economic Policy Directorate - Learning and Training **Mr. Liam Lynch,** Policy Analyst, Economic Policy Directorate - Learning and Training **Mr. John Young** Policy Analyst, Learning Systems and Outcomes Division **Mr. Trent Craddock,** Senior Research Advisor in the Trades and Apprenticeship Division (LMID) **Mr. René Maillet** Manager, Workplace Partnerships Directorate **Ms. Kelly Archer** Director, Workplace Partnerships Directorate
2	**Algonquin College**	**Ms. Jo-Ann Aubut** **Ms. Sandra Larwill** **Mr. Ernest Mulvey** **Ms. Christine Peachey**
3	**Association of Canadian Community Colleges**	**Mr. Paul Brennan** Vice President, International Partnerships **Mr. Rodolfo (Rudy) Sabas** Manager, Marketing and Development International Partnerships
4	**Canadian Council of Technicians and Technologies**	**Mr. Isidore J. LeBlond** Chief Executive Officer **Ms. Lorry Fortin,** Program Coordinator
5	**CMEC Secretariat**	**Mr. Andrew Parkin** Director General **Mr. Aamir Taiyeb,** Analyst **Natasha Sawh** Coordinator
6	**Ontario Ministry of Training, Colleges and Universities, and** **Ontario Qualification Framework**	**Mr. Louis Lizotte,** Lead Coordinator

		Ms. Vanine Yee, Senior Policy Advisor Programs Branch, Strategic Policyand Programs Division Ms. Rita Jaroka, Policy Advisor Private Career Colleges Branch, Postsecondary Education Division Ms. Seema Opal, Standards and Assessment Branch, Strategic Policy and Programs Division
7	**Humber Centre for Trades & Technology**	**Ms. Ann Dean** Dean, Program Development Planning & Development **Mr. Frank Franklin** International Advisor **Diane Simpson** Dean, International Centre **Ms. Denise Devlin-Li** Dean, School of Applied Technology **Mr. Bill Angelakos** Associate Dean, School of Applied Technology **Prof. Kerry Johnston,** Professor and Program Manager Sustainable Energy and Building technology **Mr. Michael Auchincloss** Program Coordinator, Electrical Engineering
8	**Ontario College of Trades**	**Mr. Royden Trainor** Director Policy and Programs Division **Mr. James Harvey** Stakeholder Relations Officer **Mr. Tristan Austin** Senior Communications Officer **Ms. Risa Abella** Program Coordinator
	Accompanying DSD Officers: 1.Puan Hjh Norizan Bt. Shahbaki 2. Puan Shahlisa Cheah Bt. Shihabudin	 Director of Planning, Research and Development Division Senior Assistant Director , Planning, Research and Development Division,

ORGANISATIONS VISITED AT AUSTRALIA – 16.9.2013 – 19.9.2013		
Num	**Item**	**Contact Person**
1	**Department of Industry (formerly known as Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE))**	**Dr. Melissa McEwen** General Manager **Mr. Nic Jonsson** Manager **Ms. Susan Devereux** General Manager **Dr. James Hart** General Manager **Ms. Sue Beitz** General Manager (AWPA) **Ms. Janice Anderson** Manager **Ms. Tracey Murphy** Manager **Ms. Carrie Roche** Assistant Manager **Mr. Michael Gray** Assistant Manager **Mr. Bill Luteria** Assistant Manager **Mr. Taliessin Reaburn** International Education Analyst (Austrade)
2	**Canberra Institute of Technology (CIT)** **Motor Traders Association, ACT (MTA ACT)**	**Mr. Steve McMahon**, Education Manager Automotive and Metals CIT Trade Skills **Mr. Michael Doyle** Manager, Business and Industry CIT Trade Skills **Mr. Richard Saberton**, Consultant to CIT **Ms. Christine McCauley** Executive Officer MTA ACT
3	**Construction and Property Services Industry Skills Council (CPSISC)**	**Mr. Alan Ross**, Chief Executive Officer **Mr. David Magee** Deputy CEO

			Mr. Nick Proud Director, Research and Policy
4	**Victorian Automobile Chamber of Commerce (VACC)**		**Ms. Jodie Price** **Ms. Nigel Muller** Manager, Auto Apprenticeships
5	**Kangan Institute, Automotive Centre of Excellence**		**Mr. Paul Beutel**, Business Development Manager **Mr. Adrian Lauder**, Manager, Automotive Department **Ms. Dee Richards** Business Development
6	**National Centre for Sustainability** **University of Swinburne**		**Ms. Beth Akister** Lecturer/Trainer **Mr. Trevor Plumridge,** Lecturer/Trainer
7	**Auto Skills Australia (ASA)**		**Mr. Geoff Gwilym,** Chief Executive Officer, ASA
8	**The Australian Industry Group (AIG)**		**Ms. Megan Lilly**, Director of Education and Training, Australian Industry Group
	Manufacturing Skills Australia (MSA)		**Mr. Bob Paton**, Chief Executive Officer, MSA
9	**National Skills Standards Council (NSSC)**		**Mr. Phil Clarke,** General Manager, Office of the NSSC **Mr. Luke Behncke,** Director, Office of the NSSC
10	**Sydney Institute – TAFE NSW**		**Ms. Katherine Woods**, International Business Unit **Ms. Laurie Price**, International Business Development Manager **Mr. Rick Duynhoven** Assistant Director Electro technology Sub-faculty
11	**Service Skills Australia (SSA)**		**Ms. Karen Banks** Training Package Quality and Policy Manager

	Accompanying DSD Officers:		Principal Assistant Director , Division of Planning, Research and Development,
	1. Puan Norisniwati Ab. Rahim		
	2. Puan Susana Ling Hie King		Senior Assistant Director, Division of Planning, Research and Development,

ORGANISATION VISITED AT SINGAPORE – 26th September 2013 till 27th September 2013		
Num	**Item**	**Contact Person**
1	**Workforce Development Agency**	**Mr Thomas Yeo** Assistant Director Quality Assurance Division **Mr. Derrick Low** Quality Assurance Division **Mr. Daryl Lim** Quality Assurance Division
2	**Ministry of Education**	**Mr. William Lim** Deputy Director Higher Education Division **Dr. Lim Boon Whatt** Assistant Director Higher Education Division **Mr. Isaac Lim** Senior Head, Policy Higher Education Division
	Accompanying DSD Officers : 1. Encik Abdul Halim Bin Hasan 2. Puan Safiza Binti Saleh,	 Principal Assistant Director, National Occupational Skills Standards (NOSS) Division Assistant Director , Plannning, Research and Development Division

Note: One of the respondents had wished to remain anonymous, therefore there were a total of 7 personnel that were interviewed

ANNEX 7: NATIONAL OCCUPATIONAL CLASSIFICATIONS (NOC) MATRIX

National Occupational Classification Matrix 2011

Skill type 0 - Management is presented across all skill types and is also in skill level A. Skill types 1 to 9 are presented in columns and skill levels A to D are presented in rows.

	1 Business, finance and administration occupations	2 Natural and applied sciences and related occupations	3 Health occupations	4 Occupations in education, law and social, community and government services	5 Occupations in art, culture, recreation and sport	6 Sales and service occupations	7 Trades, transport and equipment operators and related occupations	8 Natural resources, agriculture and related production occupations	9 Occupations in manufacturing and utilities
0 **Management occupations (Skill level A)**	**Major Group 00** Senior management occupations 001 Legislators and senior management								
	Major Group 01-05 Specialized middle management occupations					**Major Group 06** Middle management occupations in retail and wholesale trade and customer services	**Major Group 07-09** Middle management occupations in trades, transportation, production and utilities		
	011 Administrative services managers 012 Managers in financial and business services 013 Managers in communication (except broadcasting)	021 Managers in engineering, architecture, science and information systems	031 Managers in health care	041 Managers in public administration 042 Managers in education and social and community services 043 Managers in public protection services	051 Managers in art, culture, recreation and sport	060 Corporate sales managers 062 Retail and wholesale trade managers 063 Managers in food service and accommodation 065 Managers in customer and personal services, n.e.c.	071 Managers in construction and facility operation and maintenance 073 Managers in transportation	081 Managers in natural resources production and fishing 082 Managers in agriculture, horticulture and aquaculture	091 Managers in manufacturing and utilities
Skill level A **Occupations usually require university education.**			**Major Group 30** Professional occupations in nursing 301 Professional occupations in nursing	**Major Group 40** Professional occupations in education services 401 University professors and post-secondary assistants 402 College and other vocational instructors 403 Secondary and elementary school teachers and educational counsellors					
	Major Group 11 Professional occupations in business and finance 111 Auditors, accountants and investment professionals 112 Human resources and business service professionals	**Major Group 21** Professional occupations in natural and applied sciences 211 Physical science professionals 212 Life science professionals 213 Civil, mechanical, electrical and chemical engineers 214 Other engineers 215 Architects, urban planners and land surveyors 216 Mathemati- cians, statisticians and actuaries 217 Computer and information systems professionals	**Major Group 31** Professional occupations in health (except nursing) 311 Physicians, dentists and veterinarians 312 Optometrists, chiropractors and other health diagnosing and treating professionals 313 Pharmacists, dietitians and nutritionists 314 Therapy and assessment professionals	**Major Group 41** Professional occupations in law and social, community and government services 411 Judges, lawyers and Quebec notaries 415 Social and community service professionals 416 Policy and program researchers, consultants and officers	**Major Group 51** Professional occupations in art and culture 511 Librarians, archivists, conservators and curators 512 Writing, translating and related communications professionals 513 Creative and performing artists				
	Major Group 12 Administrative and financial	**Major Group 22** Technical occupations related to natural	**Major Group 32** Technical occupations in Health	**Major Group 42** Parapro- fessional occupations in	**Major Group 52** Technical occupations in art, and	**Major Group 62** Retail sales supervisors	**Major Group 72** Industrial, electrical and construction trades	**Major Group 82** Supervisors and technical occupations in natural	**Major Group 92** Processing, manufacturing and utilities supervisors and central

Skill level								
Skill level B Occupations usually require college education or apprenticeship training.	upervisors and dministrative ccupations 121 Administrative services supervisors 122 Administrative and regulatory occupations 124 Office administrative assistants - general, legal and medical 125 Court reporters, transcriptionists, records management technicians and statistical officers	nd applied sciences 221 Technical occupations in physical sciences 222 Technical occupations in life sciences 223 Technical occupations in civil, mechanical and industrial engineering 224 Technical occupations in electronics and electrical engineering 225 Technical occupations in architecture, drafting, surveying, geomatics and meteorology 226 Other technical inspectors and regulatory officers 227 Transportation officers and controllers 228 Technical occupations in computer and information systems	321 Medical technologists and technicians (except dental health) 322 Technical occupations in dental health care 323 Other technical occupations in health care	legal, social, community and education services 421 Parapro-fessional occupations in legal, social, community and education services	culture, recreation and sport 521 Technical occupations in libraries, public archives, museums and art galleries 522 Photogra-phers, graphic arts technicians and technical and co-ordinating occupations in motion pictures, broadcasting and the performing arts 523 Announcers and other performers, n.e.c. 524 Creative designers and craftspersons 525 Athletes, coaches, referees and related occupations	specialized sales occupations 621 Retail sales supervisors 622 Technical sales specialists in wholesale trade and retail and wholesale buyers 623 Insurance, real estate and financial sales occupations	720 Contractors and supervisors, industrial, electrical and construction trades and related workers 723 Machining, metal forming, shaping and erecting trades 724 Electrical trades and electrical power line and telecommunications workers 725 Plumbers, pipefitters and gas fitters 727 Carpenters and cabinetmakers 728 Masonry and plastering trades 729 Other construction trades	resources, agriculture and related production 821 Supervisors, logging and forestry 822 Contractors and supervisors, mining, oil and gas 823 Underground miners, oil and gas drillers and related occupations 824 Logging machinery operators 825 Contractors and supervisors, agriculture, horticulture and related operations and services 826 Fishing vessel masters and fishermen/women	control operators 921 Supervisors, processing and manufacturing occupations 922 Supervisors, assembly and fabrication 923 Central control and process operators in processing and manufacturing 924 Utilities equipment operators and controllers
	Major Group 13 Finance, insurance and related business administrative occupations 131 Finance, insurance and related business administrative occupations			**Major Group 43** Occupations in front-line public protection services 431 Occupations in front-line public protection services		**Major Group 63** Service supervisors and specialized service occupations 631 Service supervisors 632 Chefs and cooks 633 Butchers and bakers 634 Specialized occupations in personal and customer services	**Major Group 73** Maintenance and equipment operation trades 730 Contractors and supervisors, maintenance trades and heavy equipment and transport operators 731 Machinery and transportation equipment mechanics (except motor vehicle) 732 Automotive service technicians 733 Other mechanics and related repairers 736 Train crew operating occupations 737 Crane operators, drillers and blasters 738 Printing press operators and other trades and related occupations, n.e.c.		
Skill level C Occupations usually require	**Major Group 14** Office support occupations 141 General office workers 142 Office equipment operators 143 Financial, insurance and related administrative support workers 145 Library, correspondence and other clerks		**Major Group 34** Assisting occupations in support of health services 341 Assisting occupations in support of health services	**Major Group 44** Care providers and educational, legal and public protection support occupations 441 Home care providers and educational support occupations 442 Legal and public protection support occupations		**Major Group 64** Sales representatives and salespersons - wholesale and retail trade 641 Sales and account representatives - wholesale trade (non-technical) 642 Retail salespersons	**Major Group 74** Other installers, repairers and servicers and material handlers 744 Other installers, repairers and servicers 745 Longshore workers and material handlers	**Major Group 84** Workers in natural resources, agriculture and related production 841 Mine service workers and operators in oil and gas drilling 842 Logging and forestry workers 843 Agriculture and horticulture workers 844 Other workers in fishing and trapping and hunting occupations	**Major Group 94** Processing and manufacturing machine operators and related productions workers 941 Machine operators and related workers in mineral and metal products processing and manufacturing 942 Machine operators and related workers in chemical, plastic and rubber processing 943 Machine operators and related workers in pulp and paper production and wood processing and manufacturing 944 Machine operators and related workers in textile, fabric, fur and leather products processing and manufacturing 946 Machine operators and related workers in food, beverage and associated products processing 947 Printing equipment operators and related occupations

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secondary school and/or occupation-specific training.	Major Group 15 Distribution, tracking and scheduling co-ordination occupations 151 Mail and message distribution occupations 152 Supply chain logistics, tracking and scheduling co-ordination occupations					Major Group 65 Service representatives and other customer and personal services occupations 651 Occupations in food and beverage service 652 Occupations in travel and accommodation 653 Tourism and amusement services occupations 654 Security guards and related security service occupations 655 Customer and information services representatives 656 Other occupations in personal service	Major Group 75 Transport and heavy equipment operation and related maintenance occupations 751 Motor vehicle and transit drivers 752 Heavy equipment operators 753 Other transport equipment operators and related maintenance workers		Major Group 95 Assemblers in manufacturing 952 Mechanical, electrical and electronics assemblers 953 Other assembly and related occupations
Skill level **D** On-the-job training is usually provided for occupations.						Major Group 66 Sales support occupations 661 Cashiers 662 Other sales support and related occupations Major Group 67 Service support and other service occupations n.e.c. 671 Food counter attendants, kitchen helpers and related support occupations 672 Support occupations in accommodation, travel and amusement services 673 Cleaners 674 Other service support and related occupations, n.e.c.	Major Group 76 Trades helpers, construction labourers and related occupations 761 Trades helpers and labourers 762 Public works and other labourers, n.e.c.	Major Group 86 Harvesting, landscaping and natural resources labourers 861 Harvesting, landscaping and natural resources labourers	Major Group 96 Labourers in processing, manufacturing and utilities 961 Labourers in processing, manufacturing and utilities

Canada

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