Report of the
Task Force on ICT Professional
Development and Recognition

August 2015

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Executive Summary

Introduction

Information and Communications Technology (ICT) has fuelled the economy, businesses and individuals with unlimited potentials for growth and development. At the same time, businesses and the community have been increasingly reliant on robust and secure ICT infrastructure and services. To ensure that we can fully unleash the ICT power for our society, we need a highly qualified and competent ICT professional workforce. It is essential to establish ICT as a profession in Hong Kong that is recognised and valued, and will keep on improving its competence and assuring its professional standing.

Task Force on ICT Professional Development and Recognition

2. Against the above background, the Government of the Hong Kong Special Administrative Region set up a Task Force on ICT Professional Development and Recognition (Task Force) under the Digital 21 Strategy Advisory Committee in November 2012 to examine the case of establishing a unified framework for ICT professional recognition in Hong Kong, with reference to international practices and frameworks of other economies. The Task Force is led by Professor Roland Chin of the University of Hong Kong, with members coming from ICT professional bodies, ICT sector, academia and the Government.

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Conceptual Model of the Professional Recognition Framework

3.   The Task Force has critically examined the major local and international ICT qualification and competency frameworks[1] and ICT professional qualification schemes[2], and agreed on a number of desired outcomes of the professional recognition framework from the perspective of different stakeholder groups, including ICT practitioners[3], employers, ICT sector and the community.

4.   In gist, the professional recognition framework should facilitate professional career development of ICT practitioners and not unduly become a barrier to entry into practice or a barrier for advancement.   For employers, the framework should enhance the quality of ICT human resources and professional services without unduly increasing the related cost.   The framework should also facilitate local ICT industry players in upgrading their global competitiveness and advance the public interests of Hong Kong as a leading knowledge-based society.

5.   With reference to the above desired outcomes, the Task Force has discussed in great depth and agreed on the following essential features of the professional recognition framework –

    (a)   **Voluntary-based** to ensure that ICT manpower supply would not be disrupted;

    (b)   **Recognises ICT professional qualification schemes** rather than individuals for clarity and to avoid duplication of efforts;

    (c)   **Makes reference to local and international ICT qualification and competency frameworks** to facilitate cross recognition;

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[1]   ICT qualification and competency frameworks refer to those models that describe the competences including skills and knowledge requirements of ICT practitioners at various levels.

[2]   Professional qualification schemes refer to those schemes which seek to assess and recognise individual's competency in the respective profession.   The assessment could be in any forms such as examination-based, experience-based, etc.

[3]   ICT practitioners generally refer to those working on ICT.   They comprise ICT professionals, ICT technologists, amongst others.   For ICT professionals, they refer to those working in roles that carry significant responsibility and full accountability, commonly at managerial or consultant level, whereas for ICT technologists, they refer to those who are skilful in certain ICT technical aspects.

(d) **Recognition criteria** to cover **professional standard** *(based on a combination of academic qualification, examination, professional experience and competency)*, **continuing professional development** and **code of ethics** requirements of the qualification scheme, as well as the **evaluation process**, **expertise** and **organisational capability** of the respective qualifications awarding body[4];

(e) **Re-assessment** on the recognised schemes periodically to ensure their quality can be sustained continually;

(f) Managed by an **awarding body to be incorporated under the Companies Ordinance** (Cap. 622) (Awarding Body);

(g) **Self-sustaining financially** in the long run with qualifications awarding bodies jointly bearing the operating cost. Before a critical mass of recognition is achieved, funding support from the ICT industry and/ or the Government could be considered to kick-start the initiative.

6. The Task Force anticipated that the framework will provide an aligned and consistent yardstick for ensuring ICT practitioners' competency and professionalism. It will facilitate employers to identify and employ competent and qualified ICT practitioners and service providers. It will also give practitioners a clearer direction on career and professional development, thereby, attracting more young and talented people to join the ICT profession, resulting in a flourish of local ICT manpower supply.

Consultation

7. As it is important to secure the support and consensus of relevant stakeholder groups, the Task Force consulted various parties on the conceptual model of the professional recognition framework (Proposed Framework).

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[4] Qualifications awarding body refers to an organisation that develops and awards qualifications to practitioners.

8.   The Task Force briefed the Digital 21 Strategy Advisory Committee in January 2014 on the Proposed Framework and the Committee gave their support in taking the initiative forward.

9.   In February and March 2014, the Task Force organised a number of consultation and exchange sessions with the relevant stakeholder groups including employers *(chambers of commerce and SME-related trade associations)*, practitioners, academia, professional bodies and industry associations with several hundred participants joining these sessions.

10.   The limited number of stakeholders consulted notwithstanding, the overall feedback from these sessions was positive. Participants generally welcomed the Proposed Framework and believed it would build a stronger ICT community in Hong Kong.   They agreed with leveraging on existing professional qualification schemes in view of its cost effectiveness and virtually no disruption to the market dynamics.   By raising the ICT professional profile of Hong Kong and providing a clear roadmap for ICT practitioners, participants agreed that it would help attract more young and talented people to choose ICT-related disciplines in their study and pursue ICT as their career.

11.   Some SME employers have expressed concern on the possible increase in employment cost but they agreed that ensuring the quality and professional ethics and conduct of ICT practitioners is of high importance. There were also views that the Awarding Body of the Proposed Framework should strive to maintain a high degree of credibility and transparency to foster the public's confidence in the Proposed Framework.

12.   Following the exchange sessions, the Task Force briefed the IT and Broadcasting Panel of the Legislative Council (LegCo ITB Panel) at its meeting on 14 April 2014.   A special meeting of the ITB Panel was further arranged on 17 May 2014 for deputations and the public to render their views on the Proposed Framework.

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13.   While there was in principle support for the Proposed Framework, there were concerns over the details.   Some of the major concerns included the credibility and transparency of the Awarding Body of the Proposed Framework; the need to address the cross recognition arrangement with ICT professional qualification schemes of Mainland and other jurisdictions; impacts of the Proposed Framework upon SMEs such as driving up business costs; whether the introduction of the Proposed Framework would dampen innovation and creativity and raise the entry threshold for people to pursue ICT as their career; and whether the Proposed Framework should cover the recognition of ICT technologists in addition to ICT professionals.

The Working Groups

14.   In response to the comments received in the consultation and exchange sessions as well as the LegCo ITB Panel meetings, three working groups, namely Working Group on Cross Recognition with Mainland and the World, Working Group on Impacts upon SMEs, and Working Group on Recognising Technologists, with expanded industry participation were formed in October 2014 to examine the respective key areas in more details.

15.   The Working Group on Cross Recognition with Mainland and the World considered that cross recognition with the Mainland was important given its close proximity and economic relationship with Hong Kong.   The working group recommended that the Awarding Body of the Proposed Framework should take on a facilitating role while individual qualifications awarding bodies should retain their autonomy on cross recognition.   Before the establishment of the Awarding Body of the Proposed Framework, qualifications awarding bodies should be encouraged to set up a platform for consultation, coordination and collaboration to explore and take forward possible cross recognition initiatives.

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16.   The Working Group on Impacts upon SMEs considered that it would be important to let SMEs clearly understand the objectives and benefits of the Proposed Framework, e.g., its voluntary nature and the quality assurance it would render for ICT practitioners, such understanding would help alleviate SMEs' concerns over, for example, the possible increase in cost of employment and their ability to compete with large enterprises.   To provide further incentives for faster adoption, consideration could be given to seeking support from existing funding schemes[5] to initiate programmes for promoting the Proposed Framework and encouraging ICT practitioners in SMEs to attain the required qualifications.

17.   The Working Group on Recognising Technologists supported the inclusion of recognising ICT technologists, in addition to ICT professionals, in the Proposed Framework.   The working group considered that the same recognition criteria (albeit at different competency levels) could apply to both the recognition of professionals and technologists to ensure consistency and enable more effective use of resources.   The working group recommended that both categories of recognition should be launched at the same time and suggested that the operating cost of the Awarding Body of the Proposed Framework would be increased, especially in the initial few years, to cover the publicity and promotional events so as to build up a critical mass of professionals and technologists.

Recommendations

18.   Taking into account the recommendations of the working groups, the Task Force has finalised the unified ICT professional recognition framework for Hong Kong with the following key additions to the original proposal –

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[5]   Examples of existing funding schemes include the General Support Programme under the Innovation and Technology Fund administered by the Innovation and Technology Commission and the SME Development Fund managed by the Trade and Industry Department.

(a) In addition to professional schemes, the Proposed Framework could be **extended to cover the recognition of technologist schemes**. For recognition of technologist schemes, **specialism on broad work areas could be optionally applied**;

(b) To pursue cross recognition with the Mainland and other jurisdictions, the **Awarding Body of the Proposed Framework could take on a facilitating role while qualifications awarding bodies should retain their autonomy on cross recognition**; and

(c) To provide incentives for faster adoption, consideration could be given to **seeking support from existing funding schemes to initiate programmes for promotion** in order to raise the community's awareness on the Proposed Framework.

19. With the recommendations made on the unified ICT professional recognition framework, the Task Force has completed its mission according to its terms of reference in **Annex A**.

20. The Task Force noted the diverged views in society on some of the implementation details such as the composition of the Awarding Body of the Proposed Framework; and the possibility of dampening innovation and creativity, the impact upon SMEs, the possible side effect of raising the entry threshold for those who wish to pursue ICT as their career, the Task Force foresees difficulty in seeking to implement the Proposed Framework immediately. A more realistic approach is to implement measures that would build consensus as a start and the Task Force has come up with a number of recommendations that different stakeholder groups can pursue to pave way for the implementation of the Proposed Framework –

(a) **Qualifications awarding bodies** could set up a Joint Forum, for consultation, coordination and collaboration to take forward the Proposed Framework. The Joint Forum could deliberate amongst themselves the recognition standards and criteria for recognising qualification schemes at professional and technologist levels. It could also promote to the different stakeholder groups the benefits of ICT professional recognition.

(b) **Qualifications awarding bodies** should also continue to explore various ways in pursuing cross recognition of their professional qualification schemes within Hong Kong and externally with the Mainland and other jurisdictions.

(c) The **academia**, joining hands with the ICT industry, the various professional bodies and the Government, should continue to promote to students and their parents the career prospect of the ICT profession. To stimulate students' interest in ICT subjects, secondary schools are encouraged to partner with tertiary institutions and industry bodies to organise enriched ICT activities for secondary students and cultivate ICT talents early in their secondary studies.

(d) The **Government** should continue to facilitate and promote the development of the local ICT industry through various means such as provision of funding support on ICT professional recognition and development initiatives through existing funding schemes; encouraging their staff to attain relevant ICT professional qualifications and including relevant professional qualifications as requirement in ICT service procurement where warranted; and provision of official backing for qualifications awarding bodies on cross recognition agreements with the Mainland and other jurisdictions.

(e) The **Government**, in collaboration with other stakeholders, should continue to develop and update the Specification of Competency Standards for the ICT industry under the Qualifications Framework, as well as promote the adoption of local and international ICT qualification and competency frameworks in Hong Kong.

Chapter I

Introduction

Background

1.1   Information and Communications Technology (ICT) has fuelled the economy, businesses and individuals with unlimited potentials for growth and development.   At the same time, businesses and the community have been increasingly reliant on robust and secure ICT infrastructure and services.   To ensure that we can fully unleash the ICT power for our society, we need a highly qualified and competent ICT professional workforce.   It is essential to establish ICT as a profession in Hong Kong that is recognised and valued, and will keep on improving its competence and assuring its professional standing.

1.2   While many local and international ICT qualifications awarding bodies at present offer a diversity of professional qualification schemes to recognise different levels of qualification, skill and experience of ICT practitioners, we lack a unified ICT professional recognition framework in Hong Kong that is widely accepted by the higher education sector, ICT workforce, ICT sector, community and the Government.   Moreover, comparing to some other professions such as accounting, engineering, legal and medical, we consider that the ICT profession is not as well recognised due to a lack of public understanding and promotion of the profession.

Chapter I

Task Force on ICT Professional Development and Recognition

1.3   Against the above background, the Government of the Hong Kong Special Administrative Region set up a Task Force on ICT Professional Development and Recognition (Task Force) under the Digital 21 Strategy Advisory Committee in November 2012 to examine the case of establishing a unified framework for ICT professional recognition in Hong Kong, with reference to international practices and frameworks of other economies.   The Task Force is led by Professor Roland Chin of the University of Hong Kong, with members coming from ICT professional bodies, ICT sector, academia and the Government. The vision and mission of the Task Force are provided below.   The terms of reference and the membership are provided in **Annex A**.

Vision

1.4   To establish ICT as a highly qualified and internationally recognised profession in Hong Kong with high level of competence and professionalism.

Mission

1.5   To establish a unified ICT professional recognition framework in Hong Kong by aligning with international practices, which is sustainable and widely accepted by the higher education sector, ICT workforce, ICT sector, community and the Government.

Chapter I

Existing Local and International Practices

1.6   The Task Force has examined the major ICT qualification and competency frameworks that are adopted locally and internationally. These included the Qualifications Framework (QF) administered by the Education Bureau; the Skills Framework for the Information Age (SFIA) maintained by the SFIA Foundation; and the European e-Competence Framework (e-CF) developed by a large number of European ICT and human resources experts in the context of the CEN (European Committee for Standardisation) Workshop on ICT Skills. Details on the ICT qualification and competency frameworks are provided in **<u>Annex B</u>** for reference.

1.7   The Task Force has also examined the international ICT professional qualification schemes including Certified Professional in Australia, IT Certified Professional in Canada, the proposed Computing Professionals Bill in Malaysia and Chartered IT Professional in the United Kingdom besides the Certified Professional of IT and Registered Professional Engineer in Hong Kong. The National Qualification Certificate of Computer and Software Technology Proficiency《計算機技術與軟件專業技術資格（水平）考試》of the Mainland was also studied.

Chapter II

Conceptual Model of the
Professional Recognition Framework

2.1   The Task Force has discussed and agreed on a conceptual model of the professional recognition framework comprising the desired outcomes, essential features and anticipated benefits.

Desired Outcomes

2.2   The desired outcomes of the unified ICT professional recognition framework for the various stakeholder groups are as follows –

ICT Practitioners

2.3   The framework should facilitate professional career development and not unduly become a barrier to entry into practice or a barrier to advancement.

2.4   Compliance with professional requirements should not be unduly difficult.   To this end, the framework should be clear in scope and requirement, independent of technologies and brands, consistent with industry practice and should not hamper innovation and creativity.

Employers

2.5   The framework should enhance the quality of ICT human resources and professional services without unduly increasing the related cost.

Chapter II

ICT Sector

2.6   The framework should facilitate local industry players in upgrading their global competitiveness and overseas service providers viewing it as a justified elevation of professional standards rather than a barrier to market access.

Community

2.7   The framework should advance the public interests of Hong Kong as a leading knowledge-based society in the globally connected world, where ICT penetrates all sectors of the community.

Essential Features

2.8   With reference to the desired outcomes, the essential features of the ICT professional recognition framework are as follows –

Voluntary-based

2.9   The Task Force considers that the framework should be voluntary-based.   Having a voluntary framework can help establish a standard for the local ICT profession, thereby raising the ICT professional profile of Hong Kong, while at the same time, will not be seen as a barrier for entry into the ICT profession or career advancement.   This can ensure that ICT manpower supply would not be disrupted.   If the framework is effective and stakeholders see value in it, even if it is voluntary-based, they will be keen to adopt it under a market-led approach.

2.10   Moreover, imposing a mandatory requirement necessitates statutory backing with regulatory functions such that critical ICT related tasks could be performed only by competent and qualified professionals. While this could help ensure a consistently high standard and quality, being too restrictive might dampen innovation and hinder the development of the profession and there might not be enough qualified practitioners to meet the demand, especially during initial run.

Chapter II

Recognises Professional Qualification Schemes instead of Individuals

2.11   At present, different qualifications awarding bodies are already offering professional qualification schemes to give recognition to individual ICT practitioners.   It will be confusing and duplicating efforts if another new scheme targeting at individual ICT practitioners is to be introduced.   In this regard, instead of introducing another new scheme to give professional recognition to practitioners directly, the framework should recognise the ICT professional qualification schemes offered by various qualifications awarding bodies that have achieved a certain level of professional standard.

2.12   This multiple pathways approach not only helps ensure and provide an alignment on the assessment standards of the different schemes, but also enables practitioners to select the schemes that best suit their career path and development needs to attain the recognition.

Makes Reference to Local and International ICT Qualification and Competency Frameworks to Facilitate Cross Recognition

2.13   In order for the professional recognition framework to be recognised locally and internationally, it should make reference to existing well established ICT qualification and competency frameworks. Cross-recognition is particularly important to the development of the ICT profession, facilitating our service providers enter into the market of other places as well as cross flow of ICT experts in a knowledge-based economy.

2.14   For international frameworks, the e-CF has only been established for around seven years and is mainly being used in Europe while the SFIA has been established for around 12 years and is being used in nearly 200 countries/ economies.   As such, SFIA is recommended as the reference given its maturity and worldwide popularity, which can in turn facilitate cross-recognition with other economies.

2.15   Regarding the Mainland, nationwide examinations are currently being held to recognise the qualifications of ICT practitioners, without making reference to a particular competency framework.   Hong Kong should keep a close watch on the development in the Mainland and explore cross recognition opportunities as appropriate.

2.16   As for local framework, QF, which is designed to apply to various industry sectors including the ICT sector, is recommended as the reference to facilitate articulation among academic, vocational and continuing education.

Recognition Criteria

2.17   For a comprehensive assessment, the following should be considered when giving recognition to a professional qualification scheme –

(a) Whether the qualification scheme meets an appropriate **professional standard**, for example, the award is made based on a combination of academic qualification, examination, experience assessment, and/or other forms of competency-based assessment, and the competency requirements are set at an appropriate level;

(b) Whether **continuing professional development** requirements and **enforceable code of ethics and conduct** are put in place to ensure the ongoing quality of the individuals;

(c) Whether the necessary **processes and expertise** to evaluate qualification of individuals are put in place; and

(d) Whether the qualifications awarding body has the necessary **organisational capability** (such as governance, assessment processes, quality of assessors) and maturity to manage the qualification scheme.

2.18   Meeting an appropriate professional standard with continuing professional development requirement in place can ensure the professionalism of the holders of the respective professional qualification scheme.   This is important as employers value a consistently high quality of their ICT employees.   Employing qualified professionals would achieve better quality of their deliverables and increased productivity, thereby protecting investments.

2.19   Having an enforceable code of ethics to ensure the conduct of the practitioners is of equal importance, in particular to the Small and Medium Enterprises (SMEs) as they might only have one or two ICT staff who will get hold of some very key information of the company such as financial data or customer database.   The integrity of the practitioners would be protected through the code of ethics of the respective qualifications awarding bodies.

2.20   To cope with the fast changing ICT landscape, the recognised professional qualification schemes need to be re-assessed periodically to ensure their quality can be sustained continually.

Awarding Body to Manage the Recognition

2.21   To award and manage the recognition, an awarding body will be required.   The Task Force is of the view that the Awarding Body should be non-profit making, non-statutory, and to be incorporated under the Companies Ordinance (Cap. 622) as a company limited by guarantee to facilitate participation from different stakeholder groups.   It should have a simple structure with a wide representation from the ICT sector, the academia, the user organisations and the community.   It should also work independently for the management, operation and ongoing development of the framework.

2.22   A unified ICT professional recognition framework has been a long desire of the local ICT sector.   Establishing a company under the Companies Ordinance as the Awarding Body can help launch the framework in a shorter timeframe.   Moreover, this approach gives more flexibility to the Awarding Body to make appropriate adjustments to the framework based on responses from the ICT sector and the community.

2.23   The Awarding Body should comprise the following –

(a)   A Governing Board to set the overall direction and perform quality control; it will be responsible for the governance, planning, development and management of the recognition;

(b)   An Assessment Committee to propose to the Governing Board the qualification standards and assessment criteria of the recognition for approval, and to perform assessment on the applications;

(c)   An Appeal Panel to handle appeal cases; and

(d)   A Secretariat to perform executive support functions.

Self-sustainable

2.24   In the long run, the operation of the framework should aim at self-sustaining financially, with majority of the work supported by volunteers.   The source of funding can be from annual fees charged on the qualifications awarding bodies, though the fees should be low to encourage participation, especially at the initial stage.

2.25   Before a critical mass of recognition is achieved, funding support from the ICT sector and/ or the Government will be needed as an important incentive to kick-start the initiative.

Anticipated Benefits

2.26   It is anticipated that the unified ICT professional recognition framework would achieve the following benefits –

ICT Practitioners

(a)   Provide an aligned and consistent yardstick for ensuring ICT practitioners' competency and professionalism;

(b)   Remove confusion brought about by apparently similar and overlapping professional qualifications;

(c) Give practitioners a clearer direction on career and professional development;

(d) Prove their value to their employers or prospective employers, thereby improving their prospects of job selection or promotion; and

(e) Practitioners' competency and professionalism can be readily accepted worldwide as the recognition is in alignment with international standards.

Employers

(f) Easily identify and employ competent and qualified ICT practitioners and service providers;

(g) Achieve enhanced quality of deliverables and increased productivity, contributing to business success and protection of investment;

(h) Improve the overall competitiveness of the organisation and help enhance the organisation's professional image and build up their customers' confidence; and

(i) Ensure the professional ethics and conduct of the ICT employees, thereby protecting the resources and information of the organisation.

ICT Sector

(j) Raise the professional image and profile of ICT practitioners and the whole sector; and

(k) Attract more young and talented people to join the profession, resulting in a flourish of local ICT manpower supply.

Community

(l) Have clearer expectations and understanding of the roles and responsibilities of ICT practitioners and service providers; and

(m) Fortify the community's confidence on the ICT profession in managing and implementing ICT-enabled services and systems.

Chapter III

Consultation

3.1   As it is important to secure the support and consensus of relevant stakeholder groups, the Task Force consulted various parties on the conceptual model of the unified ICT professional recognition framework (Proposed Framework).

Digital 21 Strategy Advisory Committee

3.2   The Task Force briefed the Digital 21 Strategy Advisory Committee in January 2014 on the Proposed Framework and the Committee gave their support in taking the initiative forward.

Various Stakeholder Groups

3.3   In February and March 2014, the Task Force organised a number of consultation and exchange sessions with the relevant stakeholder groups including employers *(chambers of commerce and SME-related trade associations)*, practitioners, academia, professional bodies and industry associations with several hundred participants joining these sessions.

3.4   The limited number of stakeholders consulted notwithstanding, the overall feedback from these sessions was positive. Participants generally welcomed the Proposed Framework and believed it would build a stronger ICT community in Hong Kong. A sustainable and widely accepted framework could help accelerate the acceptance and recognition of ICT qualifications and improve the professional image of the ICT industry.

3.5   They agreed with leveraging on existing professional qualification schemes in view of its cost effectiveness and virtually no disruption to the market dynamics.   To ensure that the Proposed Framework could enhance the quality of ICT human resources and professional services, it would be essential to have sufficient resources to promote the Proposed Framework to ensure its sustainability.

3.6   Participants agreed that, by raising the ICT professional profile of Hong Kong and providing a clear roadmap for ICT practitioners, the Proposed Framework could help attract more young and talented people to choose ICT-related disciplines in their study and pursue ICT as their career.

3.7   Some SME employers have expressed concern on the possible increase in employment cost but they agreed that ensuring the quality and professional ethics and conduct of ICT practitioners is of high importance.

3.8   There were also views that the Awarding Body of the Proposed Framework should strive to maintain a high degree of credibility and transparency to foster the public's confidence in the Proposed Framework.

IT and Broadcasting Panel of the Legislative Council

3.9   Following the exchange sessions, the Task Force briefed the IT and Broadcasting Panel of the Legislative Council (LegCo ITB Panel) at its meeting on 14 April 2014.   A special meeting of the ITB Panel was further arranged on 17 May 2014 for deputations and the public to render their views on the Proposed Framework.

3.10   While there was in principle support for the Proposed Framework, there were concerns over the details.

Chapter III

3.11   There have been questions on whether establishing a non-statutory Awarding Body to be incorporated under the Companies Ordinance for the management, operation and on-going development of the Proposed Framework would be effective.   Concerns were also raised on the credibility and transparency of the Awarding Body to be formed.

3.12   There were views that a more detailed study should be carried out to explore cross recognition opportunities of the Proposed Framework with ICT professional qualification schemes of the Mainland and other jurisdictions so as to facilitate local ICT practitioners and service providers to enter into the Mainland and overseas markets.

3.13   Some employers revealed that they encountered difficulties in their recruitment due to general shortage in supply of ICT manpower. They were concerned that the Proposed Framework might raise the entry threshold for people to pursue ICT as their career, posing further difficulties in their recruitment and driving up business costs.   In particular, SMEs would be the sector most affected and further study on the impacts of the Proposed Framework upon SMEs should be conducted.

3.14   There were also views that ICT is a creative industry and striking a right balance on innovation, creativity, qualification and experience would be important.   Imposing too stringent control and regulation would dampen innovation and creativity and might not provide an environment conducive to the flourishing of the ICT industry.

3.15   Moreover, there were suggestions that the Proposed Framework should also include the recognition of ICT technologists in addition to ICT professionals since there is a large group of practitioners in the ICT sector working as technologists and young people might consider becoming a professional too remote.   Recognising technologists in addition to professionals would also make the framework more comprehensive and multi-tier.

Chapter IV

The Working Groups

Formation of the Working Groups

4.1   In response to the comments received in the consultation and exchange sessions as well as the LegCo ITB Panel meetings, three working groups, namely Working Group on Cross Recognition with Mainland and the World, Working Group on Impacts upon SMEs, and Working Group on Recognising Technologists, with expanded industry participation were formed in October 2014 to examine the respective key areas in more details.

4.2   The three working groups held eight meetings in total during October 2014 to January 2015.   The working groups submitted their recommendation reports to the Task Force in March 2015 (please refer to **Annex C**).

Working Group on Cross Recognition with Mainland and the World

4.3   The Working Group on Cross Recognition with Mainland and the World noted the different forms of existing cross recognition arrangements and those that were being pursued by different local qualifications awarding bodies such that further cross recognition opportunities could be explored taking advantage of these channels.   In particular, cross recognition with the Mainland was important given its close proximity and economic relationship with Hong Kong.

Chapter IV

4.4   It was recommended that the Awarding Body of the Proposed Framework should take on a facilitating role in cross recognition in formulating high-level master agreement(s) with other economies to facilitate development of cross recognition while individual qualifications awarding bodies should retain their autonomy on cross recognition.

4.5   Moreover, parties interested in participating in the Proposed Framework and cross recognition with the Mainland and other jurisdictions should be encouraged to set up a platform for consultation, coordination and collaboration as soon as possible before the establishment of the Awarding Body.

Working Group on Impacts upon SMEs

4.6   The Working Group on Impacts upon SMEs, having recognised the difference in nature between SMEs with ICT as their core business and other general SMEs which use ICT as a supporting tool for operating their business, looked into the subject matter from both angles.   For general SMEs, their major concern would be on the cost of employment while ICT SMEs were more concerned with their ability to compete with large enterprises.   To alleviate their concerns, the working group considered that it would be important to let SMEs clearly understand the objectives and benefits of the Proposed Framework, e.g., its voluntary nature and the quality assurance it would render for ICT practitioners and their delivered services.

4.7   To provide further incentives for faster adoption, consideration could be given to seeking support from existing funding schemes to initiate programmes for promoting the Proposed Framework and encouraging ICT practitioners in SMEs to attain the required qualifications.

4.8   The working group also recognised that well planned promotion programmes would be essential for the successful rollout of the Proposed Framework.   The establishment of some key performance indicators would be useful to measure the effectiveness of the promotion programmes.

Chapter IV

Working Group on Recognising Technologists

4.9 The Working Group on Recognising Technologists supported the inclusion of recognising ICT technologists, in addition to ICT professionals, in the Proposed Framework. By extending the Proposed Framework to cover technologists, it would facilitate employers to recruit competent junior ICT practitioners, which could ensure better quality and higher effectiveness in delivering their services.

4.10 The working group was of the view that the same recognition criteria under the Proposed Framework in respect of professionals should apply to technologists, albeit at different competency levels. The working group recommended both categories of recognition to be launched at the same time. It envisaged that the same Awarding Body should apply to both categories of recognition to ensure consistency and enable more effective use of resources.

4.11 The working group also suggested that the operating cost of the Awarding Body of the Proposed Framework would be increased especially in the initial few years when publicity and promotional events to the different stakeholder groups would be crucial so as to build up a critical mass of professionals and technologists.

Chapter V

Recommendations

The Unified ICT Professional Recognition Framework

5.1　　Taking into account the recommendations of the working groups, the Task Force has fine-tuned the initial proposal and recommended the unified ICT professional recognition framework (Proposed Framework) as follows –

Key Principles

(a)　The Proposed Framework will be **voluntary-based** to ensure that ICT manpower supply will not be disrupted.　After stable running of the framework and subject to market demand, one possible future development might be requiring certain critical ICT activities to be performed by recognised professionals only, but this would be subject to further study and consultation;

(b)　It will **give recognition to ICT professional qualification schemes** rather than individuals for clarity and to avoid duplication of efforts;

(c)　It will be a **generic recognition** without specialism;

(d)　In addition to professional schemes, it could be **extended to cover the recognition of technologist schemes**; and in such case, specialism on broad work areas could be optionally applied.

Recognition Criteria

(e)   The recognition criteria will cover **professional standard** *(based on a combination of academic qualification, examination, professional experience and competency)*, **continuing professional development** and **code of ethics** requirements of the qualification scheme, as well as the **evaluation process**, **expertise** and **organisational capability** of the respective qualifications awarding body;

(f)   The recognition criteria will **make reference to local and international ICT qualification and competency frameworks** (e.g. SFIA and QF) to facilitate cross recognition; and

(g)   The recognised schemes will need to be **re-assessed periodically** to ensure their quality can be sustained continually.

Operation and Sustainability

(h)   The Proposed Framework will be managed by an **Awarding Body to be incorporated under the Companies Ordinance**, comprising a wide representation from the ICT sector, academia, end-user organisations and the community.   The Awarding Body will also take on a facilitating role in cross recognition with the Mainland and other jurisdictions while qualifications awarding bodies will retain their autonomy on cross recognition;

(i)   While Government funding could be considered for the initial set-up of the Proposed Framework, it should aim at **self-sustaining financially** in the long run, with qualifications awarding bodies jointly bearing the operating cost; and

(j)   Well planned **promotional campaigns** especially to the SMEs should be launched to raise the community's awareness on the Proposed Framework.   The establishment of some key performance indicators would be useful to measure the effectiveness of the promotion programmes as well as the framework.

Chapter V

Conclusion of the Task Force

5.2   With the recommendations made on the unified ICT professional recognition framework, the Task Force has completed its mission according to its terms of reference.   A list of the major activities of the Task Force is provided in **Annex D**.

Way Forward

5.3   The Task Force noted the diverged views in society on some of the implementation details such as the composition of the Awarding Body of the Proposed Framework; and the possibility of dampening innovation and creativity, the impact upon SMEs, the possible side effect of raising the entry threshold for those who wish to pursue ICT as their career, the Task Force foresees difficulty in seeking to implement the Proposed Framework immediately.   A more realistic approach is to implement measures that would build consensus as a start and the Task Force has come up with a number of recommendations that different stakeholder groups can pursue to pave way for the implementation of the Proposed Framework.

Chapter V

Recommendation 1: *Joint Forum for Collaboration to be established by Qualifications Awarding Bodies*

5.4　　The setting up of a unified professional recognition system for the local ICT profession is an endeavour desired by the industry for more than a decade.　The ICT industry should take a stronger lead in taking forward the initiative.　Proactive participation and collaboration among qualifications awarding bodies would be a key factor for success.

Tasks:

(a) Drawing on the experience of the existing Reciprocal Recognition Agreement[6] amongst professional organisations, qualifications awarding bodies could jointly set up a platform, or a Joint Forum, for consultation, coordination and collaboration to take forward the Proposed Framework;

(b) The Joint Forum could deliberate amongst themselves the recognition standards and criteria for recognising qualification schemes at professional and technologist levels, drawing from the recommendations made by the Task Force and the working groups as appropriate; and

(c) The Joint Forum could promote to the different stakeholder groups the benefits that ICT professional recognition could bring to the community, such as assuring the professionalism and code of conduct of the ICT practitioners, enhancing the quality of ICT services, and encouraging more young and talented people to join the profession.

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[6] Examples of Reciprocal Recognition Agreements (RRAs) - the British Computer Society (BCS) and the Institution of Engineering and Technology (IET) have established RRAs with the Information Discipline of the Hong Kong Institution of Engineers (HKIE); the Engineers Registration Board (ERB) recognises professional membership of BCS, Hong Kong Computer Society (HKCS) and IET, based upon their RRAs with the HKIE.

Chapter V

<u>***Recommendation 2:*** *Cross Recognition Opportunities to be continually explored by Qualifications Awarding Bodies*</u>

5.5   Cross recognition is important to the development of the ICT profession, elevating the professional profile of the local ICT industry and facilitating their access to overseas markets.

Tasks:

  (a)   Qualifications awarding bodies could first explore cross recognition opportunities within Hong Kong.   Deliberations on recognition standards and criteria for recognising qualification schemes should enhance overall success in cross recognition with other economies; and

  (b)   Qualifications awarding bodies should continue to explore various ways in pursuing cross recognition of their professional qualification schemes with the Mainland and other jurisdictions. In particular, the Mainland has a critical mass to enable the development of its own professional recognition standard, Hong Kong should keep a close watch on the development and continue to explore cross recognition opportunities with the Mainland as appropriate.   The present status of similar initiatives in the Mainland is provided at **Annex E**.

Chapter V

<u>***Recommendation 3:*** *Promotion of ICT Programmes by the Academia*</u>

5.6   We should encourage students to take up ICT programmes in their tertiary studies or even in secondary schools and let them appreciate that the ICT profession offers broad and promising career paths.

Tasks:

(a)   The academia, joining hands with the ICT industry, the various professional bodies and the Government, should continue to promote to students and their parents the career prospect of the ICT profession, that ICT is not just about simple program coding or system support, but covers a far broader spectrum of work areas including IT strategy and planning, information security management, project management, network design and implementation, business analysis and change management, etc.; and

(b)   To provide intensive ICT training to students who are interested and talented in ICT, and to foster a pro-ICT atmosphere and stimulate interest in ICT in the school community, secondary schools are encouraged to collaborate with tertiary institutions and the industry to cultivate ICT talents early in secondary studies, for example, under the "Enriched IT Programme in Secondary Schools" launched by the Government.

Chapter V

__Recommendation 4:__ Local ICT Industry Facilitation by the Government

5.7   In addition to collaborating with the industry and the academia to encourage students to choose ICT-related disciplines in their study and pursue ICT as their career, the Government should continue to facilitate and promote the development of the local ICT industry.

Tasks:

(a)   The Government should continue to provide funding support on ICT professional recognition and development initiatives through existing funding schemes, such as promoting and educating the public and industry on the benefits of ICT professional certification and recognition, and encouraging practitioners, including those working in SMEs, to get certified;

(b)   The Government should encourage their staff to attain relevant ICT professional qualifications and include relevant professional qualifications as requirement in ICT service procurement where warranted, taking into consideration the prevailing market supply; and

(c)   In jurisdictions where government plays a strong supporting role in professional recognition, the Government may consider providing official backing for qualifications awarding bodies entering into cross recognition agreements with their counterparts as appropriate.

Chapter V

__Recommendation 5:__ Promotion of ICT Qualification and Competency Frameworks by the Government and Other Stakeholders

5.8   The Government should promote the adoption of ICT Qualification and Competency Frameworks.

Tasks:

(a)   The Government should continue to develop, review and update the Specification of Competency Standards for the ICT industry under the QF; and

(b)   The Government could promote the adoption of ICT Qualification and Competency Frameworks such as SFIA which is in popular use in nearly 200 economies. For example, the OGCIO has made reference to SFIA in formulating the Government IT Skills Framework (GISF) since 2009 for continuing professional development of the government IT professionals.

Annex A –

Task Force on ICT Professional Development and Recognition

Task Force on ICT Professional Development and Recognition

Terms of Reference

Objective:

To establish a framework for professional recognition and explore the feasibility of setting up a statutory registration system for ICT professionals in Hong Kong.

Responsibilities:

➢ To examine the existing certification, assessment, qualification and recognition schemes for the local ICT profession;

➢ To identify the mission-critical duties and processes in relation to the ICT profession that will benefit from a professional recognition system;

➢ To study the case of setting up a unified professional recognition system for the local ICT profession with reference to international practices and systems;

➢ To explore the feasibility of setting up a statutory ICT professional registration organisation and system as a further step to professional recognition;

➢ To identify the gaps between the existing and proposed systems and recommend measures to bridge the gaps; and

➢ To consult relevant stakeholders to get their buy-in to the new systems and measures for the ongoing development of the local ICT profession.

Membership List

Convenor:

- Prof Roland CHIN

Non-official Members:

- Mr Raymond CHENG

- Mr Edmand CHEUNG

- Ir Stephen LAU

- Ir Sunny LEE

- Dr Wendy LEE

- Ir Prof LEUNG Kwong-sak

- Ir William LI

- Hon Charles MOK

- Ir Dr NG Chak-man

- Ir Dennis PANG

- Ir Dr George SZE

Official Members:

- Government Chief Information Officer

- Deputy Government Chief Information Officer (Consulting and Operations), OGCIO

- Assistant Government Chief Information Officer (Governance and Resources), OGCIO

Secretary:

- Senior Systems Manager (Human Resources & Professional Development), OGCIO

Annex B –

ICT Qualification and Competency Frameworks

ICT Qualification and Competency Frameworks

1. Qualifications Framework

1.1 In February 2004, the Executive Council endorsed the establishment of a seven-level cross-sectoral Qualifications Framework (QF) and its associated quality assurance mechanism. The aim of establishing the QF is to clearly define the standards of different qualifications, ensure their quality and indicate the articulation ladders between different levels of qualifications.

1.2 The QF is designed to be applicable to a number of industry sectors to facilitate the interface between academic, vocational and continuing education. Each of the seven levels defined by the QF is characterised by outcome-based generic level descriptors which describe the common features of qualifications at the same level. The generic level descriptors describe the requirements of each level in four aspects – "Knowledge and Intellectual Skills", "Processes", "Application, Autonomy and Accountability" and "Communications, IT and Numeracy".

1.3 Different industries may draw up their own competency requirements and standards, known as "Specification of Competency Standards" (SCSs), by making reference to the generic level descriptors. The SCS for an industry mainly comprises the competency standards required at various levels. These competency standards represent the industry benchmarks for the skills, knowledge and attributes required to perform a job at a certain level.

1.4 As at July 2015, SCS for the following two branches covering 12 functional areas have been developed for the ICT industry; the SCS for a third branch is being developed.

> ➢ Software Products and Software Services

> ➢ Communications and Information Services

2. Skills Framework for the Information Age

2.1 The Skills Framework for the Information Age (SFIA) was established in July 2003 as a system for IT professionals to match the skills of the workforce to the requirements of the business. It is a logical two-dimensional skills framework defined by areas of work on one axis and levels of responsibility on the other. SFIA is owned, protected, updated and distributed by The SFIA Foundation, a not-for-profit organisation. It is currently at version 6 which was launched in July 2015.

2.2 SFIA defines 97 professional IT skills, organised in six categories, each of which has several sub-categories. It also defines seven levels of attainment, each of which is described in generic, non-technical terms that can be easily understood by all stakeholders to facilitate a common understanding of IT skills development and deployment.

2.3 SFIA is being used in nearly 200 countries/ economies as a resource for the management of IT people. The majority of users are companies in the commercial or industrial sector. Many professional bodies such as the Australian Computer Society, the British Computer Society, the Canadian Information Processing Society and the Institute of IT Professionals New Zealand have also chosen SFIA to underpin their system of professional assessment.

3.   European e-Competence Framework

3.1   The European e-Competence Framework (e-CF) was developed through a process of collaboration between experts and stakeholders from many different countries under the umbrella of the CEN Workshop on ICT Skills[1].   Version 1.0 of the e-CF was first published in 2008.   The latest version 3.0 was published in 2014.

3.2   The e-CF provides a reference of 40 competences *(classified according to five main ICT business areas)* as required and applied at the ICT workplace, using a common language for competences, skills and proficiency levels that can be understood across Europe.

3.3   As the first sector-specific implementation of the European Qualifications Framework (EQF), the e-CF fits for application by ICT service, demand and supply organisations, companies, for managers and HR departments, for education institutions and training bodies, including higher education, for market watchers and policy makers, public and private sectors.

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[1]   The CEN Workshop on ICT Skills is a network of experts representing the ICT industry, academic institutions, vocational training organisations, ICT professional associations, social partners and research institutions, which aims to promote excellence in the ICT sector and strengthen the ICT profession through the creation of relevant supporting standards that can be applied through Europe and around the world.

Annex C –

Recommendation Reports of the three Working Groups

Digital 21 Strategy Advisory Committee

Task Force on ICT Professional Development and Recognition

**Recommendation Report from the
Working Group on Cross Recognition with Mainland
and the World (WG1)**

Purpose

This paper presents the recommendations of the Working Group on Cross Recognition with Mainland and the World for consideration by the Task Force on ICT Professional Development and Recognition (Task Force).

Background

2.   With reference to international practices and frameworks of other jurisdictions, the Task Force has come up with a proposed ICT professional recognition framework for Hong Kong (Proposed Framework) and consulted various stakeholder groups including the Panel on Information Technology and Broadcasting of the Legislative Council in the first half of 2014.   In response to comments received, three working groups with expanded industry participation were formed to examine three key areas in more details.

3.   The **Working Group on Cross Recognition with Mainland and the World** was formed with the following terms of reference:

> ➢ To explore cross recognition opportunities with the Mainland and other jurisdictions, and identify any potential issues to address;

> ➢ To develop a high level framework for mutual recognition with the Mainland with respect to other jurisdictions; and

> ➢ To propose an action plan to pave way for cross recognition arrangements under the Proposed Framework.

4.   The list of members of the Working Group is in **Annex A**.

5.   The Working Group conducted two meetings on 15 October 2014 and 19 December 2014.   In between the two meetings, a questionnaire (in **Annex B**) was issued to members to collect their views on developing practical scenarios of cross recognition with Mainland and other jurisdictions.

6.   This paper presents the considered views of the Working Group. It suggests a **definition** of cross recognition for the purpose of the recommendations, identifies **various forms and opportunities** of cross recognition that should be explored, and recommends a **framework** for cross recognition as well as the **actions** to take matters forward.

Definition of Cross Recognition

7.   The Working Group notes that cross recognition between two parties can be mutual, that is, reciprocated, or it can involve only one party recognising the other and not the other way round at a certain stage. The Working Group is of the opinion that depending on the readiness and relationship between the parties involved, as well as any track record in cross recognition collaboration between the parties, different approaches to cross recognition may be more suitable under different circumstances. For this reason, the Working Group proposes to adopt a broader meaning of "cross recognition" in that **one-way, mutual or reciprocal recognition** between / among qualifications awarding jurisdictions, bodies or schemes can all be pursued.

Opportunities of Cross Recognition

8.   There are several forms of cross recognition that could be explored for inclusion under the Proposed Framework –

   (a) **Cross recognition with Mainland** – A Mainland ICT professional qualification scheme to be recognised under the Proposed Framework or vice versa (i.e. qualifications recognised under the Proposed Framework to be recognised by the Mainland);

(b) **Cross recognition with other jurisdictions** – At present, ICT practitioners in Hong Kong can acquire professional qualifications offered under a number of schemes operated by overseas professional organisations or certification bodies through their local Chapters / Sections or their reciprocal recognition agreements with local qualifications awarding bodies. Some of these overseas schemes could obtain recognition under the Proposed Framework or vice versa;

(c) **Participation in international forums / alliances** on the recognition of ICT professional qualification and competency such as the Seoul Accord[1], the International Professional Practice Partnership[2] (IP3) under the International Federation for Information Processing[3] (IFIP) or the international engineering agreements[4] (which comprises International Professional Engineers Agreement (IPEA), the Washington Accord, the Sydney Accord, etc.); and

(d) **Cross-jurisdiction collaboration** leading to the above or other forms of cross recognition.

9. The Working Group is of the view that **cross recognition with the Mainland is of particular importance** considering its close proximity and economic relationship with Hong Kong, and that systems on the recognition of professional ICT qualifications are fast developing in the Mainland. In the past few years, the industry bodies in the Mainland have taken up a stronger lead on ICT professional recognition. More work should be done to proactively explore cross recognition opportunities between the two places.

10. The Working Group takes note of cross recognition arrangements that exist or are being explored by different qualifications awarding bodies (a summary is in **Annex C**). We should actively **explore further cross recognition opportunities** taking advantage of these platforms.

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[1] http://www.seoulaccord.org
[2] http://ipthree.org
[3] http://www.ifip.org
[4] http://www.ieagreements.org

Framework for Cross Recognition

11.   Qualifications awarding bodies in Hong Kong have always been collaborating with their counterparts and pursuing opportunities to align and map relevant qualifications and, where appropriate, enter into arrangements on cross recognition including reciprocal recognition of professional qualifications.   This will continue after the establishment of the Proposed Framework.   The benefit of having the Proposed Framework is that the Awarding Body will be in a position to provide leadership.   It can identify counterpart(s) in the Mainland and other jurisdictions for collaboration and proactively develop high-level frameworks between Hong Kong and other jurisdictions to facilitate the further development of cross recognition.

12.   The high-level frameworks can take the form of **"Master Agreement(s)"** that set out agreed general rules of collaboration in cross recognition.   Under the auspices of the Master Agreements, qualifications awarding bodies in Hong Kong, individually or in joint collaboration among themselves, or the Awarding Body, can pursue cross recognition between professional qualifications schemes under the Proposed Framework and those in other jurisdictions.   Such cross-jurisdiction recognition arrangements will benefit from enhanced efficiency, consistency and trust-worthiness that the Proposed Framework brings about.

The Awarding Body

13.   The Awarding Body under the Proposed Framework should facilitate cross recognition while **individual qualifications awarding bodies should retain their autonomy on cross recognition**.   Under this principle, the Awarding Body should assume the following roles in cross recognition –

(a)   To provide a **platform for joint consultation** among local qualifications awarding bodies and with other stakeholders in the area of cross-jurisdiction recognition;

(b)   To **facilitate** qualifications awarding bodies in pursuing cross-jurisdiction recognition and related collaboration;

(c) To assist qualifications awarding bodies in **soliciting the HKSAR Government's support**, where necessary, in obtaining governmental support in counterpart jurisdictions; and

(d) Where appropriate, to **represent Hong Kong** in establishing **Master Agreement(s)** with counterparts in the Mainland and other jurisdictions.

14. The Awarding Body should **establish the appropriate structure**, e.g. committee / sub-committee, to carry out the above roles.

Qualifications Awarding Bodies

15. Qualifications awarding bodies should undertake the **substantive work** in seeking opportunities leading to cross recognition of professional qualification schemes between Hong Kong and the Mainland and other jurisdictions. Within Hong Kong, **internal collaboration** among qualifications awarding bodies should enhance overall success in cross recognition with jurisdictions outside Hong Kong. Such internal collaboration should benefit from effective facilitation by the Awarding Body.

The HKSAR Government

16. In jurisdictions where the government plays a strong supporting role in professional recognition, it may be more appropriate for the HKSAR Government to work closely with the relevant government agencies in those jurisdictions to **give official government backing** for the Awarding Body and/or the qualifications awarding bodies entering into collaboration or cross recognition agreements with their counterparts. In the Mainland, this could involve government agencies at the central (i.e. a Ministry of the Central People's Government), provincial (e.g. Guangdong) and municipal (e.g. Shenzhen) levels.

Proposed Actions on the Way Forward

17.   Success of the proposed framework for cross recognition will depend heavily on the **participation of the qualifications awarding bodies** in Hong Kong.   The Working Group is of the view that coordinated cross recognition efforts should be initiated as soon as possible.   Parties interested in participating in the Proposed Framework and cross recognition with the Mainland and other jurisdictions should be encouraged to set up **a platform for consultation, coordination and collaboration among themselves** as soon as possible before the establishment of the Awarding Body.

18.   We should also **encourage** qualifications awarding bodies to explore different ways in pursuing cross recognition of their professional qualification schemes with the Mainland and other jurisdictions.

Conclusion

19.   The Working Group has considered **various forms and opportunities** of cross recognition that we could explore as described in paragraphs 8 - 10.   The Working Group recommends for the consideration of the Task Force the **framework for cross recognition** as proposed in paragraphs 11 - 16, and the **actions to take matters forward** in paragraphs 17 - 18.

The Secretariat, Task Force on ICT Professional Development and Recognition

On Behalf of the Working Group on Cross Recognition with Mainland and the World

February 2015

Membership List of the Working Group on Cross Recognition with Mainland and the World

Convenor:

Ir Dennis Pang

Members:

Ir Stephen Lau

Ir Prof KS Leung

Ir William Li

Mr Marco Ma

Dr Johnny Ng

Ir Dr George Sze

Dr CK Wong

Adviser:

Mr Albert Chow

<u>Annex B to WG1 Report</u>

Questionnaire on Developing Practical Scenarios of Cross Recognition with Mainland and Other Jurisdictions

1. Developing practical scenario(s) of cross recognition with Mainland

    Assume, for discussion purposes, that under the proposed ICT Professional Recognition Framework for Hong Kong[1] (the HK Framework), there could be **multiple** cross recognition arrangements between professional qualifications[2] schemes under the HK Framework and scheme(s) on the Mainland (X-Arrangements w/ Mainland). A X-Arrangement w/ Mainland can be initiated and led on the HK side by either the Awarding Body to be formed under the HK Framework[3] (the Awarding Body) or by any one Participating Qualifications Awarding Bodies in HK[4] (PQABs), in collaboration with the others. The X-Arrangement w/ Mainland should be developed in line with the policy and principles of the HK Framework.

    This questionnaire adopts a broad meaning of "cross recognition" that is not restricted to one-way (either way) or two-way recognition between / among two or more qualifications awarding jurisdictions, bodies or schemes.

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[1] "The HK Framework" refers to the framework as described in paragraphs 8 to 16 of LegCo ITB Panel Paper, also annexed in PDTF-WG1 Paper No. 1.

[2] "qualification(s)" and "qualification scheme(s)" used in this document refer to IT professional qualifications conferred on an individual practitioner and schemes for that purpose.

[3] "The Awarding Body" refers to the body described in paragraph 11 of the above mentioned ITB Panel Paper.

[4] "PQABs" refer to bodies that operate ICT professional qualification schemes, which aspire to be recognized and expect to participate in The HK Framework, as discussed in paragraph 10(b) of the above mentioned ITB Panel Paper.

Under the above scenario, please provide your input as follows:

a. Suggest and describe a specific form of cross recognition with the Mainland that can be developed. Illustrate how, under the X-Arrangement w/ Mainland at a substantial stage of establishment, a PQAB could expect to recognize a Mainland qualification (e.g. the qualification will be deemed to have satisfied certain requirement(s) for a named professional qualification scheme operated by the PQAB), or vice versa (i.e. recognition by the Mainland).

b. Identify as the counterpart for cross recognition, the target Mainland qualifications scheme(s) or framework(s), the corresponding Mainland authority and its immediate sponsoring government organisation (e.g. Department / Commission) at the Central or Provincial Government level (identify the Government) where applicable.

c. Consider whether it is more pragmatic and effective for the Awarding Body itself or individual PQABs (or both) to initiate the X-Arrangement w/ Mainland. While the Awarding Body has the benefit of a collective representation of multiple PQABs under an agreed and aligned professional standard, nothing very solid could be discussed at this stage until the HK Framework is launched and the Awarding Body is formed. On the other hand, individual PQABs could ride on existing channels already established among them and their Mainland counterparts and continue the dialogue on further cross recognition opportunities, with the establishment of the HK Framework in mind.

d. If it is considered that PQABs are suitable parties for pursuing the X-Arrangement w/ Mainland, suggest which PQAB(s) can take the lead and the possible form(s) of participation by other PQABs during the initial and subsequent stages of development.

e. Suggest the role of the Awarding Body at various stages.

f. Suggest any desired specific action(s) from the HKSAR Government in aid of the development at various stages.

g. Suggest the intended benefit(s) to stakeholders in HK to be delivered by the suggested X-Arrangement w/ Mainland.

h. Suggest the actions that can be pursued to kick off the development of the X-Arrangement w/ Mainland and the intended interim deliverable(s) within the first year of the kick-off actions that should lead to the desired longer term outcome.

2. Developing practical scenario(s) of cross recognition with other jurisdictions.

At present, ICT practitioners in HK can acquire professional qualifications offered under a number of schemes operated by overseas jurisdictions (Overseas Schemes). Examples of Overseas Schemes include those operated by BCS and IET. The awarding bodies of these Overseas Schemes are represented in HK through their local Chapters / Sections. It can be anticipated that some of these Overseas Schemes could be recognized under the HK Framework and that will be a form of cross recognition. Suggestions are invited on any practical scenarios for further enhancement of such cross recognition under the HK Framework. Please respond to the following:

a. Identify Overseas Scheme(s) presently available in HK and suggest practical initiatives that can be implemented to enhance cross recognition of the Overseas Scheme(s) under the HK Framework.

b. Please give suggestions along the lines of 1(b) to 1(h) above as appropriate.

3.   Alignment (or mapping) with international professional qualification and competency frameworks.

       As one of its key principles, the HK Framework will make reference to existing well established international qualification and competency frameworks (Overseas Frameworks) such as SFIA to help gain international recognition [5].   There are also other frameworks such as IP3[6] under IFIP[7]. Suggestions are invited on any practical scenarios for developing cross recognition or alignment between an Overseas Framework and the HK Framework. Please give suggestions along the lines of Question (2) above, as appropriate.

4.   Participation in international forums / alliances on the recognition of ICT professional qualification and competency.

       Participation in relevant international forums or alliances should also help enhance international cross recognition for the HK Framework. Please give practical suggestions along the lines of Question (3) above, as appropriate.

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[5]   Please refer to paragraph 10(c) of the above mentioned ITB Panel Paper.
[6]   http://ipthree.org
[7]   http://www.ifip.org

Annex C to WG1 Report

Some Existing Cross Recognition Arrangements between Hong Kong and the Mainland or Other Jurisdictions

a) **The Hong Kong Computer Society (HKCS)** has initiated discussions with the「工業和信息化部教育與考試中心」(the Centre) to explore cross recognition possibilities with the「計算機技術與軟件專業技術資格（水平）考試」.   There is suggestion to resume the previous arrangement of having some of the examinations offered by the Centre in Hong Kong; assist the Centre in the adoption of these selected examinations to reflect the needs of Hong Kong; and further promote these examinations through some of the qualifications awarding bodies.   In parallel, HKCS could explore with the Centre for offering some of their more senior titles that are currently offered in Hong Kong through collaborative organisations in the Mainland. Starting from 1 October 2014, 「中港資訊科技人才發展中心」is authorised to coordinate the examinations in Hong Kong.

b) **The Hong Kong Institution of Engineers (HKIE)** has established a Reciprocal Recognition Agreement (RRA) with **the China Association for Science & Technology (CAST)**[1], which currently applies to the Electrical, Mechanical and Manufacturing & Industrial Engineering Disciplines.   Applicants from the Mainland should qualify through the CAST and on the approval of the CAST, apply Fellowship of the HKIE.   Similarly, applicants from Hong Kong should qualify through the HKIE and on approval of the HKIE, apply Senior Members (Senior Engineers) of the corresponding institutions in the Mainland.   Riding on this arrangement, HKIE could consider exploring with the CAST on the feasibility of including the ICT discipline in the RRA.

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[1]   http://www.cast.org.cn

c) **The British Computer Society (BCS)** and **the Institution of Engineering and Technology (IET)** have also established RRAs with the **HKIE**.   Under the Agreements, members of the BCS and the IET who are Chartered Engineers may be admitted to the HKIE in the Information Discipline subject to general and additional conditions.   Similarly, members of the HKIE in the Information Discipline may be admitted to the membership of the BCS or the IET with Chartered Engineer registration.

d) **The Engineers Registration Board (ERB)** recognises professional membership of **BCS**, **HKCS** and **IET**, based upon their RRAs with the **HKIE**, as qualifications acceptable for registration by the ERB.

e) The **HKIE** is a signatory to the following international engineering agreements[2] and the Seoul Accord[3]:

Washington Accord - recognises substantial equivalence in the accreditation of **academic qualifications in professional engineering** (including information and computer engineering). The engineering degrees accredited by the HKIE are recognised by other signatories, and vice versa.   Full Signatories to the Washington Accord include Australia, Canada, Chinese Taipei, Hong Kong, India, Ireland, Japan, Korea, Malaysia, New Zealand, Russia, Singapore, South Africa, Sri Lanka, Turkey, the United Kingdom and the United States.

Sydney Accord - recognises substantial equivalence in the accreditation of **academic qualifications in engineering technology** (including computing programmes).   The higher diplomas and associate degrees accredited by the HKIE are recognised by other signatories, and vice versa.   Full Signatories to the Sydney Accord include Australia, Canada, Chinese Taipei, Hong Kong, Ireland, Korea, New Zealand, South Africa, the United Kingdom and the United States.

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[2]   http://www.ieagreements.org
[3]   http://www.seoulaccord.org

International Professional Engineers Agreement (IPEA) - establishes an international standard of competence for professional engineering and provides a framework for the **recognition of experienced professional engineers** (including information and computer engineers) by representative organisations in the signatory jurisdictions. Each representative organisation is authorised to establish a register for those engineers wishing to be recognised as meeting the generic international standard. Full Members of IPEA include Australia, Canada, Chinese Taipei, Hong Kong, India, Ireland, Japan, Korea, Malaysia, New Zealand, Singapore, South Africa, Sri Lanka, the United Kingdom and the United States.

APEC Engineer - operates in a similar protocol as the IPEA. Member economies include Australia, Canada, Chinese Taipei, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Russia, Singapore, Thailand and the United States.

International Engineering Technologist Agreement (IETA) - provides a framework for the **recognition of experienced engineering technologists** (including computing technologists) by representative organisations in the signatory jurisdictions. Each representative organisation establishes a register for those engineering technologists wishing to be recognised as meeting the generic international standard. Full Members of the IETA include Canada, Hong Kong, Ireland, New Zealand, South Africa and the United Kingdom.

Seoul Accord - recognises substantial equivalence in the accreditation of **academic qualifications in Computing and ICT related education**. The computer science degrees accredited by the HKIE would be recognised by other signatories, and vice versa. Other Full Signatories to the Seoul Accord include Australia, Canada, Chinese Taipei, Japan, Korea, the United Kingdom and the United States.

f)   Holders of **Project Management Professional (PMP)** certification in good standing, with an academic qualification of at least Qualifications Framework (QF) level 4 in IT or an IT-related area plus five years of project management experience are eligible to apply for the Certified Professional of IT (CPIT) (Project Manager) title of **the Hong Kong Institute for IT Professional Certification (HKITPC)**.

g)   Holders of all of the **ITIL** certificates in Foundation, Operational Support & Analysis, and Release Control & Validation, with an academic qualification of at least QF level 4 in IT or an IT-related area plus two years of relevant IT work experience are eligible to apply for the CPIT (Systems Operation Officer) title of the **HKITPC**.

Digital 21 Strategy Advisory Committee

Task Force on ICT Professional Development and Recognition

<u>Recommendation Report from the</u>
<u>Working Group on Impacts upon SMEs (WG2)</u>

Purpose

This paper presents the recommendations of the Working Group on Impacts upon SMEs for consideration by the Task Force on ICT Professional Development and Recognition (Task Force).

Background

2. With reference to international practices and frameworks of other jurisdictions, the Task Force has come up with a proposed ICT professional recognition framework for Hong Kong (Proposed Framework) and consulted various stakeholder groups including the Panel on Information Technology and Broadcasting of the Legislative Council in the first half of 2014. In response to comments received, three working groups with expanded industry participation were formed to examine three key areas in more details.

3. The **Working Group on Impacts upon SMEs** was formed with the following terms of reference:

> ➢ To study and analyse the impact of the Proposed Framework upon SMEs; and

> ➢ To recommend ways to enhance the Proposed Framework to assist the SMEs and to provide incentives for adoption.

4. The list of members of the Working Group is in **<u>Annex A</u>**.

5. The Working Group conducted three meetings on 28 October 2014, 1 December 2014 and 6 January 2015. The following areas were discussed:

➢ The **potential impacts** of the Proposed Framework upon SMEs;

➢ **Ways to alleviate SMEs' concerns and to reduce the impacts** upon them;

➢ **Possible incentives for adoption** of the Proposed Framework by SMEs; and

➢ **Promotion programmes** of the Proposed Framework.

Potential Impacts of the Proposed Framework upon SMEs

6. The Working Group has analysed the number of ICT practitioners working in SMEs to gauge the extent of the potential impacts. It is noted that as at May 2012, the total number of ICT practitioners working in SMEs in Hong Kong was around 26 500 which accounted for 34% of the total ICT workforce at around 78 700. Of these ICT practitioners in SMEs, around 16 700 and 9 800 were working in ICT SMEs (ICT products and services suppliers) and general SMEs (non-ICT SMEs) respectively. For details, please refer to **Annex B**.

7. The Working Group is of the view that as the impacts upon general SMEs and ICT SMEs are not the same, their concerns should be addressed separately.

General SMEs

8. The Working Group observed that general SMEs have the following major concerns on the possible impacts brought about by the Proposed Framework –

(a) The Proposed Framework might **drive up the costs of employing qualified practitioners**;

(b) The **ICT manpower shortage problem** currently experienced by them might not be eased by the Proposed Framework in particular if it is mandatory; and

(c) The Proposed Framework is not essential to them as they are **already referencing existing technical certifications** in their recruitment.

ICT SMEs

9. The Working Group observed that ICT SMEs have the following major concerns on the possible impacts brought about by the Proposed Framework –

(a) They might have difficulty in competing with large enterprises to attract and retain the qualified ICT practitioners **with the remuneration package driven up**;

(b) **ICT professionals from the Mainland and other economies might not be able to apply for ICT jobs in Hong Kong** if their qualifications are not recognised by the Proposed Framework; and

(c) They might be **disadvantaged compared to large enterprises when bidding for tenders** which have mandatory requirements for qualifications under the Proposed Framework. They might need to **spend extra cost in supporting their employees to attain the qualifications**.

Ways to Alleviate SMEs' Concerns and to Reduce the Impacts upon Them

General SMEs

10. To alleviate general SMEs' concerns as mentioned in paragraph 8 above, the Working Group is of the view that **more vigorous promotion to SMEs should be carried out to let them understand the principles and benefits of the Proposed Framework**. The key messages should include –

(a) While the Proposed Framework might inevitably raise the costs of employing qualified practitioners in the short term, it is anticipated that **the costs would be driven down with the increasing supply of ICT practitioners in the longer run** when more young and talented people choose ICT in their studies and as their career;

(b) **The Proposed Framework will be voluntary-based** for at least a certain number of years until a critical mass of adoption is achieved to ensure that ICT manpower supply will not be disrupted;

(c) **The Proposed Framework can assure the professionalism and code of conduct of the ICT practitioners**, which may not be covered by the technical or vendor-specific certifications. This is important as the ICT employees may get hold of some key information of the company such as customer database or financial data.

ICT SMEs

11.　　Similarly, to alleviate ICT SMEs' concerns as mentioned in paragraph 9, **the following key messages could be conveyed** to them –

(a) The Proposed Framework can help them compete with larger ICT enterprises as it will provide a common and consistent basis to evaluate the quality of their workforce. Having their staff attained the recognition will **enable them to negotiate better pricing for their services** as the recognition can assure their clients of the quality of their staff and services;

(b) **Professional organisations outside Hong Kong will be encouraged to apply for recognition** under the Proposed Framework. On the other hand, the Proposed Framework could **help ICT SMEs get access to overseas markets** as the Proposed Framework will align with international standards and elevate the professional image and profile of our ICT practitioners;

(c) **The Proposed Framework will be voluntary-based** and the clients should consider **pragmatically** specifying any preferable or mandatory requirement in tenders. The more stringent qualification requirements should **only be applied to certain key roles or critical projects**.

Possible Incentives for Adoption of the Proposed Framework by SMEs

12. The Proposed Framework could facilitate the market to eventually come up with a set of **benchmarking remuneration packages for ICT practitioners** at different professional and competency levels. This could bring incentives to both general SMEs and ICT SMEs as it would provide a clear guideline for them to identify and employ competent and qualified ICT practitioners at the level they require, set the remuneration packages with reference to the benchmarks and thus help them **better utilise their resources**.

13. To provide further incentive for faster adoption, **leveraging on existing support schemes for SMEs** may be considered to encourage both general SMEs and ICT SMEs to adopt the Proposed Framework and facilitate their practitioners to attain the required qualifications. Professional organisations, SME associations and/or the Awarding Body to be formed may consider seeking funding from such support schemes to initiate **programmes for promoting the Proposed Framework and encouraging ICT practitioners in SMEs to attain the required qualifications**. Possibility of funding support could be explored from the following schemes –

General Support Programme under the Innovation and Technology Fund

14. General Support Programme (GSP)[1] is a programme under the Innovation and Technology Fund[2] administered by the Innovation and Technology Commission. GSP caters for non-R&D projects that contribute to the **upgrading and development of the industries** as well as fostering an innovation and technology culture in Hong Kong.

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[1] https://www.itf.gov.hk/l-eng/GSP.asp
[2] https://www.itf.gov.hk/l-eng/about.asp

15.   Projects to be supported under GSP may include conferences, exhibitions, seminars, workshops, promotional events, studies and surveys, youth activities, events or projects to support platform building / upgrading of industry, etc.

SME Development Fund

16.   The SME Development Fund (SDF)[3] managed by the Trade and Industry Department provides financial support to non-profit distributing organisations to implement projects which aim to **enhance the competitiveness of Hong Kong's SMEs** in general or in specific sectors.

17.   All proposals that are conducive to enhancing the competitiveness of Hong Kong's SMEs may apply.   Examples include seminars, workshops, conferences, exhibitions, research studies, award schemes, codes of best practices, etc.

Promotion Programmes of the Proposed Framework

18.   Well planned promotion programmes are essential for the successful rollout of the Proposed Framework.   The promotion programmes should be **clearly segmented by target audience groups** such as students, parents, junior practitioners, professionals, employers, etc. to enhance their effectiveness.   They should be designed with due consideration to the characteristics of the target audiences and be innovative enough to attract attention.   For those audience groups younger in age, it would be more effective to soft sell the Proposed Framework to them through social media.

19.   Furthermore, the establishment of some **key performance indicators** would be useful to measure the effectiveness of the promotion programmes.

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3   https://www.smefund.tid.gov.hk/english/sdf/sdf_objective.html

Conclusion

20.   The Working Group has analysed the **potential impacts** as described in paragraphs 8 - 9.   The Working Group recommends for the consideration of the Task Force the **alleviation measures** in paragraphs 10 - 11, the **possible incentives** in paragraphs 12 - 17, as well as **promotion programmes** in paragraphs 18 - 19.

The Secretariat, Task Force on ICT Professional Development and Recognition

On Behalf of the Working Group on Impacts upon SMEs

February 2015

Membership List of the Working Group on Impacts upon SMEs

C-23

Convenor:

Dr Wendy Lee

Members:

Mr Raymond Cheng

Mr Cheung Ga-lam

Mr Duncan Chiu

Hon Charles Mok

Mr Wilson Shea

Ir Dr George Sze

Ms Satti Wong

Mr Eric Yeung

Number of ICT Practitioners Working in SMEs

Based on the "2012 Manpower Survey of the Information Technology Sector"[1] ("Survey") conducted by the Committee on Information Technology Training and Development of the Vocational Training Council, the total number of ICT employees in Hong Kong (including freelancers) was 78 685 as at May 2012.

According to the definition of SMEs by the "Support and Consultation Centre for SMEs" of the Trade and Industry Department, manufacturing enterprises with fewer than 100 employees and non-manufacturing enterprises with fewer than 50 employees are considered as SMEs in Hong Kong[2].   With this definition and based on the Survey, **as at May 2012, the total number of ICT practitioners working in SMEs in Hong Kong was around 26 500** (34% of the total ICT workforce in Hong Kong at around 78 700) –

Sector	SME	Non-SME
Government	2 470 (3%)	
ICT-related sectors	16 675 (21%)	14 315 (18%)
Other business sectors	9 833 (13%)	35 392 (45%)
	SME Total: 26 508 (34%)	**Non-SME Total:** 49 707 (63%)

Of these 26 500 ICT practitioners, around 16 700 were working in ICT SMEs (ICT products and services suppliers) while around 9 800 were working in general SMEs (non-ICT SMEs).   Further breakdown is shown on the next page.

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[1]   http://www.vtc.edu.hk/html/en/about/manpower_publications1813.html
[2]   http://www.success.tid.gov.hk/english/aboutus/sme/service_detail_6863.html

Employment Size	Manufacturing	Electricity, Gas and Water	Construction	Wholesale, Retail and Import/ Export Trades, Catering and Hotels	Transport and Storage Services	Financing, Insurance, Real Estate and Business Services	Medical and Health Care Services	Community, Social and Personal Services	Communications Services	IT Products and Services Supplies	Digital Creative	Government B/Ds	Total
1 – 4	585	-	-	368	-	11	-	7	12	5 867	38	-	6 888
5 – 9	208	-	-	1 002	7	-	-	79	-	2 695	70	-	4 061
10 – 19	114	-	72	1 043	-	-	-	43	236	3 545	61	-	5 114
20 – 49	261	-	-	2 719	108	1 226	41	1 691	71	3 825	255	2	10 199
50 – 99	248	-	176	1 172	131	939	6	1 822	274	3 412	192	9	8 381
100 – 199	572	-	19	2 706	145	1 676	3	1 902	598	2 262	20	23	9 926
200 – 499	384	-	51	3 248	567	1 485	30	489	816	1 309	44	105	8 528
500 & Over	495	374	106	3 682	879	8 199	670	3 464	1 740	3 648	-	2 331	25 588
SME Total	1 416	0	72	5 132	115	1 237	41	1 820	319	15 932	424		26 508
	SME (Non-ICT related): 9 833								SME (ICT-related): 16 675				
Non-SME Total	1 451	374	352	10 808	1 722	12 299	709	7 677	3 428	10 631	256		49 707
	Non-SME (Non-ICT related): 35 392								Non-SME (ICT-related): 14 315				
Total	2867	374	424	15 940	1 837	13 536	750	9 497	3 747	26 563	680	2 470	78 685
	Total (Non-ICT related): 45 225								Total (ICT-related): 30 990				

Digital 21 Strategy Advisory Committee

Task Force on ICT Professional Development and Recognition

<u>Recommendation Report from the</u>
<u>Working Group on Recognising Technologists (WG3)</u>

Purpose

This paper presents the recommendations of the Working Group on Recognising Technologists for consideration by the Task Force on ICT Professional Development and Recognition (Task Force).

Background

2.   With reference to international practices and frameworks of other jurisdictions, the Task Force has come up with a proposed ICT professional recognition framework for Hong Kong (Proposed Framework) and consulted various stakeholder groups including the Panel on Information Technology and Broadcasting of the Legislative Council in the first half of 2014.   In response to comments received, three working groups with expanded industry participation were formed to examine three key areas in more details.

3.   The **Working Group on Recognising Technologists** was formed with the following terms of reference:

> ➢   To study the feasibility of including the recognition of ICT technologists (e.g. comparable to SFIA[1] Level 3) under the proposed framework; and

> ➢   To recommend an action plan to include such recognition in the proposed framework.

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[1]   Skills Framework for the Information Age (SFIA): http://www.sfia-online.org/

4.   The list of members of the Working Group is in **Annex A**.

5.   The Working Group conducted three meetings on 8 October 2014, 7 November 2014 and 10 December 2014.   The following areas were discussed:

> ➢   The **need, the feasibility and the readiness** to include the recognition of ICT technologists under the Proposed Framework;

> ➢   The **costs, benefits and impacts** if such recognition is to proceed; and

> ➢   The **proposed framework and the funding requirement** for implementing the recognition.

The Need, the Feasibility and the Readiness for Recognising ICT Technologists

6.   From the "2012 Manpower Survey of the Information Technology Sector" [2] conducted by the Committee on Information Technology Training and Development of the Vocational Training Council, it is noted that about 58% of the local ICT workforce are at technologist level (details are in **Annex B**) and **there should thus be a high market demand for qualified technologists**.

7.   Comparing to the needs for recognising professionals in the Proposed Framework, **ensuring the quality of junior practitioners** would be of the same importance as they are relatively young and inexperienced but they are the front-line staff to develop and support the IT systems day-to-day.   It is also important to be able to **inspire these junior practitioners and students** of tertiary educational institutes that ICT industry can offer rewarding and clearer defined career opportunities to them.   The Working Group therefore considered that **there is the need to include the recognition of ICT technologists under the Proposed Framework**.   It is common for other professions like legal and accounting to have recognitions at multiple levels and ICT should be of no difference.

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[2]   http://www.vtc.edu.hk/html/en/about/manpower_publications1813.html

8.   With consideration on the potential resource impact and that the original design of the Proposed Framework is to recognise qualification schemes instead of individuals, the Working Group considered that **it would be more feasible if the recognition at technologist level is also targeted at qualification schemes instead of individuals**.   The recognition of technologist schemes could also help encourage and motivate the professional organisations to enrich their provision on technologist qualification schemes.

9.   At present, **there are already a number of existing qualification schemes set at the "technologist" level** (a summary is in **Annex C**).   These schemes are awarded based on a combination of academic qualification, examination, experiences and/or competency assessment.   Most of them require the candidates to demonstrate competency at Qualifications Framework (QF) level 4 / SFIA level 3 or equivalent.   The schemes also have requirements on continuing professional development and codes of conduct and ethics.

10.   To attract the technologists to attain the qualifications and the recognition, employers' buy-in will be most essential.   For **large enterprises, they might be more ready to adopt the Proposed Framework** as they are looking for a consistent level of high quality and are more able to invest on it.   However, for **SMEs and non-government organisations (NGOs), they would have more concerns**.   There is another working group (Working Group on Impacts upon SMEs) established to look into this issue and make recommendations accordingly.

Costs, Benefits and Impacts Arising from Recognising ICT Technologists

11.   The proposed recognition of technologists would inevitably drive up the cost of various stakeholders to some extent at the start.   For example, professional organisations might have to invest on enriching their technologist schemes, employers might have to pay more to recruit qualified staff.   In this regard, we need to **strengthen the benefits brought about by the Proposed Framework**.

12.   On the benefits, by extending the Proposed Framework to cover technologists, it would **facilitate employers to specify more concrete requirements for recruiting competent junior ICT practitioners**, which could **ensure better quality** and **higher effectiveness**, leading to enhanced return on investment and business success.

13.   Inclusion of technologist schemes would also **provide practitioners with a clear progression pathway** for their career development and advancement, giving young people more incentive to choose ICT in their studies and as their career.   This could gradually help **relieve the ICT manpower supply shortage issue** currently experienced by some employers.   In the longer run, the cost will be maintained at a reasonable level with the increased manpower supply.

Proposed Framework and Funding Requirement for the Implementation

Principles

14.   The three key principles adopted by the Proposed Framework for recognising professionals are **voluntary-based**, **recognition of the ICT professional qualification schemes** (and not individual practitioners), and **alignment with local and international ICT qualification and competency frameworks**.   For recognising technologists, the Working Group considered that **the same set of principles could be followed**. Having similar mechanisms for recognising both professionals and technologists could help ensure consistency and provide a clear pathway to practitioners on development and advancement.

Recognition Criteria

15.   The recognition criteria adopted by the Proposed Framework for recognising professional schemes include:

> ➢ The type of qualification awarded **meets an appropriate professional standard** *(based on a combination of academic qualification, examination, experience assessment, and/or other forms of competency-based assessment)*;

> **Continuing professional development (CPD)** and **code of ethics** requirements are put in place;

> The necessary **processes** and **expertise** to evaluate qualification of individuals are put in place; and

> The qualification awarding body has the necessary **organisational capability** and **maturity** to manage the qualification programme.

16.   The Working Group is of the view that **all these criteria are applicable to the technologist schemes** as well although **individual criteria might pitch at a different level of requirement for professionals and technologists** (e.g. competency requirements set at SFIA level 5 for professionals and level 3 for technologists) given that the latter are relatively less experienced and their level of responsibility not as critical in general.

17.   CPD is required at technologist level to upkeep their professional and technical knowledge.   The requirement could be achieved through **a mix of structured and unstructured CPD activities for higher flexibility**.

Generic vs Specialism

18.   **Specialism could be optionally applied** to the technologist level as the work of technologists would usually focus on specific work areas.   **The specialisation should focus on broad work areas** (such as cyber security, database administration or network administration) instead of drilling down to a specific technology or programming language as they would be fast changing.   This could facilitate employers to identify and recruit the right persons.

Institutional Set-Up

19.   The proposed institutional set-up in the form of an Awarding Body for recognising professionals comprises a Governing Board, an Assessment Committee, an Appeal Panel and a Secretariat.   The Working Group is of the view that the **same set-up should be shared by both the recognition of professional and technologist schemes** as this could ensure consistency and enable more effective use of resources. While a single Assessment Committee would suffice for the assessment of both professional and technologist schemes, **the composition and number of members might need to be adjusted upwards** to cater for the increased workload accordingly.

Funding Requirement

20.   The Working Group is of the view that **the estimated recurrent cost of $2 million per annum for the operation of the Awarding Body needs to be increased significantly especially for the initial few years** when publicity and promotional events to the different stakeholder groups (such as Human Resource (HR) personnel [3], SMEs, academia, professional organisations and practitioners) would be crucial. **Vigorous promotional campaigns should be launched** to raise the community's awareness on the Proposed Framework in order to build up a critical mass of users within the shortest possible timeframe.   Once a **critical mass is formed**, the recurrent operating cost could be **maintained at a reasonable level** and be able to **share among the participating organisations**.

Implementation Timetable

21.   To provide a clear progression pathway to the practitioners, **the recognition of both professional and technologist schemes should be launched at the same time**.   This could also enhance the cost effectiveness of the promotional campaigns in promoting both levels of the recognition together.

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[3]   HR personnel should be encouraged to adopt the Proposed Framework in their recruitment process.   As it might take some time for HR personnel to get familiar with and adopt the Proposed Framework, it would be important to plan for a proper and consistent method to cover the HR personnel in the promotion and publicity plan.

Conclusion

22.   The Working Group has established **the need, the feasibility and the readiness** for recognising technologists in paragraphs 6 - 10. The Working Group then analysed **the costs, the benefits and the impacts** arising from recognising technologists in paragraphs 11 - 13. The Working Group recommends for the consideration of the Task Force the **proposed framework and the funding requirement** for recognising technologists in addition to professionals in paragraphs 14 - 21.

The Secretariat, Task Force on ICT Professional Development and Recognition

On Behalf of the Working Group on Recognising Technologists

February 2015

Annex A to WG3 Report

Membership List of the Working Group on Recognising Technologists

Convenor:

Mr Edmand Cheung

Members:

Ir Dr Alex Chan

Dr Witman Hung

Ir Sunny Lee

Ms Judy Leung

Ir William Li

Mr Peter Miao

Ir Dr CM Ng

Ir Dennis Pang

Breakdown of ICT Employees by Job Titles from the 2012 Manpower Survey of the IT Sector

Based on the "2012 Manpower Survey of the Information Technology Sector" conducted by the Committee on Information Technology Training and Development of the Vocational Training Council, the total number of ICT employees in Hong Kong was around 78 700 as at May 2012.   By analysing their job titles and responsibilities, an estimation on the number of ICT employees at different skills levels is as follows:

	SFIA / QF [1] Level	Number of Employees	Percentage
Professionals	7	1,438	2%
	5-6	10,718	14%
Technologists	3-4	45,783	58%
Operation and Support Staff	1-2	20,746	26%
	Total	**78,685**	**100%**

Detailed Breakdown

SFIA / QF Level	Job Title	Number
7	IT Director 資訊科技總監	1,438
5 - 6	Systems Development Manager 系統開發經理	1,379
5 - 6	IT Architect 資訊科技建築師	895
5 - 6	Project Manager 項目經理	3,324
3 - 4	System Analyst 系統分析員	7,056
3 - 4	Programmer 程式編製員	12,153
3 - 4	Web Designer / Developer 網站設計員／開發員	1,221
5 - 6	Quality Assurance Specialist 品質檢查專責經理	427

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[1]   For simplicity, we assume that the competency requirements at respective levels of the QF and the SFIA are roughly comparable.   The actual mapping between the QF and the SFIA will be further assessed during implementation of the Proposed Framework.

SFIA / QF Level	Job Title	Number
3 - 4	Research and Development Engineer 研究及開發工程師	312
3 - 4	Software / Firmware Product Designer 軟件／固件產品設計員	1,094
1 - 2	Technical Writer 技術撰稿員	62
3 - 4	Computer Game Designer / Artist / Developer 電腦遊戲設計／美術／開發員	1,162
5 - 6	Telecommunications Manager 電訊經理	469
5 - 6	Telecommunications Consultant 電訊顧問	800
3 - 4	Telecommunications Engineer 電訊工程師	2,047
3 - 4	Network Administrator 網絡管理主任	2,691
5 - 6	IT Security Specialist 電腦保安專責經理	577
3 - 4	Database Administrator 資料庫管理主任	1,042
3 - 4	Systems Programmer 系統程式編製員	3,705
5 - 6	Customer Engineering Manager 客戶工程經理	733
3 - 4	Customer Service Engineer 客戶服務工程師	3,309
3 - 4	Field Technician 實地服務技術員	5,129
5 - 6	Computer Operations Manager 電腦操作經理	847
3 - 4	Help Desk Supervisor 求助台主任	276
1 - 2	Help Desk Representative 求助台服務員	1,344
3 - 4	Computer Operations Supervisor 電腦操作主任	936
1 - 2	Computer Operator 電腦操作員	3,333
1 - 2	User Support / Co-ordinator 用戶支援／統籌員	10,569
3 - 4	Lecturer 講師	1,885
3 - 4	IT Trainer 資訊科技訓練員	1,377
3 - 4	IT Researcher 資訊科技研究員	388
5 - 6	Sales / Marketing Director 銷售／市場總監	1,267
1 - 2	Sales / Marketing Representative 銷售／市場代表	5,438
	Total 總計	**78,685**

Annex C to WG3 Report

Existing Qualification Schemes set at "ICT Technologist" Level

No.	Scheme	Requirements
1.	**Associate Membership of the Hong Kong Institution of Engineers (AMHKIE)**	• Attained the age of 23; • Obtained a **Higher Diploma** or **Higher Certificate accredited/recognised by the Institution**, or an acceptable equivalent in a recognised engineering or technological discipline; • Received adequate practical **training**; • Had appropriate responsible **experience**; and • Successfully completed the Institution's **Assessment Interview**. *(Candidate with Higher Diploma needs to have a minimum of three years' experience. Higher Certificate holder needs to have a minimum of four years' experience.)* *(HKIE members shall at all times so order his **conduct** as to uphold the dignity and reputation of his profession, act with fairness and integrity towards all persons with whom his work is connected and towards other members, as well as to safeguard the public interest in matters of safety and health and otherwise.)*
2.	**Examination-based Certified Professional of IT (CPIT)** of the Hong Kong Institute for IT Professional Certification (HKITPC): • Associate Project Manager (APM) • Information Security Officer (InfoSec) • Business Analyst (BA)	• Passed the CPIT **exam** which shall be a 3-hour examination with 120 multiple-choice questions; • Obtained an **academic qualification** of at least an AD/HD/undergraduate degree in IT or IT-related areas or **Qualifications Framework Level 4** equivalent; and • Possessed two years of relevant IT work **experience**. *(The candidates are also committed to **continuous professional development** and abiding to **professional ethics** under the CPIT certification framework.)*
3.	**Recognition-based Certified Professional of IT (CPIT)** of the HKITPC: • Project Manager (PM) • Systems Operation Officer (SOO)	• Holder of PMP (for PM) / Holder of ITIL Foundation + ITIL Operational Support and Analysis (OSA) + ITIL Release Control and Validation (RCV) (for SOO); • Obtained an **academic qualification** of at least an AD/HD/undergraduate degree in IT or IT-related areas or **Qualifications Framework Level 4** equivalent; and • Possessed five years of project management **experience** (for PM) / two years of relevant IT work **experience** (for SOO). *(The candidates are also committed to **continuous professional development** and abiding to **professional ethics** under the CPIT certification framework.)*

No.	Scheme	Requirements
4.	**Certified Technologist (CT)** of the Australian Computer Society	• They can operate effectively at **SFIA level 3** generic capability; • They can demonstrate in-depth competence in at least one specialism at **SFIA level 3**; • They have demonstrated a breadth of knowledge of ICT; • They have an understanding of and commitment to the ACS **codes and standards**; • They undertake 20 hours each year of **continual professional development** to maintain certification. This can include studies towards CP certification; and. • Candidates may gain the CT status through multiple pathways with different combinations of **academic** and **experience** requirements.
5.	**ICT Technician (ICT*Tech*)** of the Institution of Engineering and Technology	Open to individuals who can demonstrate competence and commitment to perform professional work to the necessary standard. Competence • Typically, someone who has completed an ICT Advanced Apprenticeship or who has other ICT practitioner qualifications at Level 3 (SCQF 6) with appropriate working **experience** would be considered competent at this level. • Individuals without formal qualifications may also apply for ICT*Tech* registration, by demonstrating they have acquired the necessary competence through substantial working **experience**. **SFIA Level 3** provides descriptions of typical responsibility levels and working relationships that reflect the level of competence required by ICT*Tech*s. Commitment Registered ICT Technicians have to demonstrate a personal and professional commitment to society, their profession, and the environment. They are required to show that they have adopted a set of values and behaviours that will maintain and enhance the reputation of the profession. Specific evidence is required in the areas of: • Complying with **codes of conduct**; • Managing and applying safe systems of work; • Undertaking ICT work in a way that contributes to sustainable development; • Carrying out **CPD** necessary to maintain and enhance competence; • Actively participating within the profession.

No.	Scheme	Requirements
6.	**Associate Membership of BCS (AMBCS)**	• 1 year relevant IT work **experience** or a non-accredited qualification; • Competencies at **SFIA level 3;** • Members have to comply with BCS' **Code of Conduct.**

Other than the above ICT-specific technologist qualification schemes, the following are some engineering technologist qualification schemes where ICT is among one of the disciplines:

No.	Scheme	Requirements
7.	Canada **Certified Engineering Technologist (CET) / Professional Technologist (PTech)** of the Canadian Council of Technicians & Technologists (CCTT)	Academic Requirement 1. An Engineering Technology qualification from a nationally accredited programme or equivalent recognised under the Sydney Accord. 2. Successful completion of examinations held by the constituent members of CCTT. Experience Requirement A minimum of 2 years post-graduation experience. Assessment A Professional Practice Examination based on ethics and other areas of importance to practicing technologists in form of Multiple-choice (MC), true or false, and/or written questions. Newfoundland & Labrador – 1 hour / True or False Prince Edward – 25 MC questions Nova Scotia – (No information provided) New Brunswick – (No information provided) Manitoba – 3 hours / Open book / True or False, MC questions and short answer case studies

No.	Scheme	Requirements
8.	Ireland **Associate Engineer (AEng MIEI) of** Engineers Ireland	Academic Requirement (either one of the following) 1. An accredited engineering technology degree/diploma (level 7) programmes in Ireland recognised under the Sydney Accord; or 2. Associate Membership of Engineers Ireland (AMIEI) through Engineers Ireland's Special Process A or any other approved Alternative Route to Membership; or 3. An accredited engineering technology qualification accepted by Engineers Ireland through the Sydney Accord; or 4. An engineering technology qualification substantially equivalent to an engineering technology degree/diploma (level 7), accredited or approved by Engineers Ireland, under EU Directives on recognition of professional qualifications. Experience Requirement A minimum of 3 years (for a 4 year degree) / 4 years (for a 3 year diploma/degree) of Initial Professional Development (IPD) period. Other experience include: 1. Full-time research work may be accepted as constituting part of the IPD period. 2. Lecturing experience on engineering subjects on a third-level engineering programme will be taken into account as part of the IPD period. 3. Work experience as an engineering technician prior to qualifying as an engineering technologist may be accepted as a maximum of one year of the IPD period. Assessment A Professional Review consisting of: 1. Submission of Engineering Practice Report; and 2. An approximately 45-minute Professional Interview, including a 10-minute presentation.

No.	Scheme	Requirements
9.	New Zealand **Technical Membership (TIPENZ)** of Institution of Professional Engineers New Zealand (IPENZ)	Academic Requirement A 3-year Bachelor of Engineering Technology (BEngTech) degree recognised under the Sydney Accord. Experience Requirement Achievement of the twelve elements of Competence Standard for Engineering Technologists. Assessment A Competence Assessment consisting of : 1. Interactive assessment A face-to-face meeting between the candidate and the assessment panel. 2. Written assignment The panel will decide on the nature and topic of the written assignment and may request the candidate to do it at any stage through the assessment. The assessors may exempt the candidate from this assignment if his/her evidence of competence is strong and the Assessors are satisfied that he/she meets the standard. 3. Knowledge assignment An assignment for candidates who have not got a Sydney Accord qualification.
10.	South Africa **Professional Engineering Technologist (Pr Tech Eng)** of Engineering Council of South Africa (ECSA)	Academic Requirement (either one of the following) 1. An accredited or recognised Bachelor of Technology (B Tech) degree in engineering recognised under the Sydney Accord; or 2. A pass in an examination recognised by ECSA. Experience Requirement 1. A minimum of 3 years of post-graduation practical training. 2. Recognition of up to 12 months may be considered in respect of advanced study. Assessment 1. Submission of Training/Experience Reports and CPD Report. 2. An applicant for registration must attend an interview should ECSA so request.

Annex D –

Major Activities of the Task Force

Major Activities of the Task Force

Date	Activity
2012	
5 November	**Task Force meeting** (1st meeting) to examine the local and international practices on IT professional development and recognition
2013	
30 January	**Task Force meeting** (2nd meeting) to discuss the intended benefits, perceived barriers and desired outcomes in establishing an ICT professional recognition framework from different stakeholders' perspectives
26 April	**Task Force meeting** (3rd meeting) to discuss the essential features of the proposed unified ICT professional recognition framework (Proposed Framework)
8 August	**Task Force meeting** (4th meeting) to discuss the organisational and operational aspects of the Proposed Framework
15 October	**Task Force meeting** (5th meeting) to fine-tune the proposal and discuss the consultation arrangement
2014	
20 January	Consult the **Digital 21 Strategy Advisory Committee** on the Proposed Framework
21 February	**Stakeholder groups consultation and exchange session** – Government ICT service contractors
28 February	**Stakeholder groups consultation and exchange session** – Chambers of Commerce
28 February	**Stakeholder groups consultation and exchange session** – Academia and training institutions
5 March	**Stakeholder groups consultation and exchange session** – Government ICT service contractors

Date	Activity
2014 (cont'd)	
14 March	**Stakeholder groups consultation and exchange session** – SME-related trade associations
14 March	**Stakeholder groups consultation and exchange session** – ICT professional bodies
17 March	**Stakeholder groups consultation and exchange session** – ICT industry associations
26 March	**Stakeholder groups consultation and exchange session** – Government ICT contractor staff
28 March	Consult the **Committee on Information Technology Training and Development** of the Vocational Training Council on the Proposed Framework
14 April	Brief the **IT and Broadcasting Panel** (ITB Panel) of the Legislative Council on the Proposed Framework
17 May	**ITB Panel special meeting** with deputations and the public to render their views
3 June	**Task Force meeting** to review the comments received during the consultation sessions
22 July	**Task Force meeting** to discuss the formation of the working groups
8 October	1st meeting of the **Working Group on Recognising Technologists**
15 October	1st meeting of the **Working Group on Cross Recognition with Mainland and the World**
28 October	1st meeting of the **Working Group on Impacts upon SMEs**
7 November	2nd meeting of the **Working Group on Recognising Technologists**
1 December	2nd meeting of the **Working Group on Impacts upon SMEs**

Date	Activity
**2014 (cont'd)**	
10 December	3rd meeting of the **Working Group on Recognising Technologists**
19 December	2nd meeting of the **Working Group on Cross Recognition with Mainland and the World**
**2015**	
6 January	3rd meeting of the **Working Group on Impacts upon SMEs**
25 March	**Task Force meeting** (6th meeting) to review the recommendations of the three working groups and discuss the way forward for the ICT professional recognition initiative
May - July	**Task Force produce the report**

Annex E –

ICT Professional Recognition Initiatives
in the Mainland

ICT Professional Recognition Initiatives in the Mainland

1. The National Qualification Certificate of Computer and Software Technology Proficiency《計算機技術與軟件專業技術資格（水平）考試》

1.1 The National Qualification Certificate of Computer and Software Technology Proficiency《計算機技術與軟件專業技術資格（水平）考試》[1] is the national examination organised by the Ministry of Human Resources and Social Security (人力資源和社會保障部) and the Ministry of Industry and Information Technology (工業和信息化部). The examination aims to carry out occupational qualification, professional and technical qualification, and professional technology level tests fairly and scientifically among the employees of the national computer technology and software sector.

1.2 The examination covers five major sections with three levels (primary, intermediate, and advanced) and twenty-seven categories. There is no academic qualification or working experience requirement for awarding the certificates. Starting from 1 October 2014, 「中港資訊科技人才發展中心」 is authorised to coordinate the examinations in Hong Kong.

	Computer Software (計算機軟件)	Computer Networks (計算機網絡)	Applied Information Technology (計算機應用技術)	Information Systems (信息系統)	IT Services (信息服務)
Advanced Level (高級資格)	• Information System Project Manager (信息系統項目管理師) • System Analyst (系統分析師) • System Architect (系統架構設計師) • Network Architect (網絡規劃設計師) • System Planner and Administrator (系統規劃與管理師)				

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[1] http://www.ruankao.org.cn/jsj/cms/English/, http://www.ruankao.org.cn

	Computer Software (計算機軟件)	**Computer Networks** (計算機網絡)	**Applied Information Technology** (計算機應用技術)	**Information Systems** (信息系統)	**IT Services** (信息服務)
Intermediate Level (中級資格)	• Software Testing Engineer (軟件評測師) • Software Development Engineer (軟件設計師) • Software Process Capabilities Appraiser (軟件過程能力評估師)	• Network Engineer (網絡工程師)	• Multimedia Application Engineer (多媒體應用設計師) • Embedded System Engineer (嵌入式系統設計師) • Computer Aid Engineer (計算機輔助設計師) • E-business Engineer (電子商務設計師)	• System Integration Project Management Engineer (系統集成項目管理工程師) • Information System Supervisor (信息系統監理師) • Information Security Engineer (信息安全工程師) • Database System Engineer (數據庫系統工程師) • Information System Management Engineer (信息系統管理工程師)	• Computer Hardware Engineer (計算機硬件工程師) • Information Technology Supporting Engineer (信息技術支持工程師)
Primary Level (初級資格)	• Programmer (程序員)	• Network Administrator (網絡管理員)	• Multimedia Application Developer (多媒體應用製作技術員) • E-business Technician (電子商務技術員)	• Information System Operation Administrator (信息系統運行管理員)	• Webpage Architect (網頁製作員) • Information Processing Technician (信息處理技術員)

Cross Recognition of the Mainland Examination with Hong Kong

1.3 The Hong Kong Computer Society (HKCS) has initiated discussions with their counterparts in the Mainland to explore cross recognition possibilities with《計算機技術與軟件專業技術資格(水平)考試》. In 2010, the Hong Kong Institute for IT Professional Certification and the Guangdong Modern Information Service Industry Association 「廣東省現代信息服務行業協會」 signed a one-year memorandum of collaboration on ICT professional recognition 《粵港信息技術領域專業人員（資訊科技界專業人士）資格推廣合作備忘錄》 with a view to promoting the ICT professional qualification schemes, enhancing the quality of the Guangdong and Hong Kong ICT practitioners, and enhancing the interaction and communication between ICT professionals of the two places. A key part of the collaboration was to promote and arrange practitioners of each side to acquire the professional qualifications of the other side (i.e. 《計算機技術與軟件專業技術資格（水平）考試》 of the Mainland and Certified Professional of IT (CPIT) of Hong Kong).

Cross Recognition of the Mainland Examination with Other Jurisdictions

1.4 The Mainland is at present keen in pursuing regional cross recognition, and certain categories of the Mainland examination have already made mutual recognition arrangement with comparable examinations of Japan and Korea.

Japan

1.5   The Information Processing Technology Examination of Japan, exists for over 40 years (since 1969), is the second largest examination in the nation designated for evaluating information processing technology according to the related laws and regulations.   Mutual recognition arrangement between the Mainland and Japan includes the examination levels and categories in the table below.   The agreement on mutual recognition of programmer, software development engineer and system analyst was signed in 2002.   Additional categories of mutual recognition were added in 2005 and 2011.

Level	Mainland Examination	Japan Examination (Information Processing Technology Examination)
Advanced	System Analyst, System Architect	System Architect
	Information System Project Manager	Project Manager
Intermediate	Software Development Engineer	Application System Development Engineer
	Network Engineer	Network Expert
	Database System Engineer	Database Expert
Primary	Programmer	Basic Information Technology Engineer

Korea

1.6   The Information Processing Engineer and Information Processing Industrial Engineer are examination-based national qualifications under Korea's National Technical Qualification System governed by their National Technical Qualifications Act.   Mutual recognition arrangement between the Mainland and Korea includes the examination levels and categories in the table below.

Level	Mainland Examination	South Korea Examination (National Qualification Test)
Intermediate	Software Development Engineer	Information Processing Engineer
Primary	Programmer	Information Processing Industrial Engineer

2. China Association for Science & Technology (中國科學技術協會)

2.1 The China Association for Science & Technology (CAST, 中國科學技術協會)[2] is the largest national non-governmental organisation of scientific and technological practitioners in China, aiming for boosting the development of science and technology in China and enhancing science literacy of the whole nation. It is an umbrella organisation comprising 201 national societies focusing on various disciplines and fields in science and engineering, including the China Computer Federation (CCF, 中國計算機學會). Through its member societies and local branches, the organisation maintains close ties with millions of Chinese scientists, engineers and other people working in the fields of science and technology.

<u>Cross Recognition Arrangement of the CAST with Hong Kong</u>

2.2 The Hong Kong Institution of Engineers (HKIE) has established a Reciprocal Recognition Agreement (RRA) with the CAST, which currently applies to the Electrical, Mechanical, and Manufacturing & Industrial Engineering disciplines. Applicants from the Mainland could qualify through the CAST and on the approval of the CAST, apply Fellowship of the HKIE. Similarly, applicants from Hong Kong could qualify through the HKIE and on the approval of the HKIE, apply Senior Members (Senior Engineers) of the corresponding institutions in the Mainland. The ICT discipline is not included in the RRA at the moment.

2.3 Based on this RRA, the Engineers Registration Board (ERB) recognises Senior Members (Senior Engineers) of i) the Chinese Society for Electrical Engineering (CSEE, 中國電機工程學會) and ii) the Electrical, Mechanical, and Manufacturing & Industrial Engineering disciplines of the Chinese Mechanical Engineering Society (CMES, 中國機械工程學會) (both societies are affiliated to CAST) as qualifications acceptable for registration as Registered Professional Engineers (R.P.E.) in the corresponding disciplines in Hong Kong.

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[2] http://english.cast.org.cn/, http://www.cast.org.cn

Cross Recognition Arrangement of the CAST with Other Jurisdictions

2.4   The CAST also maintains cooperative relations with scientific and technological organisations of many countries and, as the representative of Chinese science and technology community, is a member of the International Council for Science (ICSU) and many other international scientific and technological organisations.   In 2004, CAST was granted consultative status with the Economic and Social Council of the United Nations.   CAST is also holding provisional status in the Washington Accord.

3. China Computer Federation (中國計算機學會)

3.1 The China Computer Federation (CCF, 中國計算機學會)[3] was established in 1962. It is an academic organisation on computing and related areas in China. The objectives of CCF are to provide support on academic and career development of ICT professionals; promote academic advancement and application of technological achievements; conduct academic assessment; steer academic development; as well as recognise and reward individuals and organisations who have outstanding performance on academic and technological fronts.

3.2 The scope of work of the CCF includes organisation of academic conferences, forums and training; accreditation for computer engineering education programmes; validation on computer terminologies; ICT professional certifications, etc. CCF has close relationship or cooperation with various international academic organisations such as the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE) and the Association for Computing Machinery (ACM).

《計算機職業資格認證》

3.3 In recent years, the CCF has been launching an ICT professional certification programme《計算機職業資格認證》[4], aiming to assess the ability of ICT professionals in the areas of software development, software testing, information management, etc. The targets of the certification programme are (prospective) professionals and management personnel of the ICT industry, as well as those who are applying for post-graduate study of tertiary education. To effectively implement the certification programme, the CCF has formed a certification board (認證委員會) and three working committees. The certification board is the decision-making body of the certification programme. The technical committee (技術委員會), operational committee (運營委員會) and business development committee (業務拓展委員會) are responsible for setting the examination standards and managing the examination questions; arranging examination logistics; and promoting the certification programme respectively.

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[3] http://www.ccf.org.cn/sites/ccf/index.html
[4] http://cspro.org/lead/application/ccf/login.jsp

3.4   In 2014, the CCF launched the first certification 《計算機軟件能力認證》 under《計算機職業資格認證》 for assessing the programming ability of software developers.   The CCF is responsible for setting the examination questions and the assessment while entrusting local examination authorities to conduct the examination.   All participants of the examination will be issued a transcript (成績單) with analysis and ranking on the examination results.

3.5   According to the website of the certification programme, several corporations like Huawei, Tencent, Baidu, Alibaba, IBM (China), Microsoft (China), Intel (China), Kingsoft, Kingdee Software, etc. are paying special attention to the certification.   With the on-going development of the programme, the transcript of the certification programme will become one of the important references in the recruitment process of these corporations.   Moreover, Tsinghua University (清華大學) and a number of other universities in China will replace the post-graduate admission examination of their ICT discipline by the examination of this certification programme.   Holders of transcript of 《計算機軟件能力認證》 who have reached a certain level of standard could be exempted from the post-graduate admission examination and proceed directly to the interview process.

Annex F –

Glossary

Glossary

CEN Workshop on ICT Skills	A network of experts representing the ICT industry, academic institutions, vocational training organisations, ICT professional associations, social partners and research institutions, which aims to promote excellence in the ICT sector and strengthen the ICT profession through the creation of relevant supporting standards that can be applied through Europe and around the world.
European e-Competence Framework (e-CF)	Developed by a large number of European ICT and human resources experts in the context of the CEN Workshop on ICT Skills. It provides a reference of 40 competences as required and applied at the ICT workplace, using a common language for competences, skills and proficiency levels that can be understood across Europe.
Government IT Skills Framework (GISF)	Developed with reference to the Qualifications Framework and the Skills Framework for the Information Age for internal use by the Government of the Hong Kong Special Administrative Region. It describes the whole set of skills and competencies applicable to the Government IT profession.

ICT qualification and competency frameworks	Models that describe the competences including skills and knowledge requirements of ICT practitioners at various levels.
Professional qualification schemes	Schemes which seek to assess and recognise individual's competency in the respective profession. The assessment could be in any forms such as examination-based, experience-based, etc.
Professional recognition	Formal acknowledgement of professional status in accordance with established professional standards.
Qualifications awarding bodies	Organisations that develop and award qualifications to practitioners.
Qualifications Framework (QF)	Administered by the Education Bureau designed to be applicable to a number of industry sectors (including ICT). It aims to clearly define the standards of different qualifications, ensure their quality and indicate the articulation ladders between different levels of qualifications.
Skills Framework for the Information Age (SFIA)	Maintained by the SFIA Foundation to match the skills of the ICT workforce to business requirements. It defines 97 professional IT skills and seven levels of attainment described in generic, non-technical terms that can be easily understood by all stakeholders to facilitate a common understanding of IT skills development and deployment.

Small and Medium Enterprise (SME)	According to the definition of SMEs by the "Support and Consultation Centre for SMEs" of the Trade and Industry Department, manufacturing enterprises with fewer than 100 employees and non-manufacturing enterprises with fewer than 50 employees are considered as SMEs in Hong Kong.