6. DISCUSSION

In truth, there were as yet no common definition of standards professionals and very limited information on the job market and competency requirements for standards professionals either regionally or internationally.

This research was proposed and approved in order to provide a useful venue for discussing and building a common understanding on what kind of standards professionals need to contribute to current and future workforces in the APEC region. The objective of this project was first to define and categorize standards professionals, secondly, explore the current status and the expected requirements for standards professionals, and thirdly, identify actionable recommendations and a collaborative action plan for years 2015-2020 within the region.

6.1 Value of Defining 'Standards Professionals'

In Chapter 3, as a key part of this report, standards professionals are defined and classified using the task-based approach. Standards professionals are defined as "those people who have a job or business activities in the three standards areas — standardization (ST), conformity assessment (CA), and metrology (ME)." The three domains of standards professionals were divided into fifteen sub-domains, for example, professionals in standards planning/development (ST01), testing (CA02), legal metrology (ME04) that involves experts in standardization (standards development), conformity assessment, and metrology.

The definition and classification of a standards professional as presented here becomes the starting point for further discussion, and as such, that definition and classification is strategically important, not only for effective communication in the standards community, but also to enhance awareness. That is done precisely because the definition issue can be straightforwardly linked to an occupational standard and competency requirements. Most economies have their own domestic 'Standard Classification of Occupation (SCO)' usually managed by their Labor Ministry (agency), and the domestic standards are based on the International Classification of Occupation (ICO) for which the International Labor Organization (ILO) is held responsible.

Incorporating the concept 'standards professional' into both a domestic and international occupational standard can be a strategic way to increase awareness of standards as a profession and identify both domestically and internationally an accepted definition and classification of the standards professional. Once we set that definition and classification, developing the next generation of standards professionals can be more feasible at economic, regional, and international levels.

6.2 Value of Identifying Competency Requirements for Standards Professionals

In order to develop the next generation of standards professionals systematically, identifying the key competency requirements is of critical importance. This report collects and illustrates the evidence of job markets, the characteristics of current employees, and the expected requirements for new/potential employees in companies and standards-specialty organizations. We determined that around 11.4% of total employees in 26 companies are standards professionals who handle standards-related tasks. At a minimum, we observed that there does exist a certain job market size and also a respective category of standards professionals that requires a different competency.

Although the leaders we interviewed have some common understanding of the competency requirements for standards professional, we found some variations. Some emphasized an experience/participation- based approach, while others focused more on a young generation program and formal education curricula development.

In general, the requirements for standards professionals seem to be quite inclusive, namely, a combination of technical knowledge and non-technical skills. Non-technical skills include interpersonal and negotiation skills, the ability to work with others across internal organization boundaries, both with other companies, and with people from different cultures. In some of the interviews, standards professionals often were reduced to two general types. One type is the standards engineer who is able to develop and deploy standards – a vertical expert in a specific technology field. The other type is a standards manager who plans and evaluates standards activities – a horizontal expert in the management or operation field. However, the reality is much more complex, as many different types of standards professionals were found, as described in the previous chapter discussion on the classification of standards professionals, and their respective requirements are naturally very complex.

Although very limited research is currently publically available to describe 'the competency requirements' of standards professionals, that effort has started. Among the existing information, two studies on Japan[4] and Korea[5] are notable. These two studies describe very well the wide-ranging requirements or skill-sets for standards professionals. Noting that the 'development of competency requirements' or the 'introduction of personnel certification' are a few of the most frequently mentioned recommendations gleaned from the project interviews, these two studies can be useful stepping-stones for developing a regionally acceptable standard for competency requirements for standards professionals overall.

6.3 Chief Standards Officer (CSO) in Companies

In the project interviews and the workshop, certain participants[6] constantly emphasized that standards should be elevated to a strategic position in a company's management and its decision-making processes.

One good method to use is to verify the position of standards professionals in companies and check whether a company has a senior executive level for a standards professional. Specifically, Professor Byung-Goo Kang classified a company's activities into an operational level, a managerial level, and a strategic level. He recommends the introduction of a Chief Standardization Officer (CSO) in a company and offers the example of a Chief Information Officer (CIO). A CSO is not a wholly new concept. Already, a few large IT companies, like Microsoft Sun Microsystem, do have a 'Chief Standards Officer (CSO)'. Although APEC SCSC does not currently have a mechanism

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[4] IIEEJ (Kurokawa et al.), 2013, Skill standard ‐ Evaluation for human resource skills of required for standardization (version1.03ices), Presented at the ICES Conference 2013 (The study was sponsored by METI, the Japanese Ministry of Economy, Trade, and Industry)
(http://docbox.etsi.org/Workshop/2013/201306_ICES/Presentations/7-Papers%20and%20posters/Kurokawa%20et%20al%20IIEEJ%20Japan%20Skill%20standard.pdf)

[5] KSA (Choi and Cho), 2013, Standards Professionals – Survey, Knowledge, Certification (Findings from Korea in 2009~2013), Presented at the ICES Conference 2013 (The study was sponsored by KATS, the Korean Agency for Technology and Standards)

[6] These experts included George Arnold, USA (Annex A.15), Rob Steele (Annex A.17), and Professor. Byung-Goo Kang (APEC workshop presentation)

to promote the CSO type of concept in private companies, it is worthwhile for individual APEC SCSC Members to monitor the increases in this position in a range of companies.

6.4 Remaining Issues for Future Study and Action

In this report, standards professionals involved experts in standardization (standards development), conformity assessment, and metrology. The definition and classification of standards professionals presented herein is thus the starting point for further discussion, and as such, that definition may not be considered the final version. To guide any future efforts to continue the discussion and improve this definition, certain issues remain and are noted here.

First, there is the language issue. During project implementation, there was a question raised about the terminology, i.e., the difference between 'standards professional' and 'standardization professional'. Which one of these terms is more appropriate or more comprehensive for including conformity assessment or metrology professionals? While 'standards professionals' is the more widely used terminology in the general community[7], we did note that some experts preferred using 'standardization professional'. Some consider standards professionals to be 'documentary standards experts', while others see 'standardization professionals' as being involved with 'standards development activities' only. This language issue may not be a matter of right or wrong; more than likely, it is a matter of decision-making Therefore, in future communications, Members should clearly note that such concerns do exist.

Second, a scope issue was noted. Many experts expressed the view that metrology professionals, and in particular scientific metrology experts, have very different characteristics compared to those for standardization and conformity assessment professionals. Because the scope of APEC SCSC includes metrology, we intentionally included 'metrology experts' as a sub-set of standards professionals in APEC SCSC. Future efforts may choose to differentiate between standards professionals (standardization and conformity assessment) and metrology professionals.

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[7] For instance, offline and online standards professional societies exist - The Society of Standards Professionals (SES, www.**ses-standards**.org) and the Informal Network of Standards Professionals (LinkedIn Group).

Third, the relationship between the standards and the quality infrastructure should be further investigated. During the project workshop, the participants acknowledged that sometimes a national standards infrastructure and a national quality infrastructure are used interchangeably. This terminology mixture of 'standards' infrastructure with 'quality' infrastructure is directly related to individual specific human resources development.

Although both standards' and 'quality' do have certain things in common, standards infrastructure may not be fully interchangeable with quality infrastructure. Standards infrastructure is not only the core foundation for quality infrastructure; it also has additional important objectives in terms of supporting technology innovation, increasing safety, and protecting environment, etc. Therefore, the objective and plan used to inspire standards professionals should be clearly differentiated from the actual development of quality professionals. These three issues do need to be noted and discussed further in the standards community.