Final report

Development of competency framework for standards development professionals

June 2023

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Background and introduction

Within the framework of the ISO Action Plan for Developing Countries 2021-2025, the ISO Capacity Building Unit is interested in developing a competency framework for standards professionals. It is envisaged that could be used to develop training and possibly certification for those involved in the development of standards, including volunteer experts and national standards bodies' staff.

The key benefits of implementing a competency framework for standards professionals include the following:

- The tasks and associated knowledge, skills, and abilities (KSAs) identified during this project will be identified using a process acceptable to ISO/IEC 17024 and will result in the foundation of a scheme for standards professionals.
- By defining the competency framework, two additional deliverables may be further developed – a training programme for standards professionals, and a credential (certification) leading to certified standards professionals.
- The process used to define the competency framework will be legally defendable, valid and reliable, resulting in a defensible list of competencies that may be more easily accepted worldwide.
- The outputs from this project may be used to educate professionals who work in standards development within developing economies for purposes of capacity building, as well as standards professionals worldwide for purposes of quality improvement.

The activities in this project included:

- Reviewing all resource documents and developing a timeline of activities
- Identifying experts to participate in the first meeting
- Developing materials for this first meeting
- Conducting the three-day meeting to identify tasks and the associated knowledge, skills and attributes (KSAs) needed for standards development
- Refining the results from the first meeting
- Surveying outcomes from the first meeting;
- Further refining KSAs after completion of a survey
- Inviting experts to participate in a second meeting (which involved two virtual meetings)
- Developing all materials for the second meeting, including PowerPoint slides
- Conducting second meeting to finalize competencies
- Developing final competency framework, report of findings and other documents
- Developing framework for additional documents and outputs

This final report describes the results of the above activities.

Review of relevant research

Background research in preparation for this project included a review of the following documents:

Career roadmap and competence requirements for standards professionals, published in August 2019 by the Asia Pacific Economic Cooperation (APEC).

This document outlines the competencies of standards professionals, including KSAs, and organizes them into a career roadmap. Segregating standards professionals into two groups – those who work in companies and those who work in standards-related organizations – this work identified separate, but similar, tasks for standards professionals. This document ends with the identification of the competencies, including the tasks and KSAs. The outputs of this report may be compared with the results of this ISO study.

Inspiring the next generation of standards professionals: Towards job profiling in today's global world, published in March 2015 by the Asia Pacific Economic Cooperation (APEC).

This report was proposed and prepared to provide a forum for discussing and building a common understanding about what kind of standards professionals will be needed in the current and future workforces in the region's developing and developed economies. The objectives were to explore the skills

set required by standards professionals to meet the needs of business, government agencies, education institutions and standards-related organizations in the APEC region.

The project used three different methods to collect and analyse data related to standards professionals, namely: 1) a survey of company/standards speciality organizations, 2) written interviews with thought leaders on standards and conformance, and 3) an experts' conference/workshop to identify policy recommendations.

Within the two sectors identified in the previous document (companies and other standards-related organizations), this research focused on three types of standards professionals – standardization professionals, conformity assessment professionals and metrology professionals – with different tasks and associated KSAs related to all three.

The remainder of the document contains the data in appendices, including interview and survey data.

Guide 14: Common policy guidance for addressing standardization on qualification of professions and personnel, published in April 2010 by CEN, the European Committee for Standardization.

This document focuses on the competence of individuals involved in standards development, but is largely focused on the process of developing standards. As a result, it has less relevance to this project.

Good standardization practices, published in July 2019 by the International Organization for Standardization (ISO).

This publication describes the key elements of standardization, in the following logical sequence:

- The fundamentals of standardization
- Standardization in the light of the World Trade Organization Agreement on Technical Barriers to Trade (WTO TBT)
- Internationally-agreed principles for the development of standards
- The value chain for the development of standards by a national standards body (NSB)

International workshop agreement: Competence of standards professionals – Part 1: In companies, published in 2019 by the International Organization for Standardization (ISO).

This document was based on the need for competence requirements for standards professionals. To deliver objectivity in this document, a global survey was carried out to identify the common and specific competences required and then recommended for standards professionals in companies and standards-related organizations.

This document is based on APEC's Education Guideline 6[26], the responses to the global survey and an analysis of the responses. It presents the tasks and the related competences for standards professionals in two separate parts: in companies (this document) and in standards-related organizations (ISO/IWA 30-2).

This document includes the following topics:

- The structure of tasks and sub-tasks of standards professionals in companies
- The common competences for standards professionals in companies
- The competences by task for standards professionals in companies
- A career roadmap for standards professionals in companies

This document does not cover the certification of individuals or qualifications for personnel issues. In principle, it does not focus on competence for conformity assessment tasks because this aspect is defined in other existing ISO and IEC documents, e.g. ISO/IEC 17025.

International workshop agreement: Competence of standards professionals – Part 2: In standards-related organizations, published in 2019 by the International Organization for Standardization (ISO).

This document is a continuation of the previous Part 1 document, but focuses on individuals in standards-related organizations instead of companies.

Project management: Methodology roles, responsibilities and capability requirements, published in January 2018 by the International Organization for Standardization (ISO).

This document describes the responsibilities and capability requirements for the different roles identified within the Project Management Methodology (PMM) concept. It specifies the responsibilities and capacity requirements of various different roles involved in the development process of international standards, including Committee Managers, WG-Secretaries, Chairs, Convenors and Project Leaders. The responsibilities within this document may be compared with the tasks resulting from this project and the capabilities within this document may be compared with the KSAs resulting from this project.

My ISO job: What delegates and experts need to know, published in 2020 by the International Organization for Standardization (ISO).

The purpose of this document is to help individuals participate effectively in ISO's technical work. Divided into three parts, Part 1 provides general background information about the organization and the standards development process. Part 2 explains what is expected of ISO participants. Part 3 gives a list of the tools and resources available to participants. This document may contain foundational knowledge of which the standards development professional should be aware.

Guidance for ISO national standards bodies on stakeholder engagement and building consensus, published in October 2019 by the International Organization for Standardization (ISO).

The ISO Technical Management Board (TMB) Process Evaluation Group (PEG) examined the processes for consensus decision-making and stakeholder engagement within NSBs and liaison organizations, which could impact the credibility of resulting ISO standards. This document is a result of the PEG's pursuit of this task. The PEG sought input from ISO NSBs and liaison organizations on their internal processes for stakeholder engagement and consensus decision-making. The process for collecting and summarizing inputs is detailed in Annex A. Through consideration of this input, the PEG developed the principles and guidance presented in Section 3 of the document.

The standards development lifecycle published on the Institute of Electrical and Electronics Engineers (IEEE) website at: https://standards.ieee.org/develop/

This document describes the standards development process in a six-stage lifecycle. The six stages are as follows:

Stage 1

- Initiating the project
- How projects are started
- Types and nature of projects
- How to find a standards committee
- Submitting a project request

Stage 2

- Mobilizing the working group
- What is a working group?
- Who can participate?
- How to form a team
- How are working groups governed?
- Managing the working group

Stage 3

- Drafting the standard
- How are standards written?
- The standards preparation and editing process
- Getting help: How your programme manager and staff editor can help you
- Standards Coordinating Committee 14 (SCC14) Conventions

Stage 4

- Balloting the standard
- The balloting process
- Casting your ballot
- The IEEE Standards Association (SA) public review process

Stage 5

- Gaining final approval
- How is final approval obtained?
- What happens to a standard after approval?
- How are standards distributed?

Stage 6

- Maintaining the standard
- What happens when standards have errors?
- Revising standards
- Overview: what are standards?

Each of these stages is further defined. Content from this six-step process may be used as foundational knowledge needed by standards development professionals, and might be compared with the results from this project.

Job descriptions for standardization professionals: SES standards professional competencies. Project being conducted by the Society for Standards Professionals Job Descriptions for Standardization Professionals – SES – The Society for Standards Professionals (ses-standards.org)

This site describes an effort by the Society for Standards Professionals to develop a competency framework for standardization professionals. As part of the project, the society is beginning with job descriptions for standardization professionals. This confirms other efforts being undertaken in the same field.

Standardization essentials: Principles and practice by Steven M. Spivak and F. Cecil Brenner, Marcel Dekker, Inc., 270 Madison Ave., New York, NY 10016, 2001, ISBN 0-8247-8918-0

This book is both a primer and a review of standards and standardization. For a field as vital and pervasive as standardization, there are few books that cover the basic principles and practice, as well as share guidance and practical experiences on the actual workings of standards-developing organizations and standardization. This book begins with the first principles of standards and standardization, and gives definitions for common terms and descriptions used in this field. It explains how standards are used in international trade, strategic standardization management, quality assurance, purchasing and contractual agreements, and in many other areas.

What is a DACUM (Developing a Curriculum)? Published by The Ohio State University. Available at: https://cete.osu.edu/wp-content/uploads/2021/02/DACUM-Overview-Brochure.pdf

This document provides background information the DACUM Process, including how it is conducted and how the results may be used.

Major uses of DACUM analysis, published by The Ohio State University. Available at: https://cete.osu.edu/wp-content/uploads/2021/02/Uses-and-Types-of-DACUM-Analysis-Feb-2019-FINAL-1.pdf

This document provides background information on the DACUM process, which was used to conduct the job task analysis (JTA) for this project.

Developing curricula based on occupational standards: An operational guide, published in 2015 by the Jordanian Center of Accreditation and Quality Assurance (CAQA). Available at: Developing-a-Curriculum-based-on-Occupational-Standards-Jordanian-Govt-Pub-Excellent.pdf (thewgsg.com)

This document was developed to steer the quality standard and to implement the Employment-Technical and Vocational Education and Training (E-TVET) reform through the qualification framework, which includes quality assurance, licensing of E-TVET institutions and accrediting training programmes, conducting competency assessment and tests in line with international quality standards as per the demands of the Jordanian labour market. This guide focusses on the processes of developing occupational standards based on DACUM and how to develop training and learning materials based on principles of Competency Based Training.

Identification of experts for first meeting

Reflecting the fact that the focus of this project is on capacity building, it was the intent to invite standards development experts from developing economies. Due to a wide variability in standards bodies within developing economies, a matrix of possibilities was developed. The following characteristics were identified to ensure demographic representation of the participants for JTA:

- Membership level of body

  - o Full member body
  - o Corresponding member body

- Size of NSB

  - o Small NSB (less than 5 employees)
  - o Medium NSB (5-50 employees)
  - o Large NSB (51+ employees)

- Access to technology

  - o Good access to technology
  - o Limited access to technology

- Years NSB has been in business

  - o Less than 10
  - o 11-25
  - o 26+

- Type of NSB

  - o Government departments
  - o Public law organizations
  - o Private organizations

- NSB with active national technical committees (TCs) managed by experts
- NSB with active national mirror committee(s) for the core economic sectors
- Job title or role of participant

  - o Technical expert
  - o Manager or Director of NSB
  - o Project manager of NSB
  - o Employee of NSB

- o Consultant of NSB
- o Editor of standards at NSB
- o Convenor or Co-Convenors

- Age of participant

  - o Younger than 40
  - o Between 41-55
  - o Between 56-65
  - o Over 66

- Participant experience

  - o Less than 10 years
  - o Between 11-20 years
  - o Between 21-30 years
  - o Over 31 years

- Expert in standards development (regional level)
- Expert in standards development (international level)
- Additionally, the following regions were identified for purposes of selecting participants from geographically representative areas:

  - o Arab (R1)
  - o Caribbean (R2)
  - o Central Asia and East Europe (R3)
  - o Central and West Africa (R4)
  - o East, South-East and South Asia (R5)
  - o Eastern and Southern Africa (R6)
  - o South and Central America (R7)
  - o Developed Economy

Based on the above demographic characteristics, a matrix was developed.

Below is the finalized matrix:

Region	Arab (R1)	Caribbean (R2)	Central Asia/Eastern Europe (R3)	Central/West Africa (R4)	East/South-East and South Asia (R5)	Eastern/South Africa (R6)	South/Central America (R7)
Member body							
Corresponding member body							
Small NSB (less than 5 employees)							
Medium NSB (5-50 employees)							
Large NSB (51+ employees)							
NSB has good access to Technology							
NSB has limited access to technology							
Years NSB in business (less than 10)							
Years NSB in business (11-25)							
Years NSB in business (26+)							
Government departments							

Region	Arab (R1)	Caribbean (R2)	Central Asia/Eastern Europe (R3)	Central/West Africa (R4)	East/South-East and South Asia (R5)	Eastern/South Africa (R6)	South/Central America (R7)
Public law organizations							
Private organizations							
NSB with active national TCs managed by experts							
NSB with active national mirror committee(s) for the core economic sectors							
Technical expert							
Manager or Director of NSB							
Project manager of NSB							
Employee of NSB							
Consultant of NSB							
Editor of standards at NSB							
Convenor or Co-Convenors							
Age of participant (younger than 40)							

Region	Arab (R1)	Caribbean (R2)	Central Asia/Eastern Europe (R3)	Central/West Africa (R4)	East/South-East and South Asia (R5)	Eastern/South Africa (R6)	South/Central America (R7)
Age of participant (between 41-55)							
Age of participant (between 56-65)							
Age of participant (over 66)							
Participant experience (less than 10 years)							
Participant experience (between 11-20 years)							
Participant experience (between 21-30 years)							
Participant experience (over 31 years)							
Expert in standards development (regional level)							
Expert in standards development (international level)							

Additional requirements identified for all meeting participants were a willingness to travel to the ISO Central Secretariat in Geneva, Switzerland, strong English-speaking skills, and knowledge of the standards development process.

Based on the demographic matrix presented, an invitation letter was developed to solicit interest in participating in the first meeting (see Appendix A). ISO developed an online participant application containing a series of survey questions based on demographic characteristics. Participants were invited to fill out the application form.

A total of 34 people applied to participate in the first meeting (DACUM JTA meeting), representing 30 different developing economies. The consultants met with ISO staff and selected a demographically representative sample, designed to include broad demographic representation. The following 23 participants were invited to participate in the meeting.

Country		First name	Last name	Body	Title
Colombia	Mr	Daniel	Trillos	Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC)	Standardization Deputy Director
Dominican Republic	Mr	Eduardo	Llano	Instituto Dominicano para la Calidad (INDOCAL)	Standardization Translator and Project Manager – TC secretary
Egypt	Mr	Moamen	Rashed	Egyptian Organization for Standardization and Quality (EOS)	Standard Specialist
El Salvador	Ms	Yanira	Colindres	Organismo Salvadoreño de Normalización (OSN)	Director
Gambia	Mr	Ebrima Musa	Jallow	The Gambia Standards Bureau (TGSB)	Director of Standardization
Georgia	Mr	Daviti	Marsagishvili	Georgian National Agency for Standards and Metrology (GEOSTM)	Main Specialist of National Information Center
Jamaica	Ms	April	Farrell	Bureau of Standards Jamaica (BSJ)	Standards Development Officer
Kazakhstan	Mr	Rustam	Mussin	Kazakhstan Institute of Standardization and Metrology (KazStandard)	Head of Department of Strategic Development and Science
Kenya	Mr	Zacharia Lukorito	Chepkania	Kenya Bureau of Standards (KEBS)	Chief Manager, Standards Development and Trade
Malaysia	Ms	Nor Faezah	Mohamad Arif	Department of Standards Malaysia (DSM)	Principal Assistant Director
Moldova	Ms	Ecaterina	Ghelas	Institute for Standardization of Moldova (ISM)	Head of Standardization Department

Country		First name	Last name	Body	Title
Montenegro	Mr	Neško	Šćekić	Institute for Standardization of Montenegro (ISME)	Leading Engineer for Standardization – Quality Manager
Peru	Ms	Lily	Elliot	Instituto Nacional de Calidad (INACAL)	Standardization Coordinator
Philippines	Ms	Ma Teresita	Del Rosario	Bureau of Philippine Standards (BPS)	Chief Trade-Industry Development Specialist
Saint Lucia	Mr	Andre	Charles	St. Lucia Bureau of Standards (SLBS)	Head of Standards Development
Senegal	Ms	Ndeye Maguette	Diop	Association Sénégalaise de Normalisation (ASN)	Programme Standards Manager
South Africa	Mr	Matlhale	Peter	South African Bureau of Standards (SABS)	Senior manager: Processes and Support
Sudan	Ms	Sarah	Ahmed	Sudanese Standards and Metrology Organization	Secretary of Automotive Technical Committee, Mechanical Engineer
Uganda	Mr	Andrew	Othieno	Uganda National Bureau of Standards (UNBS)	Manager Standards Development
Uruguay	Ms	Claudia	Chocca	Instituto Uruguayo de Normas Técnicas (UNIT)	Senior Project Manager (Building Sector)
Viet Nam	Mr	Khoi	Nguyen Van	Directorate for Standards, Metrology and Quality (STAMEQ)	Director of Standards Department
Zambia	Ms	Belinda Soko	Kancheya	Zambia Bureau of Standards (ZABS)	Standards Development and Training Manager
Switzerland	Ms	Giulia	Pizzi	IEC	Content Development Specialist – IEC Academy & Capacity Building

NOTE: The two individuals highlighted in yellow were invited but not able to make it to the meeting.

ISO arranged for the travel of all meeting participants, including reimbursement for travel and hotel arrangements.

Materials for the first meeting

The purpose of the first meeting was to conduct a JTA. The facilitators, Dr Cynthia D. Woodley and Dr Vijay Krishna, used the DACUM method for conducting the JTA. DACUM stands for **D**eveloping **A** **C**urricul**UM**. The DACUM process, originally developed in Canada, is widely used for developing job profiles. It produces charts that are frequently used as the backdrop for worker training programmes, tests and needs-assessment materials. The DACUM process has been used successfully by business, industry and educational institutions to identify the content that should be included in educational and training curricula, as well as to identify knowledge gaps.

The DACUM process is used to identify instructional needs, instructional programme planning, curriculum development, and training materials development, as well as create and revise job descriptions and standards, and underpin employee recruitment and career guidance. In the past, the process was mostly used by community colleges for vocational-technical instruction. Since the 1980s, business and industry have also used it extensively for corporate and industrial training programmes. In the past few years, the DACUM concept has increasingly been used by secondary and post-secondary educators in arts and science programmes, as well as vocational-technical programmes and business/industry programmes.

The DACUM process has been found to be effective, quick and valid. It also offers an approach to occupational analysis in terms of duties, tasks, knowledge, skills, traits and attitudes. A DACUM process workshop is held to bring together a focus group of expert workers in a specific field or occupation for a brainstorming session. A trained DACUM facilitator guides the workshop participants to produce a chart that lists the tasks performed by an entry-level worker in the occupation. Under the direction of the qualified facilitator, the panel analyses the job-related tasks while using a group decision technique. A curriculum designer can then use the DACUM chart to develop an industry-validated programme of instruction for job training.

A DACUM workshop facilitated by trained facilitators is a good way of bringing business and industry into the development of educational programmes. During a DACUM workshop, expert workers and supervisors are brought together for the focus group (brainstorming) sessions or workshops to interact, describe their jobs and rate activities according to their frequency and importance. From these focus group sessions, a profile chart is created, detailing the duties and tasks involved in a particular occupation. Task-specific curricula are then developed based on the component tasks that the process has determined and verified.

The DACUM process involves the use of subject matter experts for attendance at a multi-day JTA meeting. The product (knowledge skills and ability statements) resulting from this meeting is called a DACUM chart, which describes an occupational role in terms of specific competencies, skills and tasks that the competent graduate is expected to be able to perform. A task is defined as a unit of observable work with a specific start and end point that leads to a product, service or decision. Tasks often require both knowledge in a specific content domain and practical skills necessary to carry out the task.

The DACUM process involves seven steps:

1. Committee orientation to the DACUM process
2. Occupation/job review to arrive at a mutually acceptable working title(s) for jobs and specialization areas
3. Identification of duties or general functional areas of responsibility under which tasks will fit
4. Identification of specific tasks performed in each duty area (each statement including an action verb, object, and one or more qualifying words)
5. Review and refinement of task and duty statements
6. Identification of related requirements, such as general knowledge and skills, tools and equipment supplies and materials used, worker traits and attitudes, and future occupational trends/concern
7. Task analysis to determine specific steps, performance standards and related requirements

Although there are many methods for developing curricula for educational and training programmes, two characteristics distinguish the DACUM process from other methods:

1. Experts working in the profession analyse their own work, and
2. Results are produced in a graphic format.

All materials needed for the first meeting were developed and forwarded to ISO for preparation for all meeting participants. Materials included:

- Standards Professional JTA Meeting Agenda
- Knowledge-skill-task handout
- Recorder form
- Who-what-how-why page
- List of action verbs
- DACUM JTA background
- DACUM-developing task statements handout
- DACUM JTA criteria handout
- Knowledge ratings handout
- Physical conditions ratings handout
- Attitudes rating handouts
- Name tents

Additionally, an orientation PowerPoint presentation was developed for the meeting.

ISO staff provided name tents and name badges, as well as paper copies of the ISO Good Standardization Practices (GSP) publication.

JTA meeting results

The three-day DACUM JTA meeting was held at the ISO Central Secretariat offices in Geneva, Switzerland on 5-7 September 2022. The agenda for the meeting appears in Appendix B. After introductions, the participants were given information about JTA and the DACUM process. During the three days, the participants brainstormed ideas about duties, tasks, steps, KSAs, and tools and resources for standard development professionals. A "DACUM wall" was developed.

Participants ordered the duties (in yellow) and tasks (in green) and then all duties and tasks were entered into a digital spreadsheet whereby all subsequent work was conducted digitally directly in the software.

The meeting participants completed all work within the three-day period and a draft DACUM JTA chart was created and circulated among the participants for comments and edits.

Validation survey

Once the DACUM meeting participants completed their reviews and comments, a survey was created for the purpose of validating the results of the JTA. The validation survey was placed on the ISO's survey portal and translated into several languages. Additionally, Dr Cynthia D. Woodley created a video to accompany the survey, which was also translated. A copy of the survey appears in Appendix C.

The results of the survey are detailed below.

Response rate and demographics of respondents

The number of participants who received the validation survey is unknown, but 935 individuals responded (379 completed responses and 556 partial responses). The demographic analysis was completed using the 379 completed responses. A review of the demographic data found the responses to reflect a good representation of different demographic groups. Overall, the sample size is considered sufficient to validate the initial findings from the expert panel meeting.

A total of 346 respondents (91%) are currently or were previously involved with the development of standards. Hence, the survey elicited responses from the target group (see Table 1).

Table 1 – Involvement in the development of standards

	1. Are you involved in or have you been involved in the development of standards?		Response Percent	Response Total
1	Yes		91.29%	346
2	No		8.71%	33
			answered	379
			skipped	0

Of the respondents, 67.8% are employed by an NSB while 9.5% are consultants and 17.6% serve as volunteers. The responses capture the different types of personnel that typically work for an NSB (see Table 2).

Table 2 – Relationship with the NSB

	2. What is your relationship with a national standards body?			
	Answer Choices		**Response Percent**	**Response Total**
1	I am employed by an NSB		67.81%	257
2	I am a consultant for an NSB		9.50%	36
3	I am a volunteer for an NSB		17.68%	67
4	I am not associated with an NSB		5.01%	19
			answered	379
			skipped	0

The respondents were drawn from different membership levels of NSBs. The majority (73%) were from a member body, 14.5% were from a corresponding member and 4.4% from a subscriber member (see Table 3).

Table 3 – NSB membership level

	3. What is the membership level of your NSB?			
			Response Percent	**Response Total**
1	Member body		73.09%	277
2	Corresponding member		14.51%	55
3	Subscriber member		4.49%	17
4	I don't know		7.92%	30
			answered	379
			skipped	0

The survey was completed by employees from different-sized NSBs. The percentage of respondents from large NSBs was 59.6%, the corresponding numbers from medium and small NSBs were 29.5% and 2% respectively (see Table 4).

Table 4 – Size of the NSB

	4. What is the size of your NSB?		Response Percent	Response Total
1	Small NSB (less than 5 employees)		2.37%	9
2	Medium NSB (5-50 employees)		29.55%	112
3	Large NSB (51+ employees)		59.63%	226
4	I don't know		8.44%	32
			answered	379
			skipped	0

Furthermore, 63% of the NSBs had access to good technology, while 31% had access to limited technology (see Table 5).

Table 5 – NSB's access to technology

	5. How do you evaluate your NSB's access to technology?		Response Percent	Response Total
	Answer Choices			
1	Good access to technology		62.80%	238
2	Limited access to technology		30.87%	117
3	I don't know		6.33%	24
			answered	379
			skipped	0

The respondents represented NSBs with different levels of maturity. A total of 58% were from NSBs that had been in business for more than 26 years. The corresponding number for NSBs that had been in business for less than 10 years was 12% and between 11-25 years was 25% (see Table 6).

Table 6 – Years the NSB has been in business

	6. How many years has your NSB been in business?		Response Percent	Response Total
1	Less than 10 years		11.87%	45
2	11 – 25 years		24.80%	94
3	26+ years		57.78%	219
4	I don't know		5.54%	21
			answered	379
			skipped	0

The survey also had a good response from different types of NSBs. A total of 64% responses were from NSB employees working for a government NSB, while 25% represented a not-for-profit private NSB. Of the respondents, 4% were from a private NSB (see Table 7).

Table 7 – Type of NSB

	7. What type of NSB do you work for?			
	Answer Choices		**Response Percent**	**Response Total**
1	Government department		64.38%	244
2	Not-for-profit private organization		25.33%	96
3	Profit private organization		4.22%	16
4	I don't know		6.07%	23
			answered	379
			skipped	0

The respondents represented different job titles associated with standards development professionals. The biggest category was committee manager (11%), followed by technical committee member (10%) and NSB staff (9%) (see Table 8).

Table 8 – Job title of respondent

	8. Which of the following BEST describes your job title associated with standards development?		Response Percent	Response Total
1	Analysis and Development Specialist		2.28%	8
2	Committee Manager		10.83%	38
3	Consultant		3.99%	14
4	Convenor or Co-Convenors		4.84%	17
5	Editor of Standards		0.85%	3
6	Manager or Director of NSB		3.99%	14
7	NSB staff		9.40%	33
8	Planner		0.28%	1
9	Project Leader		0.85%	3
10	Project Manager		3.70%	13
11	Project Secretary		2.28%	8
12	Proof Reader		0.57%	2
13	Standardizer		2.28%	8
14	Standards Coordinator		3.42%	12
15	Standards Developer		3.99%	14
16	Standards Expert		3.42%	12
17	Standards Facilitator		0.00%	0
18	Standards Manager		5.98%	21
19	Standards Officer		7.12%	25
20	Standards Researcher		0.57%	2
21	Standards Specialist		4.84%	17
22	Standards Writer		0.28%	1
23	Technical Committee Member		10.26%	36
24	Technical Expert		4.56%	16
25	Technical Reviewer		0.57%	2
26	Technical Secretary		6.84%	24
27	Translator		0.00%	0
28	Other		1.99%	7
			answered	351
			skipped	28
Other, please specify: (42)				
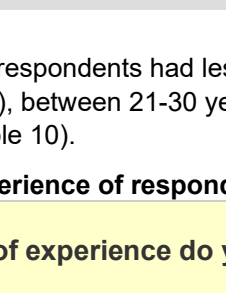
Respondents were provided with an opportunity to write their job titles in an open-ended box, with answers including the following:

- An individual interested in working with an NSB in future
- Sometimes editor of standards
- Ceramics
- Committee manager support team
- Consultant in tourism
- Editor of standards
- Editor of standards, technical committee member, standards expert
- Gestor de proyectos de normalización
- Head of delegation to ISO TC 68
- Head of electrical measures department
- Head of knowledge and 2030 Agenda
- Head of physical measurement department
- Head of professional development, previously committee manager
- Head of Standardization department
- Head, Standardization
- Head of department and technical secretary
- Manager
- Marketing and Sales Officer
- Personnel involved in the use of the product
- Planificateur, responsable de comités
- Project Secretary
- Quality Manager
- Regulatory Affairs
- Secretaria Técnica
- Senior Documentation and Information Officer
- Served as Convenor and WG leader
- Stan. editor, coordinator, developer manager
- Standard support
- Standardization leader
- STANDARDIZER
- Standards Developer
- Standards Developer, Consultant, Convenor
- Standards development Staff
- Standards Information Officer
- Standardization project operation manager
- Technical Committee (TC 14) member
- Technical expert
- Technical Expert, Consultant
- Technical Secretary

  - Work Experience and Expertise

Those highlighted in yellow were deemed to be the unique job titles not covered by the drop-down list and report in Table 8. The remainder of the list were covered in the drop-down list.
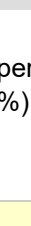
The respondents represented different age groups. In terms of age, the percentage of respondents younger than 40 was 36%, followed by 44% for those between 41 and 55, 16% between 56 and 65, and 4% over 65 (see Table 9).

Table 9 – Age of respondents

9. What is your age?			Response Percent	Response Total
1	less than 40 years of age		35.90%	126
2	between 41-55		44.16%	155
3	between 56-65		15.67%	55
4	over 66		4.27%	15
			answered	351
			skipped	28

More than half (52%) the respondents had less than 10 years of experience, followed by those with 11-20 years of experience (35%), between 21-30 years of experience (11%) and more than 31 years of experience (2%) (see Table 10).

Table 10 – Years of experience of respondents

10. How many years of experience do you have in standards development?			Response Percent	Response Total
1	less than 10 years		51.57%	181
2	between 11-20 years		34.76%	122
3	between 21-30 years		11.40%	40
4	over 31 years		2.28%	8
			answered	351
			skipped	28

Out of the 166 countries that were surveyed, a completed response was received from 77 countries. The top countries responding to the survey were as follows:

Albania	0.28%	1	Guyana	1.14%	4
Algeria	7.69%	27	Honduras	1.14%	4
Antigua and Barbuda	0.57%	2	Indonesia	0.28%	1
			Iran, Islamic Republic of	0.28%	1
Argentina	7.41%	26	Iraq	0.28%	1
Armenia	0.57%	2	Ireland	1.71%	6
Azerbaijan	0.57%	2	Israel	0.28%	1
Bahamas	1.14%	4	Italy	0.57%	2
Bahrain	0.57%	2	Japan	6.55%	23
Barbados	0.85%	3	Jordan	1.71%	6
Bhutan	1.14%	4	Kenya	0.85%	3
Bolivia	0.28%	1	Malawi	0.57%	2
Bosnia and Herzegovina	0.28%	1	Malaysia	1.42%	5
			Moldova, Republic of	2.56%	9
Botswana	0.57%	2			
Brazil	1.14%	4	Montenegro	0.57%	2
Canada	0.28%	1	Myanmar	0.28%	1
Colombia	2.85%	10	Namibia	0.28%	1
Costa Rica	0.28%	1	Nepal	0.28%	1
Croatia	0.28%	1	Netherlands	0.28%	1
Cuba	0.57%	2	Norway	0.85%	3
Cyprus	0.28%	1	Palestine, State of	0.28%	1
Denmark	0.85%	3			
Albania	0.28%	1	Peru	1.99%	7
Algeria	7.69%	27	Philippines	0.28%	1
Antigua and Barbuda	0.57%	2	Poland	4.56%	16
			Rwanda	1.71%	6
Argentina	7.41%	26	Saint Vincent/ Grenadines	0.28%	1
Armenia	0.57%	2			
Azerbaijan	0.57%	2	Saudi Arabia	0.28%	1
Bahamas	1.14%	4	Serbia	3.70%	13
Bahrain	0.57%	2	Somalia	0.28%	1
Barbados	0.85%	3	South Africa	0.28%	1
Bhutan	1.14%	4	Spain	0.85%	3
Bolivia	0.28%	1	Sudan	1.71%	6
Bosnia and Herzegovina	0.28%	1	Sudan	1.42%	5
			Sweden	0.57%	2
Botswana	0.57%	2	Switzerland	0.57%	2
Brazil	1.14%	4	Thailand	0.28%	1
Canada	0.28%	1	Togo	0.28%	1
Colombia	2.85%	10	Tunisia	0.28%	1
Costa Rica	0.28%	1	Türkiye	0.57%	2
Croatia	0.28%	1	Uganda	2.56%	9
Cuba	0.57%	2	United Arab Emirates	0.28%	1
Cyprus	0.28%	1			
Denmark	0.85%	3	United Kingdom	2.56%	9
Dominica	0.57%	2	United States	0.85%	3
Dominican Republic	0.85%	3	Uruguay	0.57%	2
			Viet Nam	2.85%	10
Ecuador	6.27%	22	Zambia	1.71%	6
Egypt	1.71%	6			
Eswatini	3.99%	14			
Fiji	0.28%	1			
Finland	0.85%	3			
Gambia	0.28%	1			
Georgia	0.57%	2			
Germany	2.56%	9			
Grenadines	0.28%	1			

These respondents represented Africa, Asia, Europe, North America and South America. As detailed in the survey results, there was representation from developing and developed economies.

To better characterize the respondents as being representative, the respondents were grouped into developing economy regions as defined by ISO. ISO defines developing economy regions as follows:

Region	Member bodies	Correspondent members	Subscriber members	Total
Arab Region 1	Algeria Bahrain Egypt Iraq Jordan Kuwait Lebanon Libya Morocco Oman Qatar Saudi Arabia Syrian Arab Rep Tunisia United Arab Emirates	Palestine, State of		16
Caribbean Region 2	Bahamas Barbados Jamaica St. Lucia Saint Kitts and Nevis Trinidad and Tobago	Dominica Guyana Haiti Saint Vincent and the Grenadines	Antigua & Barbuda Belize	12

Region	Member bodies	Correspondent members	Subscriber members	Total
Central Asia and Eastern Europe Region 3	Azerbaijan Armenia Belarus Bosnia and Herzegovina Kazakhstan Serbia Montenegro N Macedonia (Rep of) Ukraine Uzbekistan	Albania Georgia Kyrgyzstan Moldova Tajikistan Turkmenistan		16
Central and Western Africa Region 4	Benin Burkina Faso Cameroon Côte d'Ivoire Gabon Ghana Mali Nigeria Senegal	Gambia Mauritania Niger Sierra Leone Togo	Sao Tome and Principe	14

Region	Member bodies	Correspondent members	Subscriber members	Total
East, South-East and South Asia Region 5	Afghanistan Bangladesh China Fiji India Indonesia Iran, Islamic Rep. of Korea, Dem. P. Rep. of Malaysia Mongolia Nepal Pakistan Philippines Singapore Sri Lanka Thailand Viet Nam	Bhutan Brunei Darussalam Cambodia Lao People's Democratic Rep. Myanmar Papua New Guinea Vanuatu		23
Eastern and Southern Africa Region 6	Botswana Burundi Congo, Dem. Rep. of Ethiopia Kenya Malawi Mauritius Namibia Rwanda South Africa Sudan Tanzania Uganda Zimbabwe	Angola Chad Eritrea Eswatini Madagascar Mozambique Lesotho Somalia Seychelles Zambia		24

Region	Member bodies	Correspondent members	Subscriber members	Total
South and Central America

Region 7 | Argentina

Bolivia, Plurinational State of

Brazil

Chile

Colombia

Costa Rica Cuba

Dominican Republic

Ecuador

El Salvador

Guatemala

Panama

Peru

Uruguay | Honduras

Nicaragua

Paraguay | | 17 |

The respondents were grouped into their regions to obtain a better understanding of their regional representation. The results were as follows:

Arab – 46			**Caribbean – 16**		
Algeria	7.69%	27	Bahamas	1.14%	4
Egypt	1.71%	6	Guyana	1.14%	4
Jordan	1.71%	6	Barbados	0.85%	3
Bahrain	0.57%	2	Antigua & Barbuda	0.57%	2
Iraq	0.28%	1	Dominica	0.57%	2
Palestine, State of	0.28%	1	St Vincent/Grenadines	0.28%	1
Saudi Arabia	0.28%	1	Belize	0.00%	0
Tunisia	0.28%	1	Haiti	0.00%	0
UAE	0.28%	1	Jamaica	0.00%	0
Kuwait	0.00%	0	Saint Kitts & Nevis	0.00%	0
Lebanon	0.00%	0	Saint Lucia	0.00%	0
Libya	0.00%	0	Trinidad & Tobago	0.00%	0
Morocco	0.00%	0			
Oman	0.00%	0			

Arab – 46			Caribbean – 16		
Qatar	0.00%	0			
Syrian Arab Republic	0.00%	0			

Central Asia/Eastern Europe – 32			Central/Western Africa – 2		
Moldova, Republic of	2.56%	9	Gambia	0.28%	1
Armenia	0.57%	2	Togo	0.28%	1
Azerbaijan	0.57%	2	Benin	0.00%	0
Georgia	0.57%	2	Burkina Faso	0.00%	0
Montenegro	0.57%	2	Cameroon	0.00%	0
Albania	0.28%	1	Côte d'Ivoire	0.00%	0
Bosnia & Herzegovina	0.28%	1	Gabon	0.00%	0
Belarus	0.00%	0	Ghana	0.00%	0
Kazakhstan	0.00%	0	Mali	0.00%	0
Kyrgyzstan	0.00%	0	Mauritania	0.00%	0
North Macedonia	0.00%	0	Niger	0.00%	0
Tajikistan	0.00%	0	Nigeria	0.00%	0
Turkmenistan	0.00%	0	Sao Tome & Principe	0.00%	0
Ukraine	0.00%	0	Senegal	0.00%	0
Uzbekistan	0.00%	0	Sierra Leone	0.00%	0

East/S-East/South Asia – 26			Eastern/Southern Africa – 56		
Viet Nam	2.85%	10	Uganda	2.56%	9
Malaysia	1.42%	5	Rwanda	1.71%	6
Bhutan	1.14%	4	Sudan	1.71%	6
Fiji	0.28%	1	Zambia	1.71%	6
Indonesia	0.28%	1	Sudan	1.42%	5
Iran, Islamic Rep of	0.28%	1	Kenya	0.85%	3
Myanmar	0.28%	1	Botswana	0.57%	2
Nepal	0.28%	1	Malawi	0.57%	2
Philippines	0.28%	1	Namibia	0.28%	1
Thailand	0.28%	1	Somalia	0.28%	1
Afghanistan	0.00%	0	South Africa	0.28%	1

East/S-East/South Asia – 26			Eastern/Southern Africa – 56		
Bangladesh	0.00%	0	Angola	0.00%	0
Brunei Darussalam	0.00%	0	Burundi	0.00%	0
Cambodia	0.00%	0	Chad	0.00%	0
China	0.00%	0	Congo, Dem. Rep of	0.00%	0
India	0.00%	0	Eritrea	0.00%	0
Korea, Dem. People's Rep of	0.00%	0	Ethiopia	0.00%	0
Lao People's Dem Rep.	0.00%	0	Lesotho	0.00%	0
Mongolia	0.00%	0	Madagascar	0.00%	0
Pakistan	0.00%	0	Mauritius	0.00%	0
Papua New Guinea	0.00%	0	Seychelles	0.00%	0
Singapore	0.00%	0	Tanzania	0.00%	0
Sri Lanka	0.00%	0	Zimbabwe	0.00%	0
Vanuatu	0.00%	0			

South/Central America – 82		
Argentina	7.41%	26
Ecuador	6.27%	22
Colombia	2.85%	10
Peru	1.99%	7
Brazil	1.14%	4
Honduras	1.14%	4
Dominican Republic	0.85%	3
Cuba	0.57%	2
Uruguay	0.57%	2
Bolivia, Plurinational	0.28%	1
Costa Rica	0.28%	1
Chile	0.00%	0
El Salvador	0.00%	0
Guatemala	0.00%	0
Nicaragua	0.00%	0
Panama	0.00%	0
Paraguay	0.00%	0

The resulting breakdown of respondents by region is shown in Figure 1.

Figure 1 – Respondents by region
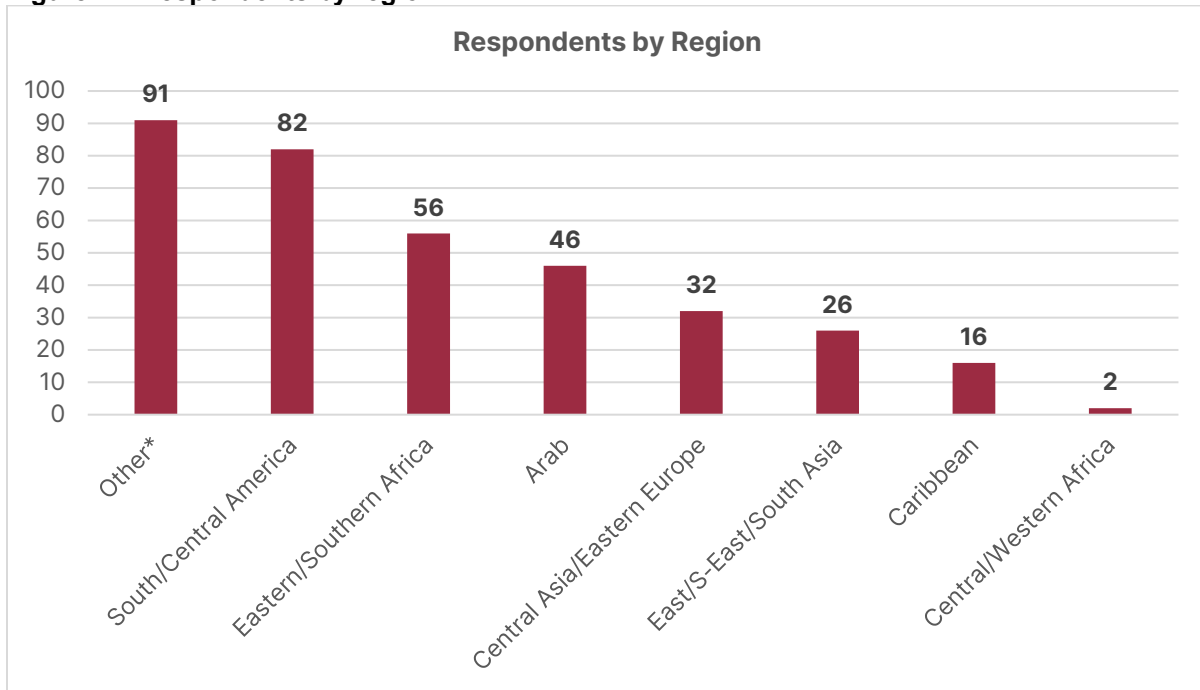
*NOTE: "Other" refers to respondents who do not represent a developing economy.

The breakdown of these respondents is as follows:

Canada	0.28%	1
Croatia	0.28%	1
Cyprus	0.28%	1
Denmark	0.85%	3
Finland	0.85%	3
Germany	2.56%	9
Ireland	1.71%	6
Israel	0.28%	1
Italy	0.57%	2
Japan	6.55%	23
Netherlands	0.28%	1
Norway	0.85%	3
Poland	4.56%	16
Spain	0.85%	3
Sweden	0.57%	2
Switzerland	0.57%	2
Turkey	0.57%	2
United Kingdom	2.56%	9
United States	0.85%	3

The data was analysed both with and without the responses of those labelled as "other" and no significant differences were found. Therefore, the data associated with respondents from this group was included in the data summary.

Survey validation demographic summary

The total number of completed responses represents a very large and representative sample size. Furthermore, over 90% of the respondents are/were involved with standards development, ensuring that the survey was completed by the intended target group. As expected, two-thirds of the respondents are NSB employees. At the same time, we got good representation from consultants or volunteers. Responses represent a good mix of membership levels and NSB sizes. The survey also elicited a good response from different age groups and job roles.

Post-survey validation meetings

A series of virtual meetings was held on 1 February and 9 February 2023 to review the results of the validation survey. The original DACUM JTA committee members were invited to participate in one of the two meetings held. Participation was as follows:

1 February 2023 meeting participants

Ecaterina Ghelas Head of Standardization Department Institute for Standardization of Moldova – ISM Moldova	**Rustam Mussin** Head of Strategic Development and Science Kazakhstan Institute of Standardization and Metrology – KazStandard Kazakhstan
Ebrima Musa Jallow, MSC Director of Standardization The Gambia Standards Bureau – TGSB Gambia	**Matlhale Peter** Senior Manager Processes and Support South African Bureau of Standards – SABS South Africa
Nor Faezah Mohamad Arif Principal Assistant Director Department of Standards Malaysia – DSM Malaysia	**Moamen Ahmed Rashed** Standard Specialist (Chemist) Egyptian Organization for Standardization and Quality – EOS Egypt
Neško Šćekić Technical Secretary Institute for Standardization of Montenegro – SME Montenegro	

9 February 2023 meeting participants

Lily Gisella Elliot Blas International Standardization Executive Instituto Nacional de Calidad – INACAL Peru	**April Farrell** Standards Development Officer Bureau of Standards Jamaica – BSJ Jamaica
Zacharia Lukorito Chepkania Chief Manager, Standards Development and Trade	**Eduardo Arturo Llano** Standardization Translator and Project Manager

Kenya Bureau of Standards – KEBS	Instituto Dominicano para la Calidad – INDOCAL
Kenya	Dominican Republic
Claudia Chocca	**Daniel Trillos**
Senior Project Manager, Building Section	Standardization Deputy Director
Instituto Uruguayo de Normas Técnicas – UNIT	Instituto Colombiano de Normas Técnicas y Certificación – ICONTEC
Uruguay	Colombia
Ndeye Maguette Diop	**Ma. Teresita G. Del Rosario**
Programme Standards Manager	Chief, Standard Development Division
Association Sénégalaise de Normalisation – ASN	Bureau of Philippine Standards – BPS
Senegal	Philippines

ISO staff and the project leaders attended both meetings.

Post-survey validation meeting results

During both meetings, the participants were presented with the demographic data associated with the respondents and asked if the target audience was reached. If not, they were asked if a second targeted mailing needed to go out. The meeting participants were satisfied with the demographic data associated with the validation survey respondents and indicated a second targeted mailing was not necessary. There was a discussion about the low participation from the Central/Western Africa region. The participants felt this was both representative of the amount of standards development occurring in many of the developing economies in this region, and therefore, that the respondents were unlikely to be able to respond.

Duty and task ratings

Following identification of the demographic questions, the survey respondents were asked to rate each task in terms of its importance for successful job performance by a standards development professional and the frequency with which the respondent did each task. There were 24 task statements identified during the JTA meeting and the respondents were asked to rate each in terms of both criteria.

There are multiple models of rating scales used in job analyses, but for the purposes of this study, two survey scales were used: task frequency and importance. Task frequency was chosen because, as identified in Newman, Slaughter & Taranath, 1999, those tasks that are performed more often should have a higher emphasis placed on them. Task importance was chosen because it is the most common scale used when evaluating tasks (Newman et al., 1999) and important tasks should also have a higher emphasis placed on them. The frequency and importance rating scales are illustrated in Table 11.

Table 11 – Importance and frequency rating scales

Importance - Please think about each task and respond regarding the importance of each task for successful job performance	Frequency - Please think about each task and respond regarding the frequency YOU do each task.
Extremely important Important Somewhat important Not important at all	Frequently Occasionally Not at all

The responses were then tabulated and an overall weighting was calculated using the following:

> **Overall rating scale = 2 x Importance + Frequency**

The results of the data tabulation follow in Table 12. The meeting participants were asked to consider any task with a frequency of less than 1 and any task with importance of less than 1 to determine if they need to be dropped from the list of tasks. The highlighted areas in the table below identify three tasks with mean frequency of less than 1.

Table 12 – Tabulated importance and frequency of tasks

Duty and task			Importance			Frequency				
			Mean	SD	SEM	Mean	SD	SEM	Comb	Weight %
A	**Planning the standards work**									
	1	Establish standards development procedures (i.e. SOPs)	2.56	0.64	0.03	1.19	0.71	0.04	6.30	4.28
	2	Develop standards work programmes (long term)	2.36	0.63	0.03	1.25	0.69	0.04	5.96	4.04
	3	Justify the need for a standard	2.55	0.58	0.03	1.43	0.66	0.04	6.52	4.42
	4	Prioritize the standards to be developed	2.50	0.60	0.03	1.42	0.68	0.04	6.42	4.36
	5	Identify interested parties	2.55	0.63	0.03	1.53	0.65	0.03	6.64	4.50
	6	Develop a standards development workplan	2.41	0.65	0.03	1.36	0.74	0.04	6.17	4.19
B	**Developing standards**									
	1	Constitute the technical committee	2.70	0.54	0.03	1.34	0.68	0.04	6.74	4.58
	2	Manage standards stakeholders	2.50	0.61	0.03	1.43	0.70	0.04	6.44	4.37
	3	Convene technical committee meetings	2.51	0.63	0.03	1.49	0.70	0.04	6.50	4.41
	4	Develop draft standards	2.64	0.55	0.03	1.50	0.66	0.04	6.78	4.60
	5	Disseminate standards for public inquiry	2.52	0.65	0.03	1.35	0.77	0.04	6.40	4.34
	6	Edit draft standards	2.42	0.63	0.03	1.40	0.73	0.04	6.25	4.24
C	**Participating in international and regional standardization**									
	1	Manage participation in international and regional standardization work	2.51	0.61	0.03	1.27	0.74	0.04	6.29	4.27
	2	Nominate experts (for international/regional participation)	2.45	0.63	0.03	1.27	0.74	0.04	6.17	4.19

Duty and task			Importance			Frequency				
			Mean	SD	SEM	Mean	SD	SEM	Comb	Weight %
	3	Constitute a national mirror committee	2.38	0.68	0.04	1.11	0.73	0.04	5.86	3.97
	4	Establish national positions	2.51	0.60	0.03	1.22	0.78	0.04	6.24	4.23
D	**Publishing standards**									
	1	Secure approval to publish	2.60	0.60	0.03	1.35	0.80	0.04	6.55	4.45
	2	Create or update digital standards	2.32	0.71	0.04	1.05	0.80	0.04	5.70	3.87
	3	Make standards available	2.68	0.57	0.03	1.22	0.83	0.04	6.57	4.46
E	**Promoting standards**									
	1	Develop a marketing communication plan	2.23	0.70	0.04	0.71	0.71	0.04	5.17	3.51
	2	Implement the marketing communication plan	2.29	0.74	0.04	0.72	0.73	0.04	5.29	3.59
F	**Managing support services (internal/external customers)**									
	1	Provide capacity building for stakeholders	2.27	0.71	0.04	1.04	0.69	0.04	5.58	3.79
	2	Manage internal services	2.23	0.65	0.03	1.03	0.72	0.04	5.49	3.72
	3	Manage external customers	2.20	0.70	0.04	0.98	0.74	0.04	5.37	3.64

The meeting participants considered the three tasks above and determined that despite the low frequency ratings, these are important tasks and should be included.

The meeting participants then considered the comments that had been written by survey respondents regarding missing tasks. It was discussed that the survey respondents did not receive the steps and so lacked the richness of detail when reviewing the JTA. As a result, all of the "write in" tasks are items that either the JTA covers, but included as a subtask or step, or alternatively not needed, in the opinion of the meeting's participants. Table 13 shows the "write in" comments regarding missing tasks.

Table 13 – Respondent write-in missing tasks

Missing tasks
Coordinating and implementing quality management systems (ISO 9001:2015) in the work of standards development.
Conducting workshops with stakeholders about the benefits of implementing developed standards.
Monitoring Memorandum of Understanding on areas related to standards development.
Encouraging the use of standards.
The resource mobilization elements could be added.
The cost of many ISO standards is one forbidding area that results in many developing countries to lag behind and instead make standards that are not at par with regional or global conditions.
Technical committee members should be sensitized about the standards voting procedures as they are very crucial for the clearance process.

Missing tasks
Understanding the issues, concerns and interests in the standardization sector. It's important to be appraised with issues such regulatory, development and consumer matters.
Providing knowledge about connection between standards and legislation. Providing a network of experts sharing knowledge.
Research task. There is need for standardizers to always first do research on a product or service standard to be evaluated for development. This helps to know if there is already a developed standard in that area and saves on resources that could have been spent in developing the standard. Need to do stakeholder engagement to discuss the need to have a standard developed but also to understand the subject very well.
In addition to these tasks, the study and research on the characteristics or properties, which allow the establishment of requirements to product standards, is carried out.
In my opinion, this survey lists the main duties and tasks that should characterize an adequate performance of a standards professional. However, the aspects related to the duty of these professionals to be linked to professional qualification programmes in order to maintain the competence requirements that should characterize them should have been addressed. For example, I am thinking of the approaches and requirements that are embodied in IWA 30-1 and 30-2, on which we are basing our strategies for measuring the behaviour of standards professionals. Another aspect that I think could have been included more explicitly is that related to the basic duty of a standards professional to keep himself constantly informed of the latest developments promoted by the three leading world standardization organizations in their respective fields performance. In this sense, I am referring to actions that do not necessarily entail logistical expenses that, as ISO well knows, constitute the main obstacles to the development of standards in our developing nations.
I think you missed the qualitative aspect of issues, for example: "Establish Standards Development Procedures (i.e. SOPs)." We know that Procedures are fundamental – but only Procedures that are correct, proper, and developed with care in order to reach their purpose. We assume that if we have Procedures they have high quality, which too often is not valid. The correct sentence should (in my opinion) be as follows: "Establish adequate and correct Standards Development Procedures (i.e. SOPs)."
A lot of the listed tasks are in databases and we react automatic notifications. ISO directives and databases dictate the work. Some tasks appear more often than others.
You missed translation. Translating nationally important standards increases standard use.
One of the tasks during the standard development plan is to confirm that the reflection and interlinking of the standard with the relevant standard(s) is well checked and if any of the cited citied standard(s) has been updated and has technical difference which could influence the development of the standard being reviewed or developed, then such difference has to be addressed.

Missing tasks
I don't understand some of the labels. For example, what is a "'standards work programme'" versus "'standards development workplan'". Does the former refer to preparing a list of standards that need to be developed/updated, and the latter, to a sequence of procedures that are necessary to develop a particular standard?
Manage interfaces between committees and deal with cross-cutting issues such as Environmental, Social and Corporate Governance (ESG) and Sustainable Development Goals (SDGs).
My suggestions are focused on training and information on the international normative procedure of interest for developing countries. The knowledge of this procedure can promote us in the objective of reaching the goal traced by ISO. My suggestions are focused on training and information on the international normative procedure of interest for developing countries. Obstacles and barriers to the application of standards in the field should be collected and communicated. As I understand it, the subscribed member will be able to benefit at least once a year from the right to attend meetings held by the participating members?
Adapt International Standards to national/regional realities.
They need to be able to navigate differing personalities and be able to reprioritize based on changing needs.
Awareness raising or guide on standards using dissemination of newly published standards or series of standards that are sector-specific (which may be covered by Duty 5 – promoting but not really marketing activities).
Public speaking and engagement.
Environmental circumstances.
Identification of relevant standards and communication with stakeholders.
We do not believe that there are any missed obligations or tasks that should be performed by the standard developer.
As an expert in tourism, I participated in works to develop 2 ISO standards promoted by Tunisia: ISO 17680 (2015) thalassotherapy service – requirements and ISO 22525 (2020) medical tourism, therefore I access to ISO platform and I'm consulting systematically all drafts for WG1 (Diving) and WG2 (Health tourism). Especially, for developing countries, I think that upstream work that should be done, mainly to have a prerequisite and prerequisites to implement an ISO standard.
Continuous linkages with international and regional bodies are very much essential to keep updating and gaining experiences, and to know what we are doing at international and regional level.

Missing tasks
MISSION 1 – 12: In part 4 related to the evaluation of tasks, and particularly the point related to the development of a work plan for the development of standards which must be periodic (annual/half-yearly plan). MISSION 2 – 16: The point related to the modification of the draft standards is not clear, it is better to put the expression "modify the draft standards after examination of the technical committee/public inquiry". MISSION 3 – 16: Before describing the point of appointment of the experts, it is important to add the section "creation of a related regional organization/authority" because there are regions which do not have regional standardization bodies. MISSION 4 – 18: The expression "create or update digital standards" may exclude the updating of hard copies of the standards, where their existence may cause a risk of use after the digital update. MISSION 5 – 20: Add the point "Develop a procedure defining the terms of claim/complaint/enrichment in the update of the published standards". MISSION 5 – 20: Add "Master outdated/obsolete normative documents". MISSION 6 – 22: To associate the elites of university establishments specialized in the field of standardization by the selection of the majors of promotions, for example, and to propose advantageous motivations.
I'm involved in a lot of committees in ISO (TC, SCs, AGs, WGs, AHGs) and depending on the situation I should give a different answer as done. Some items are more important than other ones, but none of them were useless.
Standards Development Professionals should provide technical writing, the presentation, and the structure of the standards to ensure its clarity in a concise manner and with a style that is understandable to users.
Analysis of current standards. Conflict management. Preparation of management reports. Preparation of meeting minutes.
Ensuring that standards fall within the scope of a given committee. Ensuring no overlap between standards. Coordinating the work of different committees when a standard has partial overlaps of scopes. Translating documents national comments and positions. Searching for relevant standards either national, regional or international on the subject to standardize. Having or gaining enough technical knowledge on the committee subject matter to be able to guide the work of the experts involved. Editing standards in our national language and in English when commenting on international documents.
Training to understand the standards in force, to have the same language of communication and good understanding of the requirements and the relative documentary guides.

Missing tasks
Need to do research on available standards and applicable laws related to the standards to be developed.
The duties and tasks overly cover what is involved in standards development for all the different players, i.e. standards drafters, editors and those involved in publishing.
Adoption by translation and the role of translator because our native language is not one of the official ISO languages. Innovation of standardization process to get effective and efficient actions. Data manager to develop statistics for communication material and activities, case studies and benefits of standardization. Standardization project manager to develop specific public and private alliance, for example, in education field and in international terms to develop strategies to develop relevant role and twinning activities. Trainers to develop internal capacity.
The role of standards to facilitate trade.
Translating standards.
Translation of standards and related documents.
Awareness of the added value of getting involved in the standards development process and that standardization is not just a matter of so-called experts acting as volunteers. Expertise and knowledge on the subject under discussion is important but it is also of critical importance the representativeness of those getting involved in standardization and to take into account the bias of the mandate that they could receive from the represented interest.
Manage research projects for support the development of technical standards to address industry and governmental needs.
Establishment of project monitoring tools. Establishment of Standardization Strategy and Plan. Maintaining the relevance of developed standards.
Awareness of standards to stakeholders.

Missing tasks
Check: (1) relationship with interested parties (2) national government plans (3) international standards Prioritization of documents to work. Manage technical committees: call meetings, prepare the minutes, send documents to the national Public Consultation, review comments by public consultation, review and edit the final document. Socialize normative work. Give technical talks – forums.
I wonder if the standardizer should have experience in the subject to normalize.
Provide capacity building for stakeholders.
- Privacy and copyright (intellectual properties). - Commitments of project leaders.
Setting the National Standardization Body's strategy.
At UNE, most technical officers provide standardization support for R+D+i projects, helping to define the potential scope for standards (or more frequently other standardization documents), identify the best technical body (TC, SC or WG and organization) and prepare initial drafts. We also have an active role preparing budgets of standardization activities. On the other hand, edition, publication, promotion and support services are often managed by staff focused on those tasks, with only small involvement from technical officers.
A standards developer should know ISO standards writing and editing skills.
Review and maintenance of existing standards does not seem to feature highly in your list of tasks, yet as portfolios grow it is important to evaluate and maintain the effectiveness of the existing portfolio.
Standards Officers when establishing technical committees, provision of published standards, access to developing and published standards need to consider the diversity of the population and organizations that use them. Ensure that the technical committee being established is representative of the users; manufacturers, consumers (including the diversity of users of the product or service, older persons, persons with a disability, minority groups, environmentalists, advocacy groups, technologists. Ensure suitable training and tools for the diverse membership of technical committees (ICT Tools, built environment, accessible online platforms (such as Livelink), accessible published standards).
Make sure that when writing standards there is a balance of developing countries, not only in the presence but contributing ideas. Many times developing countries are invited but for various reasons their opinion is not taken into account.
I don't think you miss a task.

Missing tasks
Consultation with stakeholders on the implementation of the directives, rules and processes.
On Duty 3, for participating in International and Regional Standardization Activities, a national mirror committee is not always needed. You can also have a national non-mirror committee. On Duty 4, it wasn't clear for me what "digital standards" mean. Are they standards in XML? or PDF is also considered digital standards? In Duty 1, another task that we do is identify the needs of interested parties. It could be included in "Develop Standards Work Programmes", but I think the identification of the needs of interested parties is a previous step for developing the standards work programme, so it can be considered as a different activity.
I don't think that standards development professionals analyse the need for standards – rather our role is to listen closely to business and then facilitate the development (and then publication) of the standards that are needed by business.
Managing and organizing the daily work and provide the required information to facilitate efficient decision making. Managing correspondence and collaborating in relevant activities with international and regional organizations. Developing and coordinating the organization's standards with regional and international organizations.
Apply for support and financing of tasks, prepare project plans and budgets. Make progress reports for supporting bodies. Present standards, prepare presentations. Prepare courses on standards and marketing happenings for the products. Participate at technical congresses in the branch of working, to keep up to date in the working field and collect possible new standardization needs and tasks in the field – important in order to keep updated! Learn the use of different digital systems, prepare digital versions of the standards, updating the skills continuously.
Contact with international, regional and other national standardization bodies.
Keep virtual meetings for international standardization.
Involvement in research and development.
External engagement to promote work of NSB, which is important, and I do occasionally.
Manage marketing to governmental stakeholder (in developing country). Manage risk (threats and opportunities) during standards development.

Proposed examination blueprint

Based on the task ratings and tabulated data, the proposed examination blueprints were developed. These explore examinations at various lengths including 100-, 120- and 150-item examinations and are based on the tabulated importance and frequency. Items with higher importance and frequency (as combined) receive more proposed test items. Those with lower importance and frequency received less proposed test items. These examination blueprints may be used to develop assessments for training completion, as well as for certification examinations for standards development professionals.
See Table 14.

Table 14 − Proposed examination blueprints

Duty and task		Comb	Weight %	100	120	150
A	**Planning the standards work**					
1	Establish standards development procedures (i.e. sops)	6.30	4.28	4	5	6
2	Develop standards work programmes (long term)	5.96	4.04	4	5	6
3	Justify the need for a standard	6.52	4.42	5	6	7
4	Prioritize the standards to be developed	6.42	4.36	4	5	7
5	Identify interested parties	6.64	4.50	4	5	7
6	Develop a standards development workplan	6.17	4.19	4	5	6
B	**Developing standards**					
1	Constitute the technical committee	6.74	4.58	5	6	7
2	Manage standards stakeholders	6.44	4.37	4	5	7
3	Convene technical committee meetings	6.50	4.41	4	5	7
4	Develop draft standards	6.78	4.60	5	6	7
5	Disseminate standards for public inquiry	6.40	4.34	4	5	7
6	Edit draft standards	6.25	4.24	4	5	6
C	**Participating in international and regional standardization**					
1	Manage participation in international and regional standardization work	6.29	4.27	4	5	6
2	Nominate experts (for international/regional participation)	6.17	4.19	4	5	6
3	Constitute a national mirror committee	5.86	3.97	4	5	6
4	Establish national positions	6.24	4.23	4	5	6
D	**Publishing standards**					
1	Secure approval to publish	6.55	4.45	5	6	7
2	Create or update digital standards	5.70	3.87	4	5	6
3	Make standards available	6.57	4.46	4	5	7

Duty and task		Comb	Weight %	100	120	150
E	**Promoting standards**					
1	Develop a marketing communication plan	5.17	3.51	4	4	5
2	Implement the marketing communication plan	5.29	3.59	4	4	5
F	**Managing support services (internal/external customers)**					
1	Provide capacity building for stakeholders	5.58	3.79	4	5	6
2	Manage internal services	5.49	3.72	4	4	5
3	Manage external customers	5.37	3.64	4	4	5

Knowledge ratings

Next the survey respondents were asked to review the list of knowledge that was generated during the DACUM JTA meeting and to determine if this knowledge is needed by standards development professionals, and if so, the degree to which it is needed. Table 15 highlights the knowledge rating scale.

Table 15 ─ Knowledge rating scale

Knowledge scale
Yes, advanced/expert understanding
Yes, intermediate understanding
Yes, basic understanding
Yes, awareness
No, this knowledge is not required

The meeting participants were asked to review the tabulated knowledge ratings and to consider dropping any knowledge with a mean below 2 and to consider dropping any knowledge with a substantial number of respondents reporting this knowledge is not required (20 or more) (highlighted in yellow). Table 16 details the tabulated results.

Table 16 ─ Tabulated knowledge ratings

Knowledge	Mean	No
Standards development processes, procedures, functions and practices	3.43	1
Good standardization practices (GSP)	3.34	0
Working knowledge of standardization at national, regional and international levels	3.31	2
Code of ethics	3.27	3
Existing standards being developed at national, regional, international levels	3.26	3
Committee member expertise	3.26	5
International/regional standardization participation process and procedures	3.23	1
Standards editing practices and quality control	3.17	4

Knowledge	Mean	No
Knowledge of the specific sector	3.16	5
Technical knowledge in the fields/sectors in which seeking leadership roles	3.14	4
Media	3.13	3
Definition of interested parties and stakeholders	3.12	3
Roles and responsibilities of mirror committee members	3.11	4
Technical knowledge	3.10	4
Standardization bodies	3.09	1
Standards publishing procedures and processes	3.08	4
Comment collating process	3.07	5
Project planning and management	3.05	2
Standard ballot casting process	3.05	4
Communication channels	3.05	3
Typical technical committee structures	3.04	3
Characteristics of stakeholders	3.04	4
Business planning for standardization work	3.03	4
ISO methodology for development of national standardization strategy (NSS)	3.03	4
Sector/field where expertise is needed	3.02	3
Terminology associated with the sector and market of the standard	3.01	3
Quality management systems	3.00	3
Meeting procedures	3.00	9
Online standards platforms	2.99	8
Copyrighting laws	2.98	4
Mutual recognition arrangements	2.97	7
International Classification of Standards (ICS)	2.96	6
Technical knowledge in the training area	2.93	7
National and International priorities and directions	2.91	4
National laws	2.90	4
Complaint procedures	2.88	4
Document security procedures	2.88	10
Presentation practices	2.87	5

Knowledge	Mean	No
Standard communication procedures	2.87	5
IT tools and services	2.86	4
Information management techniques	2.84	10
Research methodologies	2.84	10
Digital document tracking systems	2.84	11
Procedures to create and update digital standards	2.78	9
Customer Services	2.77	4
Sector and market of a standard	2.77	8
Avenues to reach public	2.77	5
Legal framework in the specific country	2.76	7
Cultural knowledge	2.76	5
Target language of a specific standard	2.75	13
Databases and database management	2.75	14
Risk evaluation methodologies	2.75	8
Marketing and marketing methodologies	2.73	5
Customers	2.73	2
Legal rules and terms	2.73	7
Internal operating procedures	2.72	6
National, regional and international catalogues and other scientific documentation	2.71	10
Adult learner principles	2.66	20
Learning management systems	2.65	9
Emerging issues	2.64	12
Standard catalogue systems	2.64	12
Event planning and management	2.61	10
Mirror committee participation platform	2.61	14
Management of national and international stakeholders	2.59	9
Survey methodology	2.54	10
Translation processes and procedures	2.54	20
SWOT analysis	2.52	12

Knowledge	Mean	No
Partnership agreements instruments	2.51	12
Budgeting and budgetary constraints	2.51	14
Familiarity with standard sales channels (web store, etc.)	2.48	17
Public relations	2.48	12
Training methods	2.44	18
Economic indicators	2.42	19
Economic comparative advantages of specific countries (already included in national standardization strategy (NSS) development)	2.39	21
Top exports and imports of a country (already included in NSS development)	2.36	27
Human resource policies and procedures	2.33	22
Market conditions, failures and needs (already included in NSS development)	2.29	20
Means of communication	2.27	18

As indicated in the table, a substantial number of respondents indicated no knowledge was needed in the areas highlighted in yellow. The meeting participants reviewed the highlighted areas and felt these were important aspects of knowledge that needed to be maintained. For the knowledge area "Adult learner principles" the meeting participants indicated this might need to be reworded to help users understand what is meant, but no wording was proposed. For the knowledge area "Translation processes and procedures" participants felt that only specific individuals were involved in this, and that the respondents may not be familiar with the importance of this knowledge. For three of the knowledge areas, participants indicated that these are already included in NSS development, so are clearly important.

Missing knowledge

After reviewing the knowledge ratings, the meeting participants considered the write-in list of missing knowledge. This was knowledge that survey respondents felt was missing from the list. Each entry was considered, and it was determined that none of the suggestions were missing. Below in Table 17 is the list of proposals from survey respondents.

Table 17 ─ Table of write-in missing knowledge

Missing knowledge
Documentation management and records control, use of standards template, data analysis.
Fundamentals of standardization (definition, aims, and types of standards).
Continuous professional development and participation in proficiency tests must be encouraged so that standard developers enhance their knowledge.
Principles for development of standards. International trade agreements.
I think you have too many. Many of which I do not know how to answer correct. Would be great to have a category "don't know".
I think a fairly exhaustive list of knowledge, skills and other qualities that a standards specialist should have has been compiled here. However, it all depends on the mission and where that normalizer works. That is, if you work as a standards writer within a committee, either in a company or at another level, or if you are in charge of directing or advising a technical group on standards, etc. Thus, a concrete and accurate answer to this question depends on the specific occupation of the technical standards specialist.
Different knowledge is needed for different roles – the result of the survey can lead to misunderstanding. Next, knowledge is important but more important are skills – I think this is a missed area.
Very good statements. There might be a trend, that standards developers confuse standards with technical research reports. At least some new EN-standards have "'framework'" in the title, and content is describing some complex environment, but not necessarily standardizing anything. Also, some EN-standards might promote some practises. Sometimes we wonder should we write minimum requirements or requirements for top-level performance. Also, standards, that list requirements have led to a word usage, that "'standard'" gets synonymous with "'requirement'".
Ethics and compliance.
National system.
Privacy. Security. Policy trends of foreign governments.
None in particular.
5) Knowledge: - Digital document tracking systems can always cause a risk because hard copies are not mentioned in this point, moreover the majority of developing countries often do not have numerization tools. - In the point related to standard sales channels, there are not only online stores, especially in developing countries, which obliges us to take into consideration the old methods of sale.
How to identify conflictive people.
Maybe I would add conflict management and effective communication.
Deep technical knowledge of English and the language in which you are translating is extremely necessary to correctly translate standards to adopt them and comment on international deliverables.
Conflict resolution, stakeholders' engagement.

Missing knowledge
Constant access to innovations and developments in the industrial sector in the world.
Innovation and change management. Project management.
Overcoming conflicts (technical, commercial, interest, etc.).
I read it in English and Spanish, but I didn't understand some of the knowledge statements listed.
Terminology associated with the sector and market of the standard.
Horizontal aspects, such as sustainability, accessibility, SDGs, safety, etc. Patent policies. Internal codes and practices, e.g. behaviour in emergencies, conflicts of interest, competence issues, use of corporate and visual image, etc.
A standards developer should know ISO standards writing and editing skills.
Negotiation skills.
A standards developer should also have knowledge about quality infrastructure, what is it, and how it works in his/her country. Standards are the basis for the quality infrastructure, and if the standards developer doesn't know what standards are used for, he/she won't be able to address many issues that come up in the committees and when developing standards. The standards developer should also know the benefits of standards, for customers, society, economics, stakeholders, industry and so on.
Social responsibility.
Knowledge of the "National Quality Infrastructure" and "National Quality Policy". Knowledge of the MSS "Management System Standards", and its relations with all other sectors.
Emotional intelligence, i.e. knowledge of how to deal with people.

Skills ratings

Finally, the survey validation respondents were asked to evaluate the list of skills that the DACUM JTA experts generated and to determine if any of the listed skills are not needed by standards development professionals. The survey simply asked the respondents to review each of the skills statements based on their experience as a standards developer, and indicate if they thought this skill is required of standards developers. The respondents were to answer a simple yes or no. Table 18 provides the tabulated data for the skills ratings.

Table 18 — Tabulated skills

Skill	Count Yes	Count No	% Yes
Ability to think systematically	343	7	98.00%
Comprehension skills	343	7	98.00%
Ability to ensure coherence in standards	342	8	97.71%
Written communication skills	341	9	97.43%
Teamwork	340	10	97.14%

Skill	Count Yes	Count No	% Yes
Basic ability to read English	339	11	96.86%
Ability to skim and comprehend documents	338	12	96.57%
Planning skills	338	12	96.57%
Reading comprehension	338	12	96.57%
Active listening skills	335	15	95.71%
Analytical skills	334	16	95.43%
Verbal communication skills	334	16	95.43%
Time management skills	333	17	95.14%
Ability to manage meetings	332	18	94.86%
Consensus building skills	332	18	94.86%
Evaluation skills	332	18	94.86%
Decision-making skills	330	20	94.29%
Ability to engage others	328	22	93.71%
Critical thinking skills	327	23	93.43%
Organizational skills	327	23	93.43%
Presentation skills	326	24	93.14%
Interpersonal skills	323	27	92.29%
Ability to connect the edited parts to the whole	322	28	92.00%
Computer literacy and skills	318	32	90.86%
Ability to manage people	316	34	90.29%
Cross-cultural communication skills	315	35	90.00%
Ability to motivate others	313	37	89.43%
Strategic thinking skills	313	37	89.43%
Proficient in the language of the international body	312	38	89.14%
Project management skills	311	39	88.86%
Conflict resolution skills	310	40	88.57%
Research skills	305	45	87.14%
Leadership skills	301	49	86.00%
Public speaking skills	300	50	85.71%
Editing skills	298	52	85.14%

Skill	Count Yes	Count No	% Yes
Negotiation skills	298	52	85.14%
Networking skills	298	52	85.14%
Ability to persuade others	293	57	83.71%
Ability to conduct a risk analysis	289	61	82.57%
Monitoring skills	285	65	81.43%
Stress management skills	283	67	80.86%
Search skills (e.g. Boolean)	279	71	79.71%
IT skills	272	78	77.71%
Ability to influence others	268	82	76.57%
Ability to teach and train	268	82	76.57%
Ability to manage databases	254	96	72.57%
Ability to develop training materials	242	108	69.14%
Translation skills	236	114	67.43%
Specific software competence	219	131	62.57%
Marketing skills	168	182	48.00%

The meeting participants were asked to consider deleting any skill where fewer than 50% of the respondents reported this skill as being needed. Table 18 shows that only one skill – marketing – scored below 50%. After discussion, the meeting participants felt that this is an important skill and should not be deleted from the list.

Missing skills

The survey respondents were asked to indicate any skills they felt were missing from the list provided in Table 18. Below Table 19 shows the list of write-in skills given by the respondents. The meeting participants did not feel any of the write-in skills were missing from the JTA.

Table 19 – Write-in missing skills

Missing Skills
Ability to achieve consensus.
Conferencing skills.
Stakeholder analysis and evaluation.
I don't think anything has been omitted. But, let's face it, if we find a person who fulfils all these skills, we could say "God in heaven and the normalizers on Earth".
A skill to disband a work item and disband a working group. Sometimes the result might be a standard that is full of compromises and not useful after all.

Missing Skills
Simple and logical thinking skills.
Ability to learn quickly and able to provide comments.
Technical writing skills.
Systemic vision skills.
Not to understand what has been said or written is to understand what has not been said.
Social conscience.
Ability for/to: - Conceptualization - Cooperation, transversality and networking - Synthesis - Control of the application of quality, health, safety and environment procedures - The design of all types of quality, safety and environment management systems - Implement quality procedures - Responsiveness - Work independently
Proficient English and editing skills I believe are absolutely necessary. Basic is not enough. Without proficient English skills, none of the other skills listed can be effectively applied at the international level, neither in meetings nor documents. Especially in leadership roles.
1. Coordination skills. 2. Efficient facilitator. 3. Good moderator. 4. Events organizing/hosting skills.
Basic knowledge if psychology.
Reporting writing. Data management.
Verbal communication skills.
Enough time for work. Time and disposition for travelling when you have to participate in meetings.
I think all skills listed above are required to some extent in the participants in developing international standards. But, however, it is not necessary for all participants to be equipped with these kinds of skills. Participants may cooperate or compensate each other in skills.
I would add: Ability to find solutions and ability to comply with limit dates (or goal oriented).
These skills have different levels of requirements. All these do not have to be equally high qualifications. Understanding of the processes is important to manage. Depends on the systems in NSB or ISO etc.
Ability to understand the other (someone different from you) skill.

Other comments

The meeting participants reviewed the other write-in comments provided by the survey respondents. Those comments appear in Appendix D.

Final DACUM JTA chart

After completing the survey validation study, the DACUM JTA chart was updated to reflect changes. There were no substantive changes beyond a few editorial and typographical errors, which were fixed. Appendix E contains a copy of the final DACUM JTA chart.

Comparison of DACUM JTA and International Workshop Agreement (IWA) documents

After completing the validation study, the project team was asked to compare the results of the DACUM JTA and the International Workshop Agreement Documents ISO/IWA 30-1:2019 and ISO/IWA 30-2:2019. This comparison found no substantive differences between the two IWA documents and the job analysis conducted. Nearly all of the competencies identified in the IWA documents are included in the job analysis, with the exception of a few company-specific competencies. Appendix F contains a copy of the comparison tables for the document ISO/IWA 30-2.

Competency framework

The purpose of this project was to conduct a JTA for the purpose of establishing a competency framework for standards development professionals. A competency framework is a tool used to identify, define and measure the knowledge, skills, abilities and behaviours required to perform a job or role effectively. The components of a competency framework can vary depending on the organization and the specific job or role being evaluated, but typically include the following:

1. Competency domains: These are the broad categories of competencies that are required for a specific job or role. For example, a competency framework for a standards development professional might include domains such as planning the standards work, developing standards and promoting standards.
2. Competency statements: These are specific descriptions of the knowledge, skills, abilities and behaviours that are required for each competency within a domain. For example, a competency statement within the "developing standards" domain would include "manage standards stakeholders" and "convene technical committee meetings" and would be comprised of the knowledge of "partnership agreements instruments" and "verbal and written communication skills" among other knowledge and skills.
3. Assessment methods: These describe the tools or methods that will be used to evaluate a standards development professional's proficiency in each competency. This might include self-assessments, peer assessments, supervisor assessments or objective measures, such as tests or simulations.
4. Developmental resources: These are the tools, resources or training that will be provided to help standards development professionals develop the competencies required for their role. This might include on-the-job training, workshops, mentoring or online courses.

Overall, a competency framework provides a structured approach to identifying and measuring the knowledge, skills, abilities and behaviours required for effective job performance. By defining competency domains, competency statements, performance levels, proficiency indicators, assessment methods and developmental resources, organizations can develop a comprehensive framework for evaluating and developing their workforce.

Appendix G contains the final competency framework for the standards development professional.

Framework for additional documents and next steps

Based on this work, several different outputs may be developed, including a training course that may be developed from both the competency framework and the job analysis.

Additionally, a certification of persons credential may be developed. Assessments may include a combination of:

- Completion of training/workshops
- Examinations
- Mentorships

It is recommended that next steps include the involvement of an instructional designer to develop training/workshops and the involvement of testing experts (psychometricians) to develop credentialing (certification examinations).

Appendix A – Invitation letter for first meeting

Dear Sir / Madam,

The ISO Capacity Building Unit is undertaking a project to develop a competency framework for persons involved in standard development. The output of this project will be a list of tasks and associated knowledge and skills (competencies) that a person who is developing standards needs to possess. The outputs may be used for a variety of activities, including developing training for standard development capacity building, developing a certification for standards development professionals, developing job descriptions and developing performance evaluation criteria.

We anticipate this project to be completed by the end of 2022. The first step is to convene a meeting of experts to identify the tasks and associated knowledge, skills and attributes (KSAs). We are looking to seat a group of around 15 to 17 experts who are able to travel to Geneva to meet at the ISO Central Secretariat on 5-7 September 2022. Attached is the meeting agenda.

The process that will be used during this first meeting is called a DACUM Job Task Analysis (JTA). DACUM stands for **D**eveloping **A Cu**rriculu**m** and is a highly structured facilitated process designed to define a job in three succinct days. A JTA is a very close analysis of a specific job, in this case, the job or role of a standard developer, although there are a number of different ways of conducting a JTA. Additional background information regarding DACUM is included.

We are interested in the following types of individuals to participate in this first meeting:

- Individuals from ISO members in developing countries
- Individuals from all sizes of national standards bodies (NSBs) (small, medium and large)
- Individuals from government, public and private NSBs
- Individuals from NSBs with a variety of years of personal and working experience
- Individuals with a variety of titles at the NSB including Director of Standardization, Head of Standards Division, Project Manager/TC Secretary, Convenor or Co-Convenors of Working Groups, Editor of Standards
- Individuals with a wide range of ages from less than 40 years of age to more than 65 years of age

It is highly recommended to ensure gender balance during the nomination process. The meeting will be conducted in English and nominees must have a good grasp of the English language. To nominate your candidate, please use this registration link (https://cvent.me/dPNWe3). ISO will cover the cost of travel for one selected individual per country, who would need to arrive the day before and could depart on the third day after 19:00 or the following day.

The deadline for registration is **25 July 2022**. Once the nomination period closes, a review will be conducted of all nominated individuals. Individuals will be selected to ensure a broad range of geographic and demographic characteristics. If a nominee is not selected for this first meeting, their names will be held for participation in future meetings. Selected individuals will receive additional meeting information. Should you experience any difficulty during the registration process, please contact Ms Nesreen Al-Khammash by e-mail at khammash@iso.org.

Further details will be made available to all the participants on the event website (https://cvent.me/xGdEeZ).

We thank you in advance for your interest and look forward to receiving your nomination.

Best regards,

Erich Kieck

Enclosures

- Meeting agenda.
- Additional background information on DACUM.

Appendix B – JTA meeting agenda

DEVELOPING A CURRICULUM (DACUM) MEETING AGENDA

DAY 1: 5 September 2022

09:00   Welcome and Introductions

09:15   Orientation to the DACUM Process

10:30   BREAK

10:50   Review the Occupation, Review Existing JTA's and Task Lists

11:00   Develop Organizational Chart

11:45   Begin Identifying the Duties and Tasks

12:30   LUNCH

13:30   Continue – Identifying Duties and Tasks

15:00   BREAK

15:15   Continue – Identifying Duties and Tasks

17:00   Adjourn for the Day

DAY 2: 6 September 2022

09:00   Reconvene – Begin Stepping out Tasks

10:30   BREAK

10:50   Continue – Stepping out Tasks

12:30   LUNCH

13:30   Continue – Stepping out Tasks

15:00   BREAK

15:15   Continue – Stepping out Tasks

16:30   Rating sheets of knowledge, skills, attributes

17:00   Adjourn for the Day

Day 3: 7 September 2022

09:00   Continue – Stepping out Tasks

10:30   BREAK

10:50   Continue – Stepping out Tasks

12:30   LUNCH

13:30   Conduct DACUM Chart Refinement and Sequencing

14:30   Complete Scope Statement, Finalize Lists and Charts

15:30   Evaluation and Conclusion of DACUM

16:00   Adjourn

Appendix C – JTA validation survey

ISO Standards Development Professional

JTA validation survey

Introduction

Welcome! The International Organization for Standardization (ISO), Capacity Building Unit, is in the process of developing a competency framework for persons involved in the development of standards in developing economies. To facilitate this project, ISO has conducted a Job Task Analysis (JTA) to identify the tasks and associated knowledge, skills and attributes (KSAs) a person involved in standards development would need.

A group of standards development experts from developing countries met in early September 2022, in Geneva, and identified duties, tasks, steps and KSAs for standards developers. ISO is now interested in validating the outcomes of this meeting through a survey of experts like you.

We would appreciate it if you would respond to this survey to help us determine if the tasks for standards developers identified during the JTA meeting are correct. The survey includes a list of tasks that are identified as tasks that standards developers would perform.

You will be asked to rate the frequency and importance of these work tasks. To help you respond, please use the following description of standards developers: *Standards Development Professionals analyse the need for standards, plan standards development, manage technical committee, and facilitate drafting of standards through stakeholder engagement to serve a country's needs.*

We anticipate the survey taking approximately 30 minutes to complete. If you do not have time to complete the survey in one sitting, you can stop and complete the survey later (provided you use the same computer and have cookies enabled on that computer). The survey will resume where you have stopped. If you do not have cookies enabled, the survey will start from the beginning again.

If you have any difficulty responding to this survey, please contact Ms Nesreen Al-Khammash at khammash@iso.org. We appreciate your assistance with this important project.

Demographic questions

1. Are you involved in, or have you been involved in the development of standards?
   a. Yes
   b. No (drop from survey)

2. What is your relationship with a national standards body?
   a. I am employed by an NSB (go to next question)
   b. I am a consultant for an NSB (go to next question)
   c. I am a volunteer for an NSB (go to next question)
   d. I am not associated with an NSB (skip to question #8)

3. What is the membership level of your NSB?
   a. Member body
   b. Corresponding member body
   c. I don't know

4. What is the size of your NSB?
   a. Small NSB (less than 5 employees)
   b. Medium NSB (5-50 employees)
   c. Large NSB (51+ employees)
   d. I don't know

5. What is the access to technology for your NSB?
   a. Good access to technology
   b. Limited access to technology
   c. I don't know

6. How many years has your NSB been in business?
   a. Less than 10 years
   b. 11-25 years
   c. 26+ years
   d. I don't know

7. What type of NSB do you have?
   a. Government NSB
   b. Public NSB
   c. Private NSB
   d. I don't know

8. Which of the following **BEST** describes your job title associated with standards development?
   a. Analysis and Development Specialist
   b. Approving Board
   c. Committee Manager
   d. Consultant
   e. Convenor or Co-Convenors
   f. Editor of Standards
   g. Implementation Specialist
   h. Manager or Director of NSB
   i. Mirror committee member
   j. Moderator
   k. NSB staff

l. Planner
m. Project Leader
n. Project Manager
o. Project Secretary
p. Proofreader
q. Standardizer
r. Standards Coordinator
s. Standards Developer
t. Standards Expert
u. Standards Facilitator
v. Standards Manager
w. Standards Officer
x. Standards Project Manager
y. Standards Researcher
z. Standards Specialist
aa. Standards Writer
bb. Supporter
cc. Technical Committee Member
dd. Technical Expert
ee. Technical Reviewer
ff. Technical Secretary
gg. Translator
hh. Other (please specify)_____

9. What is your age?
    a. Less than 40 years of age
    b. Between 41-55
    c. Between 56-65
    d. Over 66

10. How many years of experience do you have in standards development?
    a. Less than 10 years
    b. Between 11-20 years
    c. Between 21-30 years
    d. Over 31 years

11. Which country are you located in?
    a. Drop in a list of all countries.

Task ratings

Instructions: On the following pages are a list of task statements. Please think about each task and respond regarding the importance of each task to ensure successful job performance and the frequency YOU do each task.

When planning the standards work programme:	How important is it to *Establish Standards Development Procedures (i.e. SOPs)*?	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Develop Standards Work Programmes (Long Term)?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Justify the Need for a Standard?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Prioritize the Standards to be Developed?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Identify Interested Parties?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all

	How important is it to *Develop a Standards Development Workplan?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
When developing standards:	How important is it to *Constitute the Technical Committee?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Manage Standards Stakeholders?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Convene Committee Meetings?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Develop Draft Standards?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Disseminate Standards for Public Inquiry?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important	□ Frequently □ Occasionally

	□ Somewhat important	□ Not at all
	□ Not important at all	
	How important is it to *Edit Draft Standards?*	How frequently do **YOU** do this task?
	□ Extremely important	□ Frequently
	□ Important	□ Occasionally
	□ Somewhat important	□ Not at all
	□ Not important at all	
When participating in international and regional standardization:	How important is it to *Manage Participation in International and Regional Standardization Work?*	How frequently do **YOU** do this task?
	□ Extremely important	□ Frequently
	□ Important	□ Occasionally
	□ Somewhat important	□ Not at all
	□ Not important at all	
	How important is it to *Nominate Experts (for International/Regional Participation)?*	How frequently do **YOU** do this task?
	□ Extremely important	□ Frequently
	□ Important	□ Occasionally
	□ Somewhat important	□ Not at all
	□ Not important at all	
	How important is it to *Constitute a national mirror committee?*	How frequently do **YOU** do this task?
	□ Extremely important	□ Frequently
	□ Important	□ Occasionally
	□ Somewhat important	□ Not at all
	□ Not important at all	
	How important is it to *Establish National Positions?*	How frequently do **YOU** do this task?
	□ Extremely important	□ Frequently
	□ Important	□ Occasionally
	□ Somewhat important	□ Not at all
	□ Not important at all	
When publishing standards:	How important is it to *Secure Approval to Publish?*	How frequently do **YOU** do this task?

	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Create or Update Digital Standards?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Make Standards Available?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
When promoting standards:	How important is it to *Develop a Marketing Communication Plan?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Implement the Marketing Communication Plan?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
When managing support services:	How important is it to *Provide Capacity Building for Stakeholder?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all

	How important is it to *Manage Internal Services?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all
	How important is it to *Manage External Customers?*	How frequently do **YOU** do this task?
	□ Extremely important □ Important □ Somewhat important □ Not important at all	□ Frequently □ Occasionally □ Not at all

Open responses to tasks

Thinking about the tasks listed above, do you think we missed any tasks that a standards developer must perform? If so, please list below:

(Insert place for open responses)

Knowledge ratings

Review each of the knowledge statements below and based on your own personal experience as a standards developer, indicate if you think this knowledge is required of standards developers, and if so, the depth of knowledge required.

Knowledge	Is this knowledge required by standards developers and if so, what level of knowledge is required?
Adult learner principles	□ Yes, advanced/expert understanding □ Yes, intermediate understanding □ Yes, basic understanding □ Yes, awareness □ No, this knowledge is not required
Avenues to reach public	Repeat above
Knowledge of the specific sector	
Legal rules and terms	
Mutual recognition arrangements	
Budgeting and budgetary constraints	
Business planning for standardization work	
Characteristics of stakeholders	
Code of ethics	
Comment collating process	
Committee member expertise	
Communication channels	
Complaint procedures	
Copyrighting laws	
Cultural knowledge	
Customer Services	

Knowledge	Is this knowledge required by standards developers and if so, what level of knowledge is required?
Customers	
Databases and database management	
Definition of interested parties and stakeholders	
Digital document tracking systems	
Document security procedures	
Economic comparative advantages of specific countries	
Economic indicators	
Emerging issues	
Event planning and management	
Existing standards being developed at national, regional, international levels	
Familiarity with standard sales channels (web store, etc.)	
Familiarity with the standards sales process	
Good standardization practices (GSP)	
Human Resource policies and procedures	
ICS	
Information management techniques	
Internal operating procedures	
International/regional standardization participation process and procedures	
ISO methodology for development of national standardization strategy (NSS)	
IT tools and services	
Learning management systems	
Legal framework in the specific country	
Market conditions, failures and needs	
Marketing and marketing methodologies	
Means of communications	
Media	
Meeting procedures	
Mirror committee participation platform	
National and International priorities and directions	
National and International stakeholders	
National laws	
National, regional and international catalogues and other scientific documentation	
Online standards platforms	
Partnership agreements instruments	
Presentation practices	
Procedures to create and update digital standards	
Project planning and management	
Public relations	
Qualifications of editors	
Quality management	
Regional Trade Agreements (RTAs) between country of NSB and other associated countries	
Research methodologies	
Risk evaluation methodologies	

Knowledge	Is this knowledge required by standards developers and if so, what level of knowledge is required?
Roles and responsibilities of mirror committee members	
Sector and market of a standard	
Sector/field where expertise is needed	
Standard ballot casting process	
Standard catalogue systems	
Standard communication procedures	
Standardization bodies	
Standardization practices	
Standards development processes, procedures, functions and practices	
Standards editing practices and quality control	
Standards publishing procedures and processes	
Survey methodology	
SWOT	
Target language of a specific standard	
Technical knowledge	
Technical knowledge in the fields/sectors in which seeking leadership roles	
Technical knowledge in the training area	
Terminology associated with the sector and market of the standard	
Top exports and imports of a country	
Trade flows of country	
Training methods	
Translation processes and procedures	
Typical committee structures	
Working knowledge of standardization at national, regional and international levels	
WTO TBT agreements	

Open responses to knowledge

Thinking about the knowledge statements listed above, do you think we missed any knowledge that a standards developer must have? If so, please list below:

(Insert place for open responses)

Skills ratings

Review each of the skills statements below and based on your own experience as a standards developer, indicate if you think this skill is required of standards developers.

Skill	Required of standards developers?
Ability to conduct a risk analysis	□ Yes □ No
Ability to connect the edited parts to the whole	Repeat above
Ability to develop training materials	
Ability to engage others	
Ability to ensure coherence in standards	
Ability to influence others	
Ability to manage databases	
Ability to manage meetings	

Skill	Required of standards developers?
Ability to manage people	
Ability to motivate others	
Ability to persuade others	
Ability to skim and comprehend documents	
Ability to teach and train	
Ability to think systematically	
Active listening skills	
Analytical skills	
Basic ability to read English	
Comprehension skills	
Computer literacy and skills	
Conflict resolution skills	
Consensus building skills	
Critical thinking skills	
Cross-cultural communication skills	
Decision-making skills	
Editing skills	
Editorial skills	
Evaluation skills	
Interpersonal skills	
IT skills	
Leadership skills	
Marketing skills	
Monitoring skills	
Negotiation skills	
Networking skills	
Organizational skills	
Planning skills	
Presentation skills	
Proficient in the language of the international body	
Project management skills	
Public speaking skills	
Reading comprehension	
Research skills	
Search skills (e.g. Boolean)	
Specific software competence	
Strategic thinking skills	
Stress management skills	
Teamwork	
Time management skills	
Translation skills	
Verbal communication skills	
Written communication skills	

Open responses to skills

Thinking about the skill statements listed above, do you think we missed any skills that a standards developer must possess? If so, please list below.

(Insert place for open responses)

Open responses

Do you have any other comments you would like to provide ISO on this job task analysis of standards development professionals? If yes, please provide below:

(Insert place for open responses)

Would you be interested in participating in future meetings? If so, please provide your contact information:

Name:

E-mail:

Appendix D – Write-in comments provided by survey respondents

Write-in comments
All good.
Carry out more frequent research and contact with standardization bodies, and especially with their members.
Collaboration will be helpful if we have chance of collaborating.
From my perspective, this survey was very comprehensive, and this information could potentially be very useful in terms of internal capacity building.
I have seen many international editors, convenors and committee managers struggle to do their job in English and in those groups it is very difficult to reach consensus and work effective or efficiently, wasting many hours of subject matter experts' time.
I need to clarify that the affirmative choice in terms of the ability to influence others is based on the term Influence, considering it from the participatory aspect and not on voting and other aspects that require neutrality.
I propose to give professionals the opportunity to spend good time at iso premises or any other well established standardization bodies. Develop communication skills of professionals not speaking one of the ISO official languages.
I think a good standards developer must know the economic context of her/his country because this affects the way the stakeholders react to standards development.
I think ISO completely ignores the academic experts. When I move to another country, and wanted to continue offering my expertise, I learned that my new University needs to officially become the NSB member (or some other type of associated entity – please apologize for perhaps incorrect usage of the word "'member'") and … PAY for it. So, on top of my time, which I offer, my employer must pay to offer my labour to ISO. I think there is a reason for such a business model in case of companies, but it's a nonsense in case of academic institutions. I see some ISO experts, who lead standards development, literally begging on social media their professional contacts to provide feedback. And I would be happy to do it, but the only way for me to contribute to ISO standards is to convince my employer to pay a fee for a possibility to work (for free!) for ISO.
I think you did a great job. The standards developer role requires a lot of skills and knowledge, and this is a very useful tool for us to be able to keep building capacity withing our NSB.
I would like to know about the application of IWA 30-2 in some countries. It is important to know how they applied it, what difficulties they encountered and what instruments they developed.
In my new role as Head of Professional Development at NEN, I would be highly interested in the results of this survey, as well as any follow up activities.
Instead of "'yes'" or "'no'" this should be based on a scale from 1-5.
ISO should kindly allocate more training resources for member body NSB standard developers and enhance twinning activities between developed and developing countries.
It is possible for me to reply "'I don't know'" option.
It is better that the three levels for answering the skills required for standards developer be considered as "'important, mostly important, not important'".
Le travail en normalisation doit avoir une vision du travail en pompier dans l'objectif d'aboutir aux objectifs tracés pour la sécurité.

Write-in comments
Services skills, attitude and mindset.
Specific software competence.
Standards developer is called on to: - Deal with the execution, interpretation and attitude of judgments to the standards. - Demonstrate a good sense of observation. - Demonstrate initiative and develop own working methods. - Find innovative solutions to solve problems. - Try to find solutions to problems, and not only focus on effects and consequences.
The first parts of the survey, it may be better if there are five choices instead of three and four.
The need to increase the competence of people dedicated to Standardization, Metrology, Certification and Accreditation has been imposed, as these matters are defined by the international organizations that govern them, including the tools that are associated with them, such as: quality inspection, product sampling, metrological supervision, product testing, calibration and verification of measuring instruments, among others. Consequently, the National Quality Infrastructures dedicate special attention to the issues of the competences of these organizations and, in particular, of their human resources. I think that there is a fairly widespread knowledge through recognized and proven practices and documents about the competence requirements of an evaluator of an accreditation body, an analyst of a testing laboratory, a measurement specialist, etc. But, what could be said about the competence of specialists in standards when standardization is the main activity on which all the ones I mentioned before are based? How to define and measure that competence? It is something that throughout more than half a century that I have dedicated to this passion, I have not been able to explain myself in a completely satisfactory way, even taking into account that I was almost born with ISO in 1948. They say: It's never too late if happiness is good." Therefore, I congratulate the promoters of this survey within ISO and I invite them to continue and deepen the results of the work started years ago. There is a need to greatly simplify the skills, knowledge and other competency requirements of standards specialists. It is not about underestimating any of the aforementioned, but rather studying the truly essential ones and with the rest proposing a kind of gradation that allows us to base a realistic implementation on the conditions of each ISO member country. I have already mentioned before in responses to this survey the existence of IWAs that stemmed from the Korean experience. Let's continue!!! With everyone's effort, everything is possible.
The skills selection will vary to some extent, based on the actual role of the individual, e.g. a WG expert will require far more knowledge and technical skill of the subject matter of the standard than will a committee manager.
To have budget for an international meeting.
We wish ISO to expand training more and more in all of the above areas for furthering of competence.
While this initiative is gathering data on the Key Skills and Aptitudes of standards developers, it would have been highly useful to survey participants if it was clearly stated at the beginning what cognitive level, initially, in Bloom's taxonomy was the standard developer expected to satisfy/perform.
Yes, I want to conduct training courses for developers in the field of human development so that the developer's performance can continuously improve.

Appendix E – Final DACUM JTA chart

> ***Standards Development Professionals*** *analyse the need for standards, plan standards development, manage technical committees and facilitate drafting of standards through stakeholder engagement to serve a country's needs.*

		Duties and tasks of standards development professionals
A		**Planning the standards work programme**
	1	Establish standards development procedures (i.e SOPs)
	2	Develop standards work programme *(long term)*
	3	Justify the need for a standard
	4	Prioritize the standards to be developed
	5	Identify interested parties
	6	Develop standards development workplan
B		**Developing standards**
	1	Constitute the technical committee
	2	Manage standards stakeholders
	3	Convene committee meetings
	4	Develop draft standards
	5	Disseminate standards for public inquiry
	6	Edit draft standards
C		**Participating in international and regional standardization**
	1	Manage participation in international and regional standardization work
	2	Nominate experts (for international/regional participation)
	3	Constitute a national mirror committee
	4	Establish national positions
D		**Publishing standards**
	1	Secure approval to publish
	2	Create or update digital standards
	3	Make standards available
E		**Promoting standards**
	1	Develop a marketing communication plan

		Duties and tasks of standards development professionals
	2	Implement the marketing communication plan
F		**Managing support services (internal/external customers)**
	1	Provide capacity building for stakeholders
	2	Manage internal services
	3	Manage external customers

Brainstorming results for standards developers (SD)

Who (other job titles for SD)	What (what the SD person does)
Analysis and Development Specialist	Analyse implementation of standards
Approving Board	Analyse the current state of standards
Committee Manager	Apply GSP
Consultant	Assess risks
Engineer	Assess the need for standards
Implementation Specialist	Collect and review comments
Moderator	Collect information
Planner	Conduct research
Professor	Consult different views and development processes
Project Leader	Convene meetings
Project Secretary	Develop promotional materials
Proofreader	Disseminate information
Standardizer	Document the development process
Standards Coordinator	Draft standards
Standards Developer	Edit standards
Standards Expert	Ensure consensus
Standards Facilitator	Estimate budgets
Standards Manager	Give talks/trainings
Standards Officer	Identify needs
Standards Project Manager	Issue New Work Item Proposals
Standards Researcher	Maintain meeting notes/minutes
Standards Specialist	Manage technical committees
Standards Writer	Meet with experts
Supporter	Monitor/track progress of standards
Technical Reviewer	Participate in harmonization of standards
Technical Secretary	Participate in International Meetings
Technical Committee Member	Plan standards development
Translator	Prioritize standards
	Promote and publish standards
	Provide access to documents
	Recommend the constitution of technical committees
	Recording technical body decisions
	Sell standards
	Simplify and promote standards
	Training standards developers
	Translate
	Update databases

Brainstorming results for standards developers (SD) – continued

How (How the SD person does this)	Why (Why the SD person does this)
Analyse available resources	For better national regulations
Analyse needs and problems	For other global objectives
Checking with other standards	For public safety
Collate proposals from interested parties	To address the needs of the economy
Collect data	To contribute to attainment of the SDGs
Convene technical committee meetings	To contribute to creating and maintaining a quality culture
Develop draft standards	To contribute to the development of the country
Develop standards rules	To create an even playing field
Engage stakeholders	To domesticate international standards
Ensure compliance with rules and procedures	To ensure adoption of standards
Evaluate information	To ensure broad and balanced participation
Facilitate public inquiry	To ensure compliance with different treatise and documents
Finalize standards drafts	To ensure different stakeholders' views are taken into account
Follow up with technical committee members	To ensure harmonization and uniformity
Identify lists of review standards	To ensure representation and consensus
Identify stakeholders	To ensure standards are backed by science and are relevant
Increase competence of the team	To ensure the timely delivery of standards to markets
Leadership skills	To ensure we have useful and reliable standards and opportunities
Liaising with international and regional standardization bodies	To facilitate implementation of regulations
Maintain the records of the technical committee	To facilitate trade
Manage budgets	To guarantee ownership and uptake of the standards
Manage team	To identify stakeholder needs
Participate in technical workshops and seminars	To implement the six principles of standards development
Plan	To increase the quality of life
Recruit competent technical experts	To make quality products
Report back to senior management	To reach agreement and consensus
Review terms of reference	To secure citizens from unhealthy products
Send out draft standards	To set the benchmark
Study experts' opinions	To support the functioning of quality infrastructure within countries
Take care of inputs after the Technical committee meetings	To transfer knowledge and expertise
Track project milestones	
Translate standards	
Undertake research	
Use ISOlutions platform	
Use IT tools	

	Specialized knowledge (K) of SD professionals from DACUM chart			
K1	Adult learner principles		K27	Familiarity with standard sales channels (web store, etc.)
K2	Avenues to reach public		K28	Familiarity with the standards sales process
K3	Basic knowledge of the specific sector		K29	Good standardization practices (GSP)
K4	Basic understanding of legal rules and terms		K30	Human Resource policies and procedures
K5	Basic understanding mutual recognition arrangements		K31	ICS
K6	Budgeting and budgetary constraints		K32	Information management techniques
K7	Business planning for standardization work		K33	Internal operating procedures
K8	Characteristics of stakeholders		K34	International/regional standardization participation process and procedures
K9	Code of ethics		K35	ISO methodology for development of national standardization strategy (NSS)
K10	Comment collating process		K36	IT tools and services
K11	Committee member expertise		K37	Learning management systems
K12	Communication channels		K38	Legal framework in the specific country
K13	Complaint procedures		K39	Market conditions, failures and needs
K14	Copyrighting laws		K40	Marketing and marketing methodologies
K15	Cultural knowledge		K41	Means of communications
K16	Customer services		K42	Media
K17	Customers		K43	Meeting procedures
K18	Databases and database management		K44	Mirror committee participation platform
K19	Definition of interested parties and stakeholders		K45	National and International priorities and directions
K20	Digital document tracking systems		K46	National and International stakeholders
K21	Document security procedures		K47	National laws
K22	Economic comparative advantages of specific countries		K48	National, regional and international catalogues and other scientific documentation
K23	Economic indicators		K49	Online standards platforms
K24	Emerging issues		K50	Partnership agreements instruments
K25	Event planning and management		K51	Presentation practices
K26	Existing standards being developed at national, regional, international levels		K52	Procedures to create and update digital standards
K53	Project planning and management		K68	Standards editing practices and quality control
K54	Public relations		K69	Standards publishing procedures and processes
K55	Qualifications of editors		K70	Survey methodology
K56	Quality management		K71	SWOT
K57	Research methodologies		K72	Target language of a specific standard
K58	Risk evaluation methodologies		K73	Technical knowledge
K59	Roles and responsibilities of mirror committee members		K74	Technical knowledge in the fields/sectors in which seeking leadership roles
K60	Sector and market of a standard		K75	Technical knowledge in the training area
K61	Sector/field where expertise is needed		K76	Terminology associated with the sector and market of the standard

Specialized knowledge (K) of SD professionals from DACUM chart			
K62	Standard ballot casting process	K77	Top exports and imports of a country
K63	Standard catalogue systems	K78	Training methods
K64	Standard communication procedures	K79	Translation processes and procedures
K65	Standardization bodies	K80	Typical committee structures
K66	Standardization practices	K81	Working knowledge of standardization at national, regional and international levels
K67	Standards development processes, procedures, functions and practices		

Math knowledge (MK) needed by standards development professionals in importance order	
MK1	Perform simple mathematical operations of multiplication
MK2	Perform simple mathematical operations of division
MK3	Perform simple mathematical operations of subtraction
MK4	Perform simple mathematical operations of addition
MK5	Use a calculator
MK6	Collect information to solve a problem
MK7	Figure averages
MK8	Compare numbers
MK9	Transfer number sequences from a source into a column
MK10	Perform mathematical operations using single and multiple digit numbers
MK11	Make rough estimates
MK12	Solve percentage problems
MK13	Change numbers from fractions into decimals and back
MK14	Perform mathematical operations using signed (positive and negative) numbers
MK15	Perform mathematical operations with fractions
MK16	Change numbers from percentages into decimals and back
MK17	Perform mathematical operations with decimals
MK18	Solve ratio problems

Basic measurement knowledge (BMK) needed by standards development professional in importance order	
BMK1	Knowledge of basic units of measurements in SI
BMK2	Convert measurements from one unit to another
BMK3	Read, interpret, and use size-scale relationships
BMK4	Estimate and approximate measurements
BMK5	Record measurements, using appropriate unit notations (feet, yards, etc.)
BMK6	Read and apply coefficient measurements indicated in a table or chart
BMK7	Read measurements taken with common measuring tools
BMK8	Use tools to measure quantities and solve problems involving measurements
BMK9	Make simple scale drawings
BMK10	Find the dimensions of an object from a scale drawing

Communications knowledge/skills (CKS) needed by standards development professional in importance order	
CKS1	Ask questions
CKS2	Evaluate options/alternatives
CKS3	Explain procedures
CKS4	Listen
CKS5	Evaluate solutions
CKS6	Write reports
CKS7	Communicate with co-workers and/or businesspeople verbally (face-to-face)
CKS8	Communicate with co-workers and/or businesspeople verbally (telephone, radio)
CKS9	Find information in references (Machinery handbook, tap/drill charts, etc.)
CKS10	Communicate using the vocabulary/terminology of a related trade
CKS11	Participate in brainstorming
CKS12	Research information
CKS13	Summarize information
CKS14	Communicate with co-workers and/or businesspeople in writing (letters, memos)
CKS15	Find information in catalogues
CKS16	Follow verbal job instructions
CKS17	Present to others
CKS18	Speak to large groups
CKS19	Apply assertiveness
CKS20	Read and follow a map, chart, plan etc.
CKS21	Read and interpret directions found on labels, packages or instruction sheets
CKS22	Write words and numbers legibly
CKS23	Read and follow directions found in equipment manuals and code books
CKS24	Read information from tables and graphs (bar, circle etc.)
CKS25	Read statistical data
CKS26	Read flowcharts
CKS27	Compare names
CKS28	Read codes (building codes, electrical codes, standards etc.)
CKS29	Read drawings and specifications sheets

Specialized skills (S) of SD professionals from DACUM chart			
S1	Ability to conduct a risk analysis	S27	Evaluation skills
S2	Ability to connect the edited parts to the whole	S28	Interpersonal skills
S3	Ability to develop training materials	S29	IT skills
S4	Ability to engage others	S30	Leadership skills
S5	Ability to ensure coherence in standards	S31	Marketing skills
S6	Ability to influence others	S32	Monitoring skills
S7	Ability to manage databases	S33	Negotiation skills
S8	Ability to manage meetings	S34	Networking skills
S9	Ability to manage people	S35	Organizational skills
S10	Ability to motivate others	S36	Planning skills
S11	Ability to persuade others	S37	Presentation skills
S12	Ability to skim and comprehend documents	S38	Proficient in the language of the international body
S13	Ability to teach and train	S39	Project management skills
S14	Ability to think systematically	S40	Public speaking skills
S15	Active listening skills	S41	Reading comprehension
S16	Analytical skills	S42	Research skills
S17	Basic ability to read English	S43	Search skills (e.g. Boolean)
S18	Comprehension skills	S44	Specific software competence
S19	Computer literacy and skills	S45	Strategic thinking skills
S20	Conflict resolution skills	S46	Stress management skills
S21	Consensus building skills	S47	Teamwork
S22	Critical thinking skills	S48	Time management skills
S23	Cross-cultural communication skills	S49	Translation skills
S24	Decision-making skills	S50	Verbal communication skills
S25	Editing skills	S51	Written communication skills
S26	Editorial skills		

Senses (SN) needed by standards development professionals in importance order	
SN1	Hear speech
SN2	Talk
SN3	See and discriminate colours

General attitudes (GA) needed by standards development professionals in importance order			
GA1	Care for the environment	GA35	Customer-oriented
GA2	Analytic	GA36	Punctual
GA3	Responsible/accountable	GA37	Tactful
GA4	Good listener	GA38	Trustworthy
GA5	Organized	GA39	Lack of prejudice (bias)
GA6	Accurate/precise	GA40	Persistent
GA7	Cooperative	GA41	Positive attitude
GA8	Goal-oriented	GA42	Sensitive to thoughts of others
GA9	Good time manager	GA43	Confident
GA10	Professional	GA44	Courteous
GA11	Respectful	GA45	Enthusiasm
GA12	Tolerant	GA46	Initiative
GA13	Work efficiently (resources)	GA47	Safety conscious
GA14	Work in teams	GA48	Self-esteem
GA15	Adaptable/Flexible	GA49	Social skills
GA16	Creative	GA50	Friendly
GA17	Ethical	GA51	Multi-tasker
GA18	Focused	GA52	Meticulous
GA19	Patience	GA53	Personal hygiene
GA20	Quality focused	GA54	Conscientious
GA21	Self-control	GA55	Empathetic
GA22	Detail-oriented	GA56	Helpful
GA23	Eager to learn new things	GA57	Non-aggressive
GA24	Honest	GA58	Pride in job
GA25	Leader	GA59	Industrious
GA26	Self-discipline	GA60	Dependable
GA27	Team player	GA61	Free from substance abuse
GA28	Common sense	GA62	Neat
GA29	Critical thinker	GA63	Caring
GA30	Integrity	GA64	Compassionate
GA31	Manage stress/pressure	GA65	Appropriate dresser
GA32	Open-minded to change	GA66	Physical stamina
GA33	Self-motivated	GA67	Sense of humour
GA34	Work efficiently (time)		

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
A			**Planning the standards work programme**				
	1		**Establish standards development procedures (i.e SOPs)**				
		a	Manage support services	• Code of ethics • Good standardization practices (GSP) • Legal framework in the specific country • Standards development processes, procedures, functions and practices • Working knowledge of standardization at national, regional and international levels	• Ability to think systematically • Analytical skills • Basic ability to read English • Reading comprehension • Written communication skills	• Detail-oriented • Globally minded	• GSP • ISO/IEC Directives 1 & 2 • WTO TBT
		b	Ensure ethical behaviour in technical committee work				
		c	Identify other reference development procedures				
		d	Create draft procedures				
		e	Create a flowchart of steps in standards development				
		f	Validate the procedures (internal meetings, management approval, etc.)				
	2		**Develop standards work programme (long-term)**				
		a	Collect background information/data (legislation, laws, economic data, safety data, environmental, scientific, etc.)	• Economic comparative advantages of specific countries • ISO NSS methodology • National and international priorities and directions • Technical knowledge	• Analytical skills • Critical thinking skills • Leadership skills • Project management skills • Strategic thinking skills		• ISO NSS methodology • National development plans • National standardization plans, strategies, policies and rules • Previous National Standardization policies, plans and strategies • Socio-economic data
		b	Consult the national standards policy				
		c	Identify areas needed at a national level for standardization				
		d	Determine stakeholder needs				
		e	Prioritize standards projects				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		f	Identify the need for new technical committees				
		g	Identify international, national and regional standards				
		h	Identify existing and needed resources				
		i	Evaluate risks				
		j	Identify milestones				
		k	Establish key performance indicators (KPIs)				
		l	Evaluate programme outcomes				
		m	Allocate resources (mobilization, etc.)				
		n	Validate/approve the programme				
		o	Communicate the programme				
	3		**Justify the need for a standard**				
		a	Conduct an impact assessment	• Economic indicators • Market conditions, failures and needs • National and international priorities and directions • Risk evaluation methodologies • Standards development processes, procedures, functions and practices	• Ability to conduct a risk analysis • Ability to engage others • Active listening skills • Analytical skills • Computer literacy and skills • Marketing skills • Negotiation skills	• Devoted • Emotional intelligence • Flexible • Non-discriminatory • Open-minded • Strategic thinker • Transparent	• Copies of studies conducted on the benefits of standards • Country regulations • Economic and social reports • Evaluation tools • ISO NSS methodology
		b	Assess priorities (national, governmental, non-governmental, stakeholder, interested parties etc.)				
		c	Evaluate risks (health, safety, environment, economic, social etc.)				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		d	Consult national standardization policy	• SWOT	• Presentation skills • Research skills • Verbal communication skills • Written communication skills		• IT tools • National development plans • National standardization plans, strategies, policies and rules • National statistics (trade, commerce, etc.) • Report checklist • SDGs • Strategic business plans for technical committees
		e	Identify relevance to solving emerging issues				
		f	Alignment with national directives				
		g	Evaluate potential impact of standard (number of people impacted, SDGs etc.)				
		h	Address stakeholder requests				
		i	Review catalogue of existing standards and documents				
	4		**Prioritize the standards to be developed**				
		a	Develop prioritization criteria (emerging issues, urgency of standard, requests from stakeholders etc.)	• Budgeting and budgetary constraints • Emerging issues • National and International priorities and directions • National and International stakeholders	• Analytical skills • Decision-making skills • Organizational skills • Verbal communication skills • Written communication skills	• Critical thinker • Flexible • Open-minded • Strategic thinker • Team player	• Checklists • Copies of studies conducted on the benefits of standards • Country regulations • Economic and social reports • Evaluation tools • ISO NSS Methodology • IT tools • National development plans • National standardization
		b	Create a list of priorities				
		c	Outline national and international priorities				
		d	Map standards to the priorities				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
							plans, strategies, policies and rules • National statistics (trade, commerce, etc.) • Report checklist • SDGs • Strategic business plans for technical committees
	5		**Identify interested parties**				
		a	Identify stakeholders	• Basic knowledge of the specific sector • Characteristics of stakeholders • Cultural knowledge • Databases and database management • Definition of interested parties and stakeholders • National and International priorities and directions • Top exports and imports of a country	• Ability to engage others • Active listening skills • Analytical skills • Cross-cultural communication skills • IT skills • Negotiation skills • Networking skills • Planning skills • Presentation skills • Research skills • Stress management skills • Verbal communication skills	• Culturally sensitive • Diplomatic • Emotional intelligence • Non-discriminatory	• Databases of stakeholders (internal, commerce etc.) • Geographic indicators • IT tools • Online directory of organizations/ministries etc. • Reports • Trade data
		b	Obtain recommendations of potential stakeholders/ interested parties				
		c	Establish liaison relationship with associations/organizations for nominations				
		d	Conduct workshops to obtain information on potential stakeholders				
		e	Brainstorm and compile list of interested parties/stakeholders				
		f	Establish a strategy to reach out to interested parties/stakeholders				
		g	Consult relevant databases				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		h	Ensure balance in stakeholder/interested party representation		• Written communication skills		
	6		**Develop standards development workplan**				
		a	Conduct standards research	• Existing standards being developed at national, regional, international levels • Good standardization practices (GSP) • ICS • National, regional and international catalogues and other scientific documentation • Project planning and management • Research methodologies • Standardization bodies	• Analytical skills • Comprehension skills • IT skills • Marketing skills • Planning skills • Project management skills • Research skills • Search skills (e.g. Boolean) • Written communication skills	• Creative • Detail-oriented	• Databases • IT tools • National standardization plans, strategies, policies and rules • National, regional and international catalogues and scientific publications • Project management software • Statistical analysis tools • WTO ISO Gateway
		b	Establish the standards development budget				
		c	Plan for standards development resources				
		d	Establish standards development timelines				
		e	Define the stages attained in the standards development				
		f	List standards (NWIs) to be developed and associated timeline				
		g	List standards to be adopted (outline the domains)				
		h	Approve the workplan				
		i	Notify the WTO/ISO Information Gateway of the workplan				
		j	Notify other relevant parties of the workplan				
		k	Publish the workplan				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
B			**Developing standards**				
	1		**Constitute the technical committee**				
		a	Identify domain for technical committee	• Business planning for standardization work • Committee member expertise • Standardization practices	• Ability to persuade others • Consensus building skills • IT skills • Negotiation skills • Organizational skills • Planning skills • Project management skills • Stress management skills • Verbal communication skills • Written communication skills	• Goal-oriented • Open-minded	• Gant charts • IT tools
		b	Select stakeholders (per criteria to ensure balanced participation/representation)				
		c	Contact the stakeholders				
		d	Guide/induct committee members about participation rules, roles, procedures, and terms of reference.				
		e	Assign specific roles to committee members				
		f	Develop a business plan for the committee				
	2		**Manage standards stakeholders**				
		a	Identify stakeholders (including underrepresented stakeholders)	• Budgeting and budgetary constraints • Characteristics of stakeholders • Partnership agreements instruments • Sector and market of a standard • Standardization bodies • Typical committee structures	• Leadership skills • Negotiation skills • Verbal communication skills • Written communication skills	• Culturally sensitive • Diplomatic • Non-discriminatory • Open-minded • Transparent	• Databases • IT Tools • Reports
		b	Identify stakeholder needs				
		c	Engage stakeholders (industry associations, stakeholders, regulators, law makers, academic institutions etc.)				
		d	Ensure balance representation of stakeholders				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		e	Assign roles to stakeholders (leadership etc.)				
		f	Ensure participants understand their roles				
		g	Provide reports to stakeholders (budgets, progress etc.)				
		h	Develop partnerships				
	3		**Convene committee meetings**				
		a	Supervise technical committee work	• Code of ethics • Good standardization practices (GSP) • IT tools and services • Meeting procedures • Standard communication procedures • Standards development processes, procedures, functions and practices	• Ability to manage people • Ability to motivate others • Ability to persuade others • Active listening skills • Analytical skills • Conflict resolution skills • Consensus building skills • Critical thinking skills • Cross-cultural communication skills • Decision-making skills • Interpersonal skills	• Creative • Culturally sensitive • Diplomatic • Non-discriminatory • Open-minded	• GSP • ISO/IEC Directives Parts 1 & 2 • ISO/IEC Guide 2 • IT Tools • Normative references • Reference Standards • Standards Templates • Support data (Scientific data to support positions)
		b	Document all the steps involved with committee working				
		c	Organize meeting logistics (date, location, virtual/remote, times etc.)				
		d	Prepare meeting materials (references, agenda etc.)				
		e	Establish quorum				
		f	Facilitate the meeting				
		g	Prepare minutes/records of the meeting (results, attendance etc.)				
		h	Ensure consensus				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		i	Conduct training on standards development procedures and Code of ethics		- Leadership skills - Negotiation skills - Organizational skills - Presentation skills - Stress management skills - Teamwork - Time management skills - Verbal communication skills - Written communication skills		
	4		**Develop draft standards**				
		a	Outline the standards scope	- Standards development processes, procedures, functions and practices - Translation processes and procedures	- Ability to manage meetings - Conflict resolution skills - Consensus building skills - Leadership skills - Negotiation skills - Research skills - Verbal communication skills - Written communication skills	Patience	- GSP - ISO/IEC Directives Parts 1 & 2 - ISO/IEC Guide 21 - ISO/IEC Guide 2 - IT Tools - Normative references - OBP - Reference Standards - Standards Templates - Support data (Scientific data to support positions) - Translators
		b	Convene committee meetings				
		c	Follow up with standards development tasks				
		d	Identify documents needed				
		e	Create various draft standards (working draft, committee draft, final draft standard)				
		f	Document committee resolutions				
		g	Organize workshops (commenting, drafting etc.)				
		h	Translate standards				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
5			**Disseminate standards for public inquiry**				
	a		Make draft standard available/circulate	• Avenues to reach public • Means of communications • Standards development processes, procedures, functions and practices	• Consensus building skills • Organizational skills	• Responsible	• Collating tools • Contact lists • IT tools • Media and media kits • Online platforms • Tracking tools
	b		Notify the public (via media)				
	c		Receive comments to standards				
	d		Analyse standards comments				
	e		Organize workshops/meetings of stakeholders to obtain comments				
6			**Edit draft standards**				
	a		Establish editing criteria and procedures for NSB	• Qualifications of editors • Standards editing practices and quality control • Target language of a specific standard • Technical knowledge	• Ability to connect the edited parts to the whole • Ability to ensure coherence in standards • Analytical skills • Computer literacy and skills • Editorial skills • Evaluation skills • Specific software competence	• Detail-oriented • Focused	• Checklists • Dictionary • Editing rules • Editors • IT tools
	b		Outsource editing (if required)				
	c		Establish TORs for editors (technical and language)				
	d		Identify potential editors				
	e		Qualify editors				
	f		Contract with outsourced editors (if relevant)				
	g		Approve final edits				
	h		Evaluate the editing process				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
C			**Participating in international and regional standardization**				
	1		**Manage participation in international and regional standardization work**				
		a	Develop a strategy for participation	• Adult learner principles • Basic understanding of mutual recognition arrangements • International/regional standardization participation process and procedures • National laws • Online standards platforms • Technical knowledge of the fields/sectors in which seeking leadership roles	• Ability to teach and train • Consensus building skills • Decision-making skills • Interpersonal skills • IT skills • Leadership skills • Negotiation skills • Networking skills • Presentation skills • Proficient in the language of the international body • Stress management skills • Verbal communication skills	• Assertive • Culturally sensitive • Diplomatic • Emotional intelligence • Flexible • Open-minded	• International and Regional Commitments • International and Regional Guides • ISO/IEC Directives Parts 1 & 2 • ISO/IEC Guide 2 • IT tools
		b	Obtain/maintain membership in international/regional bodies				
		c	Define membership level				
		d	Secure resources to participate in international and regional activities				
		e	Train technical committee experts on international and regional procedures				
		f	Report on national adoptions				
		g	Participate in mutual recognition arrangements (MRAs)				
		h	Pursue international leadership roles				
		i	Participate in international and regional meetings				
		j	Participate in training and workshops				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
	2		**Nominate experts (for international/regional participation)**				
		a	Identify sector/field where experts are needed	• Business planning for standardization work • International/regional standardization participation process and procedures • Sector/field where expertise is needed	• Analytical skills • Decision-making skills • Interpersonal skills • Negotiation skills • Verbal communication skills	• Diplomatic • Non-discriminatory • Team player	• Available committees • Databases • IT tools • Lists of experts • My ISO job document • Online platforms
		b	Create a list of potential experts for participation				
		c	Select experts				
		d	Communicate with experts (obtain confirmation of interest)				
		e	Establish registered expert user accounts				
	3		**Constitute a national mirror committee**				
		a	Identify sector/field for the committee	• Good standardization practices (GSP) • Mirror committee participation platform • Roles and responsibilities for mirror committee members	• Ability to manage databases • Analytical skills • Decision-making skills • IT skills • Negotiation skills • Organizational skills • Presentation skills • Project management skills • Time management skills • Verbal communication skills • Written communication skills	• Creative • Diplomatic • Flexible • Goal oriented • Non-discriminatory • Open-minded • Responsible	• Databases • GSP • ISO/IEC Directives Parts 1 & 2 • IT tools • My ISO job document • Training materials and tools • Virtual communication tools
		b	Identify stakeholders				
		c	Communicate with stakeholders				
		d	Establish criteria selection of committee members				
		e	Select committee members				
		f	Train committee members				
		g	Map (register) the national mirror committee to international/regional standardization body				
		h	Establish stakeholder database				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		i	Document the entire process				
	4		**Establish national positions**				
		a	Conduct national consultation	• Comment collating process • GSP • IT tools and services • Research methodologies • Standards ballot casting process	• Analytical skills • Conflict resolution skills • Consensus building skills • Cross-cultural communication skills • Leadership skills • Negotiation skills • Research skills • Time management skills • Translation skills • Verbal communication skills • Written communication skills	• Consistent • Detail-oriented • Emotional intelligence • Impartial • Open-minded	• Commenting templates • ISO/IEC Guide 59
		b	Collect/collate comments				
		c	Build consensus on national position				
		d	Cast ballots (internal and external)				
		e	Conduct research specific to the deliverable				
		f	Participate in scientific research				
		g	Participate in international and regional meetings				
		h	Participate in international trainings and workshops				
D			**Publishing standards**				
	1		**Secure approval to publish**				
		a	Publish list of standards in Gazette	• Copyrighting laws • Document security procedures • Standards publishing procedures and processes	• Analytical skills • IT skills	• Detail-oriented	• Agreements with other standards bodies • Gazette • ISO/IEC copyright policies • IT tools
		b	Ensure standards copyright				
		c	Print master copy				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
	2		**Create or update digital standards**				
		a	Create standard catalogue system	• Databases and database management • Information management techniques • Procedures to create and update digital standards • Sector and market of a standard • Standard catalogue systems • Terminology associated with the sector and market of the standard	• Ability to skim and comprehend documents • Analytical skills • Editing skills • IT skills • Organizational skills • Reading comprehension • Time management skills • Written communication skills	• Creative • Detail-oriented • Flexible • Punctual	• Catalogue system • Databases • IT tools
		b	Update standards catalogue				
		c	Prepare standards preview				
		d	Develop standards abstract				
		e	Develop standards key words				
		f	Maintain database of standards				
	3		**Make standards available**				
		a	Print standards	• Digital document tracking systems • Document security procedures • Familiarity with standard sales channels (web store etc.) • Familiarity with the standards sales process • IT tools and services	• IT skills • Marketing skills • Negotiation skills • Organizational skills	• Courteous • Customer oriented • Detail-oriented • Diplomatic • Patience • Responsible • Transparent	• IT tools • Online platforms • Web stores
		b	Receive new request for standards (purchase order etc.)				
		c	Make standards available in web stores				
		d	Send or provide standards to customer				
		e	Sign agreements with resellers (selling agents)				
		f	Apply security features to standards (watermarks, trademarks etc.)				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
E			**Promoting standards**				
	1		**Develop a marketing communication plan**				
		a	Create a media promotion plan	• Budgeting and budgetary constraints • Communication channels • Event planning and management • Marketing and marketing methodologies • Media • Public relations	• Ability to influence others • Interpersonal skills • Leadership skills • Negotiation skills • Organizational skills • Presentation skills • Public speaking skills • Verbal communication skills	• Creative • Persuasive	• IT tools • Media and media kits • Statistical analysis tools
		b	Develop a communication plan				
		c	Develop an event plan				
		d	Identify promotional channels (i.e. invite students to committees)				
		e	Identify standards to promote				
		f	Identify goals and objectives of promotions				
		g	Identify target markets for promotions				
		h	Establish a promotional budget and resources				
		i	Identify supplies to spread the promotion				
		j	Develop promotional materials (content, scenarios, graphics etc.)				
		k	Mobilize resources for the promotional plan				
		l	Identify leaders/experts for promotions (influencers)				
		m	Identify stakeholders				
		n	Identify the needs of stakeholders				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		o	Identify potential promotional partners				
		p	Conduct market research				
	2		**Implement the marketing communication plan**				
		a	Create market demand for the published standards	• Basic knowledge of the specific sector • Characteristics of stakeholders • Cultural knowledge • Databases and database management • Event planning and management • Market conditions, failures and needs • Marketing and marketing methodologies • Standards	• Ability to engage others • Ability to teach and train • Active listening skills • Conflict resolution skills • Evaluation skills • Interpersonal skills • Leadership skills • Marketing skills • Monitoring skills • Project management skills • Verbal communication skills	• Attentive • Creative • Empathetic • Result-oriented • Team player • Visionary	• Databases of stakeholders (Internal, Commerce etc.) • Evaluation checklists • IT tools • Marketing tools • Social media
		b	Organize events, workshops, trade shows, exhibits or roundtables				
		c	Disseminate promotional materials				
		d	Conduct sensitization sessions				
		e	Conduct promotional education				
		f	Evaluate marketing communication plan				
		g	Engage stakeholders				
		h	Monitoring the implementation of the plan				
F			**Managing support services (internal/external customers)**				
	1		**Provide capacity building for stakeholders**				
		a	Identify stakeholders	• Adult learning principles • Budgeting and budgetary constraints • Characteristics of stakeholders	• Ability to develop training materials • Ability to engage others • Ability to teach and train	• Creative • Detail-oriented • Empathetic • Flexible • Goal-oriented • Open-minded	• IT tools • Standards • Training materials and tools
		b	Survey stakeholder needs				
		c	Determine training interests				
		d	Prioritize training needs				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		e	Establish needed training resources	• Good standardization practices (GSP) • Learning management systems • Presentation practices • Technical knowledge in the training area • Training methods	• Active listening skills • Comprehension skills • Interpersonal skills • IT skills • Leadership skills • Organizational skills • Presentation skills • Public speaking skills • Verbal communication skills • Written communication skills	• Patience	
		f	Establish a training framework				
		g	Develop training materials				
		h	Obtain training supplies (resource materials needed for training)				
		i	Organize training logistics				
		j	Modify/adapt existing training				
		k	Develop training calendars/workplans				
		l	Identify trainers				
		m	Arrange experiential learning (OJT)				
		n	Promote the training				
		o	Conduct stakeholder training				
		p	Evaluate training outcomes				
		q	Assess learning outcome of participants				
		r	Share post-training knowledge				
	2		**Manage internal services**				
		a	Coordinate with Procurement Services	• Basic understanding of legal rules and terms • Customer services • Human resource policies and procedures	• Ability to manage people • Leadership skills • Negotiation skills		• IT tools • Quality Management System
		b	Coordinate with Facility Services				
		c	Coordinate with IT Services				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		d	Coordinate with Editorial Services	• Internal operating procedures • IT tools and services • Marketing and marketing methodologies • Quality management	• Verbal communication skills • Written communication skills		
		e	Coordinate with Communication Services				
		f	Coordinate with Quality Assurance Services				
		g	Coordinate with International Relations				
			Coordinate with Marketing Services				
		h	Coordinate with Human Resources				
		i	Coordinate with Conformity Assessment Services				
		j	Coordinate with Legal Services				
		k	Conduct customer surveys				
		l	Evaluate customer service				
		m	Develop a feedback mechanism				
	3		**Manage external customers**				
		a	Provide customer services	• Basic understanding of legal rules and terms • Complaint procedures • Customer services • Customers • IT tools and services • Marketing and marketing methodologies		• People person	• Statistical analysis tools • Survey tools
		b	Develop informational web portal				
		c	Respond to customer feedback				
		d	Conduct customer surveys				

			Duties/tasks/steps	Special knowledge	Skills	Attributes/attitudes	Tools/resources
		e	Respond to inquiries	• Quality management • Survey methodology			
		f	Evaluate customer service				
		g	Consult on application of standards				
		h	Monitor complaints received				
		i	Identify appropriate party to respond to customers				
		j	Provide after-sales services				
		k	Develop feedback mechanism				
		l	Establish community management				
		m	Address complaints				
		n	Establish customer service agreements (charters)				
		o	Provide services proposals				
		p	Provide information regarding services				

DACUM panel

DACUM performed for:

International Organization for Standardization (ISO) for Standards Professional

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Appendix F – Comparison between ISO/IWA 30-2 and the job analysis for this project

Comparison of the ISO Capacity Building Unit job analysis for standards development professionals and the ISO/IWA 30-2 documents

The International Workshop Agreement published two documents (IWA 30-1 and IWA 30-2) which outline the competence of standards professionals. Part 1 focusses on standards professionals in companies and Part 2 focusses on standards professionals in standards-related bodies. Within the framework of the ISO Action Plan for developing countries 2021-2025, the ISO Capacity Building Unit set out to develop a competency framework for standards professionals that could be used to develop training and possibly certification for all persons involved in the development of standards including volunteer experts and staff of national standards bodies.

A job analysis was conducted and the results were compared to IWA document 30-2 as a point of validation. What follows are the results of the comparison.

ISO/IWA 30-2 and the standards development professional job analysis

ISO/IWA 30-2 identified nine tasks associated with standards professionals in standards-related bodies, again not written in task terms:

T1: Standardization planning and evaluation

T2: Standards development: work programme management

T3: Standards development: committee operation and assistance

T4: Standards development: drafting standards

T5: Participation in international standardization

T6: Editing and publication of standards

T7: Dissemination of standards

T8: Training and education about standards

T9: Public service related to standards.

General tasks

The documents began with a "common knowledge" and "common skills" section comprising a "common competencies" section. The common knowledge and the common skills and their relationship to the job analysis are included in tables 18 and 19 below.

Table 1 – General knowledge

Knowledge	Description	Location in project DACUM job analysis chart
K1: Technical knowledge in a specified sector	Standards professionals should have basic technical and/or professional knowledge of a specific industry or a related field, at a level sufficient to understand the added value of standards and standardization, and to be able to carry out the	K3, K61, K73

Knowledge	Description	Location in project DACUM job analysis chart
	applicable standardization tasks.	
K2: Knowledge of existing standards/technical regulations in a specified sector	Standards professionals should have knowledge of relevant existing standards and/or technical regulations in a specified sector.	K26, K47
K12: Knowledge of international standardization activities and organizations	Standards professionals should have practical knowledge of standardization activities and organizations at the international, regional, national or industrial level. Standards professionals participating in national standardization activities should be aware of council or technical management board decisions regarding the activities of the technical committees in general and of the committee for which s/he is responsible.	K66, K67, K81

Table 2 – General skills

Skills	Description	Location in project DACUM job analysis chart
S1: Ability to develop a strategic plan for standardization	Standards professionals should be able to identify and develop a strategic plan for standardization that harmonizes with the national plan for standards development.	S36, S45
S10: Written and verbal communication and presentation skills	Standards professionals should be able to communicate with committee members and related interested parties by written communication as well as by verbal communication when developing and disseminating standards.	S50, S51
S5: Ability to collect relevant information about standards and standardization	Standards professionals should be able to collect the relevant information of standards, standardization, market needs or other information to determine the establishment of a new standard(s) or the revision of an existing standard(s). Standards professionals should be able to search for standards (published or under development), e.g. by developing an inventory of standards in a specified sector.	S16, S31, S42
S11: Ability to work with committees and individuals	Standards professionals should be able to cooperate and co-work with experts and interested parties from different perspectives and backgrounds in terms of culture and technology.	S4, S9, S20, S28, A7

Task 1 – Standardization planning and evaluation

Task 1 was further broken into four subtasks (or steps) and each of these was compared to the job analysis. T1: "Standardization planning and evaluation" may include, but is not limited to, the following subtasks or processes:

Table 3 – Subtasks for Task 1: Standardization planning and evaluation

Task/subtask	Location in project DACUM job analysis chart
T1-1: Set and implement a medium- to long-term standardization strategic plan to align with and support the organization strategy	DACUM Chart A.2. Develop standards work programme (long term)
T1-2: Develop and implement an action plan(s) based on medium- to long-term strategies	DACUM Chart A.2. Develop standards work programme (long term)
T1-3: Conduct an environment scan and determine the context for standardization	DACUM Chart A.2. Develop standards work programme (long term)
T1-4: Review and evaluate the standardization strategic plan in line with the current organization strategy to provide new opportunities or mitigate risks	DACUM Chart A.2. Develop standards work programme (long term)

Table 4 – Knowledge for Task 1: Standardization planning and evaluation

Knowledge	Description	Location in project DACUM job analysis chart
K3: Knowledge of methodologies/methods for strategy development	Standards professionals in charge of establishing policy on standards/ standardization at the country and regional level, as well as in industry and non-government organizations, should have knowledge of methodologies/methods for strategy and roadmap development. Note: For methodologies/methods for the development of a strategy and roadmap for standardization, the following techniques can be used: • Environmental analysis (context analysis) • PEST analysis • SWOT analysis • Risk assessment etc.	K7, K53, K71
K5: Knowledge of methods for standard/technology analysis and needs survey	Standards professionals should have knowledge of designing and conducting methods for a standard/technology analysis and needs survey.	K57
K6: Knowledge of programme management	Standards professionals should have general knowledge of programme management applicable to standards development. Example: Programme management activities include setting and reviewing the objectives of a programme, coordinating activities throughout projects, and overseeing the integration of project outputs/results.	K53

Knowledge	Description	Location in project DACUM job analysis chart
	Note: A standardization programme is generally a group of standardization projects aligned with specific goals.	
K7: Knowledge of harmonization with international standards	Standards professionals participating in national standardization activities should understand the methods for the adoption of international standards and other international deliverables as regional or national standards as specified in ISO/IEC Guide 21-1 and ISO/IEC Guide 21-2.	K66, K67, K81
K4: Knowledge of methodologies for performance management	Standards professionals should have knowledge of the methodologies to measure and manage the performance of the planning, development and dissemination of standards.	K28, K30, K53, K79

Table 5 - Skills for Task 1: Standardization planning and evaluation

Skills	Description	Location in project DACUM job analysis chart
S3: Ability to develop action plans for implementing the strategic plan	Standards professionals should be able to develop action plans for implementing the strategic plan, including designing an architecture of standards related to a framework of products, services and/or processes.	S36, S45
S4: Ability to identify the needs of standardization	Standards professionals should be able to identify the needs of standardization based on an environment analysis, context analysis etc.	S1, S42
S2: Ability to conduct performance measurement and analysis for standardization	Standards professionals should be able to measure and analyse the performance of standardization activities.	S8, S9, S27, S39
S9: Ability to manage multiple projects	Standards professionals should be able to manage multiple projects simultaneously. Note: For the effective and efficient management of multiple projects, it can be necessary to prioritize projects, block times, create focuses, review the workload regularly, overlay project plans, track progress, stay organized etc.	S39
S8: Ability to prepare standards development plans	Standards professionals should be able to prepare plans for standards development in accordance with the rules of the international, regional, national and/or industrial organization in which s/he is participating.	S36, S39
S6: Ability to quantify the needs and expectations of interested parties	Standards professionals should be able to evaluate and prioritize the needs and expectations of interested parties and express them as a number or a quantity.	S2, S16, S22,

Task 2 – Standards development: work programme management

Task 2 was further broken into three subtasks or steps, and each of these was compared to the job analysis. T2: "Standards development: work programme management" may include, but is not limited to, the following subtasks or processes:

Table 6 – Subtasks for Task 2: Standards development: work programme management

Task/subtask	Location in project DACUM job analysis chart
T2-1: Develop plans or a roadmap for specific technical/industrial sectors	DACUM Chart A.2 Develop standards work programme (long term)
T2-2: Manage and evaluate the performance of work plans for specific technical/industrial sectors	DACUM Chart A.2 Develop standards work programme (long term)
T2-3: Develop and manage the standards development procedures and rules	DACUM Chart B Developing standards

Table 7 – Knowledge for Task 2: Standards development: work programme management

Knowledge	Description	Location in project DACUM job analysis chart
K10: Knowledge of the drafting rules for standards	Standards professionals should have substantial knowledge of the rules, principles and structure of standards to be drafted in detail. Standards professionals should have knowledge of how to address safety, environmental and consumer issues in product standards at all stages of the product life cycle. • Safety aspects as specified in ISO/IEC Guide 51. • Environmental aspects as specified in ISO Guide 64. • Consumer aspects as specified in ISO/IEC Guide 76.	K29, K66, K67, K68
K9: Knowledge of project management	Standards professionals should have knowledge of the project management methodology applicable to standards development at the international, regional, national and industry/association level. Project management addresses the planning, organizing, monitoring, controlling and reporting of all aspects of a project, and the motivation of all those involved to achieve the project objectives as specified in ISO 21500.	K53
K18: Knowledge of standards application to the development of technical regulations	Standards professionals should have knowledge of standards application to the development of technical regulations.	K38, K81
K7: Knowledge of harmonization with international standards		K66, K67, K81
K6: Knowledge of programme management		K53

Table 8 – Skills for Task 2: Standards development: work programme management

Skills	Description	Location in project DACUM job analysis chart
S3: Ability to develop action plans for implementing the strategic plan		S36, S45
S4: Ability to identify the needs of standardization		S1, S42
S2: Ability to conduct performance measurement and analysis for standardization		S8, S9, S27, S39
S8: Ability to prepare standards development plans		S36, S39
S9: Ability to manage multiple projects		S39
S13: Project management abilities	Standards professionals should be able to manage standardization projects effectively by planning, organizing, budgeting, directing, controlling, managing resources etc.	S39
S12: Programme management abilities	Standards professionals should be able to manage a standardization programme composed of multiple projects.	S39

Task 3 – Standards development: committee operation and assistance

Task 3 was further broken into four subtasks or steps, and each of these was compared to the job analysis. T3: "Standards development: committee operation and assistance" may include, but is not limited to, the following subtasks or processes:

Table 9 – Subtasks for Task 3: Standards development: committee operation and assistance

Task/subtask	Location in project DACUM job analysis chart
T3-1: Manage standards development projects (e.g. scheduling, prioritization, communication in the committee work programme)	DACUM Chart B. Developing standards
T3-2: Produce and circulate committee project documents (e.g. proposal, comment, resolution, ballot results)	DACUM Chart B.5. Disseminate standards for public inquiry

Task/subtask	Location in project DACUM job analysis chart
T3-3: Arrange and coordinate committee meetings (e.g. agendas, minutes, decision/resolutions, reporting)	DACUM Chart B.3. Convene committee meetings
T3-4: Advise and liaise with the chair, conveners and project leaders	DACUM Chart C.1. Manage participation in international and regional standardization work

Table 10 – Knowledge for Task 3: Standards development: committee operation and assistance

Knowledge	Description	Location in project DACUM job analysis chart
K10: Knowledge of the drafting rules for standards		K29, K66, K67, K68
K9: Knowledge of project management		K53
K7: Knowledge of harmonization with international standards		K66, K67, K81
K3: Knowledge of methodologies/methods for strategy development		K7, K53, K71
K14: Knowledge of IT systems and database management	Standards professionals participating in developing standards should have knowledge of IT systems or tools (e.g. ISO Projects Portal) that support the standards development process (e.g. documents, mirror documents, ballots, projects, meetings, global directory, notifications, submissions). Standards professionals in charge of IT systems for the sales of standards (e.g. a webstore) should have knowledge of IT systems and database management.	K18, K27, K32, K36, K62, K63

Table 11 – Skills for Task 3: Standards development: committee operation and assistance

Skills	Description	Location in project DACUM job analysis chart
S9: Ability to manage multiple projects		S39
S3: Ability to develop action plans for implementing the strategic plan		S36, S45
S8: Ability to prepare standards development		S36, S39

Skills	Description	Location in project DACUM job analysis chart
plans		
S14: Ability to draft standards	Standards professionals should be able to prepare a draft of a standard according to the specified rules/procedures for the structure and drafting of standards. Standards professionals should be able to use templates and other tools for the preparation of standards.	S19, S25, S26, S49, S51
S16: Leadership skills for committee operation	Standards professionals in the position of Committee Manager (previously called Secretary) should be able to operate a technical committee effectively and efficiently.	S30

Task 4 – Standards development: drafting standards

Task 4 was further broken into five subtasks or steps, and each of these was compared to the job analysis. T4: "Standards development: drafting standards" may include, but is not limited to, the following subtasks or processes:

Table 12 – Subtasks for Task 4: Standards development: drafting standards

Task/subtask	Location in project DACUM job analysis chart
T4-1: Draft new standards in accordance with the drafting rules (e.g. ISO/IEC Directives, Part 2[35])	DACUM Chart B.4. Develop draft standards
T4-2: Revise existing standards in accordance with the rules	DACUM Chart B.4. Develop draft standards
T4-3: Review and comment on circulated draft standards	DACUM Chart B.5. Disseminate standards for pubic inquire
T4-4: Validate standards as specified in the validation process	DACUM Chart B Developing standards
T4-5: Perform an impact analysis of standards application	DACUM Chart A.3. Conduct an impact assessment

Table 13 – Knowledge for Task 4: Standards development: drafting standards

Knowledge	Description	Location in project DACUM job analysis chart
K10: Knowledge of the drafting rules for standards		K29, K66, K67, K68
K7: Knowledge of harmonization with International Standards		K66, K67, K81
K11: Knowledge of the validation methods for standards	Standards professionals should understand the methods for the review, verification and/or validation of standards.	K57, K70

Knowledge	Description	Location in project DACUM job analysis chart
K4: Knowledge of methodologies for performance management		K28, K30, K53, K79
K3: Knowledge of methodologies/methods for strategy development		K7, K53, K71

Table 14 – Skills for Task 4: Standards development: drafting standards

Skills	Description	Location in project DACUM job analysis chart
S14: Ability to draft standards		S19, S25, S26, S49, S51
S8: Ability to prepare standards development plans		S36, S39
S4: Ability to identify the needs of standardization		S1, S42
S2: Ability to conduct performance measurement and analysis for standardization		S8, S9, S27, S39
S7: Ability to determine whether a standard(s) needs to be newly established or revised	Standards professionals should be able to determine the establishment of a new standard(s) or the revision of an existing standard(s) based on the information on standards and standardization.	S36

Task 5 – Participation in international standardization

Task 5 was further broken into 3 subtasks (or steps) and each of these were compared to the job analysis. T5: "Participation in international standardization" may include, but is not limited to, the following subtasks or processes:

Table 15 – Subtasks for Task 5: Participation in international standardization

Task/subtask	Location in project DACUM job analysis chart
T5-1: Organize and coordinate domestic mirror committees	DACUM Chart C.3. Constitute a national mirror committee
T5-2: Participate in international standardization meetings and voting	DACUM Chart C.1. Manage participation in international and regional standardization work
T5-3: Cooperate with organizations for international standardization	DACUM Chart F.3. Manage external customers

Table 16 – Knowledge for Task 5: Participation in international standardization

Knowledge	Description	Location in project DACUM job analysis chart
K7: Knowledge of harmonization with international standards		K66, K67, K81
K10: Knowledge of the drafting rules for standards		K29, K66, K67, K68
K3: Knowledge of methodologies/methods for strategy development		K7, K53, K71
K19: Knowledge of responding to foreign technical regulations (WTO/TBT)	Standards professionals should understand the process for searching foreign technical regulations related to standards development. Standards professionals should understand the process for searching TBT notifications and responding to these through the WTO/TBT Information Management System or a national WTO/TBT enquiry point(s).	K81
K18: Knowledge of standards application to the development of technical regulations		K38, K81
K4: Knowledge of methodologies for performance management		K28, K30, K53, K79

Table 17 – Skills for Task 5: Participation in international standardization

Skills	Description	Location in project DACUM job analysis chart
S20: Language and communication skills	Standards professionals should be able to communicate in both the local language and the international official language (usually English) for standardization and translation.	S38, S50, S51
S19: Documentation skills of international standardization	Standards professionals in the position of Committee Manager (previously called Secretary) or Project Leader should be able to prepare the documents for standardization [e.g. New Work Item Proposal (NWIP), International Standard documentation, CRM reports, minutes].	S25, S26
S14: Ability to draft standards		S19, S25, S26, S49, S51
S17: Ability to derive agreement on proposed standards	Standards professionals should be able to derive agreement on proposed standards in a strategic and diplomatic manner.	S21
S3: Ability to develop action plans for implementing the strategic plan		S36, S45
S4: Ability to identify the		S1, S42

Skills	Description	Location in project DACUM job analysis chart
needs of standardization		
S18: Ability to organize a committee	Standards professionals should be able to take the lead to organize a new committee, subcommittee or working group.	S4, S8, S21

Task 6 – Editing and publication of standards

Task 6 was further broken into four subtasks or steps and each of these was compared to the job analysis. T6: "Editing and publication of standards" may include, but is not limited to, the following subtasks or processes:

Table 18 – Subtasks for Task 6: Editing and publication of standards

Task/subtask	Location in project DACUM job analysis chart
T6-1: Plan and manage the standards publication process	DACUM Chart D. Publishing standards
T6-2: Organize an editing committee	DACUM Chart B.6. Edit draft standards
T6-3: Edit and proofread standards	DACUM Chart B.6. Edit draft standards
T6-4: Publish standards (online, offline)	DACUM Chart D.3. Make standards available

Table 19 – Knowledge for Task 6: Editing and publication of standards

Knowledge	Description	Location in project DACUM job analysis chart
K10: Knowledge of the drafting rules for standards		K29, K66, K67, K68
K14: Knowledge of IT systems and database management		K18, K27, K32, K36, K62, K63
K7: Knowledge of harmonization with international standards		K66, K67, K81
K13: Knowledge of marketing and public relations	Standards professionals should have a basic knowledge of marketing, such as the concepts, principles and techniques.	K40
K16: Knowledge of the laws and systems related to standardization	Standards professionals should have knowledge of the national laws (e.g. acts, decrees, rules, ordinances, regulations) and systems related to standardization.	K38

Table 20 – Skills for Task 6: Editing and publication of standards

Skills	Description	Location in project DACUM job analysis chart
S21: Ability to edit and publish documents	Standards professionals should be able to maintain the highest degree of quality, clarity, timely delivery and consistency of standards (including conformity with the relevant rules and policies) in editing and publication.	S25, S26
S14: Ability to draft standards		S19, S25, S26, S49, S51
S23: Ability to manage IT systems and databases	Standards professionals in charge of the IT system for standards (e.g. webstore, intranet) should be able to manage the IT systems and databases for standards and/or standardization.	S19, S43
S20: Language and communication skills		S38, S50, S51
S22: Ability to undertake standards marketing and sales	Standards professionals should be able to plan and implement the marketing, promotional and other programmes (including pricing) of standards.	S31
S15: Ability to validate standards	Standards professionals should be able to review, verify and/or validate the drafts of standards in terms of market relevance, duplication and conformity with the rules for the structure and drafting of standards.	S42

Task 7 – Dissemination of standards

Task 7 was further broken into six subtasks or steps and each of these was compared to the job analysis. T6: "Dissemination of standards" may include, but is not limited to, the following subtasks or processes:

Table 21 – Subtasks for Task 7: Dissemination of standards

Task/Subtask	Location in project DACUM job analysis chart
T7-1: Develop and manage a dissemination strategy	DACUM Chart D.3. Make standards available
T7-2: Develop a catalogue, package products and a handbook	DACUM Chart D.3. Make standards available
T7-3: Develop and operate an information system for standards dissemination	DACUM Chart D.3. Make standards available
T7-4: Develop and maintain an online sales system (e.g. webstore)	DACUM Chart D.2. Create or update digital standards
T7-5: Promote standards-related information (e.g. social media, such as YouTube, online services, webzines, bulletins, journals, seminars, workshops)	DACUM Chart E. Promoting standards
T7-6: Analyse and reflect interested parties' feedback	DACUM Chart F.3. Manage external customers

Table 22 – Knowledge for Task 7: Dissemination of standards

Knowledge	Description	Location in project DACUM job analysis chart
K13: Knowledge of marketing and public relations		K40
K14: Knowledge of IT systems and database management		K18, K27, K32, K36, K62, K63
K7: Knowledge of harmonization with International Standards		K66, K67, K81
K5: Knowledge of methods for standard/technology analysis and needs survey		K57
K18: Knowledge of standards application to the development of technical regulations		K38, K81
K11: Knowledge of the validation methods for standards		K57, K70

Table 23 – Skills for Task 7: Dissemination of standards

Skills	Description	Location in project DACUM job analysis chart
S22: Ability to undertake standards marketing and sales		S31
S23: Ability to manage IT systems and databases		S19, S43
S24: Ability to plan education and training programmes	Standards professionals should be able to plan education and training programmes for standards and/or standardization.	S3, S9, S37
S25: Teaching and training skills	Standards professionals should be able to teach and train people on specific standards and/or standardization.	S3, S9, S37
S3: Ability to develop action plans for implementing the strategic plan		S36, S45
S20: Language and communication skills		S38, S50, S51

Task 8 – Training and education about standards

Task 8 was further broken into three subtasks or steps and each of these was compared to the job analysis. T8: "Training and education about standards" may include, but is not limited to, the following subtasks or processes:

Table 24 – Subtasks for Task 8: Training and education about standards

Task/subtask	Location in project DACUM job analysis chart
T8-1: Develop training and education plans and programmes	DACUM Chart F.1. Provide capacity building for stakeholders
T8-2: Operate training and education courses	DACUM Chart F.1. Provide capacity building for stakeholders
T8-3: Analyse and reflect interested parties' feedback	DACUM Chart F.3. Manage external customers

Table 25 – Knowledge for Task 8: Training and education about standards

Knowledge	Description	Location in project DACUM job analysis chart
K15: Knowledge of human resource development	Standards professionals should have general knowledge of human resource development, such as the concepts, principles and techniques.	K30
K13: Knowledge of marketing and public relations		K40
K9: Knowledge of project management		K53
K16: Knowledge of the laws and systems related to standardization		K38
K5: Knowledge of methods for standard/technology analysis and needs survey		K57
K14: Knowledge of IT systems and database management		K18, K27, K32, K36, K62, K63
K20: Knowledge of statistical methods	Standards professionals should have knowledge of statistical methods/techniques that can be applied extensively to the field of standardization.	K57

Table 26 – Skills for Task 8: Training and education about standards

Skills	Description	Location in project DACUM job analysis chart
S24: Ability to plan education and training programmes		S3, S9, S37
S25: Teaching and training skills		S3, S9, S37
S20: Language and communication skills		S38, S50, S51
S9: Ability to manage multiple projects		S39
S3: Ability to develop action plans for implementing the strategic plan		S36, S45
S2: Ability to conduct performance measurement and analysis for standardization		S8, S9, S27, S39

Task 9 – Public service related to standards

Task 9 was further broken into five subtasks or steps, and each of these was compared to the job analysis. T9: "Public service related to standards" may include, but is not limited to, the following subtasks or processes:

Table 27 – Subtasks for Task 9: Public service related to standards

Task/Subtask	Location in project DACUM job analysis chart
T9-1: Develop and enact laws and public policy on standardization considering health, safety, the environment, innovation or sustainability	No
T9-2: Promote the harmonization of standards and regulations	DACUM Chart C.1. Manage participation in international and regional standardization work
T9-3: Provide an assistance/consultancy service in response to foreign technical regulations (including the operation of a WTO/TBT enquiry point)	No
T9-4: Communicate and coordinate with regulatory agencies, industry associations and other interested parties	DACUM Chart C.2. Nominate experts (for international/regional participation)
T9-5: Analyse and communicate interested parties' feedback and the impact of actions taken	DACUM Chart B.2. Manager standards stakeholders

Table 28 – Knowledge for Task 9: Public service related to standards

Knowledge	Description	Location in project DACUM job analysis chart
K18: Knowledge of standards application to the development of technical regulations		K38, K81
K16: Knowledge of the laws and systems related to standardization		K38
K17: Knowledge of the legislation process and methods	Standards professionals should understand the system, process and methods of national legislation.	K38
K19: Knowledge of responding to foreign technical regulations (WTO/TBT)		K81
K7: Knowledge of harmonization with International Standards		K66, K67, K81
K4: Knowledge of methodologies for performance management		K28, K30, K53, K79

Table 29 – Skills for Task 9: Public service related to standards

Skills	Description	Location in project DACUM job analysis chart
S28: Ability to interpret relevant documents and official letters related to WTO/TBT	Standards professionals should be able to interpret relevant documents (e.g. notifications, specific trade concerns) and official letters related to WTO/TBT.	S18
S27: Ability to apply standards to technical regulations	Standards professionals should be able to apply standards to technical regulations, whether these are to be established or revised.	S2
S29: Ability to communicate with organizations related to WTO/TBT	Standards professionals should know how to communicate with organizations related to WTO/TBT [e.g. through a national WTO/TBT enquiry point(s)]. Standards professionals should be able to search notifications and specific trade concerns (STCs) using the WTO/TBT Information Management System.	S50, S51
S4: Ability to identify the needs of standardization		S1, S42
S3: Ability to develop action plans for implementing the strategic plan		S36, S45
S2: Ability to conduct		S8, S9, S27,

Skills	Description	Location in project DACUM job analysis chart
performance measurement and analysis for standardization		S39
S26: Ability related to drafting law	Standards professionals should be able to prepare a draft of law (e.g. acts, decrees, rules, ordinances, regulations) in accordance with the national rules for legislative drafting.	Not in JTA

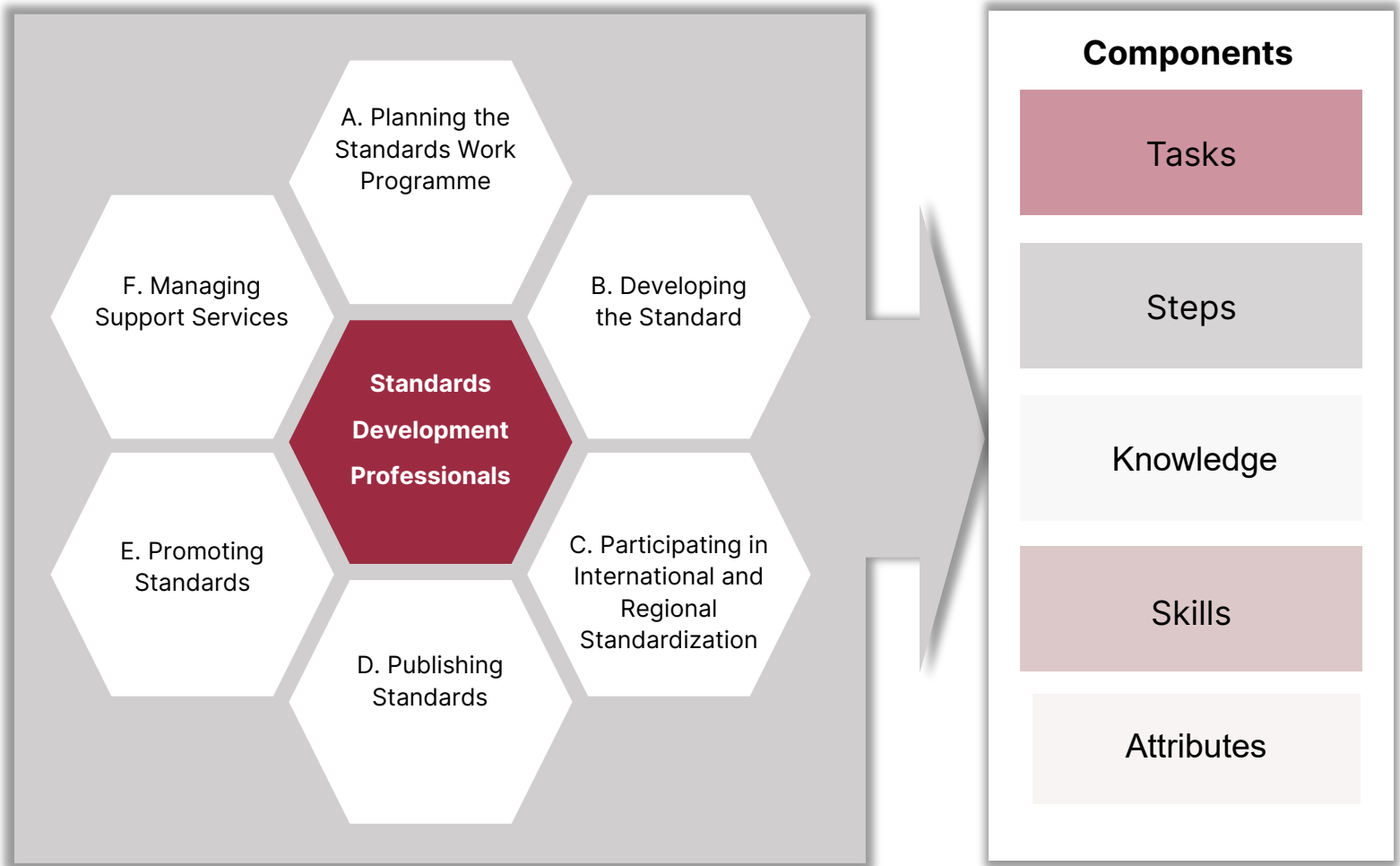# Appendix G – Competency framework for standards development professionals

Figure 2 – Components of competency framework for standards development professionals

Planning the Standards Work Programme

- Establish standards development procedures
- Develop standards work programme
- Justify the need for a standard
- Prioritize the standards to be developed
- Identify interested parties

Developing Standards

- Constitute the technical committee
- Manage standards stakeholders
- Convene committee meetings
- Develop draft standards
- Disseminate standards for public inquiry

Participating in International and Regional Standardization Work

- Manage participation in international and regional standardization work
- Nominate experts
- Constitute a national mirror committee
- Establish national

Publishing Standards

- Secure approval to publish
- Create or update digital standards
- Make standards available

Promoting Standards

- Develop a marketing communication plan
- Implement the marketing

Managing Support Services

- Provide capacity building for stakeholders
- Manage internal services
- Manage external customers

Figure 3 – Duties and tasks – Competency framework for standards development professionals

Duty A: Planning the standards work programme

Task A1: Establish standards development procedures (i.e. SOPs)

Steps:	Knowledge:	Skills:	Attributes/Attitudes:
• Manage support services • Ensure ethical behaviour in technical committee work • Identify other reference development procedures • Create draft procedures • Create a flowchart of steps in standards development • Validate the procedures (internal meetings, management approval etc.)	• Code of ethics • Good standardization practices (GSP) • Legal framework in the specific country • Standards development processes, procedures, functions and practices • Working knowledge of standardization at National, Regional and International levels	• Ability to think systematically • Analytical skills • Basic ability to read English • Reading comprehension • Written communication skills	• Detail-oriented • Globally minded

Behavioural objectives:
- The standards development professional will present information relevant to stakeholder participation including rules, roles, procedures, and terms of reference.
- The standards development professional will demonstrate the ability to assign roles to committee members by developing a list of roles and types of individual best suited for those roles.
- The standards development professional will demonstrate the ability to create a business plan for a committee by creating a hypothetical business plan for a technical committee.
- The standards development professional will demonstrate knowledge of business planning for standardization work by developing a hypothetical business plan for a technical committee.
- The standards development professional will demonstrate knowledge of standardization practices by developing a list of typical standardization practices.

Duty A: Planning the standards work programme

Task A2: Develop standards work programme (long term)

Steps:	Knowledge:	Skills:	-
Steps: • Collect background information/data (legislation, laws, economic data, safety data, environmental, scientific etc.) • Consult the National Standards Policy • Identify areas needed at a national level for standardization • Determine stakeholder needs • Prioritize standards projects • Identify the need for new technical committees • Identify International, National and Regional standards • Identify existing and needed resources • Evaluate risks • Identify milestones • Establish Key Performance Indicators (KPIs) • Evaluate programme outcomes **Steps – contained:** • Allocate resources (mobilization, etc.) • Validate/approve the programme	**Knowledge:** • Economic comparative advantages of specific countries • ISO methodology for development of national standardization strategy (NSS) • National and International priorities and directions • Project planning and management • Technical knowledge	**Skills:** • Analytical skills • Critical thinking skills • Leadership skills • Project management skills • Strategic thinking skills	-

Duty A: Planning the standards work programme

Task A2: Develop standards work programme (long term)

Communicate the programme			

Behavioural objectives:
- The standards professional will demonstrate the ability to develop a long-term standards work programme by describing the typical components of a long-term standards work programme.
- The standards professional will demonstrate knowledge of typical background information and data that may be collected to support the development of standard work by listing typical information that should be collected, including legislation, economic data, safety data, environmental data, scientific data etc.
- The standards professional will describe how to conduct a needs analysis to identify national needs for standardization.
- The standards professional will describe how to identify the needs of stakeholders
- The standards professional will describe how to identify existing and needed resources.
- The standards professional will demonstrate knowledge of how to evaluate risks by defining risks associated with a specific standard.
- The standards professional will demonstrate the ability to establish KPIs by defining what they are and developing a list of hypothetical KPIs.
- The standards professional will identify the components of programme evaluation and describe how they are used to evaluate a programme.
- The standards professional will demonstrate knowledge of how to allocate resources by describing resources in their NSB and region and how they would be mobilized for standards development.
- The standards professional will describe the process for developing a national standardization strategy.
- The standards professional will demonstrate the ability to establish national and international priorities and directions by developing draft national and international priorities and directions for their specific NSB and region.
- The standards professional will demonstrate knowledge of project planning and management by describing tools available to plan and manage projects and developing a hypothetical standardization project plan.

Duty A: Planning the standards work programme

Task A3: Justify the need for a standard

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Conduct an impact assessment • Assess priorities (national, governmental, non-governmental, stakeholder, interested parties etc.) • Evaluate risks (health, safety, environment, economic, social etc.) • Consult national standardization policy • Identify relevance to solving emerging issues • Alignment with National Directives • Evaluate potential impact of standard (number of people impacted, SDGs etc.) • Address stakeholder requests • Review catalogue of existing standards and documents	• Economic indicators • Market conditions, failures and needs • National and International priorities and directions • Risk evaluation methodologies • Standards • Standards development processes, procedures, functions and practices • SWOT	• Ability to conduct a risk analysis • Ability to engage others • Active listening skills • Analytical skills • Computer literacy and skills • Marketing skills • Negotiation skills • Presentation skills • Research skills • Verbal communication skills • Written communication skills	• Devoted • Emotional intelligence • Flexible • Non-discriminatory • Open-minded • Strategic thinker • Transparent

Behavioural objectives:
- The standards professional will describe how to justify the need for a standard.
- The standards professional will be able to describe the concept of an impact assessment and demonstrate the ability to conduct one by describing how one would be conducted.
- The standards professional will describe how to assess priorities.
- The standards professional will demonstrate knowledge of how to evaluate risks by identifying typical risks associated with a particular standard.

Duty A: Planning the standards work programme

Task A3: Justify the need for a standard

- The standards professional will demonstrate knowledge of how to evaluate the potential impact of standards by defining the impact a particular standard had.
- The standards professional will describe the best methods for cataloguing of standards and documents.
- The standards professional will identify economic indicates that impact standards development in a specific NSB or region.
- The standards professional will identify market conditions, failures and needs that will impact standards development in a specific NSB or region.
- The standards professional will demonstrate knowledge of standards development processes, procedures, functions and practices by correctly answering questions about standards development processes, procedures, functions and practices.
- The standards professional will demonstrate an understanding of SWOT analyses by defining the components of a SWOT analysis and how one would be conducted.

Duty A: Planning the standards work programme

Task A4: Prioritize the standards to be developed

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Develop prioritization criteria (emerging issues, urgency of standard, requests from stakeholders etc.) • Create a list of priorities • Outline national and international priorities • Map standards to the priorities	• Budgeting and budgetary constraints • Emerging issues • National and international priorities and directions • National and international stakeholders	• Analytical skills • Decision-making skills • Organizational skills • Verbal communication skills • Written communication skills	• Critical thinker • Flexible • Open-minded • Strategic thinker • Team player

Behavioural objectives:
- The standards professional will demonstrate the ability to develop prioritization criteria for standards development by describing appropriate prioritization criteria for a particular NSB and region.
- The standards professional will identify issues that should be considered when developing prioritization criteria for standards development (emerging issues, urgency of standard, requests from stakeholders, etc.).
- The standards professional will demonstrate the ability to create a list of priorities for standards development by developing a prioritization list for a particular NSB and region.
- The standards professional will demonstrate the ability to map standards to the priorities by identifying existing standards or standards that should be developed to address a specific list of priorities.
- The standards professional will demonstrate knowledge of budgets by developing a sample standards development budget.
- The standards professional will demonstrate knowledge of emerging issues by creating a list and describing emerging issues for a particular NSB or region.
- The standards professional will identify national and international stakeholders.

Duty A: Planning the standards work programme

Task A5: Identify interested parties

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Identify stakeholders • Obtain recommendations of potential stakeholders/ interested parties • Establish liaison relationship with associations/organizations for nominations • Conduct workshops to obtain information on potential stakeholders • Brainstorm and compile list of interested parties/stakeholders • Establish a strategy to reach out to interested parties/stakeholders • Consult relevant databases • Ensure balance in stakeholder/interested party representation	• Basic knowledge of the specific sector • Characteristics of stakeholders • Cultural knowledge • Databases and database management • Definition of interested parties and stakeholders • National and international priorities and directions • Top exports and imports of a country	• Ability to engage others • Active listening skills • Analytical skills • Cross-cultural communication skills • IT skills • Negotiation skills • Networking skills • Planning skills • Presentation skills • Research skills • Stress management skills • Verbal communication skills • Written communication skills	• Culturally sensitive • Diplomatic • Emotional intelligence • Non-discriminatory

Behavioural objectives:
- The standards professional will be able to identify stakeholders to the standards development process, including obtaining recommendations.
- The standards professional will demonstrate the ability to establish liaison relationships with associations and organizations by creating a list of associations and organizations for which relationships should be established and describing the steps to establish a relationship with those bodies.
- The standards professional will demonstrate the ability to conduct workshops to reach stakeholders by describing an agenda for a typical stakeholder workshop.

Duty A: Planning the standards work programme

Task A5: Identify interested parties

- The standards professional will compile a list of interested parties and stakeholders for a particular standard for their particular NSB or region.
- The standards professional will describe a strategy to reach out to interested parties and stakeholders, and identify databases containing information on stakeholders and interested parties.
- The standards professional will describe how to ensure balance in stakeholders and interested parties.
- The standards professional will demonstrate knowledge of characteristics of stakeholders, including cultural knowledge, by creating a sample list of stakeholders for a hypothetical standard.
- The standards professional will be able to define interested parties and stakeholders.
- The standards professional will demonstrate knowledge of national and international priorities and top exports and imports of a country by creating a list of national and international priorities, and creating a list of top exports and imports for a particular NSB in a specific region or country.

Duty A: Planning the standards work programme

Task A6: Develop a standards development workplan

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Conduct standards research • Establish the standards development budget • Plan for standards development resources • Establish standards development timelines • Define the stages attained in the standards development • List standards (NWIs) to be developed and associated timeline • List standards to be adopted (outline the domains) • Approve the workplan • Notify the WTO/ISO Information Gateway of the workplan • Notify other relevant parties of the workplan • Publish the workplan	• Existing standards being developed at national, regional, international levels • Good standardization practices (GSP) • ICS • National, regional and international catalogues and other scientific documentation • Project planning and management • Research methodologies • Standardization bodies	• Analytical skills • Comprehension skills • IT skills • Marketing skills • Planning skills • Project management skills • Research skills • Search skills (e.g. Boolean) • Written communication skills	• Creative • Detail-oriented

Behavioural objectives:
- The standards development professional will demonstrate the ability to conduct standards research by describing how to conduct standards research, including where to look and the type of documents and research to collect.
- The standards development professional will describe the components of a standards development budget and demonstrate the ability to create a budget by creating a hypothetical standards development budget.
- The standards development professional will identify common resource needs for standards development.
- The standards development professional will demonstrate the ability to develop a standards development timeline by creating a hypothetical standards development timeline.

Duty B: Developing standards

Task B1: Constitute the technical committee

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Identify domain for technical committee • Select stakeholders (per criteria to ensure balanced participation/representation) • Contact the stakeholders • Guide/induct committee members about participation rules, roles, procedures and terms of reference • Assign specific roles to committee members • Develop a business plan for the committee	• Business planning for standardization work • Committee member expertise • Standardization practices	• Ability to persuade others • Consensus-building skills • IT skills • Negotiation skills • Organizational skills • Planning skills • Project management skills • Stress management skills • Verbal communication skills • Written communication skills	• Goal-oriented • Open-minded

Behavioural objectives:
- The standards development professional will present information relevant to stakeholder participation, including rules, roles, procedures and terms of reference.
- The standards development professional will demonstrate the ability to assign roles to committee members by developing a list of roles and types of individual best suited for those roles.
- The standards development professional will demonstrate the ability to create a business plan for a committee by creating a hypothetical business plan for a technical committee.
- The standards development professional will demonstrate knowledge of business planning for standardization work by developing a hypothetical business plan for a technical committee.
- The standards development professional will demonstrate knowledge of standardization practices by developing a list of typical standardization practices.

Duty B: Developing standards

Task B2: Manage standards stakeholders

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Identify stakeholders (including underrepresented stakeholders) • Identify stakeholder needs • Engage stakeholders (industry associations, stakeholders, regulators, law makers, academic institutions, etc.) • Ensure balance representation of stakeholders • Assign roles to stakeholders (leadership, etc.) • Ensure participants understand their roles • Provide reports to stakeholders (budgets, progress, etc.) • Develop partnerships	• Budgeting and budgetary constraints • Characteristics of stakeholders • Partnership agreements instruments • Sector and market of a standard • Standardization bodies • Typical committee structures	• Leadership skills • Negotiation skills • Verbal communication skills • Written communication skills	• Culturally sensitive • Diplomatic • Non-discriminatory • Open-minded • Transparent

Behavioural objectives:
- The standards development professional will describe how to identify stakeholders and stakeholder needs.
- The standards development professional will list stakeholders that represent underrepresented populations and will describe how to engage them.
- The standards development professional will describe effective methodologies for engaging stakeholders.
- The standards development professional will define what a balance of representation of stakeholders is and how to ensure it.
- The standards development professional will describe the roles that may be assigned to stakeholders, and how to determine who should be assigned what roles.
- The standards development professional will demonstrate the ability to ensure participants understand their roles by describing how to verify participants understand their roles and what to do if they do not.

Duty B: Developing standards

Task B2: Manage standards stakeholders

- The standards development professional will describe effective methods for developing partnerships with stakeholder groups.
- The standards development professional will demonstrate knowledge of budgeting and how to address budgetary constraints by developing a hypothetical budget and describing typical ways around budgetary constraints.
- The standards development professional will identify the various characteristics of stakeholders for a particular NSB and region.
- The standards development professional will demonstrate knowledge of partnership agreement instruments by describing the major components of these agreements.
- The standards development professional will describe typical standards development committee structures.
- The standards development professional will describe the various types of standardization bodies.

Duty B: Developing standards

Task B3: Convene committee meetings

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Supervise technical committee work • Document all the steps involved with committee working • Organize meeting logistics (date, location, virtual/remote, times, etc.) • Prepare meeting materials (references, agenda, etc.) • Establish quorum • Facilitate the meeting • Prepare minutes/records of the meeting (results, attendance, etc.) • Ensure consensus • Conduct training on standards development procedures and Code of ethics	• Code of ethics • Good standardization practices (GSP) • IT tools and services • Meeting procedures • Standard communication procedures • Standards development processes, procedures, functions and practices	• Ability to manage people • Ability to motivate others • Ability to persuade others • Active listening skills • Analytical skills • Conflict resolution skills • Consensus-building skills • Critical thinking skills • Cross-cultural communication skills • Decision-making skills • Interpersonal skills • Leadership skills • Negotiation skills • Organizational skills • Presentation skills • Stress management skills • Teamwork • Time management skills • Verbal communication skills • Written communication skills	• Creative • Culturally sensitive • Diplomatic • Non-discriminatory • Open-minded

Behavioural objectives:
- The standards development professional will develop procedures and processes to supervise technical committee work.
- The standards development professional will describe how to organize meeting logistics.
- The standards development professional will describe the various meeting materials that should be developed.
- The standards development professional will demonstrate the ability to facilitate a meeting by facilitating a mock meeting.
- The standards development professional will describe the process for preparing minutes/records of the meetings.
- The standards development professional will describe practices for ensuring consensus.
- The standards development professional will demonstrate the ability to conduct training on standards development procedures and the code of ethics by developing training materials and a plan for delivering those materials.

Duty B: Developing standards

Task B3: Convene committee meetings

- The standards development professional will demonstrate knowledge of a code of ethics by describing the major components that should be in a code of ethics for committee participants.
- The standards development professional will demonstrate knowledge of good standardization practices by describing the major components that are covered by the good standardization practices.
- The standards development professional will describe common IT tools and services useful for convening committee meetings.
- The standards development professional will describe typical meeting formats and procedures.
- The standards development professional will describe typical standards development processes, procedures, functions and practices.

Duty B: Developing standards

Task B4: Develop draft standards

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Outline the standards scope • Convene committee meetings • Follow up with standards development tasks • Identify documents needed • Create various draft standards (working draft, committee draft, final draft standard) • Document committee resolutions • Organize workshops (commenting, drafting etc.) • Translate standards	• Standards development processes, procedures, functions and practices • Translation processes and procedures	• Ability to manage meetings • Conflict resolution skills • Consensus-building skills • Leadership skills • Negotiation skills • Research skills • Verbal communication skills • Written communication skills	• Patience

Behavioural objectives:
- The standards development professional will describe how to outline a standards scope and provide examples of standards scopes.
- The standards development professional will demonstrate knowledge of the process of convening a meeting by listing the typical steps.
- The standards development professional will describe the steps in creating various draft standards.
- The standards development professional will demonstrate the ability to organize workshops by describing the steps to organizing a typical workshop.
- The standards development professional will describe the processes and procedures to translate standards.
- The standards development professional will demonstrate knowledge of the standards development process by describing the process.

Duty B: Developing standards

Task B5: Disseminate standards for public inquiry

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Make draft standard available/circulate • Notify the public (via media) • Receive comments to standards • Analyse standards comments • Organize workshops/meetings involving stakeholders to obtain comments	• Avenues to reach public • Means of communication • Standards development processes, procedures, functions and practices	• Consensus-building skills • Organizational skills	• Responsible

Behavioural objectives:
- The standards development professional will describe procedures and methods for circulating standards.
- The standards development professional will describe the process and procedures for receiving comments to standards and addressing the comments.
- The standards development professional will describe various avenues for reaching the public for comments to standards.
- The standards development professional will describe methods for achieving consensus.

Duty B: Developing standards

Task B6: Edit draft standards

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Establish editing criteria and procedures for NSB • Outsource editing (if required) • Establish TORs for editors (technical and language) • Identify potential editors • Qualify editors • Contract with outsourced editors (if relevant) • Approve final edits • Evaluate the editing process	• Qualifications of editors • Standards editing practices and quality control • Target language of a specific standard • Technical knowledge	• Ability to connect the edited parts to the whole • Ability to ensure coherence in standards • Analytical skills • Computer literacy and skills • Editorial skills • Evaluation skills • Specific software competence	• Detail-oriented • Focused

Behavioural objectives:
- The standards development professional will describe how to establish editing criteria and procedures for an NSB.
- The standards development professional will describe how to locate outsourced editors.
- The standards development professional will identify the components of TORs for editors.
- The standards development professional will describe methods for qualifying editors and what the typical qualifications for editors are.
- The standards development professional will demonstrate knowledge of how to evaluate the editing process by listing specific criteria that should be reviewed.
- The standards development professional will demonstrate knowledge of standards editing practices by answering simple editing questions.

Duty C: Participating in international and regional standardization

Task C1: Manage international and regional participation

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Develop a strategy for participation • Obtain/maintain membership of international/regional bodies • Define membership level • Secure resources to participate in international and regional activities • Train technical committee experts on international and regional procedures • Report on national adoptions • Participate in mutual recognition arrangements (MRAs) • Pursue international leadership roles • Participate in international and regional meetings • Participate in training and workshops	• Adult learner principles • Basic understanding of mutual recognition arrangements • International/regional standardization participation process and procedures • National laws • Online standards platforms • Technical knowledge of the fields/sectors in which seeking leadership roles	• Ability to teach and train • Consensus-building skills • Decision-making skills • Interpersonal skills • IT skills • Leadership skills • Negotiation skills • Networking skills • Presentation skills • Proficient in the language of the international body • Stress management skills • Verbal communication skills	• Assertive • Culturally sensitive • Diplomatic • Emotionally intelligent • Flexible • Open-minded

Behavioural objectives:
- The standards development professional will demonstrate the ability to develop a strategy for participation by drafting a sample strategy.
- The standards development professional will demonstrate knowledge of how to obtain and maintain membership in international and regional bodies by identifying appropriate bodies to join, and listing the membership requirements for those bodies.
- The standards development professional will define the various membership levels for standardization.
- The standards development professional will describe how to secure resources for participants in standards activities.
- The standards development professional will describe methods for training technical committees in international and regional procedures.
- The standards development professional will list MRAs and describe how to participate in them.

Duty C: Participating in international and regional standardization

Task C1: Manage international and regional participation

- The standards development professional will list international leadership roles who may participate.
- The standards development professional will participate in training sessions, workshops and international and regional meetings.

Duty C: Participating in international and regional standardization

Task C2: Nominate experts (for international/regional participation)

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Identify sector/field where experts are needed • Create a list of potential experts for participation • Select experts • Communicate with experts (obtain confirmation of interest) • Establish-registered expert user accounts	• Business planning for standardization work • International/regional standardization participation process and procedures • Sector/field where expertise is needed	• Analytical skills • Decision-making skills • Interpersonal skills • Negotiation skills • Verbal communication skills	• Diplomatic • Non-discriminatory • Team player

Behavioural objectives:
- The standards development professional will describe how to identify sectors/fields where experts are needed.
- The standards development professional will describe how to develop criteria for experts.
- The standards development professional will describe how to create a list of potential experts for participation.
- The standards development professional will create selection criteria for selecting experts.
- The standards development professional will describe various systems for registering and tracking expert user accounts.
- The standards development professional will demonstrate knowledge of business plans for standardization work by describing the components of a business plan.

Duty C: Participating in international and regional standardization

Task C3: Constitute a national mirror committee

Steps:	Knowledge:	Skills:	Attributes/Attitudes:
• Identify sector/field for the committee • Identify stakeholders • Communicate with stakeholders • Establish criteria selection of committee members • Select committee members • Train committee members • Map (register) the national mirror committee to international/regional standardization body • Establish stakeholder database • Document the entire process	• Good standardization practices (GSP) • Mirror committee participation platform • Roles and responsibilities of mirror committee members	• Ability to manage databases • Analytical skills • Decision-making skills • IT skills • Negotiation skills • Organizational skills • Presentation skills • Project management skills • Time management skills • Verbal communication skills • Written communication skills	• Creative • Diplomatic • Flexible • Goal-oriented • Non-discriminatory • Open-minded • Responsible

Behavioural objectives:
- The standards development professional will describe how to identify sectors/fields where stakeholders are needed to constitute a national mirror committee.
- The standards development professional will develop criteria for the selection of stakeholders.
- The standards development professional will describe how to identify potential stakeholders for a national mirror committee.
- The standards development professional will describe the training that needs to occur for national mirror committees.
- The standards development professional will describe various stakeholder databases that are available.
- The standards development professional will describe the entire process of establishing a national mirror committee.
- The standards development professional will demonstrate knowledge of good standardization practices by describing the components of good standardization practices.
- The standards development professional will list the various roles and responsibilities required of national mirror committee members.

Duty C: Participating in international and regional standardization

Task C4: Establish national positions

Steps:	Knowledge:	Skills:	Attributes/Attitudes:
• Conduct National Consultation • Collect/collate comments • Build consensus on national position • Cast ballots (internal and external) • Conduct research specific to the deliverable • Participate in scientific research • Participate in international and regional meetings • Participate in international training and workshops	• Comment collating process • GSP • IT tools and services • Research methodologies • Standards ballot casting process	• Analytical skills • Conflict resolution skills • Consensus-building skills • Cross-cultural communication skills • Leadership skills • Negotiation skills • Research skills • Time management skills • Translation skills • Verbal communication skills • Written communication skills	• Consistent • Detail-oriented • Emotionally intelligent • Impartial • Open-minded

Behavioural objectives:
- The standards development professional will demonstrate the ability to create a standard catalogue system by describing the process to establish and operate the system.
- The standards development professional will describe how to operate and update the standards catalogue.
- The standards development professional will demonstrate knowledge of developing standards abstracts by developing a hypothetical abstract for a standard.
- The standards development professional will describe how to develop standards key words.
- The standards development professional will describe how to maintain a database of standards.
- The standards development professional will demonstrate knowledge of databases and database management by describing typical databases and database management.
- The standards development professional will describe information management techniques.
- The standards development professional will describe procedures to create and update digital standards.
- The standards development professional will describe typical sectors and markets for standards.
- The standards development professional will describe typical standard catalogue systems.
- The standards development professional will define typical terminology associated with various standard sectors and markets.

Duty D: Publishing standards

Task D1: Secure approval to publish

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Publish list of standards in Gazette • Ensure standards copyright • Print master copy	• Copyrighting laws • Document security procedures • Standards publishing procedures and processes	• Analytical skills • IT skills	• Detail-oriented

Behavioural objectives:
- The standards development professional will describe the process for publishing standards.
- The standards development professional will describe the process for copyrighting standards.
- The standards development professional will demonstrate knowledge of copyrighting laws by describing copyrighting practices.
- The standards development professional will demonstrate knowledge of standards publishing procedures and processes by describing typical procedures and processes.

Duty D: Publishing standards

Task D2: Create or update digital standards

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Create standard catalogue system • Update standards catalogue • Prepare standards preview • Develop standards abstract • Develop standards key words • Maintain database of standards	• Databases and database management • Information management techniques • Procedures to create and update digital standards • Sector and market of a standard • Standard catalogue systems • Terminology associated with the sector and market of the standard	• Ability to skim and comprehend documents • Analytical skills • Editing skills • IT skills • Organizational skills • Reading comprehension • Time management skills • Written communication skills	• Creative • Detail-oriented • Flexible • Punctual

Behavioural objectives:
- The standards development professional will demonstrate the ability to create a standard catalogue system by describing the process to establish and operate the system.
- The standards development professional will describe how to operate and update the standards catalogue.
- The standards development professional will demonstrate knowledge of developing standards abstracts by developing a hypothetical abstract for a standard.
- The standards development professional will describe how to develop standards' key words.
- The standards development professional will describe how to maintain a database of standards.
- The standards development professional will demonstrate knowledge of databases and database management by describing typical databases and database management.
- The standards development professional will describe information management techniques.
- The standards development professional will describe procedures to create and update digital standards.
- The standards development professional will describe typical sectors and markets for standards.
- The standards development professional will describe typical standard catalogue systems.
- The standards development professional will define typical terminology associated with various standard sectors and markets.

Duty D: Publishing standards

Task D3: Make standards available

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Print standards • Receive new request for standards (purchase order etc.) • Make standards available in web stores • Send or provide standards to customer • Sign agreements with resellers (selling agents) • Apply security features to standards (watermarks, trademarks etc.)	• Digital document tracking systems • Document security procedures • Familiarity with standard sales channels (web store etc.) • Familiarity with the standards sales process • IT tools and services	• IT skills • Marketing skills • Negotiation skills • Organizational skills	• Courteous • Customer-oriented • Detail-oriented • Diplomatic • Patience • Responsible • Transparent

Behavioural objectives:
- The standards development professional will describe a typical system for publishing standards.
- The standards development professional will describe typical standard web store formats.
- The standards development professional will define the major components of typical reseller agreements.
- The standards development professional will identify the methods for applying security features to standards.
- The standards development professional will describe digital document tracking systems and the major components of them.
- The standards development professional will define document security procedures.
- The standards development professional will describe typical standard sales channels and the standard sales process.

Duty E: Promoting standards

Task E1: Develop a marketing communication plan

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Create a media promotion plan • Develop a communication plan • Develop an event plan • Identify promotional channels (i.e. invite students to committees) • Identify standards to promote • Identify goals and objectives of promotions • Identify target markets for promotions • Establish a promotional budget and resources • Identify supplies to spread the promotion • Develop promotional materials (content, scenarios, graphics etc.) • Mobilize resources for the promotional plan • Identify leaders/experts for promotions (influencers) • Identify stakeholders • Identify the needs of stakeholders	• Budgeting and budgetary constraints • Communication channels • Event planning and management • Marketing and marketing methodologies • Media • Public relations	• Ability to influence others • Interpersonal skills • Leadership skills • Negotiation skills • Organizational skills • Presentation skills • Public speaking skills • Verbal communication skills	• Creative • Persuasive

Duty E: Promoting standards

Task E1: Develop a marketing communication plan

Steps – Continued: • Identify potential promotional partners • Conduct market research			

Behavioural objectives:
- The standards development professional will create a media promotion plan for an NSB.
- The standards development professional will develop a communication plan for an NSB.
- The standards development professional will develop an event plan for an NSB.
- The standards development professional will identify promotional/communication channels for marketing standards.
- The standards development professional will describe the process for selecting standards to promote.
- The standards development professional will list typical goals and objectives of promotional activities.
- The standards development professional will describe how to identify and select target markets for promotional activities.
- The standards development professional will describe the typical components of a promotional budget.
- The standards development professional will identify typical resources available for promoting standards.
- The standards development professional will list the supplies needed to promote standards.
- The standards development professional will develop promotional materials for a hypothetical promotional campaign.
- The standards development professional will describe how to identify leaders/experts (influencers) for promotions.
- The standards development professional will describe how to identify stakeholders and their needs.
- The standards development professional will describe how to identify potential promotional partners.
- The standards development professional will describe how to conduct market research.
- The standards development professional will describe typical marketing methodologies.
- The standards development professional will demonstrate knowledge of how to work with media by answering questions about media resources.

Duty E: Promoting standards

Task E2: Implement the marketing communication plan

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Create market demand for the published standards • Organize events, workshops, trade shows, exhibits or roundtables • Disseminate promotional materials • Conduct sensitization sessions • Conduct promotional education • Evaluate marketing communication plan • Engage stakeholders • Monitoring the implementation of the plan	• Basic knowledge of the specific sector • Characteristics of stakeholders • Cultural knowledge • Databases and database management • Event planning and management • Market conditions, failures and needs • Marketing and marketing methodologies	• Ability to engage others • Ability to teach and train • Active listening skills • Conflict resolution skills • Evaluation skills • Interpersonal skills • Leadership skills • Marketing skills • Monitoring skills • Project management skills • Verbal communication skills	• Attentive • Creative • Empathetic • Results-oriented • Team player • Visionary

Behavioural objectives:
- The standards development professional will describe how to create market demand for published standards.
- The standards development professional will describe how to organize events, workshops, trade shows, exhibits and roundtables.
- The standards development professional will describe how to disseminate promotional materials.
- The standards development professional will describe the process for conducting sensitization sessions.
- The standards development professional will describe the process for conducting promotional education.
- The standards development professional will describe how to evaluate marketing communication plans.
- The standards development professional will list typical characteristics of stakeholders.
- The standards development professional will demonstrate cultural knowledge by answering cultural awareness questions.
- The standards development professional will describe instances of market failures.

Duty F: Managing support services (internal/external customers)

Task F1: Provide capacity building for stakeholders

Steps:	Knowledge:	Skills:	Attributes/attitudes:
• Identify stakeholders • Survey stakeholder needs • Determine training interest • Prioritize training needs • Establish needed training resources • Establish a training framework • Develop training materials • Obtain training supplies (resource materials needed for training) • Organize training logistics • Modify/adapt existing training • Develop training calendars/workplans • Identify trainers • Arrange experiential learning (OJT) • Promote the training • Conduct stakeholder training • Evaluate training outcomes • Assess learning outcome of participants • Share post-training knowledge	• Adult learning principles • Budgeting and budgetary constraints • Characteristics of stakeholders • Good standardization practices (GSP) • Learning management systems • Presentation practices • Technical knowledge in the training area • Training methods	• Ability to develop training materials • Ability to engage others • Ability to teach and train • Active listening skills • Comprehension skills • Interpersonal skills • IT skills • Leadership skills • Organizational skills • Presentation skills • Public speaking skills • Verbal communication skills • Written communication skills	• Creative • Detail-oriented • Empathetic • Flexible • Goal-oriented • Open-minded • Patience

Behavioural objectives:
- The Standards Development Professional will describe how to survey stakeholder needs.
- The Standards Development Professional will describe how to determine training interests.
- The standards development professional will describe how to prioritize training needs.

Duty F: Managing support services (internal/external customers)

Task F1: Provide capacity building for stakeholders

- The standards development professional will describe how to identify necessary training resources.
- The standards development professional will describe how to develop a training framework.
- The standards development professional will describe how to develop training materials.
- The standards development professional will describe how to obtain training supplies.
- The standards development professional will list the components of training calendars and workplans.
- The standards development professional will describe how to identify trainers.
- The standards development professional will describe the process for establishing experiential learning (OJT).
- The standards development professional will describe how to promote training.
- The standards development professional will describe how to evaluate the effectiveness of training.
- The standards development professional will describe typical processes for assessing the learning outcomes of training participants.
- The standards development professional will describe typical adult learning principles.
- The standards development professional will describe typical learning management systems.
- The standards development professional will describe effective presentation practices.
- The standards development professional will describe typical training methods.

Duty F: Managing support services (internal/external customers)

Task F2: Manage internal services

Steps:	Knowledge:	Skills:	-
• Coordinate with Procurement Services • Coordinate with Facility Services • Coordinate with IT Services • Coordinate with Editorial Services • Coordinate with Communication Services • Coordinate with Quality Assurance Services • Coordinate with International Relations • Coordinate with Marketing Services • Coordinate with Human Resources • Coordinate with Conformity Assessment Services • Coordinate with Legal Services • Conduct customer surveys • Evaluate customer service • Develop a feedback mechanism	• Basic understanding of legal rules and terms • Customer Services • Human Resource policies and procedures • Internal operating procedures • IT tools and services • Marketing and marketing methodologies • Quality management	• Ability to manage people • Leadership skills • Negotiation skills • Verbal communication skills • Written communication skills	

Behavioural objectives:
- The standards development professional will discuss how to coordinate with procurement, facility, IT, editorial, communication, quality assurance, international relations, marketing, human, conformity assessment and legal services.
- The standards development professional will describe the process for conducting customer surveys.
- The standards development professional will describe how to evaluate customer service.

Duty F: Managing support services (internal/external customers)

Task F2: Manage internal services

- The standards development professional will describe the components of a feedback mechanism.
- The standards development professional will demonstrate basic knowledge of legal rules and terms by answering questions about them.
- The standards development professional will describe typical human resource policies and procedures.
- The standards development professional will describe typical IT tools and services.
- The standards development professional will describe a quality management system.

Duty F: Managing support services (internal/external customers)

Task F3: Manage external customers

Steps:	Knowledge:	-	Attributes/attitudes:
• Provide customer services • Develop informational web portal • Respond to customer feedback • Conduct customer surveys • Respond to inquiries • Evaluate customer service • Consult on application of standards • Monitor complaints received • Identify appropriate party to respond to customers • Provide after-sales services • Develop feedback mechanism • Establish community management • Address complaints • Establish customer service agreements (charters) • Provide services proposals • Provide information regarding services	• Basic understanding of legal rules and terms • Complaint procedures • Customer Services • Customers • IT tools and services • Marketing and marketing methodologies • Quality management • Survey methodology		• People person

Behavioural objectives:
• The standards development professional will describe typical customer services policies and procedures, including obtaining customer feedback and responding to inquiries and complaints.
• The standards development professional will describe how to develop an informational web portal.

Duty F: Managing support services (internal/external customers)

Task F3: Manage external customers

- The standards development professional will describe typical methods for evaluating customer service.
- The standards development professional will describe typical after-sales services.
- The standards development professional will describe the major components of customer service agreements.

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