

# **Skill Standards for IT Professionals, Version 2**

## **Part 1: Overview**

*English edition Draft 1.0    December.2006*

**INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN**  
**IT Skill Standards Center**

**Ministry of Economy, Trade and Industry**



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## Preface

The skill standard for IT professionals (hereafter the skill standards) was published by the Ministry of Economy, Trade and Industry (METI) in December 2002.

Since then, it has come into widespread use among companies not only in the IT service industry but also in other industries.

In order to promote the spreading and utilization of the skill standards, the IT skill standards center was established by METI in the INFORMATION TECHNOLOGY PROMOTION AGENCY (IPA) in July 2003. It launched professional communities in December 2003. With their cooperation, IPA continues to reinforce enrichment of the skill standards, training and development, and evaluation of professionals via the skill standards. In April 2006, it released a major revision, the skill standards for IT professionals V2 that greatly improved its ease of use and comprehensibility. A minor revision, V2 2006, is planned in October 2006.

The main points of the revisions are listed below.

- Clarification of basic structure: Divided into “Career” specification and “Skill” specification
- Restructuring the document contents: Referenced with the directives, such as public ISO documents, and restructured the contents
- Clarification of evaluation criteria: Redefined evaluation criteria as entry-requirements, and enriched information in the description formats for easy understanding and information on the number experiences in KPI<sup>1</sup>
- Skill description: Created a skill dictionary as at-a-glance table
- Area of specialty: Redefined area of specialty in some careers, that is IT architect, project management, and operations

The skill standards is requested to improve and/or to add for changing business situations and technology in consideration of international acceptability. As it is not convenient for the user that the skill standards upgrade at irregular intervals, it is considered to upgrade regularly every year according to the revision cycle in Figure 1.

There are two revision types as a policy. Substantial revisions across many careers changes the version number. Trivial revisions, such as addition or modification of skill components or knowledge taxonomy, assigns the number of a year, but does not change the version number.

The time schedule of each revision cycle is basically that, revision proposal drafts developed by professional communities are submitted every March, and a revision document will be published in October by taking in account these proposals and other improvement requirements.

[An image of Revision cycle]

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<sup>1</sup> The entry criteria standards for minimum and indispensable requirements used to evaluate different levels. The index defined in the skill standards stands for the criteria of value that sets condition value and number of performances etc. that are required in order to make an evaluation.

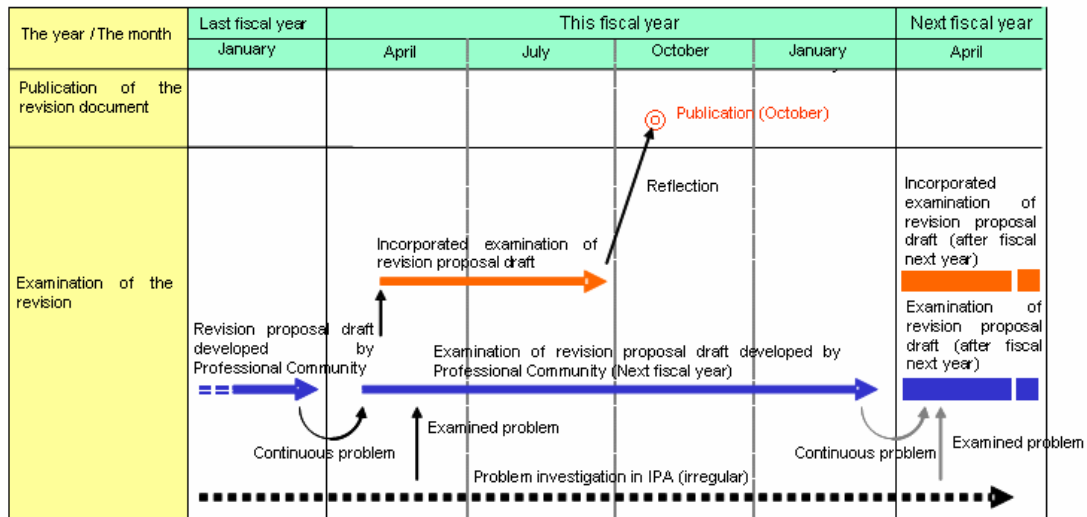


Figure 1. The Revision Cycle

- Records of revision date
  - 1 April 2006      First edition: Version 2

## Introduction

### (1) Background of developing skill standards

A background of developing the skill standards for IT Professionals (hereafter the skill standards) was the situation where human resources were recognized as a more significant factor in business and management along with the remarkable changing of the business environment.

“Offering” that the IT industry provided has been shifting from “product”, such as hardware and/or software, alone, to “services,” such as providing from proposals for business strategies to solutions for business issues that a company needs to solve. The quality of the “service” is dependent on the skills of the human resources. As the ratio of service business to the total amount of sale and profits became higher, the IT service industry faced the situation in which the competitiveness of the company was directly connected to schemes of development and management of individual skills in order to provide services.

The various usages of information technology were on the increase along with the spreading of internet technology, then customer needs became also more various and complex. What currently customer desire is systematization with wide business perspectives using information technology, which includes operation process improvements based on understanding of the customer’s business characteristics and sophisticated outsourcing such as Business Process Outsourcing (BPO). The IT service company needs to be not merely a provider of products, but be a partner that creates business value with their customers.

In such business circumstance, the demand for experts with high specialties has been increasing. It reinforces the importance of human resource development in the strategic and systematic way to improve company competitiveness.

It is important to companies to establish the business strategy, which is able to exploit own strength, by foreseeing environment changes and its future directions, and based on the strategy, to proceed human resources development and reorganization of internal structure. To do so, it is necessary to achieve detail objectives by combining skills to meet the customer needs adaptively while taking into consideration of environment changes such as technological innovation.

The importance of human resources development (hereafter HRD) is recognized well, but is difficult to realize an effective HRD. Even many companies, especially in the IT service industry, have needed a concrete reference and/or indicator for clarifying necessary skills and procurement policy in order to achieve the strategic objectives, there was no practical indexes available with some exceptions abroad.

On the other hand, the environment for individuals related to providing IT services also changed significantly. Individuals not only need to have values within their companies but also need to be recognized the expertise in the market and/or industry. Then it is necessary to individuals to imagine their career in the early career stage, and to develop their expertise thorough experiences. However, in the past, it was difficult to identify the aim for their career and the skills an individual needs to acquire. This issue is also

caused by a lack of concert and objective skill indicators.

The skill standards was developed in order to solve these issues related to skill indicators. Of course, the issues of human resources were varied and wide, it was not enough to solve the issues from the perspective of the company and the individual. To be a high level professional occupation, it is necessary to clarify work values and ethics, and to promote social recognition for the necessity of these occupations, and to establish high-status as advanced profession. It is also necessary to establish support structures to transfer their expertise to their successors in order to bring up future experts. To realize these things, it is indispensable to make well organized measures and policies among industry, government, and academia. The cooperation among industry, government and academia is expected to go step further by the introduction of the skill standards.

## (2) Overall structure of the skill standards

The skill standards consists of three parts as shown in figure 2.

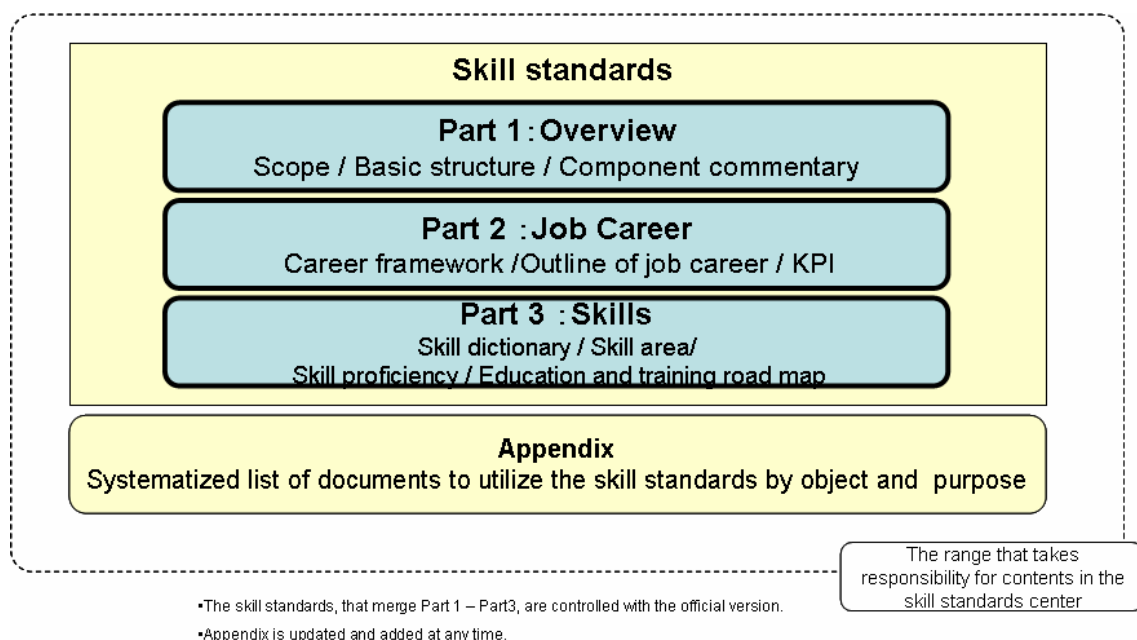


Figure 2. Whole structure of skill standards

The contents of Part 1, “Overview,” have been enriched compared to the previous version of the skill standards, and it provides instructions on how to read the structure and documents and how to interpret the contents of the skill standards. Chapter 4 in Part 1, “Basic structure of the skill standards,” describes a perspective to grasp human abilities in the business context in detail.

One is business performance and results and the other is maturity of abilities. In Part 2, “Job career,” explains the former, and Part 3, “Skills,” explains the latter. These three parts are the basic components of the new the skill standards version, and are controlled with the official version.



In addition to above, significant and sophisticated complementary materials are introduced in the “Appendix” in order to promote utilization and adaptation. There are already-existing reports, output of professional communities, and practical cases in some companies arranged from the viewpoints of users who are management, personnel staff, and individuals. They will be expanded gradually.

### (3) Position of Part 1, Overview

Part 1, “Overview,” describes the structure, definitions, and meaning of the skill standards in order to develop a correct understanding and promote adaptive use within companies.

The skill standards has received a great deal of attention from the IT industry itself, however, a kind of misunderstandings have occurred with its practical applications in the real world. This comes from the skill standards was designed with a general and widespread use in mind and it uses abstract concepts and expressions in order to keep the system general.

For example, when the skill standards is being introduced in practice, it is necessary to link (or replace) its terminology to the specific product names. Such company-specific terminology has t been excluded from the skill standards. It is one of important role of this overview part to clarify the actual scope of application and positioning of the skill standards

In another case, the purpose of the skill standards has not been properly recognized. Such as, it merely is used to personnel evaluation or skill level assessment but without business strategy.

It is one of purposes of this overview to provide complementary explanations to avoid these confusions.

The contents of Part 1 are shown below, see figure 3.

1. Scope
2. Utilization of skill standards
3. Terminology and definitions
4. Fundamental Structure of skill standards

Figure 3. The contents of Part 1 : Overview

## 1. Scope

The skill standards is the index, which identifies and systematizes practical abilities required to provide IT services. The widths and the heights for the job careers and specialty fields, then the measurement indexes for the entry criteria for each level were defined.

### 1.1 Purpose

Capital investment is a key issue for management. When considering capital investment for human resources development, it is insufficient to focus only on individual or specific skills. It is important to clarify the roles, value, and skills exercised by human resources as professionals from the viewpoint of business success. The skill standards provides an objective guideline with a clear organization and systematized structure. The purposes of the skill standards is to promote effective capital investment for human resources development in the IT service industry by utilizing the index provided by the skill standards .

### 1.2 Application Field

The skill standards targets on the business capability of IT human resources as professionals engaged in the IT service industry. It focuses on mainly the IT service industry facing customers but also the IT department in companies in general..

Companies, individuals, and educational institutions are major targets, which are expected to use the skill standards.

- IT service companies (including IT departments in user companies):  
The skill standards will serve as a guideline for HRD and procurement along with the company strategy. Companies, who already have their original systems and criteria for skills and careers in place, is able to locate and recognize their position objectively in the outside world by defining their relationships to the skill standards.
- Individual as a professional:  
The skill standards will serve as a guideline for designing career paths and determining methods for skill development. Moreover, individuals who may consider changing career is able to grasp necessary experiences and business performance of target career in detail.
- Various institutions provide training and development courses and services (including higher education institution):  
The skill standards will serve as a guideline to explain the rational reasons for the design and method of skill development in the institution's curriculum and services. The standards is expected to be common guidelines for human resources development for cooperation between industry and academia.

The skill standards provides a common framework which is needed for the effective

cooperation among various parties related to IT human resources, and enables the recognition of individuals across companies.

### 1.3 General Versatility of skill standards<sup>2</sup>

The knowledge and skills used in the skill standards is designed as a general concept in order to promote widespread use and to have a certain level of versatility. The knowledge and skill concept are divided into layers from the perspective of generality and specialty (see figure 4). The characteristics of knowledge and skill are more general and transferable in the lower layers and more concrete and specific in the upper layers.

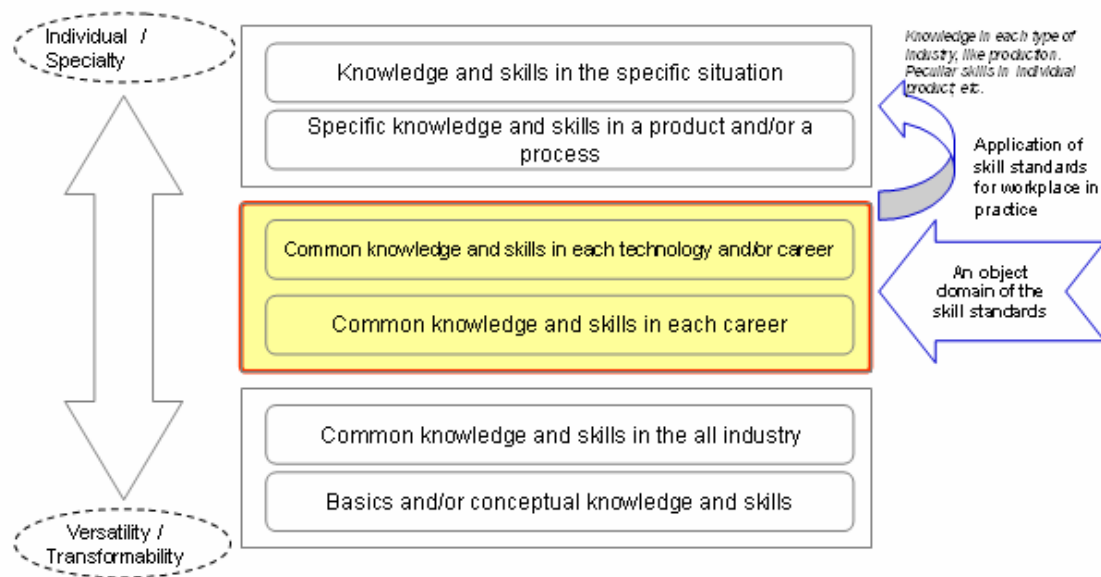


Figure 4. Versatility level of skill standards

The skill standards was developed as to be a common index within the IT service industry. The skill standards is an general level index as shown in the middle layers (see figure 4). This means the skill standards is positioned as a levels common to various technology areas and applications. When introducing the skill standards in real fields, more detail contents are needed. For example, company or products specific contents are to be adapted to skills derived from the characteristics and definitions of capability, and the job descriptions in each company. Increasing the generality attains transformability, transferability, reduction of cognitive workload, and common understanding, and so on.

### 1.4 Application of skill standards for companies

Just as companies employ a variety of business strategies, companies invest capital in different careers and vocations. At the application of the skill standards in a company, a company need to use the definitions of the skill standards as a common index, and then settles own index on it, which reflects company specific career and skill requirements

<sup>2</sup> The reference in this paragraph has been made to Editor, Hirata, K., Authors, Hirata, K., Seta, K., & Ikeda, M. The Ministry of Economy, Trade, and Industry, 2004.

along their business strategy (see figure 5).

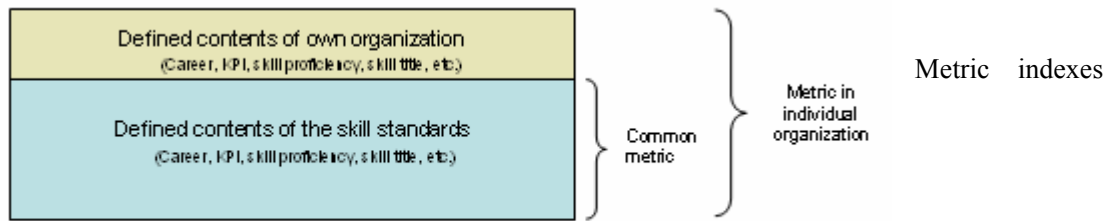


Figure 5. Viewpoint of utilization

Each company interprets or redefines the skill standards into company common specific internal guidelines that are understood at the workplace in practice. In this way, the differences of interpretation among companies can be reduced.

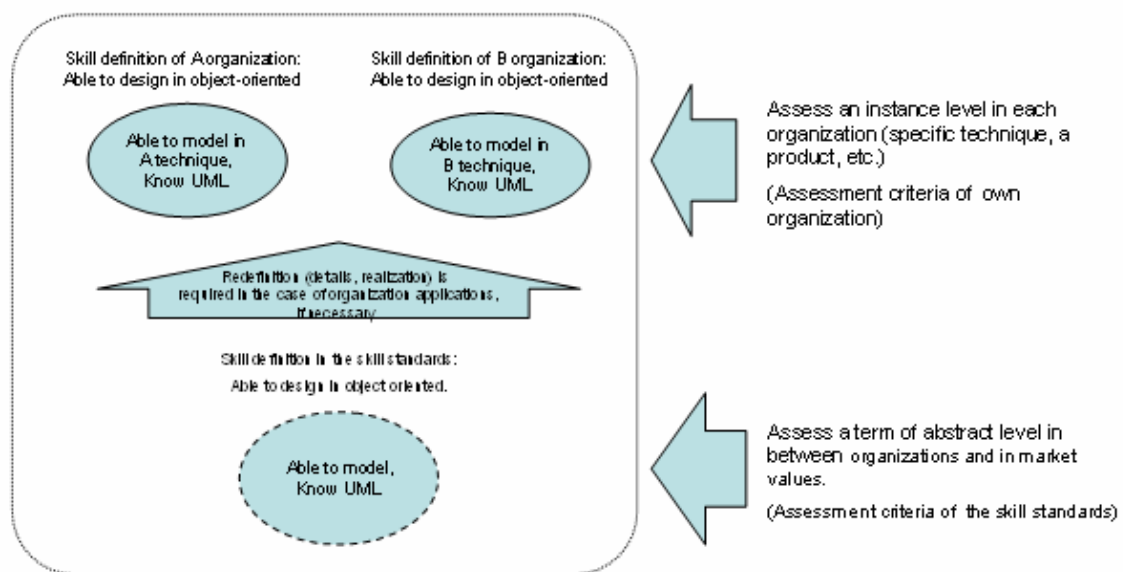


Figure 6. The application image of skill standards for workplace in practice

### 1.5 Consideration for applying skill standards

The skill standards must adequately be used to measure individual contributions to business activities. The introduction of the skill standards without a strategy and management decisions on capital investment for human resources will not realize the development of IT human resources, who lead the business and technology and competitiveness advantage. Introduction focusing only on convenience of personnel management or for a revision of the reward system may result in decreasing individual motivation.

The skill standards should be recognized as a referenced model, not a criterion or a specification. It is an index to share a common understanding among parties engaged in development and training of human resources in various aspects. Although the skill standards is called “standard.”, there is no need to deploy the full specification and exact adaptation, rather it allows the use of only those parts that are needed for realizing the business strategies.

Some terms in the skill standards have different meanings depending on the context. For example, the term “communication” has somewhat different meanings in terms of contents and degree of performance among job careers. The terms for expressing degree, such as complex, sophisticated, advanced, and successful have different meanings with regard to contents and base line among job careers and specialties.

## 1.6 Reference

- METI Research Report: The skills trend survey for IT service industry in Japan. Editor, Hirata, K.; Authors, Hirata, K., Ohta, M., Matsuo, M., & Suehiro, J. The Ministry of Economy, Trade, and Industry, 2003.
- METI Research Report: Knowledge engineering approach for the skill standards. Editor, Hirata, K., Authors, Hirata, K., Seta, K., & Ikeda, M. The Ministry of Economy, Trade, and Industry, 2004.
- METI Report: Introduction of skills standard for IT professionals. Editor, The council of skills standard for IT professionals. The Ministry of Economy, Trade, and Industry, 2002.

## 2. Utilization of skill standards

### 2.1 Utilization of skill standards

#### (1) Responding to diversification of skill requirements

The specialization and segmentation in the IT industry have steadily increased, corresponding to broadening of the application domain using IT and to rapid progress and diversification of technology. In these circumstances, it is no longer adequate to assume a “super-SE,” who understands both wide range of business operations and technologies and is able to cope with them alone.

In order to deal with the variety of the IT investment opportunities, there is a need to promote training and development of human resources as professionals for each diversified technology field.

In the previous IT human resources market, there was a typical linear career path from programmer to systems engineer to project leader. Most IT engineers in Japan are populated in the intermediate-level or below. Consequently, the industry needs to develop expert engineers as “professionals” who can handle each solution and the latest technologies in order to meet with customer requirements and ensure customer satisfaction.

The skill standards provides a guideline for markets, which is described as the direction and contents of a variety of skills.

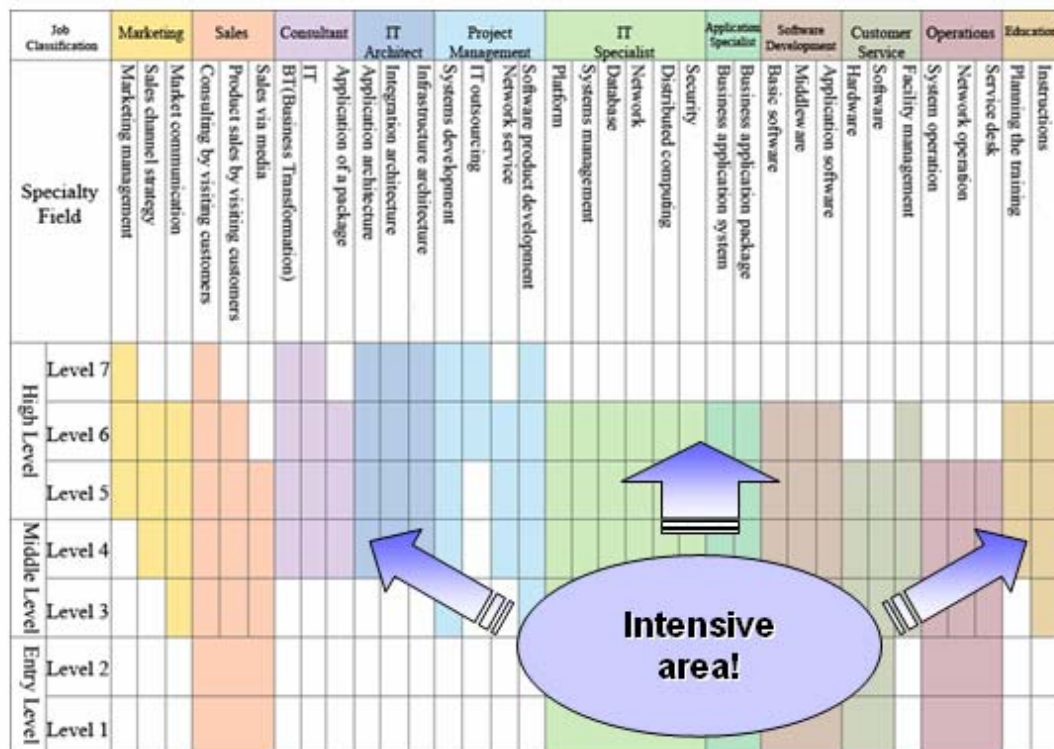


Figure 7. The image about uneven distribution of an IT human resources

## (2) Promotion of skill proficiency

The skill standards has important functions that indicate not only the variety need for skills on the horizontal axis, but also skill proficiency on the vertical axis.

To indicate level of skill proficiency as metrics means to indicate goals and objectives, and alternatives to IT human resources with an intention to be professional in early career stage. There are many works, which require higher-maturity skill level, such as a project management of a large scale project, an architect of the most complex system, the system with superior safety, and so on. Expert engineers who emerge with their higher-maturity skill level on practice, such as shown above, will create new information technologies, methodologies, and solutions required in next decade. By utilizing these newly created solutions and technologies, more IT human resources are developed. Moreover, their skill proficiency are enhanced.

## (3) Common guidelines for planning and realizing skill strategy

IT service industry is one of industries that require the most various and the most advanced skills. In this industry with rapid technological improvement, it certainly becomes a necessity to develop expert human resources required over the medium-to-long term HRD and work experience. Expert development should not only focus on knowledge and skills that are dependent on individual IT products and technology trend.

IT service companies need to have business strategies to develop the medium and long term skill development strategy. It is necessary to make decision, for example, whether to strengthen upper stream business such as consulting, to focus on a specific area such as data base or network technology, or to shift to financial sector business or public sector business, and so on. By having a clear business strategy, a company becomes to be able to formulate own skill strategy to take competitive advantage, which includes focusing skills needed to develop, rearrangement of infrastructure for developing skills, and setting motivation for training and development, and so on. In this way, the skill standards is a useful guideline for designing and planning skill strategy.

Likewise, individuals are necessary to design and to realize their own career path as independent professionals. To improve skill proficiency, it is important for individuals to find out the possible career path in their companies. The skill standards is, as a common framework, a valuable tool for individual to ensure own career path.

As shown above, the skill standards provides common framework for individuals and companies to design strategies for careers and skills. The entirety of the framework leads to obvious mutual recognition between individuals and companies on which skills and levels to focus.

## (4) Providing guidelines for IT human resources development

Another important purpose of the skill standards is to provide an index for trading information services and training courses in market.

Of course, the skill standards does not determine the unit price of a specific service nor certify the quality. The skill standards is simply an index used by individuals and

companies for considering skill strategies. The purpose of the skill standards is to define a common index for a skill building roadmap, and to make it possible to confirm the relative positions among in-house training, in-house qualifications, official qualifications, public licenses, and training courses.

For example, it is possible to recognize the relative level of consultants among companies who introduced their own professional qualification system for consultant by comparing their level of the skill standards.

The common index offers a significant advantage for understanding the skill levels of other companies. It improves procurement convenience. When a company is not able to fulfill their requirements for human resources in-house, the company may easily make appropriate procurement of human resources in the market.

The skill standards is an effective common index to confirm each individual's skill level for optimizing resource assignment to improve overall service quality. It is valuable as a complementary tool to evaluate vendors' service affordability.

The skill standards is used as a common index for HRD. By using this common index commonly among variety types of parties related to human resource development, such as IT service companies, individuals, training institutions, and universities, and they are able to collaborate with each other closely. Consequently, the development of IT human resources becomes more efficient and effective.

## 2.2 Skill standards and Developing Professionals

HRD without a proper business strategy does not lead to a critical HRD policy for developing professionals, who have a significant role in the technology and business for their own company and who support company competitiveness. The investment process into human resources based on a business strategy is necessary in order to enhance the competitive advantage of company. The skill standards is effective and meaningful when it is utilized based on the human resources development process to support business strategy as shown in figure 8.

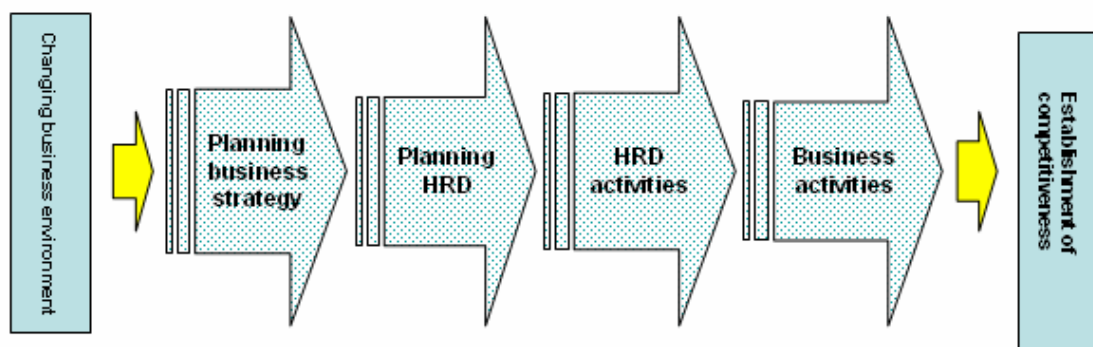


Figure 8. Process of Human Resource investment



Companies need to define the direction and policies according to their business issues. The “Planning business strategy” is the first step in the process to identify investments of company resources. The second step is “Planning HRD strategy”. In this step, necessary skills are identified for business strategy realization. This step includes identification of the skills requirement for business needs, analysis of the skills level of current human resources, and determination of ways to fill the gaps. The third step is “HRD activity” to implement the HRD strategy. In this step, actual HRD is executed and its progress is managed. The last step is “Business activity” to utilize developed human resources in business, and to establish competitiveness advantages.

The next section discusses the human resources investment process from the perspective of utilization of the skill standards.

### 2.3 Planning business strategy

In the “Planning business strategy” step, the future orientation of the business domain is discussed. For example, the primary weight of business will shift from system development to system consulting, or not. Successful utilization of the skill standards is dependent on whether the business strategy is clear. Because the identification of the human resources and skills needed for strategy implementation is possible only after a clear business strategy is in place. The skill standards as a guideline is not meaningful if a company has no strategic plan or objectives. The skill standards is effective only when it is recognized and used as a guideline for achievement of the business strategy and objectives.

### 2.4 Planning human resources strategy

This step has the following process sequence, identification of IT human resources for the business strategy, gap analysis between the current status and the desired status, development of skill acquisition policy, and planning of human resources development.

#### (1) Identification of IT human resources for the business strategy

The step analyzes the skills for realizing the business strategy and identifies the required human resources. In this step, each company should identify job careers and levels by referencing the skill standards and indicate career paths for individuals using the skill standards.

##### 1. Identification of the required skills based on the business strategy

Companies need develop and procure human resources to perform business activities. The identification of “required skills for business attainment” is derived from the business strategy drove by top management. Companies need to make effective human resources investment by selection and concentration based on their own requirements.

##### 2. Indicating careers and career paths

Once the required skills are clarified, it is necessary to indicate career paths as road maps for systematic skills acquisition. The skill standards is useful for indicating specific road maps. Utilization of the skill standards for road maps leads to providing specified career guidelines, not ambiguous goals for their careers, which match the career orientation between the company strategy and individual development. The skill standards promote effective HRD with the common objectives shared by companies and individuals.

Figure 9 shows a typical career path in project management. In this illustration, career switches between job careers maintain the same career levels to avoid complex expressions. However, in actuality, the required skill levels and experiences are different before and after reassignment. To keep the same level after the switch of job career, training and development as well as gaining experiences are needed.

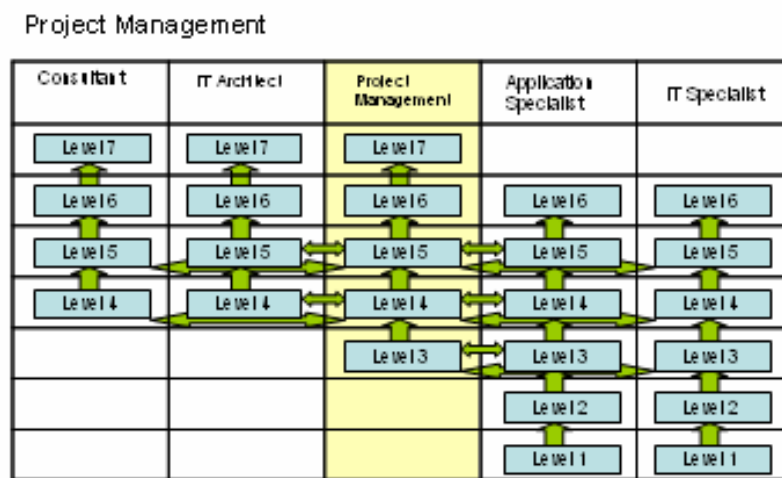


Figure 9. Image of typical career path

## (2) Gap analysis between current status and desired status

When required and desired skills are defined and targeted, it is necessary to ascertain the current status of the skills demonstrated by the company's human resources. Individuals can clearly imagine their career paths along the skill standards as a guideline. Therefore, individuals can recognize the distance from the current status to future skills and career objectives. Also, ascertaining the current status of skills is important for companies. Ascertaining the skills possessed by the company in detail based on the skill standards is valuable for planning of the career and skills development plan.

## (3) Making policy of skill acquisition

When the current status of skills is ascertained, a policy to bridge the gap in required skills needs to be clarified. Various cases are considered, such as employee development, recruitment of experienced staff, and outsourcing of operations. In every case, the skill standards is useful as an index of decision criteria.

#### (4) Planning for human resources development

To promote HRD in effective way, it is important to make the HRD strategy and direction of each individual development consistent. Based on the policy of skills acquisition, companies need to clarify target job careers, target the number of workforce in each job career and target date, and then map each individual to find the gap. It is important to identify the HRD issues, after companies ascertain the gap between the current status of skills possession and the desired status by referencing the skill standards.

### 2.5 Human Resources Development Activities

The next step after mapping the assessment of HRD planning of the company into individuals is training and development for individuals. The company determines the target careers (job careers, specialty field, level), means of HRD, and achievement target date.

HRD planning needs medium to long-term plans and short-term plans. For example, HRD plan in medium to long-term, by considering career path, targets to develop the skills, which are difficult to fulfill in short term, in planned and intensive manner. At the implementation of the HRD plan, it is necessary to ascertain the status of progress organizationally and to feed it back to individuals.

#### (1) Human Resource Development Planning

The next two points of view need to be considered together at the development of HRD plans.

##### 1. Career Development

The HRD issue in the medium and long term needs to consider the current status of the careers of professionals (career, field of specialty, and level) and target career to be aimed. The HRD plan is developed by considering systematic skills acquisition, which is based on career paths.

##### 2. Skill Development

The HRD issue for the short term is to make clear the sufficiency of each necessary skill element necessary for the current and near future careers. The HRD plan needs to consider the development of the skills in planned and intensive manner, which are not fulfilled sufficiently.

#### (2) Implementation and Promotion of HRD

For implementation of HRD, it is important to designate training and development based on business practice by combining OFF-JT (training course participation, conferences, and community activities) and OJT (mentoring, coaching, and job assignments in an actual project).

In order to promote training and development inside the company as a human resource investment activity, it is necessary to organize and promote the system on an activity

basis.

Furthermore, in order to advance training and development effectively, each company needs to support individuals to develop skills easily, for example, providing incentives to make the effort actively and voluntarily for skill development.

### (3) HRD and Assessment

The skill standards has two aspects of evaluation. One is the evaluation from the aspect of experience and achievement, and the other one is the evaluation from the aspect of product specific technologies and methodologies, and so on. Both are necessary for HRD and evaluation. It is necessary to manage the focused skills to develop, but it is not enough for the overall assessment.

. It is important not only to have domain specific skills independently but also to have the business capability to select the necessary technology and to combine the optimum to solve the various aspects of business issues. The skill standards is designed based on the idea of assessing it as the skill of professionals.

The skill assessment of human resources is an issue that needs to be addressed across the internal organization from top management to corporate information services. In particular, it is necessary to recognize that skill assessment is connected to reconfirming the own technologies and services.

Skills are mainly acquired through experience. Therefore, the assessment needs to be done by higher ranked professionals with high-level skills in the same job career.

However, higher ranked professionals in the field are busy, and in reality, they cannot guarantee the time for assessment. The development of subordinates and assessment are important in the skill standards. Because of this, the skill standards include the requirement to train subordinates or colleagues and community activities as a condition for a high-level ranking as professionals. The aim is to contribute to HRD and assessment by handing down the high-level skills possessed by higher-level professionals.

High-level professionals are requested to assess strictly how one executes the skills and contributes to the project as a real professional. The assessment methods are assumed document reviews, which describe project experiences and performance in detail, and interviews if the assessment needs to be a more rigorous examination.

In the lower levels, on the other hand, the circumstances of the effort to acquire skills, such as ways to deepen knowledge and develop skills, are emphasized. This is because learning in the lower level stages will be essential to grow toward the higher level in the future. Records of participation in training courses and judgment of individual skills are assumed to be used at the assessment. The meaning of learning in business in the field is also significant. The system for mentoring and coaching in the field to support practical learning is important.

It is necessary to position the certification system for the information service industry, not as a closed system within an company. This makes possible to the broader

perspective of motivating individuals to raise their skill levels.

In addition to the certifications, certified professionals can be motivated by extra pay or benefits, by linking their performance assessments to promotions in the rank, and by rewards or compensation system.

HRD and assessment cannot be isolated like the wheels of a car. It is important to connect evaluation of training results to the next career step. In order to accomplish this, it is important to provide an opportunity for experience and performance utilizing the job assignment after the circumstances of assessing skill acquisition. This idea also leads to the employment and application of new graduate human resources. It is a major incentive to those with effective specialized vocational training in school to provide early opportunities for experience and performance according to the level of learning..

## 2.6 Business Activities

The skill standards as a common guideline can be applied to the following business activities.

### (1) Human Resources Procurement on Project

Personnel planning is developed according to the necessary human resources based on the responsibility range, complexity, and size in the skill standards. However, in the real world, it is often difficult to procure human resources to fulfill all the requirements. In such occasion, one way is to assign human resources to the project from career development point of view by referring the skill standards.

### (2) Common Understanding of Human Resources across companies

It is important to minimize the gap between the human resources sought by the company and the personnel provided by the information service company. The skill standards is effective to share the same image of human resources between both companies. The skill standards can be utilized as the reference model for professional requirements to describe them in detail with clear, specific job careers and levels, not just like such conventional requirements as asking for the number of workforce needed from each “the low ranked, middle ranked, and high ranked SE.”

## 2.7 Promotion of Human Resource Investment

### (1) Necessarily of the Management Commitment

Human resources investment is an essential issue of corporate management more than traditional human affair. The top management needs to recognize its importance. The commitment and participation from the top management is essential to the promotion of investment into human resources within the company.

### (2) Necessary Effort for Cross Intersection in an Company

In addition to the commitment by top management, the organizational effort beyond the boarder of divisions is necessary. Traditionally HRD tends to be left entirely up to the personnel or training division. However, the collaboration of business operation divisions is essential for investment to human resources development. In other words, a “cross divisional type” of effort is necessary involving all related divisions, not only top management and the personnel division. Top management, personnel division, and business operations divisions need to be organically cooperative beyond the existing framework.

In order to formulate a structure that differs from the traditional structure, such as establishment of a new career certification system, the reformation related to the whole organization is necessary. Human resource investment activities can be promoted by the unit that assumes the cross divisional role by performing planning of human resource investment, as well as management and promotion of activities. What is important is that top management takes into account the various opinions of the business operations divisions.

### 3. Terminology and definitions

Basically, the terms and definitions of the skill standards considers existing standards and the bodies of knowledge. The following terms and definitions are unique to the skill standards. They have special meanings and it is important to understand them for proper understanding and utilization of the skill standards.

#### 3.1 Skills

Skill in the skill standards is defined as business capability<sup>3</sup>. Skill does not mean a set of individual technology elements. Skill is a business capability to realize solving of problems by selecting and applying technology elements.

#### 3.2 Professional

A professional is a person who successfully achieves business result in practice and contributes to the industry growth. The necessary criteria for a professional are listed below.

- Achieve commitment to the customer and the company
- Trains and develops subordinates who succeed experience and knowledge
- Performs activities continuously to improves own business capability
- Holds social responsibility and commitment to ethical standards as a professional

A professional attains business outcomes, which fulfills customers' requirements by utilizing a combination of appropriate skills. Possessing advanced skills as a professional means providing great value for customers, project members, partners, and the own company as a professional. To achieve a commitment to customers and the company, a professional needs to possess not only high technological skills, but also high level personal skills such as communication, negotiation, and leadership, and also business related skills. Moreover, for the succession of technology, a professional needs to contribute training and development of subordinates such as by mentoring or coaching.

#### 3.3 Job Career

Job career in the skill standards means the specialized domain professional stands on. Job career does not indicate the roles within a company or project.

#### 3.4 Responsible person

Responsible person is a person having responsibility in a service provider in charge of whole pertinent activity processes and phases. The destination to which the responsible

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<sup>3</sup> In general, "skill" is often referred to as knowledge and expertise on element technology of a specific product, know-how on the application of service, and specific programming language etc. However, it is difficult to judge "skill" as an ability to make customer's business successful by relying only on knowledge and expertise of individuals.

person delivers value directly is the person in charge in the customer.

### 3.5 Leader

Leader is a person having responsibility for promoting execution in particular pertinent activity processes and phases assigned. The destination to which the leader delivers value directly is the responsible person.

### 3.6 Member

Member is a person creating deliverables and business outcomes. The destination to which a member delivers value directly is the leader.



## 4. Fundamental Structure of skill standards<sup>4</sup>

This chapter explains the basic idea and the general outline of the skill standards components in order to understand the structure of the skill standards. Part 2, Job Careers, and part 3, Skills, have the body of the skill standards and their explanation in a narrative style.

### 4.1 Structural View of human capability and competency

There are two perspectives to human capability. One is actual achievement and the other one is ability possessed by an individual. They are shown in Figure 10.

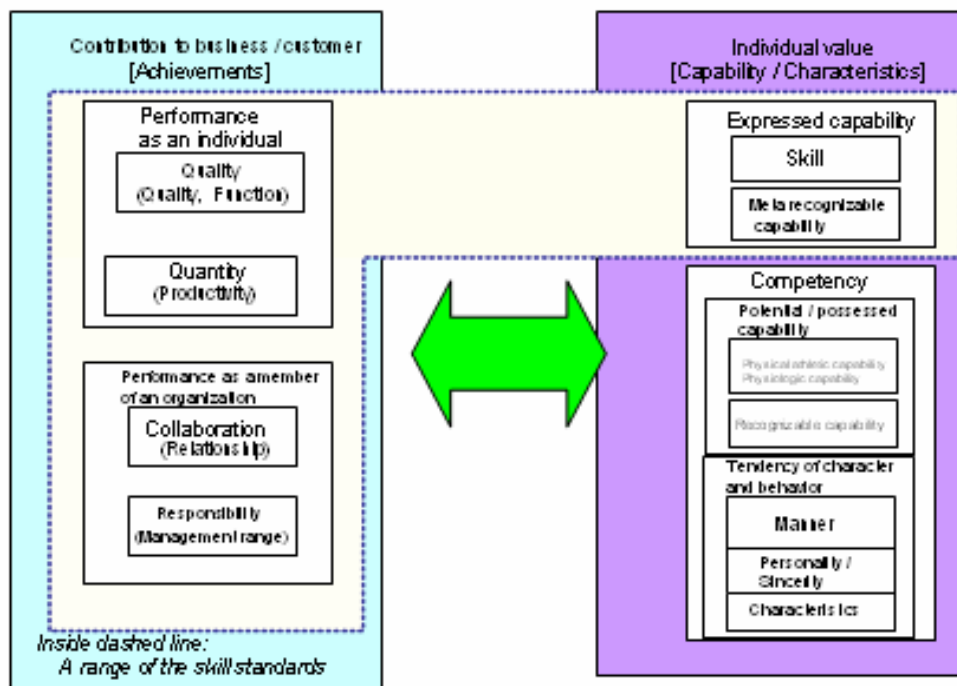


Figure 10. Structural View of human capability and competency

The left hand side of the figure shows the assessment of the value of individual from two aspects, achievement of individual and contribution to business. The evaluation of the capability is based on the problem needed to be resolved or the requirement at performing assigned duties

The right hand side of the figure shows the assessment the value of individual mainly from the aspect of value of an individual. The evaluation of the capability is based on the ability possessed by an individual.

From the viewpoint on the left hand side, there are four elements in the evaluation dimension: quality, quantity, relationship, and responsibility. The four elements are

<sup>4</sup> The reference in this paragraph has been made to METI Research Report: The skills trend survey for IT service industry in Japan. Editor, Hirata, K.; Authors, Hirata, K., Ohta, M., Matsuo, M., & Suehiro, J. The Ministry of Economy, Trade, and Industry, 2003. And METI Research Report: Knowledge engineering approach for the skill standards. Editor, Hirata, K., Authors, Hirata, K., Seta, K., & Ikeda, M. The Ministry of Economy, Trade, and Industry, 2004.

evaluated with regard to business performance and outcomes, such as degree of fulfillment of the quality requirement, degree of productivity, executing assigned duties as an company in a cooperative and collaborative way with others and achievement of business outcome in a responsible role.

These two viewpoints are differentiated by the evaluation activities. The evaluation on the left hand side is called performance assessment, which depends on an evaluation of the difficulty of business issues and the degree of business performance or contribution as outcomes. After execution of assigned duties, the outcomes are measured as to the degree of effectiveness, usefulness, or satisfaction internally to company or externally to customer.

The evaluation on the right hand side is called capability assessment, which depends on an evaluation of the capabilities exposed by an individual. It aims for realization of desired human resources, and for stability in business execution or job implementation. It is also useful information at the reassignment in future.

#### 4.2 Skill standards structure and concepts

Based on the idea above, the skill standards is designed in a conceptual structure as shown in figure 11.

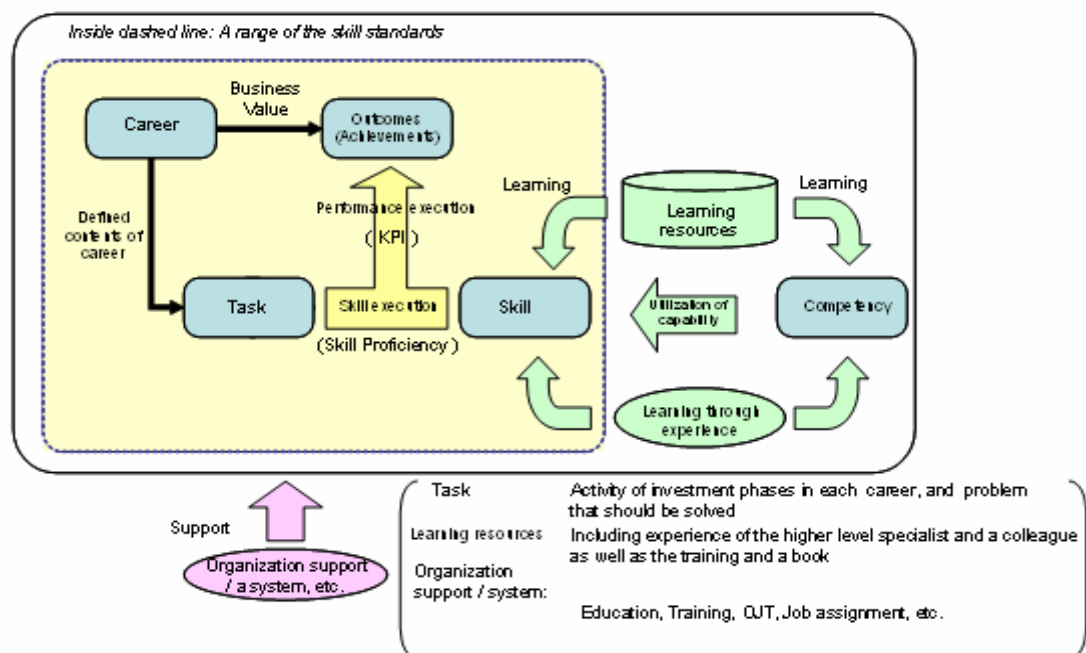


Figure 11. Skill standards concepts and each relations

Issues that needs to be solved are indicated as tasks. The content of a particular task is different for each job, and is defined for each job career. Task is executed by utilizing skills, and the business outcome is achieved.

Business outcome that satisfies customer requirements is achieved by the execution of a task with best performance according to the level of proficiency of skills. Depending on the degree of skill utilization, the achievement of an assigned task is desirably high performance or less performance.

The skill standards describes the measurable assessment of human capabilities in two

forms. One is skill proficiency, which indicates skill execution as a level of capability, and another one is key performance indicator (KPI), which indicates the degree of business performance as a level of outcomes or results.

The skill standards targets especially measurable and observable capabilities in practice, and skills acquirable posteriori by obtaining necessary knowledge through education and training, and by developing mainly through learning from real experience.

This learning-performance cycle is recognized as experience and business performance. The accumulation of this cycle makes advancement to the next step possible.

### 4.3 Basic structure of skill standards

The skill standards has two major parts, the document specification of careers and the document specification of skills. Career framework<sup>5</sup> is an at-a-glance chart, which represents the requirement index as business performance. The skill dictionary is another at-a-glance chart, which represents the skill index necessary for business performance.

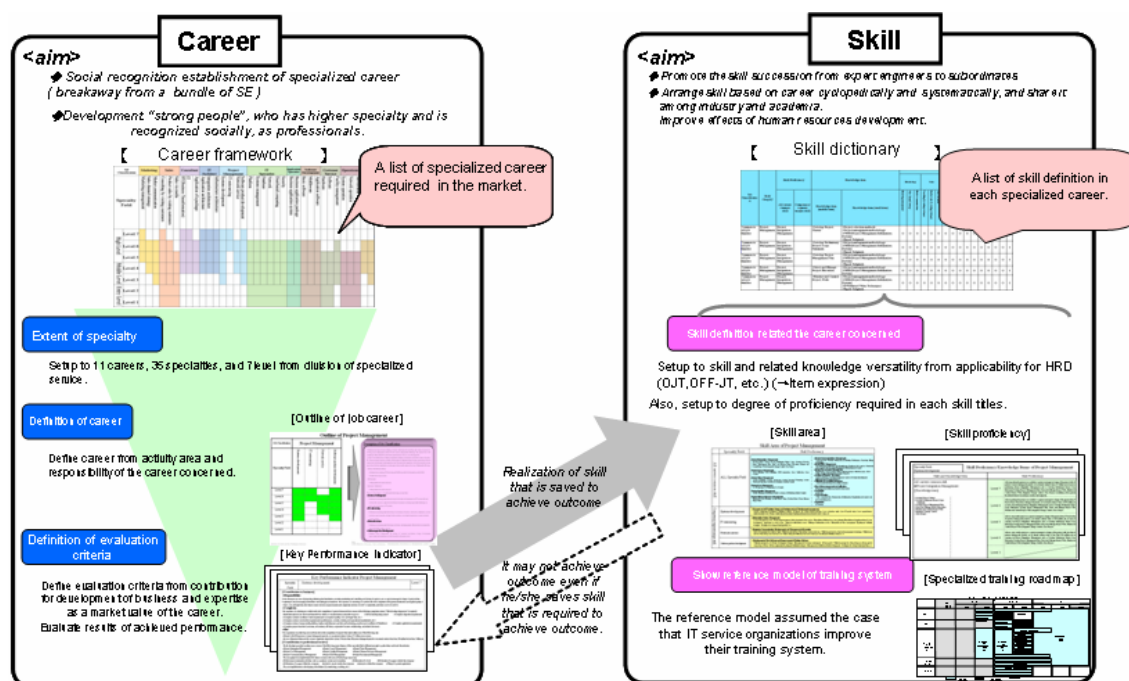


Figure 12. Basic structure of skill standards

#### (1) Document specification of job careers

Activity domains of each job career are identified, and based on it, job careers and specialty fields are classified. KPI is settled for each job career and specialty field, which describes the experience and business performance with metrics to assess

<sup>5</sup> The reference in this paragraph has been made to METI Research Report: The skills trend survey for IT service industry in Japan. Editor, Hirata, K.; Authors, Hirata, K., Ohta, M., Matsuo, M., & Suehiro, J. The Ministry of Economy, Trade, and Industry, 2003. And METI Research Report: Knowledge engineering approach for the skill standards. Editor, Hirata, K., Authors, Hirata, K., Seta, K., & Ikeda, M. The Ministry of Economy, Trade, and Industry, 2004.



the pertinent IT investment phases and the values to be provided in these phases.

### (3) Key performance indicator (KPI)

KPI is defined as the metrics for each job career and specialty that assess and identify the levels of business capability objectively based on experience and business performance. The distinctive feature of the skill standards is the assessment of the capability level by KPI, which are based on real experience and business performance.

Two types of contribution are defined in KPI, One is contribution to business contribution, which is the individual direct contribution to business, and the other one is contribution to professional society, which is the contribution to the company internally as well as to the information service industry as a professional. Assessing levels for human resources is performed by judging both of these contributions in a comprehensive manner.

### (4) Skill dictionary

Skill dictionary covers all the skill items and knowledge items that are used in the skill standards. Skill items and knowledge items are hierarchically structured and indicated on an at-a-glance chart, and made clear their connection to job careers and specialty fields.

### (5) Skill item and knowledge item

Skill items are defined as the capability elements necessary for business performance and achievement. Skill items indicate the required knowledge to acquire a skill. They are utilized as guidelines for acquisition of knowledge for each skill.

### (6) Skill area

Skill areas are descriptions of the skill items and knowledge items necessary for each job career and specialty field. Skill area descriptions consist of job career common skills and specialty field-specific skills for each career.

### (7) Skill proficiency

Skill proficiency is defined as a necessary degree of maturity for performing business activities. Skill proficiency is described in the criteria as “able to do so,” it is an evidence of reaching a certain level of capability in a specific job career. In other words, it provides a guideline that an individual who is assessed at a specific level in a job career is able to perform a certain degree of work for this particular skill item.

### (8) Education and training road map

Education and training roadmap contains the training subjects necessary to be acquired in training for each job career in accordance with the skill standards. It constituted by “Systematic chart” and “List of courses” which show a group of training courses at a glance for each career, and “Course description” describing each course, and “Matrix of knowledge items” showing relationship with knowledge items for each course.

#### 4.5 Relationship among components

This section explains the relationship among components from the perspective of business performance and capability.

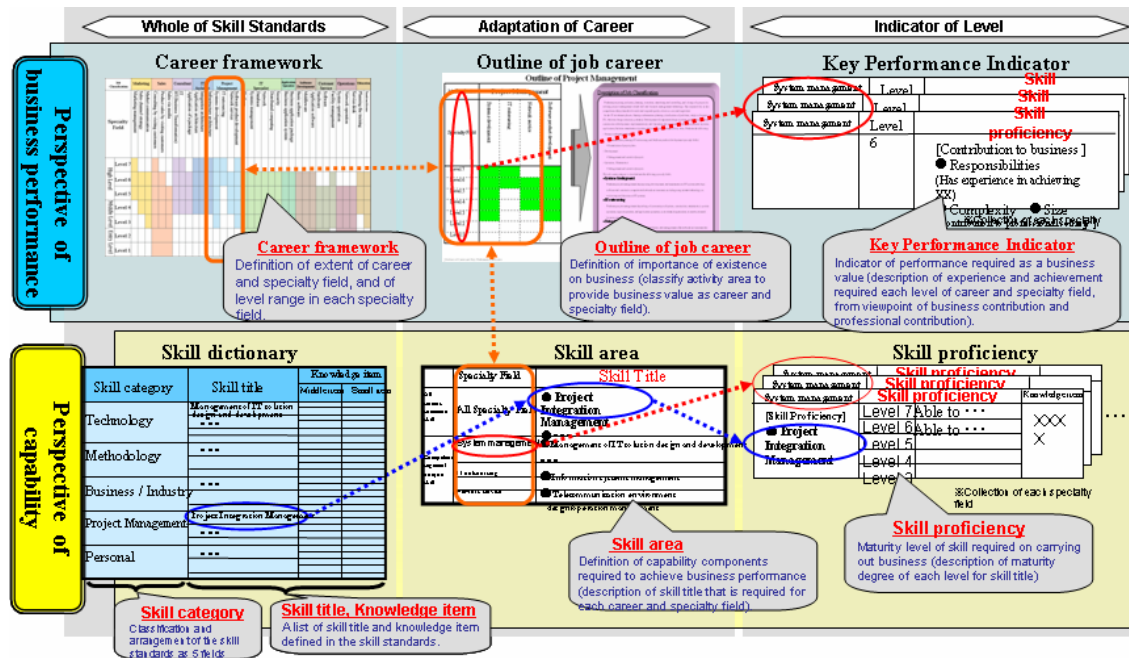


Figure 14. Relationship between components

##### (1) Document from business performance view

There is the job career overview for each job career shown in the career framework. It consists of descriptions of the level, job career, and specialty field. KPI is defined for each specialty field and level.

##### (2) Document of capability view

All the skill items defined in the skill standards is organized in the skill dictionary. Among all skills, a set of skills necessary to perform business activities as professionals is categorized into a skill area. Skill area is defined for each job career. For each specialty field all necessary skill items are defined with skill proficiency. Skill proficiency indicates the degree of maturity necessary to the achievement levels defined in the KPI.

#### 4.6 Level assessment

KPI is an assessment index for an individual as a professional. Skill proficiency is an assessment index for a single skill. It is noted that KPI and skill proficiency tend to be mixed up because both have the level concept.

KPI defines the level of experience and achievement to accomplish the required outcomes for an external or internal customers by integration of skills and knowledge based on the premise that an individual possessing a pertinent level of skill proficiency in a certain specialty,

The skill standards systematically organizes the components of business capabilities required for realizing value that professionals provide to customers in practice from the standpoint of business success. Assessment of professionals needs to be measured with KPI, which identifies the metrics of experience and business performance.

Skill proficiency measures a limited range of capability. Skill proficiency is a necessary condition, but not a sufficient condition for assessment of KPI. It is because skill proficiency is not the final goal for human resources. The skill standards targets professional human resources who are able to achieve outcome to fulfill customer business requirements by utilizing the proficiency of skills.

The level used in KPI has seven stages representing the degree of experience and business performance required for solving problems as a professional in a particular job career and specialty field. Figure 15 provides its general perspective without considerations for particular job careers or specialty fields.

level	Entry level		Middle level		High level		
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
Contribution for value creation	Able to find out and resolve a problem on-the-job problem (utilization)				Lead (creation) business, technology and methodology		
	Carry out under the guidance		Lead in the scope of work (project)		Contribute to the company	Contribute to the industry	Lead the industry
							Has a influence for the market
						Recognized in the market	
					Recognized in the company		
Achievement of required works				Guides subordinates			
			Practice by him/her self				
		Able to ....by him/her self in constant degree					
	Able to .... under the guidance						
Assessment range Assessment object						Result as a member of the industry	
				Results as a member of an organization			
	Results as an individual						

Figure 15. The concept of level and assessment

#### □Level 7 – level 5 (high level)

Individuals in this level is able to create and lead technologies, methodologies, and business inside and outside of the company. Individual at these levels assume responsible for quality of outcome in the assigned duties for customers in charge.

- Level 7: Recognized as a professional with experience and business performance to lead advanced service development and commercialization with respect to the whole market.
- Level 6: Recognized as a professional with sufficient experience and business performance within the company and outside in the market as well.
- Level 5: Recognized by oneself and others as a professional with sufficient experience and business performance in the company.

Individuals at the high level are commonly necessary to contribute to the planning and actualization of the company strategy in skill development.

#### □Level 4 – level 3 (middle level)

Individuals at this level have established specialty in their specialty field, and are able to identify and solve problems alone by utilizing their own skills. Individuals at this level assume responsibility for the quality of outcomes in assigned duties for customers and the team.

- Level 4: Creates knowledge from experience as required of a professional and applies the knowledge within the company and the development of subordinates.
- Level 3: Performs all requested activities alone.

Individuals at the middle level are necessary to develop skills continuously in career development.

#### □Level 2 – level 1 (entry level)

Individuals at this level have not established a specialty, but are able to identify and solve problems in assigned duties under the guidance of upper-level professionals in the same job career. Individuals at this level assume responsibility for performing activities in assigned duties.

- Level 2: Performs some requested activities independently.
- Level 1: Performs some requested activities with guidance from others.

Individuals at the entry level are necessary to develop skills proactively for realization of a career path and career development.





SkillIII Standards for IT Professionals, V2. Draft Part 1. December.2006.

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Publisher INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN IT Skill Standards Center  
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