Outline of Job Career and Key Performance Indicator

(8) *Software Development*

English edition Draft 1.0 December.2006

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Outline of Job Career

Software Development

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Outline of Software Development

Job career	Software Development		
Specialty Field	Basic software	Middleware	Application software
Level 7			
Level 6			
Level 5			
Level 4			
Level 3			
Level 2			
Level 1			

Description of Job Career

Performs planning, specification determination, design, and development of software products accepted in the market based on marketing strategy, by utilizing software engineering technologies Performs consultation and makes proposals on business strategy related to software products in the higher-level of this job career. Has responsibility in functionality, reliability, etc., of developed software products.

This job career category is classified into the following specialty fields.

- **Basic software**
  Performs design, development, customization and technical support on basic software of management of the whole computer systems and provides basic functions, such as operation system, language, network, etc., that exploits hardware characteristics.
- **Middleware**
  Performs design, development, customization and technical support on platform-independent software that provides functions such as database management, transaction processing functions and distributed object environment.
- **Application software**
  Performs design, development and technical support on software that supports business transformation, business process improvement and increase of work efficiency utilizing information system for a certain purpose or in a certain area such as business packages (including ERP and CRM) and office suite.

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator

Software Development

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Basic software	Level 6

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to basic software acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of basic soft development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 6 or equivalent, and others can be of Level 5).

●Complexity

Has experience in achieving successful results in the completion of a basic soft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation of all functional requirements, maximum use of hardware/OS performance □Promotion of development spread between 2 or more development sites
□Realization of the high operability, robustness, and reliability that can be used as a basic system of a company □500 or more interfaces

●Size

Has experience in achieving successful results in the complication of basic soft product development project that meets either one of the following size.

□A development project with 15 persons or more during peak periods, and development period with 1 year ore more.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field sufficient enough to guide others and contributes to the industry.

□Planning of product-related business strategy
□Planning, design, development, customize, and technical support for software products
□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments four items or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company
□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Basic software	Level 5

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to basic software, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of basic soft development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 5 or equivalent, and others can be of Level 4).

●Complexity

Has experience in achieving successful results in the completion of a basic soft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation of all functional requirements, maximum use of hardware/OS performance □Promotion of development spread between 2 or more development sites
□Realization of the high operability, robustness, and reliability that can be used as a basic system of a company □Approximately 100 - 500 interfaces

●Size

Has experience in achieving successful results in the complication of basic soft product development project that meets either one of the following size.

□A development project from 5 but less than 15 persons during peak periods, and development period from 6 months but less than 1 year.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field sufficient enough to guide others and contributes to the company.

□Planning of product-related business strategy
□Planning, design, development, customize, and technical support for software products
□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments three items or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company
□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Basic software	Level 4

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to basic software, acts as a leader of development team, assigned to development area. Has experience in achieving successful results in the completion of basic soft development that satisfies set quality goal (functionality, reliability, etc.) two times or more (at least one project must meet complexity and size of Level 4 or equivalent, and others can be of Level 3).

●Complexity

Has experience in achieving successful results in the completion of a basic soft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation where the functional requirements and hardware/OS, etc. are balanced □Promotion of the development at single development base

□Requirements of high-level operability, solidity, and reliability □Less than 100 interfaces

●Size

Has experience in achieving successful results in the complication of basic soft product development project that meets either one of the following size.

□A development project from 5 but less than 15 persons that participate in the project during peak periods, and development period from 6 months but less than 1 year.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field and guides subordinates.

□Design, development, customize, and technical support for software products

□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments one item or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company

□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Basic software	Level 3

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to basic software, acts as a member of development team, assigned to development area. Has experience in achieving successful results in the completion of basic soft development that satisfies set quality goal (functionality, reliability, etc.) once or more (equivalent to complexity and size of Level 3).

●Complexity

Has experience in achieving successful results in the completion of a basic soft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation where the functional requirements and hardware/OS, etc. are balanced

□Promotion of the development at single development base

□Requirements of high-level operability, solidity, and reliability

□Less than 100 interfaces

●Size

Has experience in participating in the basic soft product development project regardless of its size.

[Contribution to professional society]

-Holds the specialty in either one or more of the following major themes of this Specialty Field and practices by him/herself.

□Development, customize, and technical support for software products

□Completion by the set-up shipment time

□Assurance of the quality(functionality, reliability, etc.) which fulfills the shipment standard

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Middleware	Level 6

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to middlesoftware, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of middlesoftware development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 6 or equivalent, and others can be of Level 5).

●Complexity

Has experience in achieving successful results in the completion of a middlesoft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation of all functional requirements, maximum use of the basic software performance

□Promotion of development spread between 2 or more development sites

□Realization of the high operability, robustness, and reliability that can be used as a basic system of a company

□500 or more interfaces

●Size

Has experience in achieving successful results in the complication of middlesoft product development project that meets either one of the following size.

□A development project with 15 persons or more during peak periods, and development period with 1 year ore more.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field sufficient enough to guide others and contributes to the industry.

□Planning of product-related business strategy

□Planning, design, development, customize, and technical support for software products

□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments four items or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company

□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Middleware	Level 5

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to middlesoftware, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of middlesoftware development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 5 or equivalent, and others can be of Level 4).

●Complexity

Has experience in achieving successful results in the completion of a middlesoft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation of all functional requirements, maximum use of the basic software performance

□Promotion of development spread between 2 or more development sites

□Realization of the high operability, robustness, and reliability that can be used as a basic system of a company

□Approximately 100 - 500 interfaces

●Size

Has experience in achieving successful results in the complication of middlesoft product development project that meets either one of the following size.

□A development project from 5 but less than 15 persons during peak periods, and development period from 6 months but less than 1 year.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field sufficient enough to guide others and contributes to the company.

□Planning of product-related business strategy

□Planning, design, development, customize, and technical support for software products

□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments three items or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company

□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Middleware	Level 4

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to middlesoftware, acts as a leader in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of middlesoftware development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 4 or equivalent, and others can be of Level 3).

●Complexity

Has experience in achieving successful results in the completion of a middlesoft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation where the functional requirements, and performance of basic software, etc. are balanced

□Promotion of the development at single development base

□Requirements of high-level operability, solidity, and reliability

□Less than 100 interfaces

●Size

Has experience in achieving successful results in the complication of middlesoft product development project that meets either one of the following size.

□A development project from 5 but less than 15 persons that participate in the project during peak periods, and development period from 6 months but less than 1 year.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field and guides subordinates.

□Design, development, customize, and technical support for software products

□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments one item or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company

□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Middleware	Level 3

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to middlesoftware, acts as a leader in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of middlesoftware development that satisfies set quality goal (functionality, reliability, etc.) once or more (equivalent to complexity and size of Level 3).

●Complexity

Has experience in achieving successful results in the completion of a middlesoft product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation where the functional requirements, and performance of basic software, etc. are balanced

□Promotion of the development at single development base

□Requirements of high-level operability, solidity, and reliability

□Less than 100 interfaces

●Size

Has experience in participating in the middlesoft product development project regardless of its size.

[Contribution to professional society]

-Holds the specialty in either one or more of the following major themes of this Specialty Field and practices by him/herself.

□Development, customize, and technical support for software products

□Completion by the set-up shipment time

□Assurance of the quality(functionality, reliability, etc.) which fulfills the shipment standard

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Application software	Level 6

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to application software, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of application software development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 6 or equivalent, and others can be of Level 5).

●Complexity

Has experience in achieving successful results in the completion of an application product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation of all functional requirements, maximum use of hardware/OS performance

□Promotion of development spread between 2 or more development sites

□Realization of the high operability, robustness, and reliability that can be used as a basic system of a company

□500 or more interfaces

●Size

Has experience in achieving successful results in the complication of application soft product development project that meets either one of the following size.

□A development project with 15 persons or more during peak periods, and development period with 1 year ore more.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field sufficient enough to guide others and contributes to the industry.

□Planning of product-related business strategy

□Planning, design, development, customize, and technical support for software products

□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments four items or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company

□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Application software	Level 5

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to application software, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of application software development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 5 or equivalent, and others can be of Level 4).

●Complexity

Has experience in achieving successful results in the completion of an application product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation of all functional requirements, maximum use of hardware/OS performance

□Promotion of development spread between 2 or more development sites

□Realization of the high operability, robustness, and reliability that can be used as a basic system of a company

□Approximately 100 - 500 interfaces

●Size

Has experience in achieving successful results in the complication of application soft product development project that meets either one of the following size.

□A development project from 5 but less than 15 persons during peak periods, and development period from 6 months but less than 1 year.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field sufficient enough to guide others and contributes to the company.

□Planning of product-related business strategy

□Planning, design, development, customize, and technical support for software products

□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time

-Has recognized accomplishments three items or more in the area of technology succession.

□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company

□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application

-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Application software	Level 4

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to application software, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of application software development that satisfies set quality goal (functionality, reliability, etc.) three times or more (at least one project must meet complexity and size of Level 4 or equivalent, and others can be of Level 3).

●Complexity

Has experience in achieving successful results in the completion of an application product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation where the functional requirements and hardware/OS, etc. are balanced
□Promotion of the development at single development base
□Requirements of high-level operability, solidity, and reliability
□Less than 100 interfaces

●Size

Has experience in achieving results in the complication of application soft product development project that meets either one of the following size.

□A development project from 5 but less than 15 persons that participate in the project during peak periods, and development period from 6 months but less than 1 year.

[Contribution to professional society]

-Holds the high specialty in either one or more of the following major themes of this Specialty Field and guides subordinates.
□Design, development, customize, and technical support for software products
□Assurance of software product quality (functionality, reliability, etc.) by the set-up shipment time
-Has recognized accomplishments one item or more in the area of technology succession.
□Professional community activities such as academic society and committee □Publication of a book □Publication of a paper outside the company
□Publication of a paper within the company □Invited to speak outside the company □Instructor within the company □Filing of a patent application
-Has accomplishments in developing subordinates (by mentoring, coaching, etc.)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Application software	Level 3

[Contribution to business]

●Responsibilities

In phases of planning, design, development, customization, and technical support related to application software, acts as a responsible person in charge of a product in development project, by leading development team. Has experience in achieving successful results in the completion of application software development that satisfies set quality goal (functionality, reliability, etc.) once or more (equivalent to complexity and size of Level 3).

●Complexity

Has experience in achieving successful results in the completion of an application product development project, with implementation of advanced architecture that meets two or more of the following complexity criteria.

□Implementation where the functional requirements and hardware/OS, etc. are balanced
□Promotion of the development at single development base
□Requirements of high-level operability, solidity, and reliability
□Less than 100 interfaces

●Size

Has experience in participating in the application soft product development project regardless of its size.

[Contribution to professional society]

-Holds the specialty in either one or more of the following major themes of this Specialty Field and practices by him/herself.

□Development, customize, and technical support for software products
□Completion by the set-up shipment time
□Assurance of the quality(functionality, reliability, etc.) which fulfills the shipment standard

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Common to Software Development	Level 2

[Contribution to business]

●Responsibilities

Acts as a member of development team for software product assigned to development area under guidance of a higher-level specialist in the same job carrier category, or the existing work standards or guidance. Has experience in participating in a series of phases of design, and development of software product development, once or more (equivalent to complexity and size of Level 2).

●Complexity

Has experience in participating in a software product development project, regardless of complexity.

●Size

Has experience in participating in the software product development project regardless of its size.

[Contribution to professional society]

-Has basic knowledge and experience in the following major themes of this Specialty Field.

□Programming languages

□Test techniques

□Various tools (such as AD tools, library management tools, and so on)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

Key Performance Indicator : Software Development

Specialty Field	Common to Software Development	Level 1

[Contribution to business]

●Responsibilities

Acts as a member of development team for software product assigned to development area under guidance of a higher-level specialist in the same job carrier category, or the existing work standards or guidance. Has experience in participating in either one of phases of design, and development of software product development, once or more (equivalent to complexity and size of Level 1).

●Complexity

Has experience in participating in a software product development project, regardless of complexity.

●Size

Has experience in participating in the software product development project regardless of its size.

[Contribution to professional society]

-Has basic knowledge and experience in the following major themes of this Specialty Field.

□Programming languages

□Test techniques

□Various tools (such as AD tools, library management tools, and so on)

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN

This document refers to PMBOK® terms.
"PMBOK" is a trademark of PMI® registered in the U.S. and other nations.

©2006 Ministry of Economy, Trade and Industry. INFORMATION-TECHNOLOGY PROMOTION AGENCY, JAPAN