



# **Skill Area and Skill Proficiency**

## **(8) Software Development**

## Skill Area

Job category: Software Development

# Skill Area of Software Development

	Specialty area	Skill Item
Job category common skill item	All Specialty fields	<ul style="list-style-type: none"> <li> <b>●Software Engineering</b>  Web application technologies, Program design, Design Methods, Development Methods, Utilization of development support tools, Program Implementation, Programming Techniques, Testing Techniques, Reuse Methods, Implementation and Inspection of Security Systems, External design, etc </li> <li> <b>●Technology</b>  Latest Technology Trends, Internet Application Fundamental Technology, Database design, Computer Science Fundamentals, Computer system, System development environment, Database technologies, Design of Database Operations, etc </li> <li> <b>●Design</b>  Design Methods, Understanding and Utilization of Modeling Techniques, Architecture process, Database, Middleware, Distributed Computing Design, Design of Development Environment, Requirements Definition, Estimation and Schedule Methods </li> <li> <b>●Development Methods Design</b>  Selection of Adaptive Standards, Fundamentals of Risk Management, Software development process, Quality Inspection (Software Development), Creation of Test Implementation Plan </li> <li> <b>●Analysis and Requirements Definition</b>  Understanding of Market Trends and Competitive Trends, Formulation of Software Product Strategy, Formulation of Project and Plan, Management of Business Issues, Intellectual property rights, Knowledge of Relevant Regulation, etc </li> <li> <b>●Project Management</b>  Project Integration Management, Project Scope Management, Project Time Management, Project Cost Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management </li> <li> <b>●Leadership</b>  Leadership </li> <li> <b>●Communication</b>  2-Way communication, Transmission of information, Organization and analysis and retrieval of information </li> <li> <b>●Negotiation</b>  Negotiation </li> </ul>
Specialty field specific skill item	Operating system	<ul style="list-style-type: none"> <li> <b>●Hardware Compatibility Design</b>  Understanding for Architecture of Applied Hardware </li> </ul>
	Middleware	<ul style="list-style-type: none"> <li> <b>●Platform-Independent Design</b>  Understanding and Utilization for Architecture of Application Hardware, Related Operating System, and Related Middleware </li> </ul>
	Application software	<ul style="list-style-type: none"> <li> <b>●Business application design</b>  Understanding and Utilization of Application Software Knowledge </li> </ul>

<Note> Important skills and knowledge for IT professionals are marked with "X" in skill dictionary (corresponding table of ITEE) even if that skills and knowledge are not belonged to the specialty field in the job category as Software Development.

## Skill Proficiency/Knowledge Items

Job category: Software Development

Specialty field: Operating System

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Software Engineering</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Web application technologies</li> <li>-Program design</li> <li>-Design methods</li> <li>-Development methods</li> <li>-Utilization of development support tools</li> <li>-Program Implementation</li> <li>-Programming techniques</li> <li>-Testing techniques</li> <li>-Reuse methods</li> <li>-Implementation and inspection of security systems</li> <li>-External design</li> <li>-Internal design</li> <li>-Object-oriented development</li> <li>-Debugging techniques</li> <li>-Utilization and practice of techniques for technical verification</li> <li>-Security and privacy</li> <li>-Information development</li> <li>-Techniques for solving technical problems</li> <li>-System audit</li> <li>-Standardization</li> </ul>	Level 7	
	Level 6	Able to perform software development, by carrying out design for program implementation, design for operation, design for failures prevention, program production, evaluation, and performance tuning of the whole project, with utilization of software engineering technology, as a person responsible for operating system development project with 15 or more management staff during peak periods
	Level 5	Able to perform software development, by carrying out design for program implementation, design for operation, design for failures prevention, program production, evaluation, and performance tuning of the whole project, with utilization of software engineering technology, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform software development, by carrying out design for program implementation, design for operation, and design for failures prevention, program production, evaluation, and performance tuning, with utilization of software engineering technology, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods
	Level 3	Able to perform software development, by carrying out design for program implementation, design for operation and design for failures prevention, program production, evaluation, and performance tuning, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <ul style="list-style-type: none"> <li>-Latest technology trends</li> <li>-Internet application fundamental technology</li> <li>-Database design</li> <li>-Computer science fundamentals</li> <li>-Computer system</li> <li>-System development environment</li> <li>-Database technologies</li> <li>-Basic functions of relational database management systems</li> <li>-Data modeling</li> <li>-Design of database operations</li> <li>-Platform technologies</li> <li>-System platform technologies</li> <li>-Understanding and utilization of network technologies</li> <li>-Internet technologies</li> <li>-Programming languages, Markup languages</li> <li>-Programming techniques for parallel processing</li> <li>-Middleware technologies</li> <li>-Methods of communication between components</li> <li>-Application security</li> <li>-Relationship between transaction processing and synchronization points of databases</li> </ul> </div> <div> <ul style="list-style-type: none"> <li>-Understanding and utilization of computer system architectures and fundamental technologies</li> </ul> </div>	Level 7	
	Level 6	Able to lead technical team about highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a person responsible for operating system development project with 15 or more management staff during peak periods
	Level 5	Able to carry out technical guidance for the technical team, and to practice solving of highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods.
	Level 4	Able to practice solving of highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to practice technical problems solving, and to carry out selection of application technology based on the latest technology trends in the assigned area, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <p>-Design methods</p> <p>-Understanding and utilization of modeling techniques</p> <p>-Architecture process</p> <p>-Database</p> <p>-Middleware</p> <p>-Design of distributed computing</p> <p>-Design of development environment</p> <p>-Requirements definition</p> <p>-Estimation, schedule methods</p>	Level 7	
	Level 6	Able to perform software design, by carrying out selecting and utilization of optimum modeling techniques and design techniques, as a person responsible for operating system development project with 15 or more management staff during peak periods
	Level 5	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Development Methods Design</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Selection of adaptive standards</li> <li>-Fundamentals of risk management</li> <li>-Software development process</li> <li>-Quality inspection (software development)</li> <li>-Creation of test implementation plan</li> </ul>	Level 7	
	Level 6	Able to design optimum, effective and efficient development methods in operating system development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment and development language of the whole development project, as a person responsible for operating system development project with 15 or more management staff peak periods
	Level 5	Able to design optimum, effective and efficient development methods in operating system development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment, and development language of the whole development project, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to design optimum, effective and efficient development methods in operating system development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment, and development language, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to design optimum, effective and efficient development methods, in operating system development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment, and development language, as a team member of operating system development project.



Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Analysis and Requirements Definition</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Understanding of market trends and competitive trends</li> <li>-Formulation of software product strategy</li> <li>-Formulation of project and plan</li> <li>-Management of business issues</li> <li>-Globalization</li> <li>-Intellectual property rights</li> <li>-Industry and technology trends</li> <li>-User centered design</li> <li>-Accessibility(Software development)</li> <li>-Knowledge of relevant regulation</li> </ul>	Level 7	
	Level 6	Able to carry out formulation of software product strategy and software product development planning for operating system product development, by understanding and analyzing market trends and customer's demands, as a person responsible for operating system development project with 15 or more management staff during peak periods
	Level 5	Able to carry out formulation of software product strategy and software product development planning for operating system product development, by understanding and analyzing market trends and customer's demands, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out formulation of software product strategy and software product development planning for operating system product development, by understanding and analyzing market trends and customer's demands, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out formulation of software product strategy and software product development for operating system product development, by understanding and analyzing of customer's demands and market trends, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Project Management</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Project Integration Management</li> <li>-Project Scope Management</li> <li>-Project Time Management</li> <li>-Project Cost Management</li> <li>-Project Quality Management</li> <li>-Project Human Resource Management</li> <li>-Project Communications Management</li> <li>-Project Risk Management</li> <li>-Project Procurement Management</li> </ul>	Level 7	
	Level 6	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a person responsible for operating system development project with 15 or more management staff during peak periods
	Level 5	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a person responsible for the operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a team leader of operating system development project with 5 but less than 15 participation staff during peak periods.
	Level 3	Able to perform either one of main project management such as project plan formulation, implementation, and change management in the assigned area, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Leadership</p> <p>[Knowledge Items]</p> <p>-Leadership</p>	Level 7	
	Level 6	Able to carry out operating system development project, by issuing instructions and orders to development team, as a person responsible for operating system development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out operating system development project, by issuing instructions and orders to development team, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out operating system development project, by leading development team, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out operating system development project, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Communication</p> <p>[Knowledge Items]</p> <p>-2-Way communication -Transmission of information -Organization, analysis, and retrieval of information</p>	Level 7	
	Level 6	Able to carry out communication and exchange opinions related to project with the person in charge of order side, as a person responsible for operating system development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out communication and exchange opinions related to project with the person in charge of order side, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out communication and exchange opinions related to project with team members of operating system development project, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out communication and exchange opinions related to project with operating system development project members, as a team member of development project in operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Negotiation</p> <p>[Knowledge Items]</p> <p>-Negotiation</p>	Level 7	
	Level 6	Able to obtain agreement, by carrying out every negotiations related to operating system development project with a person in charge of order side, as a person responsible for operating system development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out negotiations related to operating system development project with a responsible person on order side, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out negotiations related to project with team members of operating system development project, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform the project by carrying out negotiations related to project, with project team members of operating system development project, as a team member of operating system development project.

Specialty area:  
Operating System

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Specialty area specific skill item] ●Hardware compatibility design</p> <p>[Knowledge Items]</p> <p>-Understanding for architecture of the applied hardware</p>	Level 7	
	Level 6	Able to carry out design of effective implementation methods and processing methods for operating system, by understanding the operating hardware architecture, as a person responsible for operating system development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out design of effective implementation methods and processing methods for operating system, by understanding the operating hardware architecture, as a person responsible for operating system development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out design of effective implementation methods and processing methods for operating system, by understanding the operating hardware architecture, as a team leader of operating system development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out design of effective implementation methods and processing methods for operating system, by understanding the operating hardware architecture, as a team member of operating system development project.

## Skill Proficiency/Knowledge Items

Job category: Software Development

Specialty field: Middleware

Specialty area:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Software Engineering</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Web application technologies</li> <li>-Program design</li> <li>-Design methods</li> <li>-Development methods</li> <li>-Utilization of development support tools</li> <li>-Program Implementation</li> <li>-Programming techniques</li> <li>-Testing techniques</li> <li>-Reuse methods</li> <li>-Implementation and inspection of security systems</li> <li>-External design</li> <li>-Internal design</li> <li>-Object-oriented development</li> <li>-Debugging techniques</li> <li>-Utilization and practice of techniques for technical verification</li> <li>-Security and privacy</li> <li>-Information development</li> <li>-Techniques for solving technical problems</li> <li>-System audit</li> <li>-Standardization</li> </ul>	Level 7	
	Level 6	Able to perform software development, by carrying out design for program implementation, design for operation, design for failures prevention, program production, evaluation, and performance tuning of the whole project, with utilization of software engineering technology, as a person responsible for middleware development project with 15 or more management staff during peak periods
	Level 5	Able to perform software development, by carrying out design for program implementation, design for operation, design for failures prevention, program production, evaluation, and performance tuning of the whole project, with utilization of software engineering technology, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform software development, by carrying out design for program implementation, design for operation, and design for failures prevention, program production, evaluation, and performance tuning, with utilization of software engineering technology, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods
	Level 3	Able to perform software development, by carrying out design for program implementation, design for operation and design for failures prevention, program production, evaluation, and performance tuning, as a team member of middleware development project.



Specialty area:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <ul style="list-style-type: none"> <li>-Latest technology trends</li> <li>-Internet application fundamental technology</li> <li>-Database design</li> <li>-Computer science fundamentals</li> <li>-Computer system</li> <li>-System development environment</li> <li>-Database technologies</li> <li>-Basic functions of relational database management systems</li> <li>-Data modeling</li> <li>-Design of database operations</li> <li>-Platform technologies</li> <li>-System platform technologies</li> <li>-Understanding and utilization of network technologies</li> <li>-Internet technologies</li> <li>-Programming languages, Markup languages</li> <li>-Programming techniques for parallel processing</li> <li>-Middleware technologies</li> <li>-Methods of communication between components</li> <li>-Application security</li> <li>-Relationship between transaction processing and synchronization points of databases</li> </ul> </div> <div> <ul style="list-style-type: none"> <li>-Understanding and utilization of computer system architectures and fundamental technologies</li> </ul> </div>	Level 7	
	Level 6	Able to lead technical team about highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a person responsible for middleware development project with 15 or more management staff during peak periods
	Level 5	Able to carry out technical guidance for the technical team, and to practice solving of highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods.
	Level 4	Able to practice solving of highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to practice technical problems solving, and to carry out selection of application technology based on the latest technology trends in the assigned area, as a tem member of middleware development project.

Specialty area:  
Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <p>-Design methods -Understanding and utilization of modeling techniques -Architecture process -Database -Middleware -Distributed computing design -Design of development environment -Requirements definition -Estimation and schedule methods</p>	Level 7	
	Level 6	Able to perform software design, by carrying out selecting and utilization of optimum modeling techniques and design techniques, as a person responsible for middleware development project with 15 or more management staff during peak periods
	Level 5	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a team member of middleware development project.

Specialty area:  
Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Development methods design</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Selection of adaptive standards</li> <li>-Fundamentals of risk management</li> <li>-Software development process</li> <li>-Quality inspection (software development)</li> <li>-Creation of test Implementation plan</li> </ul>	Level 7	
	Level 6	Able to design optimum, effective and efficient development methods in middleware development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment and development language of the whole project, as a person responsible for middleware development project with 15 or more management staff during peak periods
	Level 5	Able to design optimum, effective and efficient development methods in middleware development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment and development language of the whole project, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to design optimum, effective and efficient development methods in middleware development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment, and development language, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to design optimum, effective and efficient development methods in middleware development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment, and development language, as a team member of middleware development project.

Specialty area:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Analysis and requirements definition</p> <p>[Knowledge Items]</p> <p>-Understanding of market trends and competitive trends</p> <p>-Formulation of software product strategy</p> <p>-Formulation of project and plan</p> <p>-Management of business issues</p> <p>-Globalization</p> <p>-Intellectual property rights</p> <p>-Industry and technology trends</p> <p>-User centered design</p> <p>-Accessibility(Software development)</p> <p>-Knowledge of relevant regulation</p>	Level 7	
	Level 6	Able to carry out formulation of software product strategy and software product development plan for middleware product development, by understanding and analyzing market trends and customer demands, as a person responsible for middleware development project with 15 or more management staff during peak periods
	Level 5	Able to carry out formulation of software product strategy and software product development plan for middleware product development, by understanding and analyzing market trends and customer demands, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out formulation of software product strategy and software product development plan for middleware product development, by understanding and analyzing market trends and customer demands, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out formulation of software product strategy and software product development plan for middleware product development, by understanding and analyzing market trends and customer demands, as a team member of middleware development project.

Specialty area:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Project Management</p> <p>[Knowledge Items]</p> <p>-Project Integration Management  -Project Scope Management  -Project Time Management  -Project Cost Management  -Project Quality Management  -Project Human Resource Management  -Project Communications Management  -Project Risk Management  -Project Procurement Management</p>	Level 7	
	Level 6	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a person responsible for middleware development project with 15 or more management staff during peak periods
	Level 5	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a person responsible for the middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a team leader of middleware development project with 5 but less than 15 participation staff during peak periods.
	Level 3	Able to perform either one of main project management such as project plan formulation, implementation, and change management in the assigned area, as a team member of middleware development project.

Specialty area:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
[Career common skill item] ●Leadership [Knowledge Items] -Leadership	Level 7	
	Level 6	Able to carry out middleware development project, by issuing instructions and orders to development team, as a person responsible for middleware development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out middleware development project, by issuing instructions and orders to development team, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out middleware development project, by leading development team, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out middleware development project, as a team member of middleware development project.

Specialty area:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Communication</p> <p>[Knowledge Items]</p> <p>-2-Way communication -Transmission of information -Organization, analysis, and retrieval of information</p>	Level 7	
	Level 6	Able to carry out communication and exchange opinions related to project with the person in charge of order side, as a person responsible for middleware development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out communication and exchange technical opinions related to project with the person in charge of order side, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform project by carrying out communication related to project with team members of middleware development project, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform project by carrying out communication related to project with middleware development project members, as a team member of middleware development project.

Specialty area:  
Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Negotiation</p> <p>[Knowledge Items]</p> <p>-Negotiation</p>	Level 7	
	Level 6	Able to obtain agreement by carrying out every negotiations related to middleware development project with the person in charge of order side, as a person responsible for middleware development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out negotiations related to middleware development project with the person in charge of order side, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out negotiations related to project with team members of middleware development project, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform the project by carrying out negotiations related to project with team members of middleware development project, as a team member of middleware development project.



Specialty area:  
Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Specialty area specific skill item] ●Platform-Independent Design [Knowledge Items]</p> <p>-Understanding and utilization of architecture of applied hardware, related middleware, and related operating system</p>	Level 7	
	Level 6	Able to carry out effective design for implementation methods and processing methods for middleware, by understanding operating system architecture, as a person responsible for the middleware development project with 15 or more management staff during peak periods
	Level 5	Able to carry out effective design for implementation methods and processing methods for middleware, by understanding operating system architecture, as a person responsible for middleware development project with 5 or more but less than 15 management staff during peak periods.
	Level 4	Able to carry out effective design for implementation methods and processing methods for middleware, by understanding operating system architecture, as a team leader of middleware development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out effective design for implementation methods and processing methods for middleware, by understanding operating system architecture, as a team member of middleware development project.

## Skill Proficiency/Knowledge Items

Job category: Software Development

Specialty field: Application Software

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Software Engineering</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Web application technologies</li> <li>-Program design</li> <li>-Design methods</li> <li>-Development methods</li> <li>-Utilization of development support tools</li> <li>-Program implementation</li> <li>-Programming techniques</li> <li>-Testing techniques</li> <li>-Reuse methods</li> <li>-Implementation and inspection of security systems</li> <li>-External design</li> <li>-Internal design</li> <li>-Object-oriented development</li> <li>-Debugging techniques</li> <li>-Utilization and practice of techniques for technical verification</li> <li>-Security and privacy</li> <li>-Information development</li> <li>-Techniques for solving technical problems</li> <li>-System audit</li> <li>-Standardization</li> </ul>	Level 7	
	Level 6	Able to perform software development, by carrying out design for program implementation, design for operation, design for failures prevention, program production, evaluation, and performance tuning of the whole project, with utilization of software engineering technology, as a person responsible for application software development project with 15 or more management staff during peak periods
	Level 5	Able to perform software development, by carrying out design for program implementation, design for operation, design for failures prevention, program production, evaluation, and performance tuning of the whole project, with utilization of software engineering technology, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform software development, by carrying out design for program implementation, design for operation, and design for failures prevention, program production, evaluation, and performance tuning, with utilization of software engineering technology, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods
	Level 3	Able to perform software development, by carrying out design for program implementation, design for operation and design for failures prevention, program production, evaluation, and performance tuning, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <ul style="list-style-type: none"> <li>-Latest technology trends</li> <li>-Internet application fundamental technology</li> <li>-Database design</li> <li>-Computer science fundamentals</li> <li>-Computer system</li> <li>-System development environment</li> <li>-Database technologies</li> <li>-Basic functions of relational database management systems</li> <li>-Data modeling</li> <li>-Design of database operations</li> <li>-Platform technologies</li> <li>-System platform technologies</li> <li>-Understanding and utilization of network technologies</li> <li>-Internet technologies</li> <li>-Programming languages, Markup languages</li> <li>-Programming techniques for parallel processing</li> <li>-Middleware technologies</li> <li>-Methods of communication between components</li> <li>-Application security</li> <li>-Relationship between transaction processing and synchronization points of databases</li> </ul> </div> <div> <ul style="list-style-type: none"> <li>-Understanding and utilization of computer system architectures and fundamental technologies</li> </ul> </div>	Level 7	
	Level 6	Able to lead technical team about highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a person responsible for application software development project with 15 or more management staff during peak periods
	Level 5	Able to carry out technical guidance for the technical team, and to practice solving of highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods.
	Level 4	Able to practice solving of highly complex technical problems, by leading selection of application technology based on the latest technology trends, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to practice technical problems solving, and to carry out selection of application technology based on the latest technology trends in the assigned area, as a tem member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <p>-Design methods -Understanding and utilization of modeling techniques -Architecture process -Database -Middleware -Distributed computing design -Design of development environment -Requirements definition -Estimation and scheduling methods</p>	Level 7	
	Level 6	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a person responsible for application software development project with 15 or more management staff during peak periods
	Level 5	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform software design, by carrying out selection and utilization of optimum modeling techniques and design techniques, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Development methods design</p> <p>[Knowledge Items]</p> <p>-Selection of adaptive standards -Fundamentals of risk management -Software development process -Quality inspection (software development) -Creation of test Implementation plan</p>	Level 7	
	Level 6	Able to design optimum, effective and efficient development methods in application software development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment and development language of the whole project, as a person responsible for application software development project with 15 or more management during staff peak periods
	Level 5	Able to design optimum, effective and efficient development methods in application software development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment and development language of the whole project, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to design optimum, effective and efficient development methods in application software development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment and development language, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to design optimum, effective and efficient development methods, in application software development project, by carrying out review, analysis, and evaluation on development process, development method, development tools, development environment, and development language, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Analysis and requirements definition</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Understanding of market trends and other company trends</li> <li>-Formulation of software product strategies</li> <li>-Formulation of project and plan</li> <li>-Management of business problems</li> <li>-Globalization</li> <li>-Intellectual property rights</li> <li>-Industry and technology trends</li> <li>-User centered design</li> <li>-Accessibility (Software development)</li> <li>-Knowledge on related regulations</li> </ul>	Level 7	
	Level 6	Able to carry out formulation of software product strategy and software product development plan for application software development, by understanding and analyzing market trends and customer demands, as a person responsible for application software development project with 15 or more management staff during peak periods
	Level 5	Able to carry out formulation of software product strategy and software product development plan for application software product development, by understanding and analyzing market trends and customer demands, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out formulation of software product strategy and software product development plan for application software product development, by understanding and analyzing market trends and customer demands, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out formulation of software product strategy and software product development plan for application software product development, by understanding and analyzing market trends and customer demands, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Project Management</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Project Integration Management</li> <li>-Project Scope Management</li> <li>-Project Time Management</li> <li>-Project Cost Management</li> <li>-Project Quality Management</li> <li>-Project Human Resource Management</li> <li>-Project Communications Management</li> <li>-Project Risk Management</li> <li>-Project Procurement Management</li> </ul>	Level 7	
	Level 6	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a person responsible for application software development project with 15 or more management staff during peak periods
	Level 5	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a person responsible for the application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform the project management such as project plan formulation, implementation, and change management, in collaboration with project managers, as a team leader of application software development project with 5 but less than 15 participation staff during peak periods.
	Level 3	Able to perform either one of main project management such as project plan formulation, implementation, and change management in the assigned area, as a team member of application software development project.



Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Leadership</p> <p>[Knowledge Items]</p> <p>-Leadership</p>	Level 7	
	Level 6	Able to carry out application software development project, by issuing instructions and orders to development team, as a person responsible for application software development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out application software development project, by issuing instructions and orders to development team, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out application software development project, by leading development team, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out application software development project, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Communication</p> <p>[Knowledge Items]</p> <p>-2-Way communication -Transmission of information -Organization, analysis, and retrieval of information</p>	Level 7	
	Level 6	Able to carry out communication and exchange opinions related to project with the person in charge of order side, as a person responsible for application software development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out communication and technical exchange opinions related to project with the person in charge of order side, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to perform project by carrying out communication related to project with team members of application software development project, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform project by carrying out communication with application software development project team members, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Job category common skill item]</p> <p>●Negotiation</p> <p>[Knowledge Items]</p> <p>-Negotiation</p>	Level 7	
	Level 6	Able to obtain agreement by carrying out every negotiations related to application software development project with the person in charge of order side, as a person responsible for application software development project with 15 or more management staff during peak periods.
	Level 5	Able to carry out negotiations related to application software development project with the person in charge of order side, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods
	Level 4	Able to carry out negotiations related to project with team members of application software development project, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to perform project by carrying out negotiations related to project with team members of application software development project, as a team member of application software development project.

Specialty area:  
Application Software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Specialty area specific skill item] ●Business application design</p> <p>[Knowledge Items]</p> <p>-Understanding and utilization of application software knowledge</p>	Level 7	
	Level 6	Able to carry out effective design for implementation methods and processing methods for application software, by understanding operating system and middleware architecture, as a person responsible for application software development project with 15 or more management staff during peak periods
	Level 5	Able to carry out effective design for implementation methods and processing methods for application software, by understanding operating system and middleware architecture, as a person responsible for application software development project with 5 or more but less than 15 management staff during peak periods.
	Level 4	Able to carry out effective design for implementation methods and processing methods for application software, by understanding operating system and middleware architecture, as a team leader of application software development project with 5 or more but less than 15 participation staff during peak periods.
	Level 3	Able to carry out effective design for implementation methods and processing methods for application software, by understanding operating system and middleware architecture, as a team member of application software development project.