

# **Skill Area and Skill Proficiency**

## **(8) Software Development**

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## Skill Area

Job career: Software Development

# Skill Area of Software Development

	Specialty Field	Skill Item
Career common skill item	All Specialty Field	<ul style="list-style-type: none"> <li> <b>●Software engineering</b>  Web application technologies, Program design, Development techniques, Utilization of development support tools, Implementation of program, Programming techniques, Test techniques, Reutilization techniques, Implementation and inspection of security systems, External design, etc </li> <li> <b>●Technology</b>  Latest technology trends, Technologies for Internet application platforms, Database design, Computer science fundamentals, Computer systems, System development environment, Database technology, Database operation design, etc </li> <li> <b>●Design</b>  Design techniques, Understanding and utilization of modeling technique, Architecture processes, Design of Database, Middleware and Distributed computing, Development environment design, Definition of requirements, Estimation, scheduling techniques </li> <li> <b>●Designing development methods</b>  Selection of standards to comply with, Risk management fundamentals, Software development processes, Quality inspection (software development), Creation of plan for running tests </li> <li> <b>●Definition of analysis requirements</b>  Grasp of market trends and other company trends, Formulation of software product strategies, Formulation of project and plan, Management of business problems, Intellectual property rights, Knowledge on related regulations, 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, Distribution of information, Organization and analysis and retrieval of information </li> <li> <b>●Negotiation</b>  Negotiation </li> </ul>
	Basic software	<ul style="list-style-type: none"> <li> <b>●Hardware compatibility design</b>  Understanding of architecture of the applied hardware </li> </ul>
	Middleware	<ul style="list-style-type: none"> <li> <b>●Platform-Independent Design</b>  Understanding and utilization of architecture of related middleware, related basic software, and applied hardware </li> </ul>
	Application software	<ul style="list-style-type: none"> <li> <b>●Business operation design</b>  Grasp and utilization of application software knowledge </li> </ul>

## Skill Proficiency/Knowledge Items

Job career: Software Development

Specialty Field: Basic software

Specialty Field:

Basic software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career 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 techniques</li> <li>-Development techniques</li> <li>-Utilization of development support tools</li> <li>-Implementation of program</li> <li>-Programming techniques</li> <li>-Test techniques</li> <li>-Reutilization techniques</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 carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a responsible person of the basic software development project with 15 persons or more during peak periods
	Level 5	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a leader of the basic software development project from 5 but less than 15 persons during peak periods
	Level 3	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a member of development team in the basic software development project.

Specialty Field:

Basic software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <ul style="list-style-type: none"> <li>-Latest technology trends</li> <li>-Technologies for Internet application platforms</li> <li>-Database design</li> <li>-Computer science fundamentals</li> <li>-Computer systems</li> <li>-System development environment</li> <li>-Database technologies</li> <li>-Basic functions of relational database management systems</li> <li>-Data modeling</li> <li>-Database operation design</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 responsible person of the basic software development project with 15 persons or more 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 responsible person of development in the basic software development project from 5 but less than 15 persons 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 leader of development team in the basic software development project from 5 but less than 15 persons 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 member of development team in the basic software development project.

Specialty Field:

Basic software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Design techniques</li> <li>-Understanding and utilization of modeling techniques</li> <li>-Architecture processes</li> <li>-Design of database, middleware and distributed computing</li> <li>-Design of development environment</li> <li>-Requirements definition</li> <li>-Estimation, scheduling techniques</li> </ul>	Level 7	
	Level 6	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a responsible person of the basic software development project with 15 persons or more during peak periods
	Level 5	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a member of development team in the basic software development project.

Specialty Field:

Basic software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Designing development methods</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Selection of standards to comply with</li> <li>-Risk management fundamentals</li> <li>-Software development processes</li> <li>-Quality inspection (software development)</li> <li>-Creation of plan for running tests</li> </ul>	Level 7	
	Level 6	Able to design optimum, and effective development method, in the basic software development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language in the whole development project, as a responsible person of the basic software development project with 15 persons or more during peak periods
	Level 5	Able to design optimum, and effective development method, in the basic software development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language in the whole development project, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to design optimum, and effective development method, in the basic software development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language, as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to design optimum, and effective development method, in the basic software development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language, as a member of development team in the basic software development project.



Specialty Field:

Basic software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Definition of analytical requirements</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Grasp 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 plan and planning of software product strategy for basic software product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of the basic software development project with 15 persons or more during peak periods
	Level 5	Able to carry out formulation of software product plan and planning of software product strategy for basic software product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to carry out formulation of software product plan and planning of software product strategy for basic software product development, by grasping and analyzing of customer's demands and market trends, as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out formulation of software product plan and planning of software product strategy for basic software product development, by grasping and analyzing of customer's demands and market trends, as a member of development team in the basic software development project.

Specialty Field:

Basic software

## 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 plan formulation of project, implementation, and change management, etc, by cooperating with project management, as a responsible person of the basic software development project with 15 persons or more during peak periods
	Level 5	Able to perform the project management such as plan formulation of project, implementation, and change management, etc, by cooperating with project management, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to perform the project management such as plan formulation of project, implementation, and change management, etc, by cooperating with project management as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform either one of main project management such as plan formulation of project, implementation, and change management, etc, in the assigned area, as a member of development team in the basic software development project.

Specialty Field:  
Basic software

## Skill Proficiency/Knowledge Items of Software Development

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

Specialty Field:

Basic software

## 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, analytical, and retrieval of information</p>	Level 7	
	Level 6	Able to carry out communication, and to exchange opinions related to project with the responsible person on orderer side, as a responsible person of the basic software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out communication, and to exchange opinions related to project with the responsible person on orderer side, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to carry out communication, and to exchange opinions related to project with the basic software development project member, as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out communication, and to exchange opinions related to project with the basic software development project member, as a member of development team in the basic software development project.

Specialty Field:  
Basic software

## 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 basic software development project with a responsible person on orderer side, as a responsible person of the basic software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out negotiations related to basic software development project with a responsible person on orderer side, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to carry out negotiations related to project with project team members of basic software development project, as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform the project by carrying out negotiations related to project, with project team members of basic software development project, as a member of development team in the basic software development project.

Specialty Field:  
Basic software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Specialty Field specific skill item]</p> <p>●Hardware compatibility design</p> <p>[Knowledge Items]</p> <p>-Understanding of architecture of the applied hardware</p>	Level 7	
	Level 6	Able to carry out design with feasibility method, process method for effective basic software, by understanding the operating hardware architecture, as a responsible person of the basic software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out design with feasibility method, process method for effective basic software, by understanding the operating hardware architecture, as a responsible person of the basic software development project from 5 but less than 15 persons during peak periods
	Level 4	Able to carry out design with feasibility method, process method for effective basic software, by understanding the operating hardware architecture, as a leader of development team in the basic software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out design with feasibility method, process method for effective basic software, by understanding the operating hardware architecture, as a member of development team in the basic software development project.

## Skill Proficiency/Knowledge Items

Job career: Software Development

Specialty Field: Middleware

Specialty Field:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career 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 techniques</li> <li>-Development techniques</li> <li>-Utilization of development support tools</li> <li>-Implementation of program</li> <li>-Programming techniques</li> <li>-Test techniques</li> <li>-Reutilization techniques</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 carry out middleware development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a member of development team in the middleware development project.



Specialty Field:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <ul style="list-style-type: none"> <li>-Latest technology trends</li> <li>-Technologies for Internet application platforms</li> <li>-Database design</li> <li>-Computer science fundamentals</li> <li>-Computer systems</li> <li>-System development environment</li> <li>-Database technologies</li> <li>-Basic functions of relational database management systems</li> <li>-Data modeling</li> <li>-Database operation design</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 responsible person of the middleware development project with 15 persons or more 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 responsible person of development in the middleware development project from 5 but less than 15 persons 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 leader of development team in the middleware development project from 5 but less than 15 persons 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 member of development team in the middleware development project.

Specialty Field:  
Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Design techniques</li> <li>-Understanding and utilization of modeling techniques</li> <li>-Architecture processes</li> <li>-Design of database, middleware and distributed computing</li> <li>-Design of development environment</li> <li>-Requirements definition</li> <li>-Estimation, scheduling techniques</li> </ul>	Level 7	
	Level 6	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a member of development team in the middleware development project.

Specialty Field:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Designing development methods</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Selection of standards to comply with</li> <li>-Risk management fundamentals</li> <li>-Software development processes</li> <li>-Quality inspection (software development)</li> <li>-Creation of plan for running tests</li> </ul>	Level 7	
	Level 6	Able to design optimum, and effective development method, in the middleware development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language in the whole development project, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to design optimum, and effective development method, in the middleware development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language in the whole development project, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to design optimum, and effective development method, in the middleware development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to design optimum, and effective development method, in the middleware development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language, as a member of development team in the middleware development project.

Specialty Field:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Definition of analytical requirements</p> <p>[Knowledge Items]</p> <p>-Grasp of market trends and other company trends</p> <p>-Formulation of software product strategies</p> <p>-Formulation of project and plan</p> <p>-Management of business problems</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 on related regulations</p>	Level 7	
	Level 6	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a member of development team in the middleware development project.

Specialty Field:

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 plan formulation of project, implementation, and change management, etc, by cooperating with project management, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to perform the project management such as plan formulation of project, implementation, and change management, etc, by cooperating with project management, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to perform the project management such as plan formulation of project, implementation, and change management, etc, by cooperating with project management, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform either one of main project management such as plan formulation of project, implementation, and change management, etc, in the assigned area, as a member of development team in the middleware development project.

Specialty Field:  
Middleware

## Skill Proficiency/Knowledge Items of Software Development

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

Specialty Field:

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, analytical, and retrieval of information</p>	Level 7	
	Level 6	Able to carry out communication, and to exchange opinions related to project with the responsible person on orderer side, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to carry out communication, and to exchange technical opinions related to project with the responsible person on orderer side, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to perform the project by keeping good team communication with middleware development project team members, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform the project by keeping good team communication with middleware development project team members, as a member of development team in the middleware development project.

Specialty Field:  
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 a responsible person in charge on orderer side, as a responsible person of the middleware development project with 15 persons or more during peak periods.
	Level 5	Able to carry out negotiations related to middleware development project with a responsible person in charge on orderer side, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out negotiations related to project with project team members of middleware development project, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform negotiations related to project with project team members of middleware development project, as a member of development team in the middleware development project.



Specialty Field:

Middleware

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Specialty Field specific skill item]</p> <p>●Platform-Independent Design</p> <p>[Knowledge Items]</p> <p>-Understanding and utilization of architecture of related middleware, related basic software, and applied hardware</p>	Level 7	
	Level 6	Able to carry out design with feasibility method, process method for effective middleware, by understanding the basic operating software architecture, as a responsible person of the middleware development project with 15 persons or more during peak periods
	Level 5	Able to carry out design with feasibility method, process method for effective middleware, by understanding the basic operating software architecture, as a responsible person of development in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out design with feasibility method, process method for effective middleware, by understanding the basic operating software architecture, as a leader of development team in the middleware development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out design with feasibility method, process method for effective middleware, by understanding the basic operating software architecture, as a member of development team in the middleware development project.

## Skill Proficiency/Knowledge Items

Job career: Software Development

Specialty Field: Application software

Specialty Field:

Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career 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 techniques</li> <li>-Development techniques</li> <li>-Utilization of development support tools</li> <li>-Implementation of program</li> <li>-Programming techniques</li> <li>-Test techniques</li> <li>-Reutilization techniques</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 carry out application software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software development, by using software engineering technology, and carrying out program design implementation, operation, prevention of failures design, and carrying out program production, evaluation, and performance tuning of the whole project, as a member of development team in the application software development project.

Specialty Field:

Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <ul style="list-style-type: none"> <li>-Latest technology trends</li> <li>-Technologies for Internet application platforms</li> <li>-Database design</li> <li>-Computer science fundamentals</li> <li>-Computer systems</li> <li>-System development environment</li> <li>-Database technologies</li> <li>-Basic functions of relational database management systems</li> <li>-Data modeling</li> <li>-Database operation design</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 responsible person of the application software development project with 15 persons or more 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 responsible person of development in the application software development project from 5 but less than 15 persons 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 leader of development team in the application software development project from 5 but less than 15 persons 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 member of development team in the application software development project.

Specialty Field:

Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Design techniques</li> <li>-Understanding and utilization of modeling techniques</li> <li>-Architecture processes</li> <li>-Design of database, middleware and distributed computing</li> <li>-Design of development environment</li> <li>-Requirements definition</li> <li>-Estimation, scheduling techniques</li> </ul>	Level 7	
	Level 6	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software design, by using and selecting optimum modeling technique and design technique, as a member of development team in the application software development project.

Specialty Field:

Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Designing development methods</p> <p>[Knowledge Items]</p> <p>-Selection of standards to comply with</p> <p>-Risk management fundamentals</p> <p>-Software development processes</p> <p>-Quality inspection (software development)</p> <p>-Creation of plan for running tests</p>	Level 7	
	Level 6	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software product plan formulation of development and software product strategy planning for application software product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a member of development team in the application software development project.

Specialty Field:

Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Definition of analytical requirements</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Grasp 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 software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out software product plan formulation of development and software product strategy planning for application software product development, by grasping and analyzing of customer's demands and market trends, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out software product plan formulation of development and software product strategy planning for middleware product development, by grasping and analyzing of customer's demands and market trends, as a member of development team in the application software development project.

Specialty Field:

Application software

## 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 plan formulation of project, implementation, and change management, by cooperating with project management, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to perform the project management such as plan formulation of project, implementation, and change management, by cooperating with project management, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to perform the project management such as plan formulation of project, implementation, and change management, by cooperating with project management, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform either one of main project management such as plan formulation of project, implementation, and change management, etc, in the assigned area, as a member of development team in the application software development project.



Specialty Field:  
Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career 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, by issuing instructions and orders to development team, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out application software development, by issuing instructions and orders to development team, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out middleware development project, by leading development team, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out application software development project, as a member of development team in the application software development project.

Specialty Field:  
Application software

## 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, analytical, and retrieval of information</p>	Level 7	
	Level 6	Able to carry out communication, and to exchange opinions related to project with the responsible person on orderer side, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out communication, and to exchange opinions related to project with the responsible person on orderer side, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to perform the project by keeping good team communication with application software development project team members, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform the project by keeping good team communication with application software development project team members, as a member of development team in the application software development project.

Specialty Field:

Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
[Career common skill item] ●Negotiation [Knowledge Items] -Negotiation	Level 7	
	Level 6	Able to obtain agreement, by carrying out every negotiations related to application software development project with a responsible person on orderer side, as a responsible person of the application software development project with 15 persons or more during peak periods.
	Level 5	Able to carry out negotiations related to application software development project with a responsible person on orderer side, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out negotiations related to project with project team members of application software development project, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to perform negotiations related to project with project team members of application software development project, as a member of development team in the application software development project.

Specialty Field:  
Application software

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Specialty Field specific skill item]</p> <p>●Businss application design</p> <p>[Knowledge Items]</p> <p>-Grasp and utilization of application software knowledge</p>	Level 7	
	Level 6	Able to carry out design with feasibility method, process method for effective application software, by understanding the basic operating software or middleware architecture, as a responsible person of the basic software development project with 15 persons or more during peak periods
	Level 5	Able to carry out design with feasibility method, process method for effective application software, by understanding the basic operating software or middleware architecture, as a responsible person of development in the application software development project from 5 but less than 15 persons during peak periods.
	Level 4	Able to carry out design with feasibility method, process method for effective application software, by understanding the basic operating software or middleware architecture, as a leader of development team in the application software development project from 5 but less than 15 persons during peak periods.
	Level 3	Able to carry out design with feasibility method, process method for effective application software, by understanding the basic operating software or middleware architecture, as a member of development team in the middleware development project.

## Skill Proficiency/Knowledge Items

Job career: Software Development

Specialty Field: Common to Level 1, 2

Specialty Field:

Common to Software Development

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career 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 techniques</li> <li>-Development techniques</li> <li>-Utilization of development support tools</li> <li>-Implementation of program</li> <li>-Programming techniques</li> <li>-Test techniques</li> <li>-Reutilization techniques</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 2	Able to carry out software development, by carrying out program production, evaluation, and performance tuning in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to participate in software development in the assigned area, by following concrete instructions as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Technology</p> <p>[Knowledge Items]</p> <div> <div> -Latest technology trends  -Technologies for Internet application platforms  -Database design  -Computer science fundamentals  -Computer systems  -System development environment  -Database technologies  -Basic functions of relational database management systems  -Data modeling  -Database operation design  -Platform technologies  -System platform technologies  -Understanding and utilization of network technologies  -Internet technologies  -Programming languages, Markup languages  -Programming techniques for parallel processing  -Middleware technologies  -Methods of communication between components  -Application security  -Relationship between transaction processing and synchronization points of databases </div> <div> -Understanding and utilization of computer system architectures and fundamental technologies </div> </div>	Level 2	Able to practice technical problems solving, by using known knowledge, and technology, and to explain about selection reason of latest technology trends and application technology in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to grasp status of technical problems occurrence, and to explain about selection reason of latest technology trends and application technology in the assigned area, by following concrete instructions as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Design</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Design techniques</li> <li>-Understanding and utilization of modeling techniques</li> <li>-Architecture processes</li> <li>-Design of database, middleware and distributed computing</li> <li>-Design of development environment</li> <li>-Requirements definition</li> <li>-Estimation, scheduling techniques</li> </ul>	Level 2	Able to participate in the software design, in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to participate in the software design, in the assigned area, by following concrete instructions, as a member of development team under guidance of a higher-level specialist in the same job career category.



Specialty Field:

Common to Software Development

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Designing development methods</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Selection of standards to comply with</li> <li>-Risk management fundamentals</li> <li>-Software development processes</li> <li>-Quality inspection (software development)</li> <li>-Creation of plan for running tests</li> </ul>	Level 2	Able to support optimum and effective design of development method, in the development project, by carrying out examination, analytical, and evaluation on development process, development method, development tools, development environment, development language in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to support examination, and analytical on development tools, and development language in the assigned area, by following concrete instructions as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
<p>[Career common skill item]</p> <p>●Definition of analytical requirements</p> <p>[Knowledge Items]</p> <ul style="list-style-type: none"> <li>-Grasp 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 2	Able to carry out requirements definition by grasping and analyzing of customer's demands and market trends in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to support requirements definition by analyzing customer's demands and market trends in the assigned area, by following concrete instructions, as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## 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> <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 2	Able to participate in the software development project in the assigned area by using known knowledge, and technology, and follows project plan created by a higher-level specialist, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to participate in the software development project in the assigned area by using known knowledge, and technology, and following project plan created by a higher-level specialist, and following concrete instructions as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## Skill Proficiency/Knowledge Items of Software Development

Skill Item and Knowledge Items	Skill Proficiency	
[Career common skill item] ●Leadership [Knowledge Items] -Leadership	Level 2	Able to participate in the development project in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to participate in the development project in the assigned area, by following concrete instructions as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## 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, analytical, and retrieval of information</p>	Level 2	Able to participate in the project by keeping good communication with development project team members in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to participate in the project by keeping good communication with development project team members in the assigned area, by following concrete instructions, as a member of development team under guidance of a higher-level specialist in the same job career category.

Specialty Field:

Common to Software Development

## 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 2	Able to participate in the project by carrying out negotiations on project, with project team members of basic software development project in the assigned area, as a member of development team under guidance of a higher-level specialist in the same job career category.
	Level 1	Able to participate in the project by carrying out negotiations on project, with project team members in the assigned area, by following concrete instructions, as a member of development team under guidance of a higher-level specialist in the same job career category.

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