SONY

INTERNAL USE ONLY

Sony DevOps Way

Global IS Shared Services

IS Process Management
Global Strategy, GIS

Objective for DevOps Training

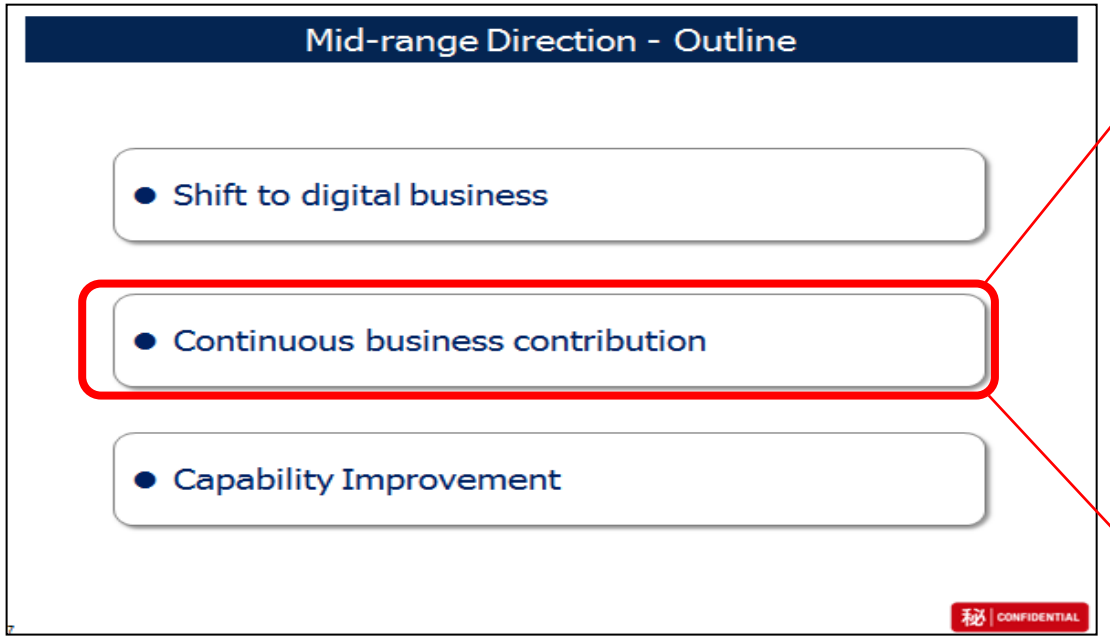
Today, DevOps is defined in many different ways but no clear definition exists.

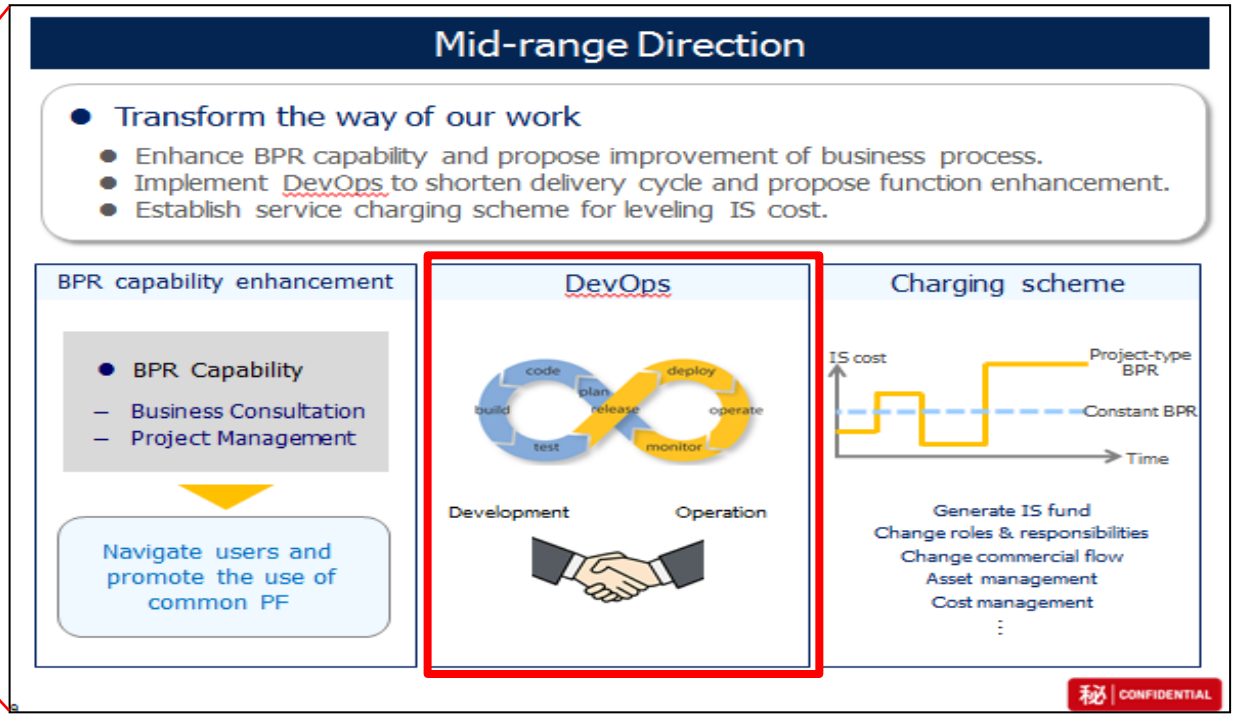
By the end of the session, the participants will be able to:

- ✓ Understand the definition of Sony IS Way of DevOps to realize the GIS Mid-range Direction.

SONY

Mid-range Direction

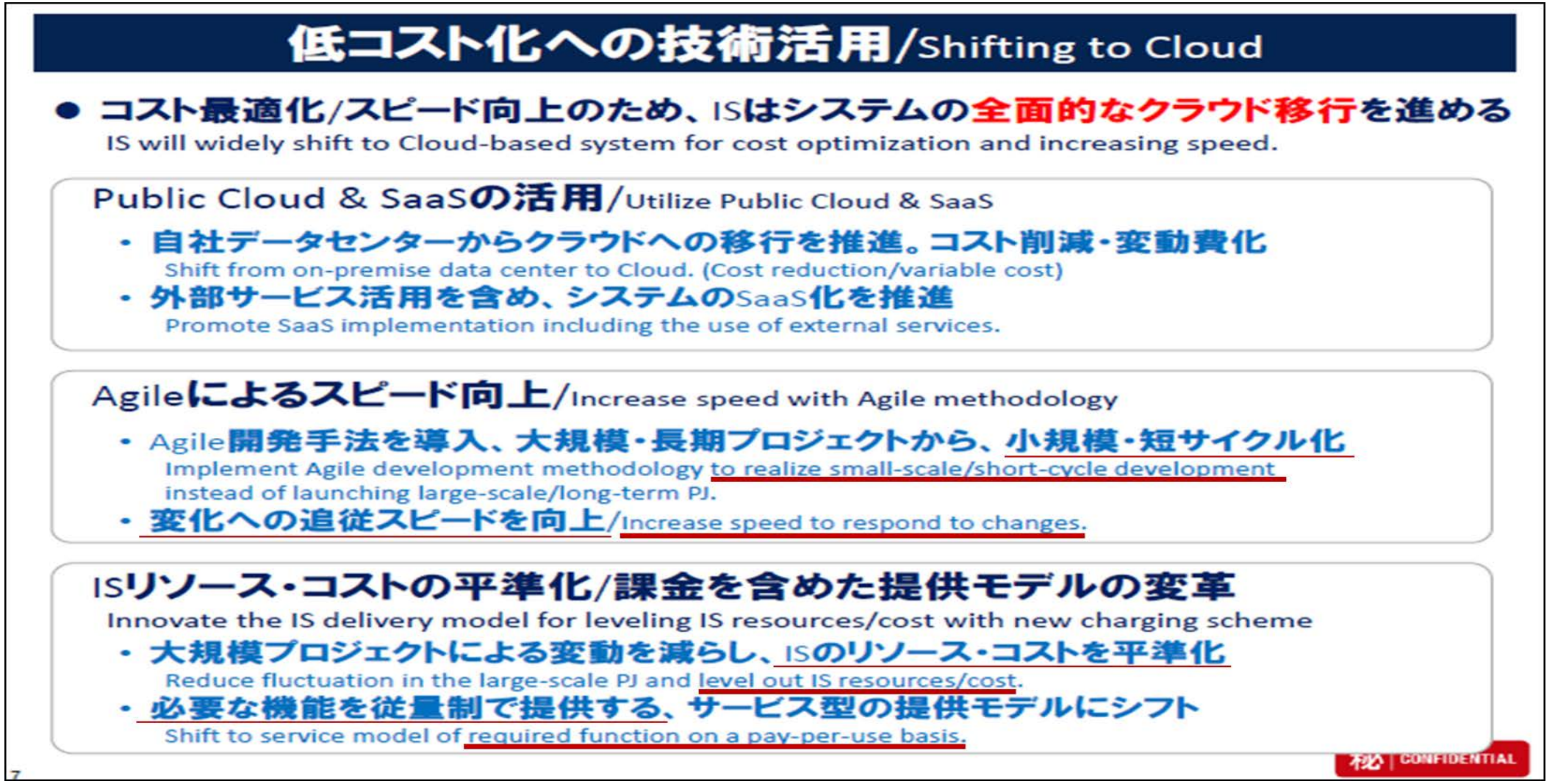




Implement DevOps to shorten delivery cycle and propose function enhancement.

SONY

Global IS Shared Service (GIS) Midrange Direction



Objective of “DevOps” Implementation

SONY

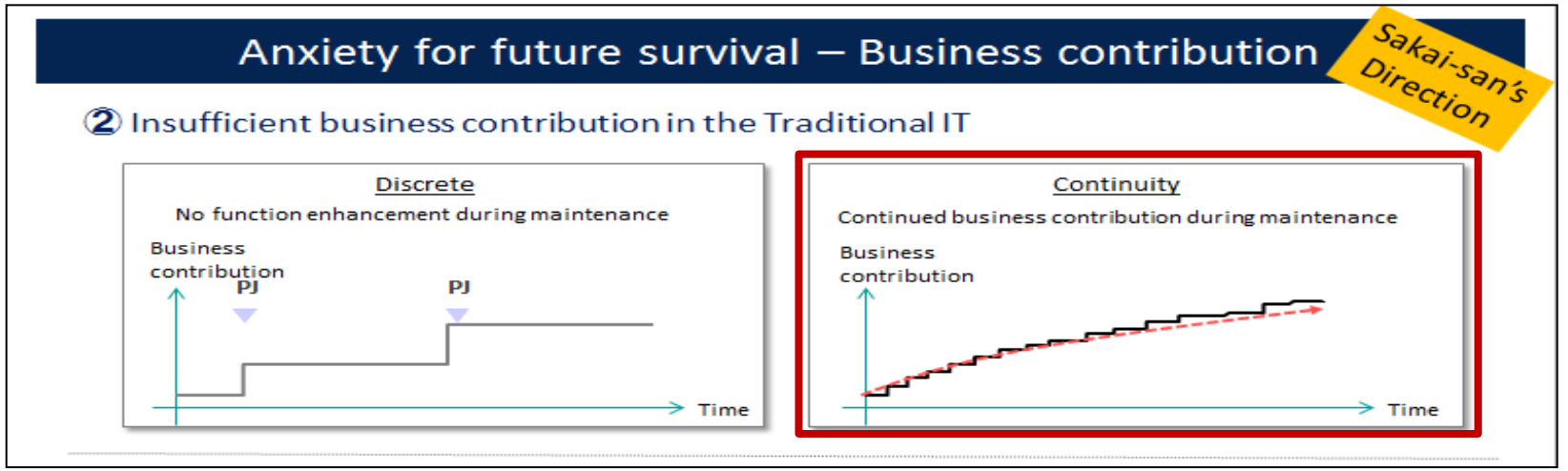
Small-scale and shot-cycle development

Ex.) Maximum of 3-months delivery cycle

Increase speed to respond to changes

Level out IS resources/cost

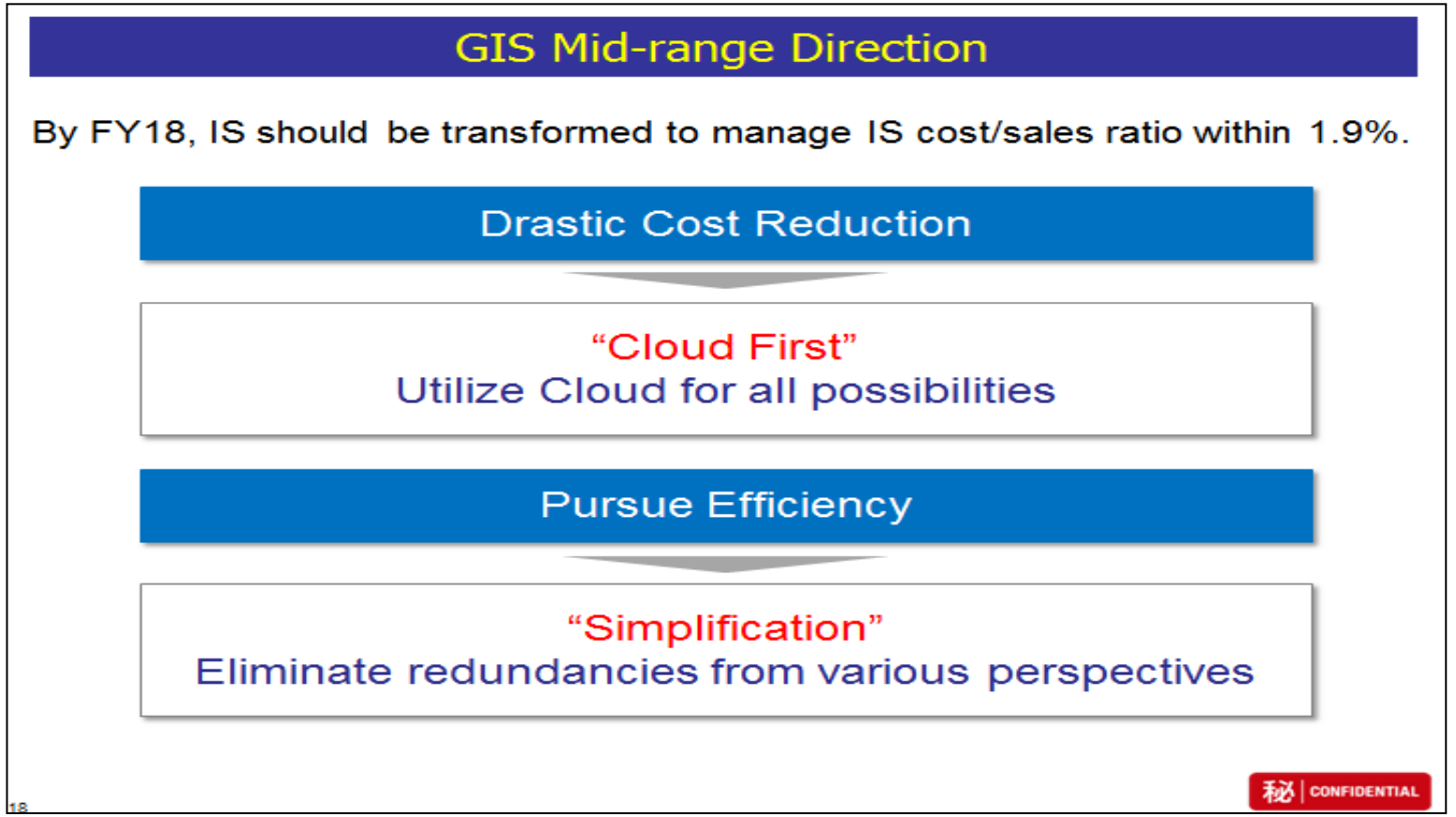
Provide service on pay-per-use basis



Contribute to business with Sony Way “DevOps”

Assumption of DevOps

SONY



Utilize Cloud

Define function provisioning in delivery cycles of 3 months at the maximum

What's DevOps

SONY

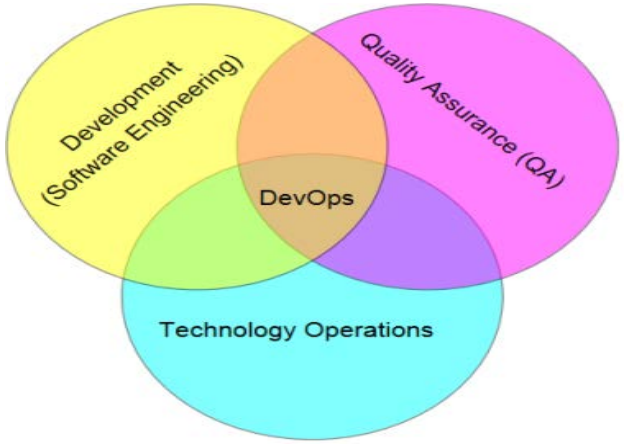
■ What's DevOps？

参考:DevOps for DUMMIES (Compliments of IBM) より引用

Abbreviation of "Development and Operations".

DevOps is an approach to provide software continuously under the collaboration between business owners and development, operation and QA teams based on the principle of "Lean" and "Agile".

With this approach, an enterprise will be able to capture market opportunities faster and receive customer feedback in shorter time.



参考:Gartner Research より引用

■ DevOps Target

- Aim to provide "faster, cheaper and better service" continuously for the benefit and achievement of customers (users) and business.
- Aim to utilize an expanding programmable infrastructure from a lifecycle perspective through trial use of advanced technologies like automated tools, etc. (e.g. release automation, server configuration management automation)

Keys to “DevOps” Implementation

SONY

“DevOps”

Process

- Apply Agile software development method (Persistent development, Continual testing, Continual quality feedback)

Tool

- Develop Cloud-based infrastructure
- Utilize automation tools (testing, release etc.)
- Utilize management tools for efficient development, laborsaving and shortened delivery time.

Culture

- United team of service development and system operation (Service Provider Team).
- Capability for utilizing Process/Tools.

Increase speed to respond to changes

Level out IS resources/cost

“DevOps” Configuration Elements

SONY

参考:DevOpsを実現する11の要素(tracpath.com)

Element 1：Software development method
Element 2：Source code review
Element 3：Test automation
Element 4：Continuous Integration（CI）
Element 5：Bug tracking
Element 6：Development/test environment setup
Element 7：Virtualization
Element 8：Version management system
Element 9：Configuration management
Element 10：Communication

“DevOps” Configuration Elements

参考:DevOpsを実現する11の要素(tracpath.com)

Element 1：Software development method

Apply the Agile Software Development method to shorten the interval between development and release . This is based on an assumption that infrastructure for realizing short-cycle release is established.

Element 2：Source code review

Define the method of source code review and result check for ensuring quality of short-cycle release software.

Element 3：Test automation

Release short-cycle and high quality software through test automation.

Element 4：Continuous Integration (CI)

In software development, execute short-cycle building and test processes repeatedly for early detection of problem, efficient development, labor saving and shortening of delivery time.

This is based on an assumption that version management of source code and deliverables is conducted as stated in Element 8.

Element 5：Bug tracking

Establish a series of operation from problem detection, submitting a bug report, testing, fixing until the problem is solved.

“DevOps” Configuration Elements

SONY

参考:DevOpsを実現する11の要素(tracpath.com)

Element 6：Development/test environment setup

Reduce the number of defects caused by environmental difference through automating the environment update based on the defined rules.
Provide end-to-end development and test environment by utilizing Cloud.

Element 7：Virtualization

Realize efficient server management in short cycles with virtualization technology.

Element 8：Version management system

Conduct version management of source code and deliverables to ensure proper release.

Element 9：Configuration management

Conduct configuration management for frequent release, realize flexible and scalable provisioning and automate resources release.
This is based on an assumption that version management of source code and deliverables is conducted as stated in Element 8.

Element 10：Communication

Realize efficient processes, labor saving and shortened delivery time by working in a collaborative team of development and operation and utilizing an effective communication tool.

“DevOps” Factors and Innovative Points

SONY

“DevOps” Factors			Process	Tool	Culture
1	**Software development method**	• Adopt a development method of Agile, etc. with weekly release.	✓		
2	**Source code review**	• Decide the method of source code review/result check. (incl. using tools)	✓	✓	
3	**Test automation**	• Automate testing of unit test, integration test, system test, user acceptance test, etc.		✓	
4	**Continuous Integration (CI)**	• A practice to build and test repetitively in a short cycle for software development.	✓	✓	
5	**Bug tracking**	• Establish a series of operations for bug tracking.	✓	✓	
6	**Development/test environment setup**	• Provide an end-to-end development environment and test environment using Cloud. • Environment setup/update to be completed within a few days.		✓	
7	**Virtualization**	• Use virtualization technology		✓	
8	**Version management system**	• Version management of source code and deliverables		✓	
9	**Configuration management**	• Configuration management for frequent release		✓	
10	**Communication**	• Establish communication framework between development team and operation team.			✓

“DevOps” - Process

SONY

Adopt a development method of Agile (GCM Guideline for Agile Project)

“Agile Development” is a software development method to enable quick implementation and release of small increments of working software for customers who have surging requirements to meet changing needs of market and end users.

Policy necessary for development

– ***Flexible response to a change***

☐ Continuous requirement development by representative of customer.

- It is necessary to meet changing needs, usually by performing analysis and prioritization of requirements.

☐ Iteration of short-term development.

- In the event of rework triggered by requirements change, it is necessary to minimize time loss.
- For early detection and managing of problems, it is necessary to confirm requirements early with customer who operates the business.

☐ Iteration of small scale development.

- In the event of rework triggered by requirements change, it is necessary to minimize scope of impact.

“DevOps” - Process

SONY

Policy necessary for development

– *Early release of a product* ***(Rapid development)***

☐ **Streamline the communication process (Unify the development process, simplify the design document, etc.).**

- It is necessary to organize a small development team with relevant knowledge and skill.
- Representative of customer works in the same location as the development team as it is necessary to have frequent face-to-face conversation with them.

☐ **Highly-skilled development team.**

- All members would be highly-skilled because it is necessary to work independently.

☐ **Dedicated project environment (where a development team can devote itself to development).**

- It is necessary to build and maintain a dedicated project environment so that development team can devote itself to development.

“DevOps” - Process

SONY

Policy necessary for development

– *Early release of a product* ***(Rapid decision-making)***

☐ **Dedicated representative of customer.**

- It is necessary to promptly identify and prioritize requirements by a dedicated representative of customer.

☐ **Effective environment for requirement development.**

- It is necessary to build and maintain the environment where representative of customer can manage the requirements effectively.

“DevOps” – Tool (Instance)

SONY

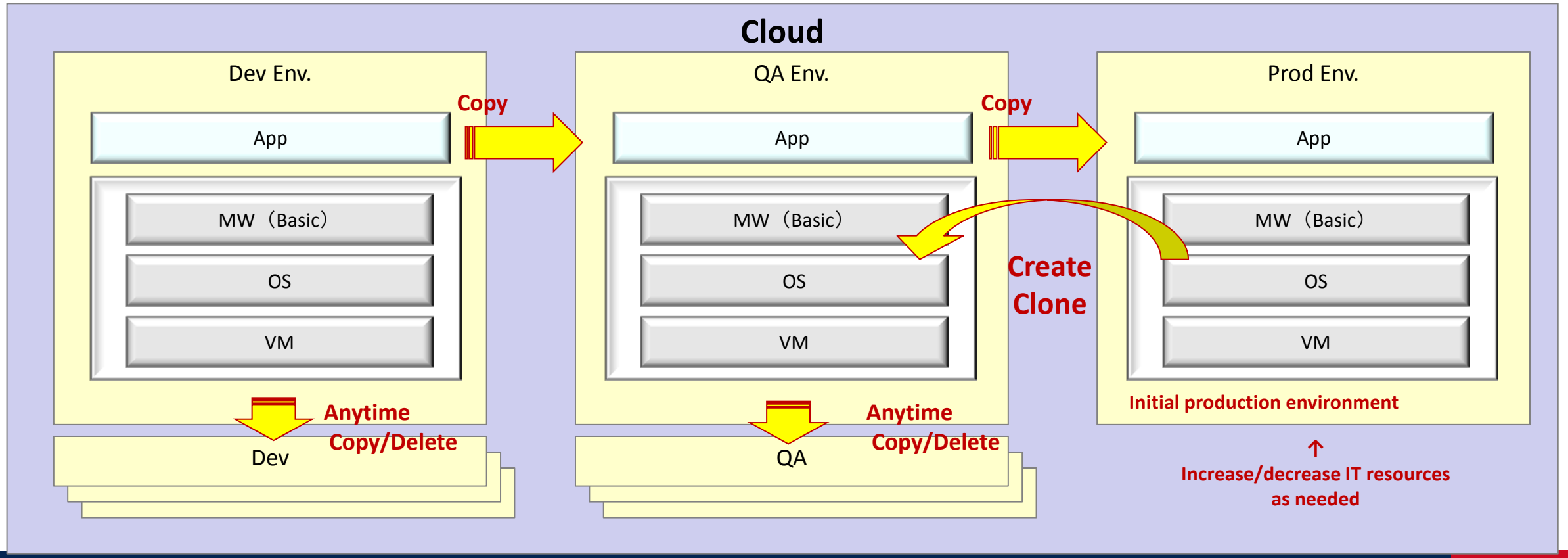
■ Develop Instance Environment by Using Cloud

☐ Secure necessary IT resources when necessary

- Service Provider Team shall have the control of managing IT resources flexibly according to environment changes.

☐ Build development/QA environment similar to production environment easily

- Need to eliminate environmental constraints to simplify operation for building similar environments.



“DevOps” – Tool (Demand Management)

SONY

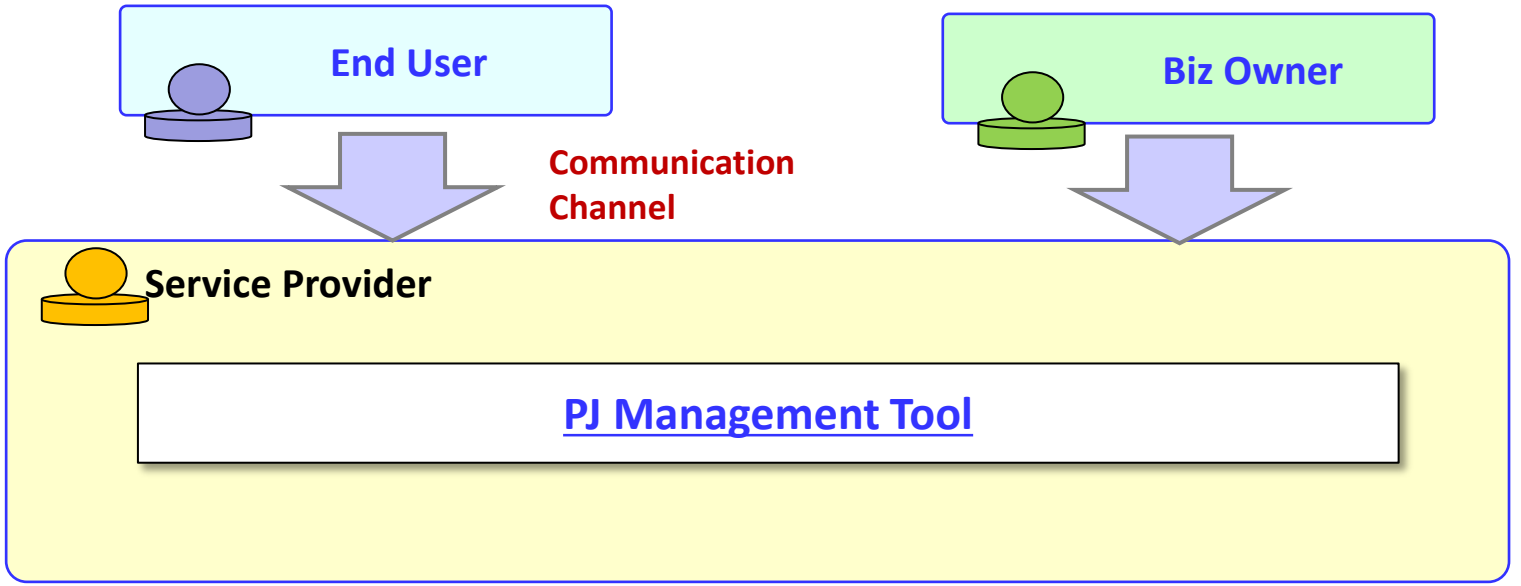
■ Utilize automated tool for receiving user requirements directly

☐ Receive user requirements directly

- Need to establish a communication channel for the Service Provider Team to receive user requirements directly.

☐ Link with PJ Management Tool for early release of user requirements

- Need to establish a scheme for the Service Provider Team to analyze user requirements promptly and release as needed.



“DevOps” – Tool (Demand Management)

SONY

■ Utilize automated tool in the Agile Software development environment

A) Common tool for short cycle release of high quality software

- Provide a tool that defines the method of source code review/result check.
- Provide a tool that defines the method of programming/result check for test automation.

B) Common tool for early detection of problem, efficient development, labor saving and shortening of delivery time in software development

- Provide Continuous Integration (CI) tool for automating operation.
- Need to conduct monitoring from early stage of lifecycle.
- Need to lower the risk of deployment failure by automating deployment and executing deployment process test in the environment similar to production environment.

C) Common tool for shortening the lead time from problem detection, fixing, until release in software development

- Provide a tool for establishing a series of operation from submitting a bug report, testing, fixing until the problem is solved.

D) Common tool for proper software release

- Provide a version management tool of source code and deliverables.

E) Common tool for frequent software release

- Provide a configuration management tool for realizing flexible and scalable provisioning and automating resources release.

“DevOps” – Automated Tool

SONY

Utilize automated tool in the Agile Software development environment

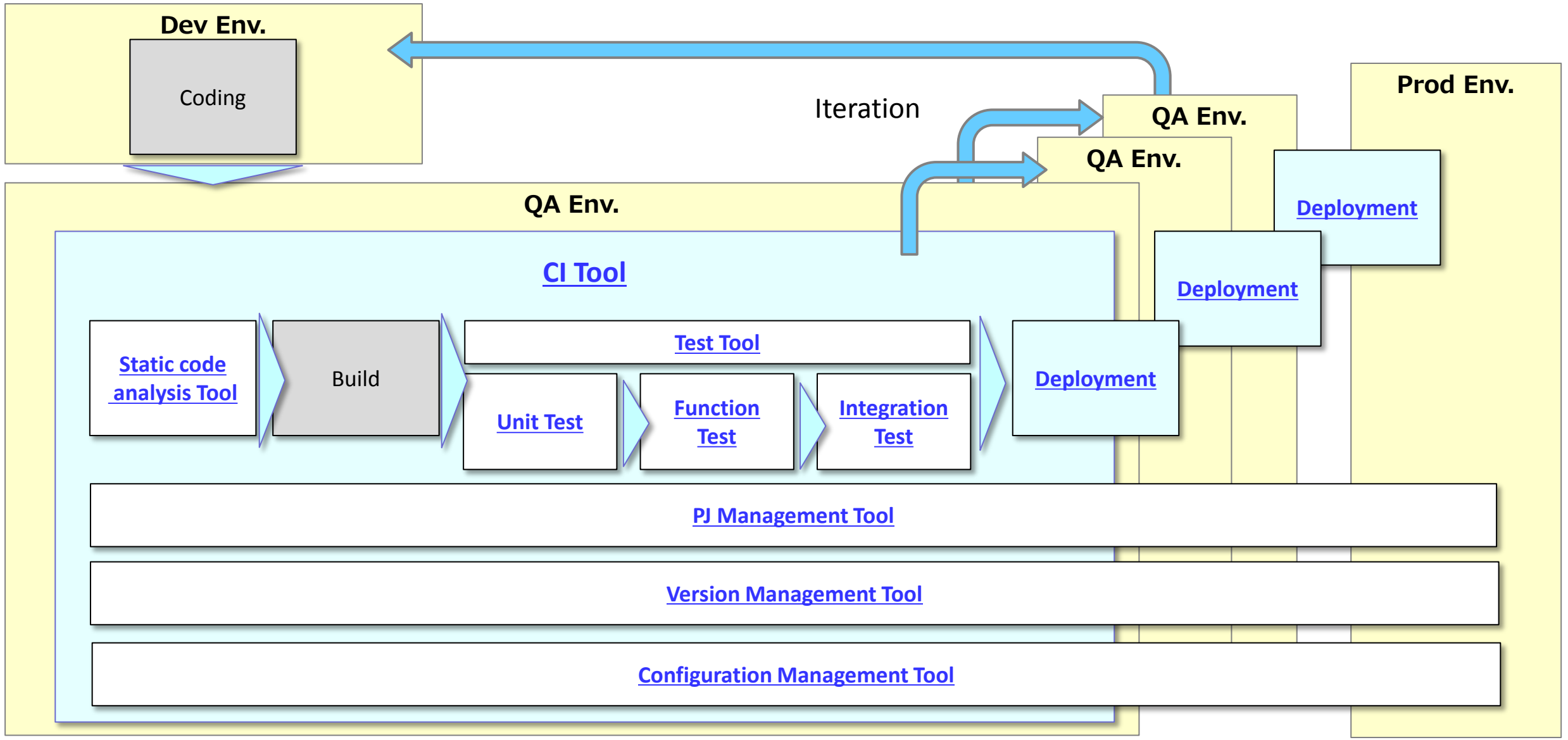
		Tools under review by GADC	
		Tool Category	Product name
A)	Source code review	**Static code analysis**	SonarQube
B)	Test automation	**Unit Test**	JUnit
	Test automation	**Function Test**	Selenium
C)	Continuous Integration	**CI tool**	Jenkins
		Build	Maven
		Coverage Check	Jacoco
		Deployment	Jenkins
D)	PJ Management Tool	**Management**	Redmine
E)	Version Management Tool	**Source Code Management**	SVN
F)	Configuration Management Tool		

Refer to the link for the tools recommended by GADC

https://shs03.jp.sony.com/sites/ADSC/G-ADC/Delivery%20Competency/Project-lessmodel/SitePages/Home.aspx

“DevOps” – Automated Tool

SONY



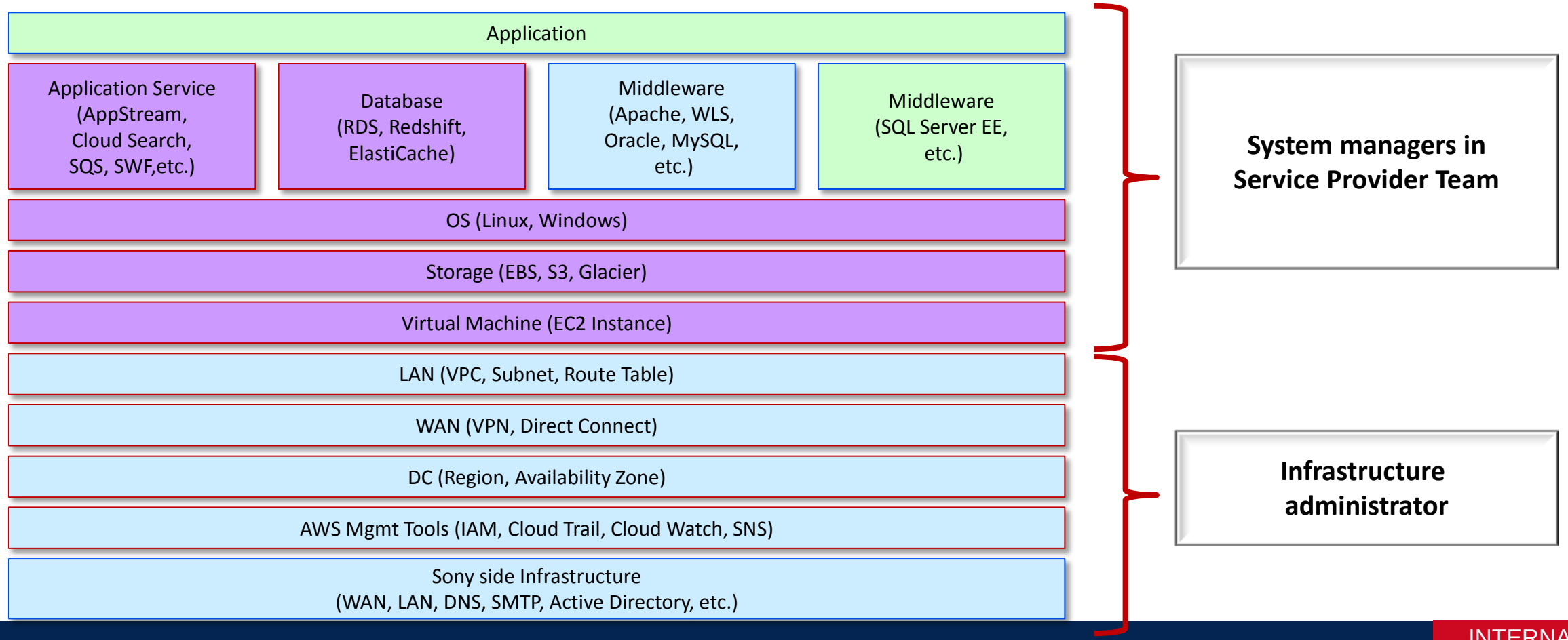
“DevOps” – Culture (Instance)

SONY

■ Allocate System Managers in Service Provider Team

☐ For the Cloud-based instance environment, allocate system managers of VM/OS/MW/App

- Conduct flexible system management within the team to secure necessary resources when needed.
- System managers need to do the sizing of production environment.

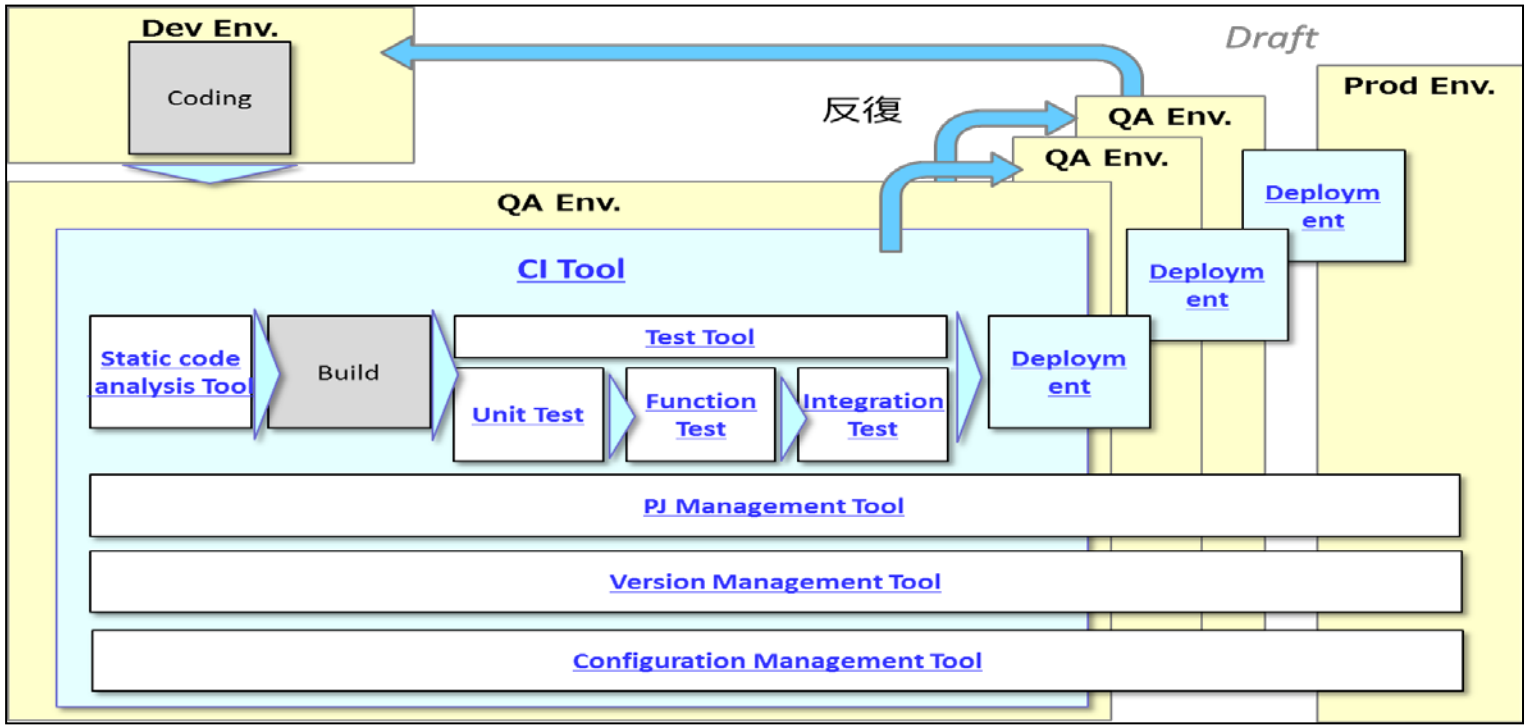


“DevOps” – Culture (Automation Tools)

SONY

☐ Allocate System Managers in the Service Provider Team for utilizing an automated tool

- Manage system for utilizing an automated tool for each environment or across the environment depending on the situation.



Establish/provide common communication environment and automated tool

System managers in Service Provider Team

Automated Tool Administrator

“DevOps” – Culture (Process)

SONY

■ To apply the roles in Agile Development Project

– *Flexible response to a change*

☐ Representative of Customer

- To have authority to decide the priority of requirements and the specifications.
- To exclusively perform duty and work to maximize the value of the product.
- To work in the same site as development team as there will be frequent face-to-face conversation.

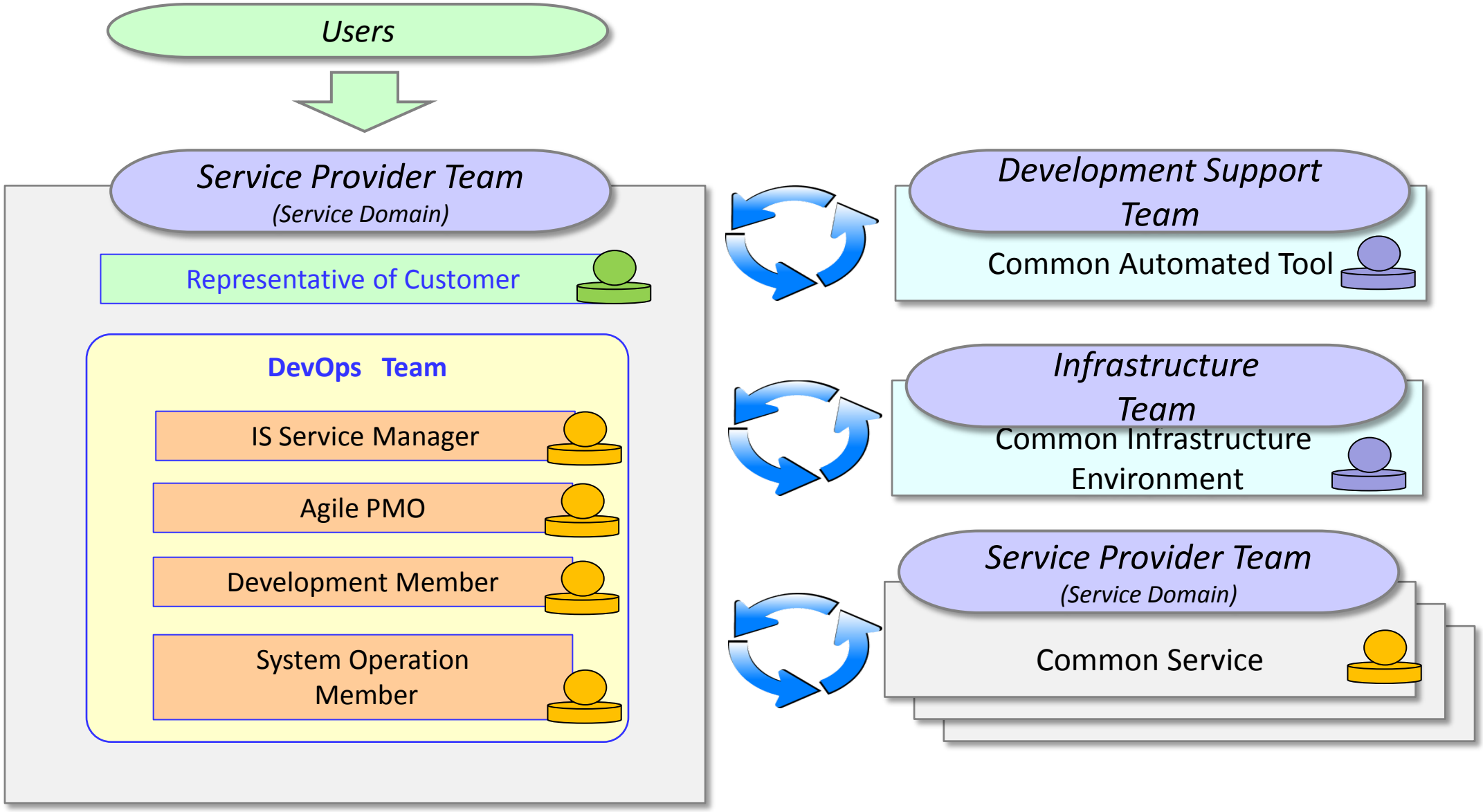
☐ Development Team

- To carry out all development works (design, implementation, test, etc.).
- To have Agile development experience, otherwise, have some Agile development experts participate and coach the team.

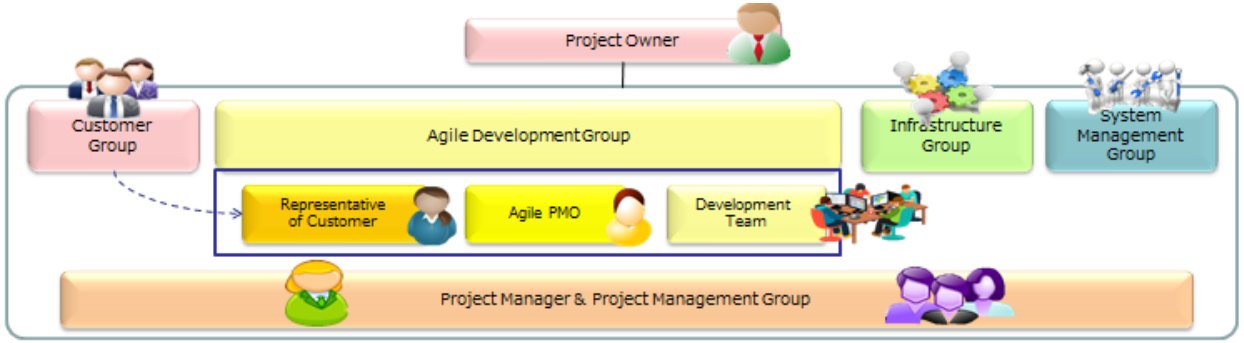
☐ Agile Project Management Office (PMO)

- To support the representative of customer to effectively manage the requirements.
- To provide and maintain a conducive project environment* where a development team can devote itself to development.

“DevOps” – Culture (DevOps Organization)



“DevOps” – Culture (DevOps Organization)



IS Service Manager

Users

Representative of Customer

Development Member

Agile PMO

Infrastructure Team

System Operation Member

Role name		Responsibility
Project Owner		• Approve the plan of business transformation and IT adoption. • Manage the fund raising and the budget controlling.
Project Manager		• Lead and manage project. • Bear the ultimate responsibility of project execution.
Customer Group		• Plan and execute the business transformation and the system development to meet needs of market and business. • Prepare the environment for training and migration, and migrate the new business smoothly.
Agile Development Group	Representative of Customer	• Develop the requirements continuously while considering the changing needs of market and users. • Control the priority of implementation while communicating with development team. • Accept the system which is implemented at the each iteration. (similar to ‘Product Owner’ defined in SCRUM)
	Development Team	• Make the release plan and the iteration plan. • Develop and release the system according to the plan.
	Agile PMO	• Support the Representative of Customer in requirements development. • Maintain and Improve the communication environment for Agile Development Group. • Maintain and Improve the development support tools for Agile Development Group. (similar to ‘SCRUM Master’ defined in SCRUM)
Infrastructure Group		• Design, implement, test and provide the following system environments: application development environment, test environment, training environment, migration environment and production environment.
System Management Group		• Define the service requirements for system management. • Implement the organization and the detailed procedures to provide services.
Project Management Group		• Define the management rules to achieve the project goal and manage the project.

Sony DevOps Maturity Matrix (Draft)

SONY

Dimension / Level	Initial (Level 0)	Managed (Level 1)	Defined (Level 2)	Measured (Level 3)	Optimized (Level 4)
Process	No documented process or documented process exists with some Service teams. Unpredictable / reactive.	Processes are documented within each Service team but not standardized across the organization.	Processes are documented and standardized in the GIS organization. Each Service team adopt the standardized processes.	Organizational metrics for some specific processes are established centrally. Metrics of those specific processes are collected and measured by each Service team and reported to Function Head.	Continuous assessment and improvement of processes by Process Owners where best practices and lessons learnt are shared.
Tool	No tool. No automation, manual work (build, test, configuration, deployment, etc.).	Individual (each Service team) tools. Partial automation. No standardized tools across the organization.	Standardized tools exist but different levels of adoption.	Standardized tools exist with high levels of adoption.	Continuous improvement of standardized tools using metrics analytics, self-learning and self-organizing. Self-service automation is provided to various stakeholders.
Culture	Limited collaboration. Low trust. Low management support/sponsorship to promote DevOps culture. Inadequate communication / coordination. Roles and responsibilities are not well defined.	Managed communication and collaboration exist within one location. Management support/sponsorship to promote DevOps culture exists. Roles and responsibilities are defined within some Service teams.	Collaboration / communication mechanism established across multiple locations. Management support/sponsorship to establish GCP/knowledge sharing portal. Service team members (across locations) share accountability and mutual trust based on the roles and responsibilities defined in the organization.	Bottle-necks and inefficiences are identified and measured by each Service team for each Service team and reported to Function Head.	Collaboration / communication is optimized for knowledge sharing and indivdual empowerment. Dynamic and self-organizing team focusing on continuous improvement and risk management/control with contingency plans.
People (Skills)	Has little or no Agile / DevOps knowledge. No hands-on Agile / DevOps experience.	Overview (basic) Agile / DevOps training provided by organization. Have some hands-on Agile / DevOps experience in some Service teams in one location.	Detailed (standardized) Agile / DevOps training provided by organization. All members in each Service team (across locations) have hands-on Agile / DevOps experience.	Levels of Agile / DevOps expertise and contribution to GCP/knowledge sharing portal are measured by portal owner and reported to Function Head.	Proactively share lessons learned in the GCP/knowledge sharing portal. Frequently refers to GCP/knowledge sharing portal for continuous improvement.

Check List

SONY

Category	#	Evaluation Item	Answer/Expected evidence	AS-IS	After
Service Mgmt. Process	1-1	Service management process documents and training provide sufficient information to understand.	Yes / No		
	1-2	Service level is defined or updated before starting architectural design of platform.	SLA		
	1-3	Requirement was split to 'Request for Change with appropriate scale to release within 4 weeks.	Estimated development period of each RFC		
	1-4	CAB was held in one-month basis.	CAB material / minutes / frequency		
DevOps - Culture	2-1	Development and operation members join 'Service Provider Team'	Org. chart / member location		
	2-2	'Representative of Customer' joins 'Service Provider Team'	Org. chart / member location		
DevOps - Process	3-1	'Service provider Team' can release any change (business projects, infrastructure initiatives, preventative maintenance initiatives and even unplanned work) in 2 weeks to 6 weeks by same release framework.	Weeks from CAB to release	(X-weeks)	(Y-weeks)
	3-2	Feedback process from system operation is established, and feedback items are registered in Backlog.	Backlog (Request, Incident, Problem, User registration)		
DevOps - Tool	Following tools are introduced, then each tool contributed to manpower reduction.				
	4-1	Continuous Integration tool	Yes / No, Name of CI tool,		
	4-2	Continuous testing tool (e.g. test automation)	Yes / No, Name of testing tool		
	4-3	Continuous delivery tool (e.g. version control, release automation)	Yes / No, Name of deployment tool		
	4-4	Infrastructure configuration tool	Yes / No, Name of infrastructure configuration tool		
	4-5	Tools supporting feedback loops and development management tool	Yes / No, Backlog (Request, Incident, Problem, User registration)		

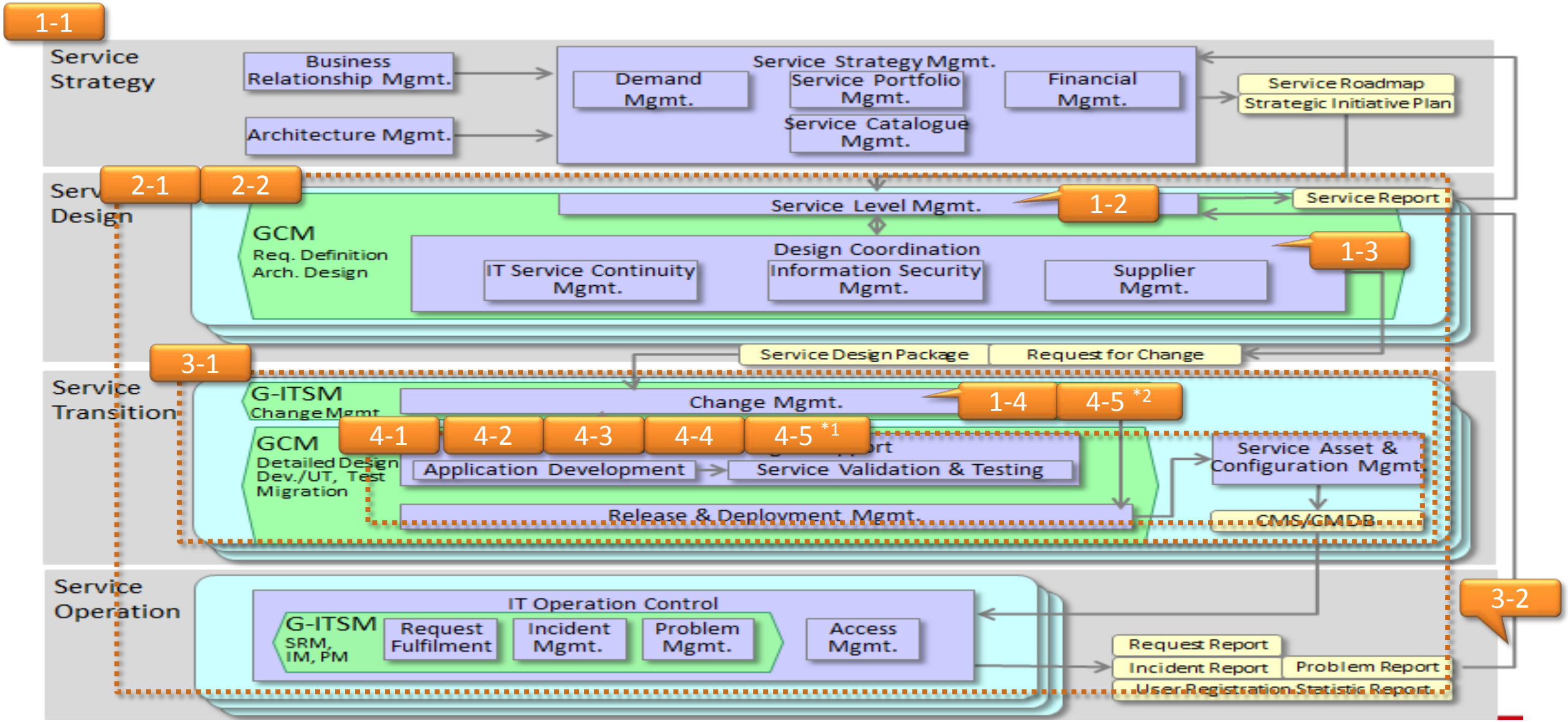
Mapping b/w Evaluation Objective and Check Items

SONY

Objective of Evaluation							Category	#	Evaluation Item
Agility	Leveling of Total FTE	Motivation of S&M members	Cost Reduction	Manpower Reduction	Light Asset	Ease of plugging in/out			
							Service Mgmt. Process	1-1	Service management process documents and training provide sufficient information to understand.
			X					1-2	Service level is defined or updated before starting architectural design of platform.
X	X							1-3	Requirement was split to ‘Request for Change with appropriate scale to release within 4 weeks.
X			X					1-4	CAB was held in one-month basis.
	X						DevOps - Culture	2-1	Development and operation members join 'Service Provider Team'
X								2-2	'Representative of Customer' joins 'Service Provider Team'
X							DevOps - Process	3-1	‘Service provider Team’ can release any change (business projects, infrastructure initiatives, preventative maintenance initiatives and even unplanned work) in 2 weeks to 6 weeks by same release framework.
X		X						3-2	Feedback process from system operation is established, and feedback items are registered in Backlog.
							DevOps - Tool	Following tools are introduced, then each tool contributed to manpower reduction.	
		X		X				4-1	Continuous Integration tool
		X		X				4-2	Continuous testing tool (e.g. test automation)
		X		X				4-3	Continuous delivery tool (e.g. version control, release automation)
		X		X		X		4-4	Infrastructure configuration tool
X		X						4-5	Tools supporting feedback loops and development management tool

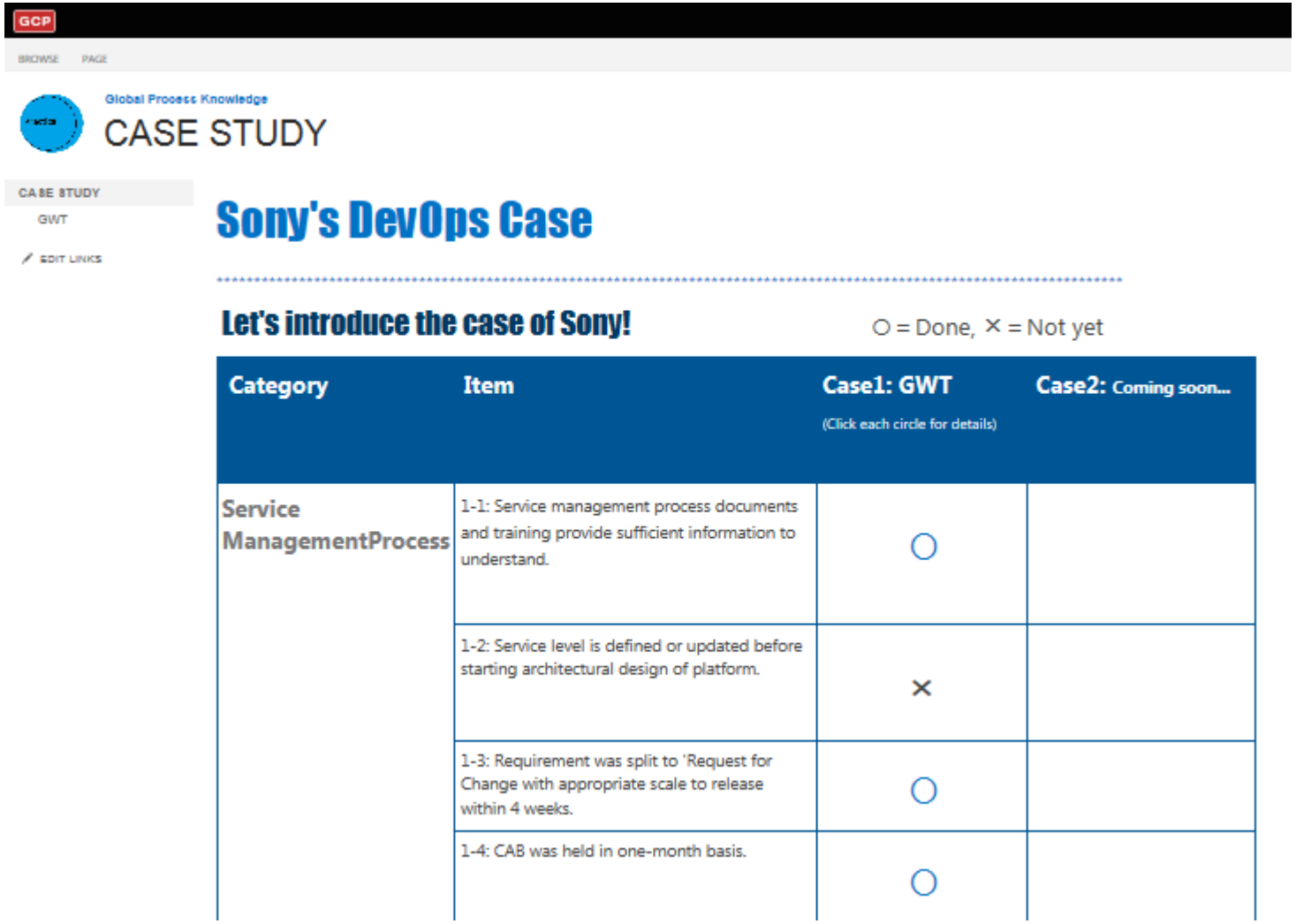
Evaluation Item Positioning

SONY



*1 Development Management Tool *2 Feedback Loops Tool

Check List (case study sample)



Check List (case study sample)

SONY

DevOps - Culture	2-1: Development and operation members join 'Service Provider Team'	○	
	2-2: 'Representative of Customer' joins 'Service Provider Team'	○	
DevOps - Process	3-1: 'Service provider Team' can release any change (business projects, infrastructure initiatives, preventative maintenance initiatives and even unplanned work) in 2 weeks to 6 weeks by same release framework.	○	
	3-2: Feedback process from system operation is established, and feedback items are registered in Backlog.	○	
DevOps - Tool	4-1: Continuous Integration tool	○	
	4-2: Continuous testing tool (e.g. test automation)	×	
	4-3: Continuous delivery tool (e.g. version control, release automation)	○	
	4-4: Infrastructure configuration tool	○	
	4-5: Tools supporting feedback loops and development management tool	○	

DevOps Competency Test

Revision History

SONY

Rev. date	Version	Revision	Description
	1.00		Newly released.
2017/01	1.10		Streamlined the material.