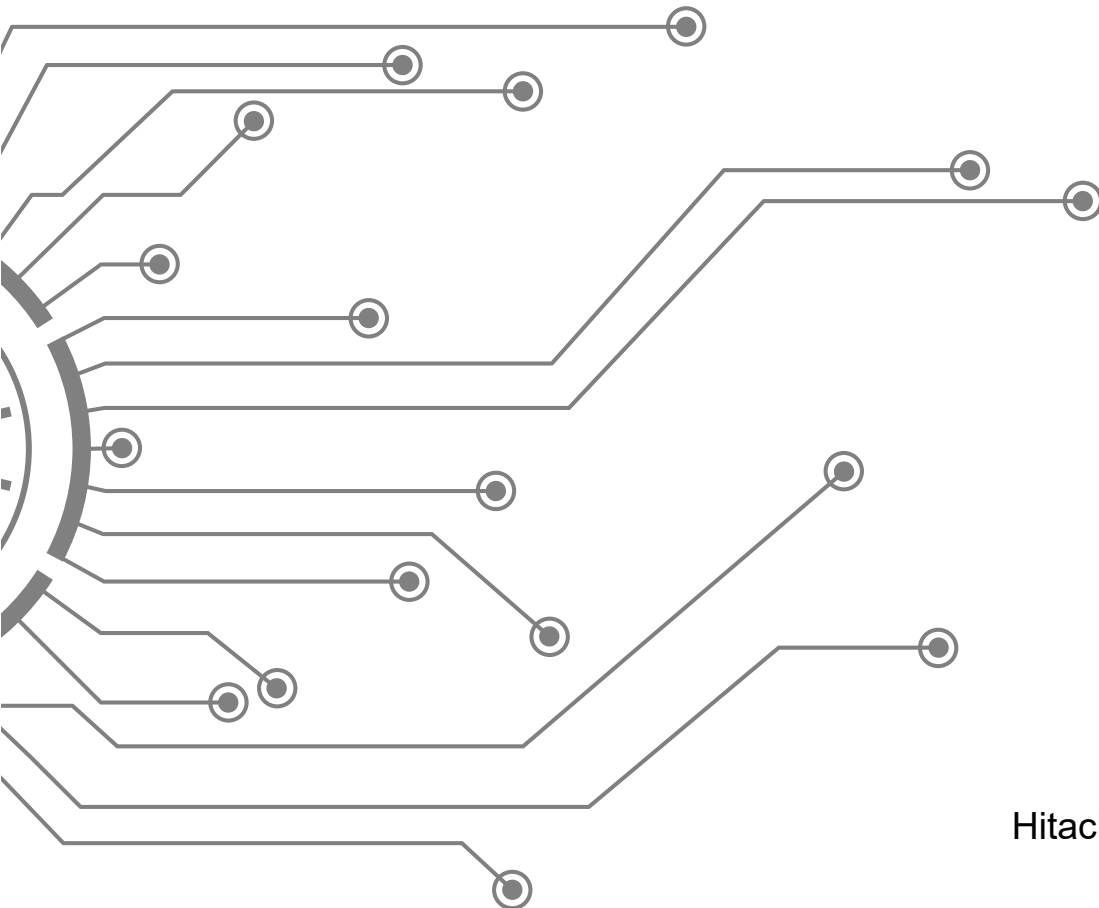


Maturity Assessment & AI TRansformation IndeX

MA-ATRIX



Hitachi, Ltd. / Gen-AX Corp.
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Symbols and abbreviations

Symbols and abbreviations	Meaning
OJT	On-the-Job Training
PLM	Product Lifecycle Management
RAG	Retrieval-Augmented Generation
PoC	Proof of Concept
DX	Digital Transformation
LLMOps	Large Language Model Operations
GenAIOps	Generative AI Operations
KPI	Key Performance Indicator

1. Introduction

1.1. Background and Purpose of MA-ATRIX

With the rapid advancement of generative AI technology in recent years, there are growing expectations for new value creation leveraging generative AI at businesses and organizations. At the same time, implementation of generative AI has been limited to testing of technology or pilot projects at some organizations, and the failure to produce sufficient business outcomes or business transformation is becoming an issue. This is because, though generative AI is easier to use than conventional AI and organizations are able to introduce relevant generative AI, they hit a roadblock when they try to pursue more advanced usage in actual implementation with the same ambiguous operations and judgments as they had been using till then. In other words, to effectively integrate generative AI into operations and produce sustainable results, it is essential to take a multifaceted approach encompassing business process, organizational structure, governance, and risk control in addition to introduction of technology. Currently, there are maturity models and methodology available in the market that can be utilized for introducing generative AI. However, many of them focus on specific parts such as technology introduction and ethical aspects. They do not focus on a systematic approach taking a bird's eye view of the organization. A comprehensive framework targeting the entire organization is necessary for drawing out generative AI's value and realizing business transformation.

Against this background, we are proposing Maturity Assessment & AI TRansformation Index; Generative AI Adaptation Roadmap (MA-ATRIX) in this document. To promote business transformation using generative AI, MA-ATRIX evaluates maturity of an organization based on the extent to which various generative AI-related initiatives (technology introduction, business process, organizational structure, governance, risk management, etc.) are being implemented and offers a framework that facilitates effective business transformation in a phased manner. This will give a clear picture of the optimum approach an organization should take to leverage generative AI to improve business processes and results, and enable it to quantitatively grasp the progress in transformation. It is also aimed at supporting strategic and sustainable utilization of generative AI through sharing of practices that contribute to improving the maturity of the organization.

1.2. Intended Audience

This document is intended for everyone engaged in promoting their business using generative AI. In particular, we are assuming that those with a certain responsibility or role in utilization of generative AI—e.g. those in business planning considering how to utilize generative AI in the organization or those implementing business improvement and transformation leveraging generative AI—will use MA-ATRIX, to understand where they currently stand and the direction they should pursue.

1.3. Utilization of MA-ATRIX

This document is composed of the following three main parts.

- Chapter 2: Scenario for Achieving Business Transformation and Assessment Aspects of MA-ATRIX
- Chapter 3: MA-ATRIX
- Chapter 4: Procedure for Maturity Assessment

In Chapter 2, we describe the events and factors MA-ATRIX includes as its assessment targets as well as events and factors it excludes.

Chapter 3 introduces assessment dimensions, which are the components of MA-ATRIX, and definition of maturity level for each assessment dimension as well as Practices for achieving the maturity levels. It describes information necessary to carry out assessment correctly so that those who actually implement maturity assessment using MA-ATRIX to accurately understand the policies and ideas on which the assessment is based. It also explains the types of Practices the assessed organization should work on next to raise its maturity to higher levels.

In Chapter 4, we introduce in detail the procedure of maturity assessment using MA-ATRIX.

1.4. Copyright and License of MA-ATRIX

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2. Scenario for Achieving Business Transformation and Assessment Aspects of MA-ATRIX

This chapter explains how the business transformation is achieved corresponding to the maturity stage of generative AI utilization defined by MA-ATRIX with examples. It also reveals the events and factors MA-ATRIX includes in or excludes from its assessment target.

2.1. Scenario for Achieving Business Transformation

The examples below use maintenance operation as a scenario to show how operations and organization change as business transformation progresses in stages. In early stages, the operation is dependent on individual engineers and is inefficient. As standardization and utilization of generative AI progresses, operation becomes more efficient and quality improves. Further, as optimization advances, it enables more sophisticated business transformation and value creation as generative AI and people work together.

Maintenance operation, which we have used here as the scenario, denotes operation and management activities for safely and efficiently operating equipment and devices used at factories and facilities. Maintenance includes the following tasks.

- Periodic inspection, troubleshooting: Confirming and diagnosing whether the equipment is operating appropriately. Preventing failure of equipment by exchanging worn parts, cleaning, and confirming its operation.
- Troubleshooting: Identifying the root cause and aiming for early recovery by repairing or replacing parts when a sudden malfunction occurs. For complicated malfunctions, the cause of the failure is investigated by referring to drawings and other design documents.
- Maintenance record: Recording the results of the inspection and the repair history, and preparing data to be utilized for improvement.

The aim of the maintenance operation is to raise the safety of the equipment and minimize disruptions to operation through these tasks. For example, suspension of operation directly affects sales and delivery in the manufacturing industry. Therefore, maintenance operation is an important factor that decides the competitiveness of the business.

These scenarios are aimed at enabling readers to intuitively understand the path to improve maturity level by showing the impact of business transformation on the actual work site scenes. How to proceed with the implementation varies by organization, so it does not necessary mean that these examples should be implemented as they are.

(1) Early stages of business transformation (Fig. 1)

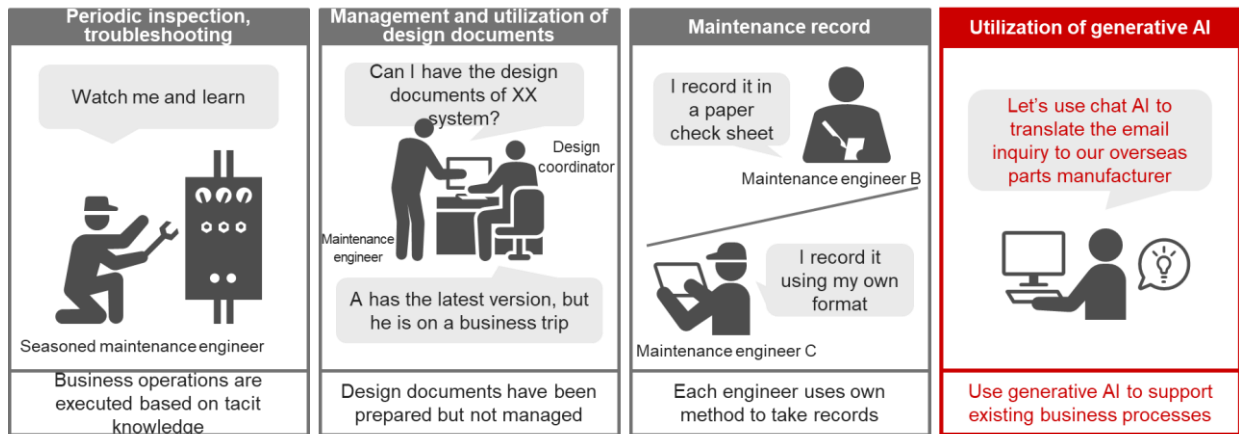


Fig. 1 Early stages of business transformation

- **Periodic inspection, troubleshooting:** The work is carried out primarily based on experience and tacit knowledge of seasoned maintenance engineers. This prevents sharing of knowledge and experience between engineers and it takes a long time for a new worker to become capable of handling the work independently. For example, on-the-Job training (OJT), in which workers learn how to handle the work by observing seasoned engineers at work, has become the norm at work sites.
- **Management and utilization of design documents:** Design documents are not centrally managed and they are left up to a design coordinator. For example, when you are looking for a necessary document, you find that the latest design documents are stored at another department or that only the designer has the required knowledge and other such issues.
- **Maintenance record:** The method of recording is not standardized with one maintenance engineer using paper check sheet while another records it in a file he created on a tablet. This makes it difficult to centrally manage information.
- **Utilization of generative AI:** It is still in the trial phase, with usage limited to assisting part of existing operations. For example, chat AI is used to translate contents of email inquiring about the detailed specifications of parts to an overseas manufacturer.

(2) Stage where standardization and utilization of generative AI have progressed (Fig. 2)

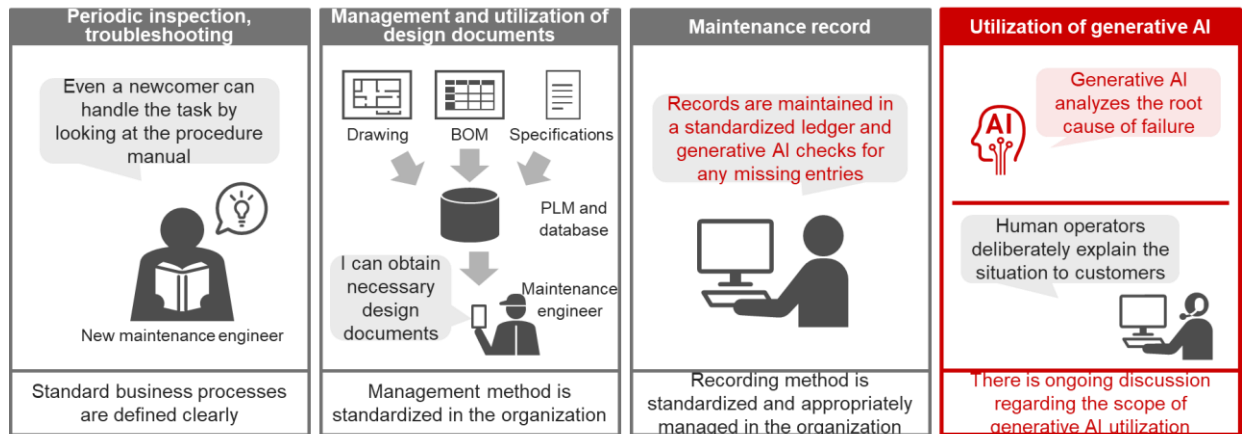


Fig. 2 Stage where standardization and utilization of generative AI have progressed

- **Periodic inspection, troubleshooting:** Business processes and procedure manuals have been developed, and a new maintenance engineer can carry out standard tasks by referring to the manuals.
- **Management and utilization of design documents:** Design documents are stored in Product Lifecycle Management (PLM) and dedicated database and the management method is standardized throughout the organization. Maintenance engineers can acquire necessary design information using a tablet terminal in real time, which improves on-site work efficiency.
- **Maintenance record:** Documentation format is standardized and generative AI assists in checking of recorded contents (checking for omissions and deficiencies). This improves quality of maintenance record and reduces the workload of input.
- **Utilization of generative AI:** The scope of application of generative AI is discussed and it is utilized in the right way at right places. For example, generative AI analyzes the cause of failure in maintenance operation and a human operator explains it to the customer, advancing cooperation leveraging the features of generative AI.

(3) More advanced business transformation and value creation (Fig. 3)

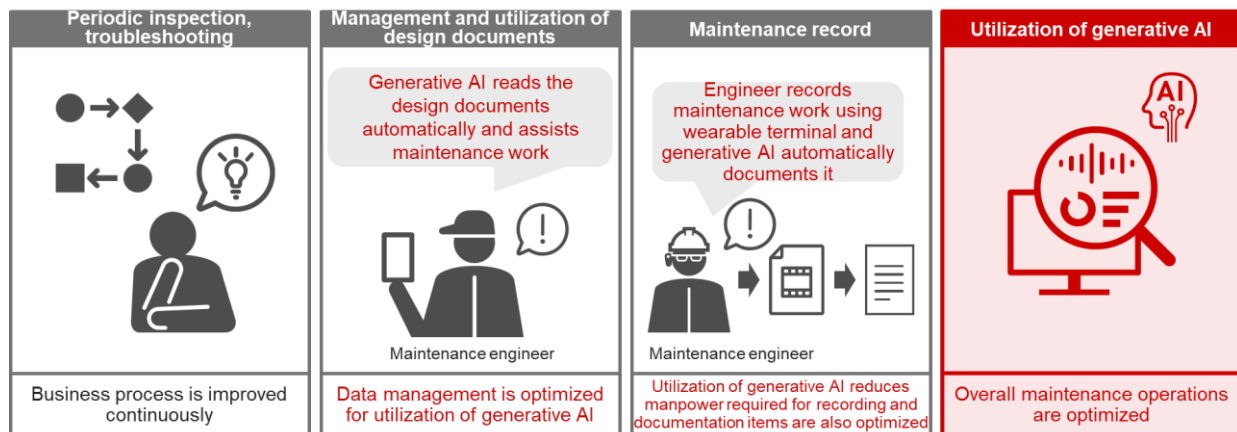


Fig. 3 More advanced business transformation and value creation

- **Periodic inspection, troubleshooting:** Business processes and manuals are being improved continuously based on data from maintenance records, etc., and operations are being implemented more efficiently.
- **Management and utilization of design documents:** Method for managing design documents has evolved further, with generative AI automatically analyzing design information and assisting maintenance work. For example, generative AI identifies the root cause of equipment failure and provides the necessary repair process and related design documents to the maintenance engineer.
- **Maintenance record:** Generative AI reduces workload of documentation. For example, the organization introduces a mechanism that utilizes wearable terminals and IoT devices for automatic recording of maintenance work. Generative AI optimizes recording items (what to be recorded) and efficiently sorts out required information.
- **Utilization of generative AI:** Overall maintenance operations are optimized. Humans and generative AI leverage their respective strengths and implement works in close cooperation. For example, generative AI carries out the operations ranging from failure diagnosis to proposal of work instruction and humans focus on especially important decision making and other complicated tasks.

2.2. Application Target and Scope of Generative AI

When applying generative AI to business operations, the optimum answer to the question of which operations are to be entrusted to generative AI, and to what extent, differs depending on use case, and needs to be judged carefully. This judgment is made based on features of individual operations such as the importance of the business operation and its impact on customers. For example, a luxury hotel may utilize generative AI for standard services such as bookings and tourist information to improve efficiency, while a concierge attends to special requests by VIP guests and offers detailed personal services with emphasis on guest experiences and hospitality. In this manner, the scope of application of generative AI needs to be judged depending on the nature of the business operation. So, it does not necessarily mean that it is better to entrust a broader range of work to generative AI.

MA-ATRIX does not use the extent to which generative AI is applied in business operations as an assessment criterion. Instead, it focuses on whether the organization is deciding the scope based on sound reasoning.

2.3. Technological Level of Generative AI

There are various types of generative AI ranging from the basic types including chatbots to sophisticated AI agents, which autonomously execute complicated tasks. However, the appropriate technology levels differ depending on the operations and use cases, and will change according to the purpose of use, cost effectiveness, stability and reliability of the technology, need for future expansion, and other such conditions. For example, while chatbot is sufficient for handling simple inquiries, a more

sophisticated AI agent may be needed to assist in complex decision making.

MA-ATRIX does not use the level of technology itself as a metric for maturity. Instead, it places emphasis on whether the organization is selecting and utilizing generative AI with a technology level appropriate for the purpose of the organization or the business operation.

2.4. Selection of Generative AI Models and Services

There are various generative AI models and services available, and in some cases, organizations develop and utilize their own models. There also are various methods such as prompt engineering, retrieval-augmented generation (RAG), fine-tuning, distillation, and model structure development. Moreover, when generative AI fails to produce sufficient accuracy, one can narrow the scope of application of generative AI, and supplement the remaining parts with regular programs or models other than generative AI. The most optimum selection of these models and the depth of their utilization differ depending on the business purpose, resources, and required accuracy.

MA-ATRIX focuses on whether the organization is selecting appropriate models and services depending on the purpose, and managing and assessing them, instead of whether it is using more sophisticated models and services.

3. MA-ATRIX

MA-ATRIX is made up of the following four components:

- **Assessment dimensions:** Aspects required for multifaceted assessment of an organization's initiatives regarding generative AI utilization. It sets forth seven dimensions.
- **Maturity levels:** It assesses the level of evolution of the organization's generative AI utilization for each assessment dimension using a seven-grade scale from Level 0 to 6. Each level indicates the growth process of the organization in steps from the stage of initial efforts to company-wide optimization and autonomous optimization by AI.
- **Goals:** It clearly defines as Goals the specific states and outcomes that should be met by the organization in each assessment dimension and maturity level. Goals present the specific states the organization should aim to realize.
- **Practices:** MA-ATRIX defines concrete initiatives and actions toward achieving Goals as Practices. Practices are the guidelines for measures and action plans which an organization needs to implement at each level.

As explained, MA-ATRIX has Goals and Practices for each combination of assessment dimension and maturity level, and offers a framework that supports the entire process from diagnosis of the current state of an organization to staged growth as well as formulation of detailed actions for business transformation. We will explain assessment dimensions and maturity levels in detail in 3.1 and 3.2, respectively. From 3.3 onwards, we will describe Goals and Practices for each level of each assessment dimension.

3.1. Assessment Dimensions

MA-ATRIX sets forth assessment dimensions for seven elements required by an organization to carry out business improvement and transformation utilizing generative AI, and assesses the maturity in a multifaceted and phased manner.

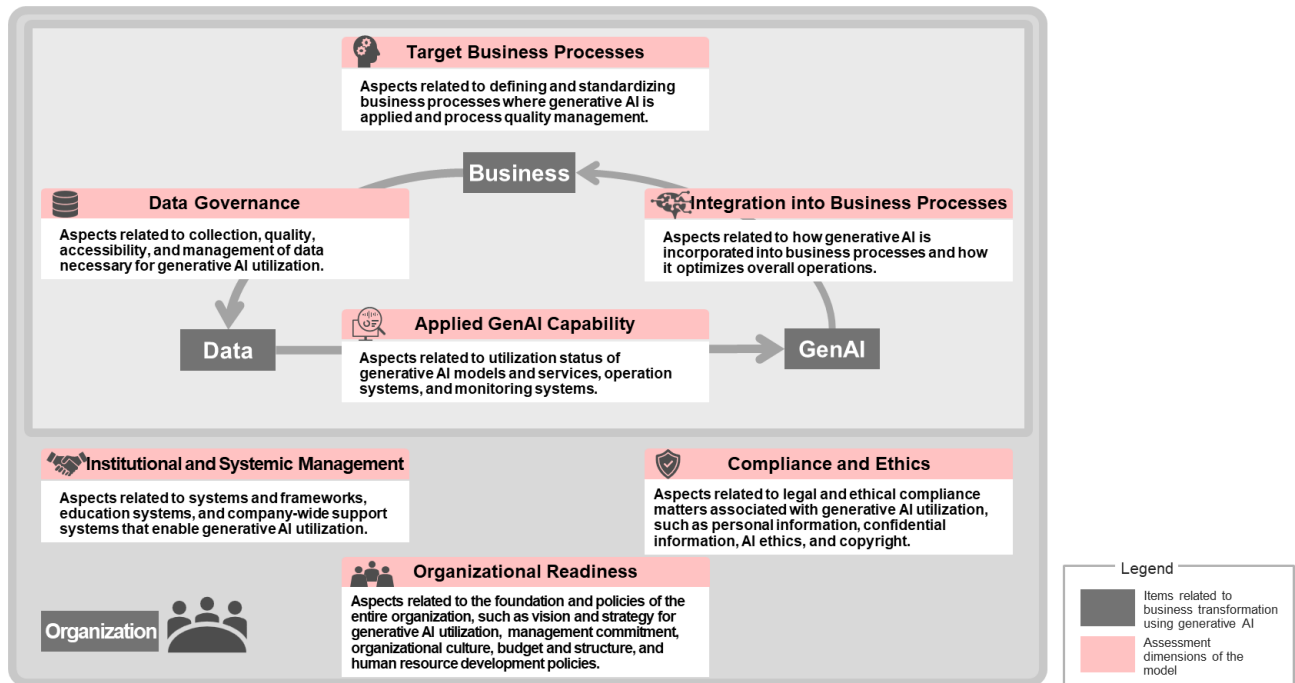


Fig. 4 Composition of assessment dimensions of MA-ATRIX

Fig. 4 shows the structure of items related to business transformation utilizing generative AI. An organization, which is the entity utilizing generative AI, has multiple business operations being carried out simultaneously. These business operations have a circular structure: Each operation accumulates data such as manuals and ledgers, which is then incorporated into models, etc. of generative AI, and finally generative AI is utilized in each business operation. For this structure, MA-ATRIX set forth seven assessment dimensions: **Organizational Readiness**, which is an assessment dimension, and **Institutional and Systemic Management** and **Compliance and Ethics**, which are assessment dimensions related to organization, and **Target Business Processes**, **Data Governance**, **Applied GenAI Capability**, and **Integration into Business Processes**, which are assessment dimensions regarding utilization of generative AI. These assessment dimensions enable organizations to assess its maturity in utilization of generative AI in a multifaceted and composite manner.

Both **Target Business Processes** and **Integration into Business Processes** are assessment dimensions related to business processes. The former assesses the maturity as to what extent the business processes have been standardized and optimized, while the latter assesses the maturity as to what extent generative AI has been integrated into the business processes. It is important to make a clear distinction between them in business transformation using generative AI. If they are not handled separately, it could become difficult to separate the issues in the Target Business Processes side from those in the Integration into Business Processes side, which may cause issues such as generative AI

getting integrated in a business process that is immature and not producing the desired effect.

Table 1 Assessment dimensions of MA-ATRIX

Assessment Dimensions	Aspects and assessment targets
Organizational Readiness	<p>[Aspects] Aspects related to the foundation and policies of the entire organization, such as vision and strategy for generative AI utilization, management commitment, organizational culture, budget and structure, and human resource development policies.</p> <p>[Assessment targets] Utilization of generative AI requires development of organizational infrastructure as well as nurturing of management attitude and culture for supporting transformation. Therefore, MA-ATRIX focuses on management leadership needed for promoting utilization of generative AI, organization-wide structure for driving forward the transformation, fostering psychological safety, and policy for securing and nurturing specialized human resources.</p>
Institutional and Systemic Management	<p>[Aspects] Aspects related to systems and frameworks, education systems for all employees, and organization-wide support systems that enable generative AI utilization.</p> <p>[Assessment targets] It assesses whether these systems and mechanisms are organically collaborating with the work site utilizing generative AI and contributing to establishment and expansion of generative AI utilization. The assessment looks for the existence of an environment for utilizing generative AI, which is a prerequisite.</p>
Compliance and Ethics	<p>[Aspects] Aspects related to legal and ethical compliance matters associated with generative AI utilization, such as personal information, confidential information, AI ethics, and copyright.</p> <p>[Assessment targets] It assesses whether there is a consistent organization-wide compliance structure as well as the education and operation statuses. The assessment targets not only compliance with laws and regulations and information security but also risks unique to generative AI, AI ethics, copyrights, and relationships with external stakeholders to assess the development and operation of a wide-ranging and practical compliance structure.</p>

Assessment Dimensions	Aspects and assessment targets
Target Business Processes	<p>[Aspects] Aspects related to defining, standardizing, and quality management of the processes of the business operation targeted for generative AI utilization.</p> <p>[Assessment targets] To apply generative AI to business operations, the target business processes have to be clearly defined and the procedures, deliverables, and management method should be organizationally developed and operated. These are the prerequisites. This assessment, therefore, targets whether business processes have been developed to serve as the base for generative AI utilization. In other words, it assesses whether business processes exist, their maturity as well as their standardization and management status. Therefore, whether the organization is actually utilizing generative AI in its business operations is outside the scope of this assessment dimension. Further, the status of integration of generative AI into business processes is assessed separately in the assessment dimension of Integration into Business Processes.</p>
Data Governance	<p>[Aspects] Aspects related to collection, quality, accessibility, and management of data necessary for generative AI utilization.</p> <p>[Assessment targets] This dimension targets the purpose and structure of data collection, quality standards, and risk management, and attaches importance to maturity level of data environment, which is the base of generative AI utilization. Taking into consideration the fact that data form the foundation for value creation and business transformation using generative AI, the dimension's important assessment targets include the purpose and structure of data collection, quality standards, establishment of appropriate access authority, response to laws and regulations and contract conditions, and management of risks arising from data utilization to assess whether the organization has been able to manage and utilize highly reliable data continuously according to the purposes.</p>

Assessment Dimensions	Aspects and assessment targets
Applied GenAI Capability	<p>[Aspects] Aspects related to utilization status of generative AI such as selection, operation, monitoring, and assessment of generative AI models and services.</p> <p>[Assessment targets] The dimension assesses, in a systematic manner, whether the organization is capable of appropriately selecting, operating, and managing optimum generative AI technologies and services for respective business operations and purposes as well as the maturity level of the structure and process. This enables to assess whether the organization is selecting generative AI technologies appropriate for its tasks and goals and whether it is continuously utilizing and improving them.</p>
Integration into Business Processes	<p>[Aspects] Aspects related to how generative AI is incorporated into business processes and how it optimizes overall business operations.</p> <p>[Assessment targets] Utilization of generative AI often ends up being limited to individual introduction or partial application if the overall business operations are not optimized. For this reason, in terms of assessment targets, MA-ATRIX attaches importance to whether target business processes have been developed on the premise of generative AI utilization, and whether they are integrated and managed throughout the business operations, in order to assess how utilization of generative AI has spread across the entire organization from the aspects of business process redesign and optimization of overall business operations.</p>

3.2. Maturity Levels

MA-ATRIX assesses the development level of generative AI utilization using a seven-grade scale from Level 0 to 6. Maturity levels start from the level where it is yet to be developed and gradually develops to formulation of policies and manuals, standardization, quantified management, continued optimization, and autonomous optimization by AI. Assessment is carried out based on the level of achievement of goals defined for each level of respective assessment dimensions. This enables the organization to grasp the current state of generative AI utilization and clarify the next goals and concrete initiatives to be taken. Table 2 shows a list of the maturity levels.

Table 2 MA-ATRIX maturity levels

Level	Definition
Level 0: Incomplete	The organization is not utilizing generative AI or is unaware of whether generative AI is being used.

Level	Definition
Level 1: Implemented	The organization has begun taking action. Reproducibility is lacking due to person-dependent and ad-hoc implementation.
Level 2: Managed	The basic policy and procedures regarding generative AI utilization have been documented and management and person in charge have been made clear. Minimum management functions are operational.
Level3: Defined	Company-wide standards and processes regarding generative AI application are systematized, allowing consistent operations throughout the organization.
Level 4: Managed Quantifiably	Process of generative AI utilization and performance goals and metrics have been defined quantitatively and the organization is implementing quantitative analysis, management, and continued improvement.
Level 5: Optimized	Continuous optimization is conducted organizationally, enabling rapid responses to changes
Level 6: Autonomously Optimized by AI	AI autonomously performs data analysis, makes decisions, optimizes business processes, and makes improvement proposals to generate optimal outcomes.

Level 5 denotes a state where organizational improvement is being made continuously. However, the authority to make the final decision on the corrections needed for the improvements remains with humans, with AI playing the role of assisting the person who makes the decision. On the other hand, Level 6 is a stage where AI autonomously carries out continuous improvement. The authority to decide on improvement is entrusted to AI and it is a situation where the improvement progresses automatically without the need for human intervention. However, Level 6 still requires a framework where humans can confirm the improvement process carried out by AI and its decision making and intervene when errors occur.

For this reason, in MA-ATRIX we consider that it is important to assess maturity from aspects different from conventional perspectives in the process of reaching a state where Level 6 can be achieved. Therefore, currently we do not have a detailed definition of Level 6 for each assessment dimension and plan to reflect the outcome of future discussions in upcoming revisions of MA-ATRIX.

3.2.1. Maturity Level Improvement Scenarios

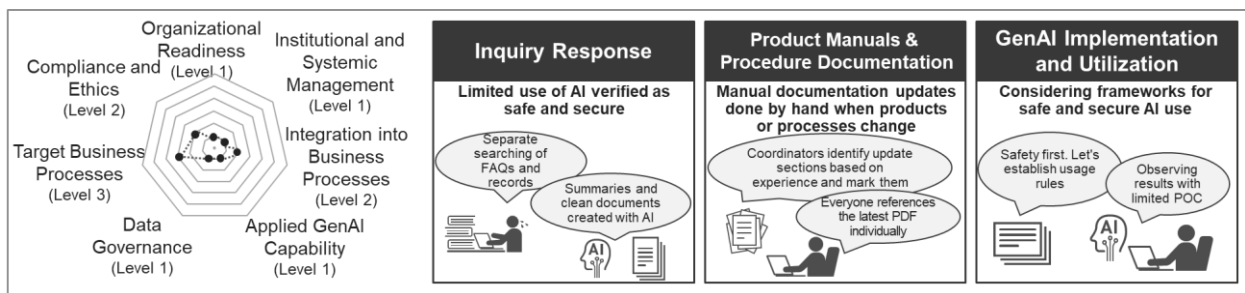
The examples below give a rough idea of how business operations and the organization change along with the improvement in maturity levels for each assessment dimension defined by MA-ATRIX at a company whose sales support center responds to customer inquiries regarding product details, inventory confirmation, purchase request, and defects. In early stages of generative AI implementation, utilization of generative AI is limited because business operations are mainly handled by humans. The scope of generative AI utilization expands as data development and formulation of rules and mechanisms for AI

utilization progress. Operations become more efficient and quality improves as AI replaces humans in business operations and humans take on the role of managing and supervising AI.

These scenarios show the relationship between maturity levels and the corresponding business operations, and how the business operations change as the maturity level improves using actual work site scenes. This is merely one example and it does not necessarily mean that companies need to implement it as described here.

(1) Early Stages of Generative AI Implementation

(



(2) Fig. 5)

The center used to prepare product manuals and procedure manuals at the time of replacement of products or changes to business operations, and humans used to confirm that using FAQs and ledgers to handle inquiries. It introduced generative AI with confirmed safety and reliability in the partial business operation of preparing cover letters (implemented as Proof of Concept).

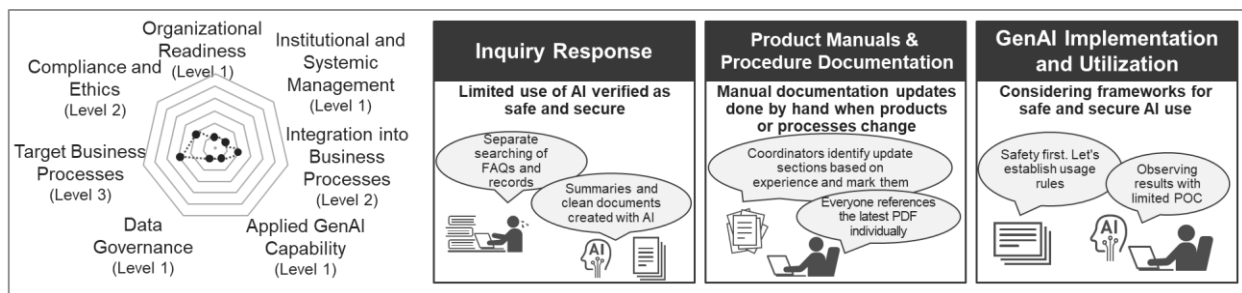


Fig. 5 Early stages of generative AI Implementation

(3) Highly Optimized for Generative AI (Fig. 6)

Along with preparing product manuals and procedure manuals for generative AI utilization, the center introduced generative AI to search the manuals and create response letters. It introduced an automatic response system as it prepared a mechanism for continuous assessment of the accuracy of generative AI and switching of data while accumulating data to be used for improving the accuracy. The center promotes continuous improvements to make business operations more advanced and autonomous.

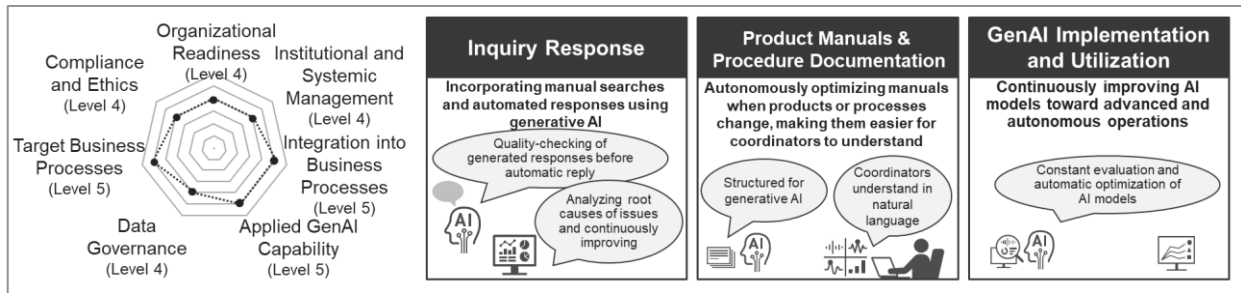


Fig. 6 Highly optimized for generative AI

3.3. Assessment Dimension 1: Organizational Readiness

This assessment dimension assesses, in terms of organizational activities related to generative AI, whether the organization has set a clear vision, whether it is working on these as part of its business strategy, whether the management is proactively involved in these, whether it has assigned human resources in and outside the organization, and whether organizational culture has been developed. Establishing a base for utilizing generative AI and acquiring necessary knowledge are prerequisites for an organization to drive forward its business by realizing business processes that utilize generative AI. It is, therefore, important to improve individual elements that make up the organizational activities and management in an integrated and composite manner.

3.3.1. Organizational Readiness: Level 0

State

- The organization is not utilizing generative AI or is unaware of whether generative AI is being used.

3.3.2. Organizational Readiness: Level 1

Goals

- The organization has indicated utilization of generative AI as a management policy and has begun considering utilizing it in the organization.
- The organization has made investments in generative AI utilization and implements POC measures when there is an opportunity.

Practice examples

- Obtain information regarding generative AI utilization methods from external stakeholders.
- Consider generative AI utilization in each new initiative and start from the POC level.
- Maintain at least a minimum level of record of results and learning from POC and use that record for reference.

3.3.3. Organizational Readiness: Level 2

Goals

- The organization has documented the basic policy regarding generative AI application. When implementing various projects, it appoints a person in charge of the project, considers how to utilize generative AI in accordance with the basic policy, and introduces it.
- The organization manages the scope of application of generative AI and documents the technology that was adopted in individual projects and what kind of outcomes they produced.

Practice examples

- As basic policy regarding utilization of generative AI, sort out the targets, approaches, improvements from introduction, budget application method, examples of adopted technologies,

and how to utilize external stakeholders based on existing system introduction policy and DX policy.

- Upon utilization of generative AI, form a project, assign members, and implement activities in a systematic manner.
- Formulate a human resource development plan for generative AI experts and visualize the human resources, the capabilities they possess, and the roles they play in utilization and promotion of generative AI.
- Prepare project management ledgers and manage them so as to enable listing of the scope, budget, benefits, and risks.

3.3.4. Organizational Readiness: Level 3

Goals

- The organization has defined a strategic roadmap and a reform plan for business, service, etc. regarding generative AI utilization, which are consistent with its business strategy. These have been well-established and communicated to the employees with support from the management, and it is possible for them to take on the challenge of utilization of generative AI with a certain level of psychological safety.
- The organization has allocated budget and resources to utilization of generative AI according to its business strategy, and has a standardized process for considering introduction and operation of generative AI.
- It has developed a standardized process for responding to problems that occurred in the process of generative AI utilization in accordance with risk management and incident response plans. The organization has a structure and culture of reflecting on the problems, learning from it, and making improvements.

Practice examples

- Review the introduction of generative AI, budget it, respond to risks and incidents, develop standard processes for reflection and learning, and clarify responsibility assignment matrix (RACI).
- Formulate a strategy for leveraging external stakeholders who conform to the organization's business strategy, envision the ideal form of the business and services where generative AI is appropriately adopted, and give shape to the business process reform plan.
- Reflect the business strategy on to the human resource development plan for generative AI experts and sort out the schedule and method to acquire and nurture required human resources looking ahead to the future.
- Develop standard processes and structure for responding to problems, make employees share risks and concerns regarding utilization of generative AI, feedback to generative AI utilization strategy, and develop an environment for improving the next initiative.

3.3.5. Organizational Readiness: Level 4

Goals

- The organization has defined the metrics for achieving the business strategy according to the goals of generative AI utilization and analyzed them statistically, and has assessed the cost of generative AI application and the impact on business strategy.
- It quantitatively assesses the implementation status of generative AI utilization including failures and review of outcomes, measures the impact of improvement, and utilizes them to review business strategy.

Practice examples

- Define the metrics for measuring the effectiveness of generative AI in businesses and services, assess the impact of utilization strategy, and use it as the grounds for the next budget formulation.
- Define the metrics for measuring the effectiveness of external stakeholder utilization, assess the impact of the utilization strategy, review the segregation of roles with external stakeholders, and use it as the grounds for reviewing request details.
- Define the metrics for measuring whether the generative AI experts promote business transformation adequately, assess the impact of the human resource development plan, and use it as the grounds for the review of required human resources for the future.

3.3.6. Organizational Readiness: Level 5

Goals

- Based on the result of the analysis of organization-wide generative AI utilization cost and its impact on business strategy, the organization is swiftly making the decisions for optimization from the financial and management perspectives with proactive involvement of the management layer.
- It reviews generative AI utilization including failures, continuously implements the PDCA cycle, and evolves the generative AI utilization strategy and its implementation while improving the organization-wide psychological safety.

Practice examples

- Visualize the contribution of generative AI as part of business and service assessment and discuss its contributions to achievement of management goals using management dashboard or at a management board meeting, and brush up the generative AI utilization strategy for boosting financial values and management values based on the project-wide assessment results within the business.
- Assess the outcome of generative AI cooperation with external stakeholders in real time from multiple aspects and consider maintenance of relationship and cooperation measures for more sophisticated utilization so as to optimize the effective utilization of external stakeholders'

expertise and that of internal knowledge and business operation know-how.

- Taking into account the cooperative relationship with external stakeholders and the level of progress in generative AI technologies, review the skill capabilities of generative AI experts, the training methods for acquiring them and the external human resource hiring strategy, and establish the methodology for internal human resources to maintain high expertise.

3.4. Assessment Dimension 2: Institutional and Systemic Management

Institutional and Systemic Management in this context denotes systematic and operational framework such as structures, rules, education, and operation integration required for promoting generative AI utilization in the organization in a continuous and effective manner. In early stages, systems and mechanisms are not developed and the organization has not grasped the status of generative AI utilization. As it matures, the organization starts grasping the utilization status and developing the support structure. Implementation of organization-wide standardization and education program as well as system integration into business process will also make progress. Further, the organization quantitatively evaluates operation status of systems and mechanisms as well as effect of education and continuously implement improvement activities. Ultimately, AI autonomously monitors and analyzes the operation status of systems and mechanisms and the organization will have a structure where AI and humans work together to promote optimization. Through this staged development, the organization is sought to raise the consistency and efficiency of generative AI utilization and build a foundation that supports organization-wide business transformation.

3.4.1. Institutional and Systemic Management: Level 0

State

- The organization is not utilizing generative AI or is unaware of whether generative AI is being used.

3.4.2. Institutional and Systemic Management: Level 1

Goals

- The organization is utilizing generative AI for part of its business operations and has developed individual procedures and rules on a practical level.

Practice examples

- Utilize generative AI in part of business operations based on on-site decision.
- The division or team in charge stipulates the rules and procedures regarding generative AI utilization and apply it in their business operation.
- The person in charge unofficially grasps information regarding utilization status of generative AI and shares it with concerned parties as necessary.
- Share knowledge and skills related to generative AI utilization orally or through OJT at work sites.

3.4.3. Institutional and Systemic Management: Level 2

Goals

- The mechanism to grasp how generative AI is utilized and in which business operations of the organization, has been established and the organization has begun implementing management of utilization status.
- Some divisions have a structure in place to support generative AI utilization and the segregation of roles have been made clear.

Practice examples

- The supervisor periodically confirms the utilization status of generative AI and records and sorts out the business operations and the divisions that utilize it.
- Allocate personnel or teams in charge of supporting generative AI utilization at some divisions to support operations on site.
- Share information regarding generative AI utilization among concerned parties to promote visualization of utilization status in the organization.
- Clarify the roles and scope of responsibility in generative AI utilization support and collaborate with business operations.

3.4.4. Institutional and Systemic Management: Level 3

Goals

- The procedures for introduction, utilization, and maintenance of generative AI are internally defined and standardized.
- The role of promoting generative AI utilization is made clear throughout the organization and the support structure is in place.
- The organization has a systemized education program on generative AI utilization for all employees, which is continuously implemented.
- The systems and mechanisms have been integrated into business processes and transparency of generative AI utilization is ensured.

Practice examples

- Develop usage procedure and use environment (security, access management, etc.) of generative AI in the organization.
- Allocate personnel or teams in charge of supporting generative AI utilization throughout the organization and clarify their roles and responsibilities.
- Formulate standardized procedures and rules regarding utilization of generative AI, communicate that to all employees, and implement them.
- Design and implement systematic education program for all employees and promote appropriate utilization of generative AI.
- Compile generative AI utilization status (divisions, purposes, frequency, outcomes, etc.) on a

regular basis and ensure transparency by sharing the result with concerned parties.

3.4.5. Institutional and Systemic Management: Level 4

Goals

- The operation status of systems and mechanisms regarding utilization of generative AI are quantitatively assessed and the outcome is utilized for making improvements.
- The effect of the education program is quantitatively assessed and the outcome is leveraged to improve employees' AI skills.
- The status of compliance with the systems and mechanisms is grasped quantitatively and shared within the organization.

Practice examples

- Assess the operation status and effect of the systems and mechanisms (e.g. generative AI utilization rate and rate of business efficiency improvement) using quantitative metrics and analyze and report the outcome on a regular basis.
- Grasp the attendance rate of the education program and the results of the comprehension tests in figures and utilize them to improve the program.
- Periodically monitor the compliance status of the systems and mechanisms and take corrective measures when violation or deviation is found.
Share the quantitative assessment results with the involved divisions and the management layer and utilize them to improve the systems and review the education policy.

3.4.6. Institutional and Systemic Management: Level 5

Goals

- The systems and mechanisms regarding utilization of generative AI are continuously reviewed and the review results are contributing to improvement in the quality of business processes and deliverables.
- The education program is updated to address latest technology trends and business operation needs and its contents contribute to improvement in employees' skills.
- The systems and mechanisms are integrated throughout the organization and are contributing to optimization of generative AI utilization.

Practice examples

- Carry out periodic reviews and improvement activities based on the operation status and assessment results of the systems and mechanisms.
- Update the contents of the education program to reflect technology trends and business operation issues and offer it once again to employees.
- Share improvement examples of the systems and mechanisms and best practices throughout the organization and promote their expansion to other divisions.

- Analyze the relationship between the development status of the systems and mechanisms and business operation outcomes and clarify the direction to be taken to improve the system.
- Confirm the integration status of the systems and mechanisms throughout the organization and coordinate to prevent duplications and omissions.

3.5. Assessment Dimension 3: Compliance and Ethics

Compliance and Ethics denotes efforts related to laws and regulations, rules, ethics, internal policies, etc. the organization should adhere to upon utilization of generative AI. Compliance and Ethics in this context is efforts on systematically developing and operating measures to comply with laws and regulations, rules, ethics, and internal policies regarding utilization of generative AI. In early stages, policies and ethical codes are yet to be established and the organization's responses to laws, regulations, and copyrights are on a case-by-case basis and fragmented. As it matures, the organization will formulate standards and procedures aimed at addressing critical risks and develops and operates integrated rules throughout the organization. The organization will become able to quantitatively assess the response status, collaborate with external stakeholders, and swiftly adapt to law amendments, and ultimately have an established structure where AI autonomously detects and responds to the risks. The organization is required to ensure reliability and social responsibility in utilization of generative AI through this phased development.

3.5.1. Compliance and Ethics: Level 0

State

- The organization is not utilizing generative AI or is unaware of whether generative AI is being used.

3.5.2. Compliance and Ethics: Level 1

Goals

- Awareness regarding the necessity of addressing risks, laws and regulations, and ethics pertaining to utilization of generative AI is shared to a certain extent within the organization.
- Handling of personal information, confidential information, copyrights, and AI ethics are being carried out individually by employee or job based on their own judgment and experience.
- The organization has begun considering the direction of responses by referring to advanced cases and insights from outside the organization.

Practice examples

- Deepen awareness of risks associated with utilization of generative AI and the necessity to take actions through divisional meetings and information sharing.
- Exchange information with businesses and organizations with advanced generative AI utilization and gather and share insights and compliance-related actions.
- Consider an integrated internal response method by referring to collected external cases.

- Each employee or each job takes care to not input personal information or confidential information in generative AI.
- If there are concerns from the perspectives of copyrights and laws and regulations regarding the contents of the output, employees individually investigate and confirm the contents, and work together with relevant divisions if necessary.
- Confirm and adjust output of generative AI keeping in mind the basic concept of AI ethics (fairness, elimination of prejudice, prevention of misinformation, etc.).

3.5.3. Compliance and Ethics: Level 2

Goals

- The organization has formulated individual policies and code of ethics regarding personal information, confidential information, copyrights, AI ethics, laws and regulations, etc. to respond to critical risks associated with utilization of generative AI.
- The organization is managing compliance status of the formulated standards and procedures.

Practice examples

- Formulate standards and procedures for addressing personal information, confidential information, copyrights, AI ethics, and other laws and regulations.
- Document the policy regarding input and output of generative AI and make it available for reference during business operations.
- Define the criteria for distinguishing personal information and confidential information and establish rules regarding information handling.
- Record and grasp the utilization status of generative AI based on the formulated standards and procedures and grasp the compliance status.
- Explain the content of the formulated rules to divisions and employees using generative AI and promote implementation.

3.5.4. Compliance and Ethics: Level 3

Goals

- Necessary policy and code of ethics are comprehensively established and uniformly operated in the organization.
- The formulated policy and code of ethics are reflected in the activities involving utilization of generative AI.

Practice examples

- Uniformly establish regulations related to personal information management and handling of confidential information and apply them throughout the organization.
- Systematize the regulations related to AI ethics and share them throughout the organization.
- Uniformly define the procedures for responding to copyright and laws and regulations and

reflect them in the business operations.

- Standardize the criteria for determining personal information and confidential information and set forth the method to operate them throughout the organization.
- Define the response processes in the event of any violations to the formulated regulations and clearly designate the coordinator for response.
- Provide necessary support and coordination to enable each department to utilize generative AI in accordance with the unified regulations.

3.5.5. Compliance and Ethics: Level 4

Goals

- The organization's policy and code of ethics are accurately and reliably reflected in the activities involving generative AI utilization and the response status is quantitatively assessed.

Practice examples

- Use quantitative metrics to assess the management status and risk mitigation initiatives regarding personal information, confidential information, AI ethics, copyright, and other laws and regulations.
- Grasp the compliance status and improvement trends at each department based on the assessment metrics and push for responses as needed.
- When utilizing models and data in which external stakeholders are involved, confirm and assess the status of compliance with the organization's own policy and code of ethics.
- Based on the assessment results, identify what needs to be improved in the compliance structure and share it with involved departments.
- Continuously operate the assessment mechanism to raise the effectiveness of compliance response at the organization.

3.5.6. Compliance and Ethics: Level 5

Goals

- Vision and policy regarding generative AI utilization are continuously reviewed and optimized so as to adapt promptly to organizational changes and external environment.
- The organization has established a system that can swiftly respond to amendment to the laws and changes in external environment and the compliance level is constantly improved.

Practice examples

- Anticipate changes in international situation, amendments to laws, technological trends, and other such changes, and review the policy and code of ethics as needed.
- Swiftly reflect the revised regulations on the business processes that use generative AI.
- Consider the risks of restrictions on use of specific models or data or their discontinuation, and take countermeasures including alternative methods depending on the importance.

- Record and manage the update history of regulations and response status and utilize that for continuous improvements.
- Document the judgment criteria and update flows to respond to changes in the external environment and share it with concerned parties.

3.6. Assessment Dimension 4: Target Business Processes

This dimension refers to the initiative to develop, in stages, the definition, standardizing, management, and improvement of business processes where generative AI is utilized. In early stages, while there are business operations, the procedures and flow are not documented and the reproducibility of deliverables is low. As the organization matures, it documents and shares the business process, and the business operation will be implemented in accordance with standardized procedure. Further, the organization is quantitatively assessing implementation status of the process and the quality of the deliverables and it is organizationally carrying out continuous improvement activities. Ultimately, the organization establishes a system where AI autonomously monitors and analyzes the business process and collaborates with humans to continuously implement optimization. The organization is required to build the foundation for effective utilization of generative AI and business transformation through these staged developments.

Also, the target of this assessment dimension is the initiative towards utilization of generative AI. Whether generative AI is utilized or not is assessed under another dimension, and considering that point, be aware that this could be Level 2 or higher if the business process management, etc. are appropriately carried out even in situations where generative AI is not used.

3.6.1. Target Business Processes: Level 0

State

- While there are business operations, the procedures and flow are not defined clearly, and it has not been organized as a process.
- The approach to the business operation is dependent on an individual's discretion with no standardized procedure shared in the organization.
- There are inconsistencies in the output of the business operation, and reproducibility and stable quality are not ensured.

3.6.2. Target Business Processes: Level 1

Goals

- The business operation is carried out based on the experience and tacit knowledge of the employee, and certain procedures and judgment criteria are individual-dependent.

Practice examples

- The employee learns the procedure and flow through experience by repeatedly carrying out the same business operation.
- Primarily, seasoned employees convey the approach to the business operation and the key

points in judgment orally or through OJT to other employees.

- The employees make adjustments to the approach and judgment individually based on their own experience and past examples.
- The approach to the business operation is not shared, but the employees unofficially consult with each other and exchange information.

3.6.3. Target Business Processes: Level 2

Goals

- The procedures and flow are documented for individual business operations and are defined clearly as business processes.
- The implementation status of the business process is recorded and managed, and is in a state where it can be shared between employees.

Practice examples

- Document the procedures and flow of the business operation and define them clearly as business processes.
- Share the defined business processes among the employees and make them available for reference.
- Ensure that a newly appointed employee can implement the business operation based on the documented business processes.
- Record the progress and implementation status of the business operation so that the supervisor can grasp the status.
- Revise the document if there is any change or update to the business processes and notify concerned parties.

3.6.4. Target Business Processes: Level 3

Goals

- The business processes are standardized and the goals and deliverables of the business operations are clearly defined.
- The business operations are being implemented in a consistent manner in accordance with the standardized business processes.

Practice examples

- Standardize the procedures and flow of the business operations and prepare a manual or guideline with the goal and examples of deliverables of the business operations.
- Share the standardized business processes with all involved employees and make them available for reference at the time of implementation of business operations.
- The employees implement the business operations in accordance with the standardized business processes, and ensure consistency in the approach to the business operations and

quality of the deliverables.

- Confirm the compliance status of the business processes periodically and take corrective measures in the case of any deviation.

3.6.5. Target Business Processes: Level 4

Goals

- The metrics related to the business processes and the quality of the deliverables are defined and are in a state where they can be measured quantitatively.
- The compliance status of the business processes and the quality of the deliverables are assessed, and the organization is implementing measures for improvements.

Practice examples

- Set quantitative metrics (e.g. processing time, error rate, customer satisfaction rate, etc.) related to business processes and quality of deliverables.
- Collect and analyze the quantitative data and assess the implementation status of the business processes and quality of deliverables.
- Identify areas to improve in the business processes based on the assessment results and consider measures.
- Confirm the compliance status of the business processes periodically and take corrective measures in the case of any deviation.
- Share the assessment and improvement measures with concerned parties to nurture awareness regarding improving business operation quality.

3.6.6. Target Business Processes: Level 5

Goals

- The Business processes and quality of deliverables are continuously reviewed and improvement measures are implemented periodically.
- The outcome of the improvement activities is shared within the organization, and measures aimed at improving business operation quality are being implemented organizationally.

Practice examples

- Confirm the business processes and quality of deliverables periodically and implement improvement activities systematically.
- Record the outcome of the improvement activities and manage them as update history of the business processes.
- Share the outcome of the improvement activities and best practices cross-departmentally and promote their sharing with other departments.
- Continuously monitor and assess the business processes even after the improvement to explore possibilities for further improvements.

- Link the measures for improving the quality of the business operations with goals and policies of the organization.

3.7. Assessment Dimension 5: Data Governance

This dimension assesses how the organization is collecting and managing the data that is necessary for assessing generative AI and improving its accuracy upon using generative AI for business operations. Specifically, it assesses in a phased manner whether the data format and the information to be stored are defined, whether the accumulated data is being managed and shared including the data as such and the metadata including type of data, confidentiality of the information, and risks associated with its use, and whether assessment from the quality perspective and improvement activities of data are being made to be used in generative AI, so that it is easy to use the data within the organization.

Also, considering that this metric is premised on usage of generative AI for Level 3 or above, be aware that if appropriate data governance is being carried out in situations where generative AI is not used, this could be considered a Level 2.

3.7.1. Data Governance: Level 0

State

- Data is not collected or accumulated in a form in which it can be utilized by the organization.

3.7.2. Data Governance: Level 1

Goals

- Data that was created, updated, etc. in the process of business operations, is collected and accumulated.

Practice examples

- All kind of deliverables of the business operations are accumulated as digital data and shared within the organization.

3.7.3. Data Governance: Level 2

Goals

- The criteria for creating, collecting, and accumulating data are clearly defined with the rules for data collection and accumulation stipulated by individual business operation, and the business operations are implemented according to those rules.
- The organization carries out assessment regarding confidentiality and the usability of the data is defined taking that into account.

Practice examples

- Store the various deliverables of the business operations in the format stipulated by the organization in the designated storage location.

- Save the business operation log automatically and share where it is stored and in what format within the organization.
- Correctly assess and manage the level as to the confidentiality level of the information in the stored deliverables and logs and whether it contains personal information, and define the usability according to that.

3.7.4. Data Governance: Level 3

Goals

- The specifications of the collected data are defined in terms of data structure in a format and quality that can be used by generative AI, and data compliant with that definition is created, collected, and accumulated.
- Management methods to create, collect, and accumulate data are systematically stipulated throughout the business operations, and shared within the organization.

Practice examples

- Storing the deliverables and logs of the business operations in a format that is not only readable by people (e.g. description of the overall process, complicated payment conditions, etc. are compiled not as text but as images such as process diagrams, customized tree diagrams, or tables) but also in a format that AI understands (e.g. Markdown, and mermaid format for compiling diagrams) is defined as an organizational rule and criteria for introducing the system, and data is created and collected according to that.
- The organization has internally established management standards regarding the confidentiality, availability, accuracy, completeness, and currentness of the stored data, specifically, rules regarding whether they can be used for AI learning and restrictions on data storage location (limited to within the country), etc.
- As for data that are easily readable by people, the organization has standardized the format of the metadata (type of document, level of confidentiality of the stated information, etc.) used to extract information using generative AI. It manages data using the format, enabling generative AI to carry out accurate processing.

3.7.5. Data Governance: Level 4

Goals

- The quality and structure of the data are assessed quantitatively against the generative AI utilization objectives, and the outcome is shared throughout the organization to implement measures for improvements.
- The compliance status of data creation, collection, and management processes is quantitatively assessed and the outcome is shared throughout the organization to implement measures for improvement.
- Availability of data and risks is assessed quantitatively, helping to improve effectiveness of

generative AI utilization.

Practice examples

- Regarding data that is search target of RAG, work on improving the quality of the accumulated data by carrying out preprocessing such as deletion of data that is not needed for reference during implementation of the business operations (e.g. data referring to the previous information such as reply to email or the data of the greetings at the beginning of email among data that put together previous exchanges regarding inquiries from customers) and analyzing the effect of the deletion and the impact it has on search quality in order to swiftly acquire information that matches the context, which is the aim of generative AI utilization.
- Manage the accumulated respective data by confirming the contents, whether it contains confidential or personal information, the level of accuracy, whether completeness is guaranteed regarding missing or duplicate data, and how currentness of the data is guaranteed including management of the versions and the expiry dates. By taking these into account, prepare a framework to quantitatively assess whether each data is available for use according to the intended usage purpose and what kind of risks should be managed by its usage, and then carry out assessment as needed during implementation of business operations and take improvement measures corresponding to the assessment outcomes.
- Organize and manage the data accumulated in the processes of business operations by checking the type of data, how it is collected and accumulated, the terms for using the data, and the risks upon using the data, and share it so that they can be used throughout the organization.

3.7.6. Data Governance: Level 5

Goals

- The organization is continuously improving the data structure and data quality optimized for AI utilization as well as data creation and collection methods to adapt to technological progress and changes in the business operations, and applying them in the business operations promptly and effectively.
- Data governance is integrated across the organization, contributing to the optimization of business operations where generative AI is applied.

Practice examples

- Confirm the usefulness of the data accumulated in own organization every time there is an improvement in performance of generative AI model or a new technology that uses generative AI emerges. And, if the accuracy drops compared to before or if accuracy is lower than expected, establish and implement a process to consider and adopt initiatives for learning the appropriate format and quality through trial and error to obtain data structure and quality that bring out the performance from the new generative AI model or technology and for changing

data accordingly as well as a mechanism for maintaining the confidentiality, availability, accuracy, completeness, and currentness of the data.

- Along with utilization of the accumulated data in various processes of the business operations adopting generative AI, allow efficient and rational implementation of the business operations, capture the deliverables, logs, etc. during implementation of the business operations as training data in a timely manner to enable performance improvement of the generative AI model.

3.8. Assessment Dimension 6: Applied GenAI Capability

There are various generative AI models and services, and they are rapidly evolving. It, therefore, is important to assess and choose in a timely manner how to select from the various generative AI and how to utilize them. In this assessment dimension, how the organization selects and manages the generative AI utilized in business operations and how it is achieving improvements through the operation and monitoring cycle (LLMOps and GenAIOps) are assessed in a phased manner.

3.8.1. Applied GenAI Capability: Level 0

State

- The organization is not utilizing generative AI or is unaware of whether generative AI is being used.

3.8.2. Applied GenAI Capability: Level 1

Goals

- Utilizes generative AI models and services as an organization.

Practice examples

- Rather than individual employees introducing generative AI models and services on their own discretion, the organization gets the license and introduces them and informs employees about utilization methods and prohibited matters to create an environment for members of the organization to utilize them.
- Employees start using generative AI on a trial basis in POC, etc.

3.8.3. Applied GenAI Capability: Level 2

Goals

- Employees utilize different generative AI models and services depending on the purpose.

Practice examples

- Choose the appropriate generative AI model to be used depending on the difficulty level of the task being entrusted to generative AI.
- For example, if it is a task that categorizes certain texts, use a light-weight, versatile text generation model as it is not a complicated task. On the other hand, if it is a task for addressing

a complex logical problem, use an inference AI model that generates the answer after repeated reasoning, as the task requires logical thinking.

- When using a service utilizing generative AI, make the purpose clear, compare the features and advantages of multiple services, and then use the appropriate one. For example, if the aim is to widely explore the possibilities of generative AI and increase the number of employees utilizing it, use a generative AI studio service that guarantees security and is versatile. If the aim is to ensure uniformity in customer responses by optimizing the business operations of the customer contact center, introduce a service utilizing generative AI that is specialized in contact center tasks.
- Compile the features and utilization method of the generative AI models and services and ensure it can be referenced as basic information.

3.8.4. Applied GenAI Capability: Level 3

Goals

- The organization has defined assessment dimensions related to generative AI models and services and is carrying out assessment.
- The organization is managing the structure of the generative AI models and services (prompt, code, settings, environment, etc.).

Practice examples

- Define the comparative dimension and the assessment method to assess the generative AI models and services, and carry out the assessment in accordance with it to choose appropriate model and service.
 - **Accuracy of output:** Carry out quantitative assessment as much as possible regarding the level of accuracy. Also carry out qualitative analysis as needed. Further, if the assessment is carried out by humans, use multiple assessors rather than a single person to prevent bias.
 - **Contribution to the business operation:** Calculate the level of contribution to the business operation from the aspects of both impact on business efficiency improvement such as job processing time and number of processes per unit time as well as impact on customer satisfaction level such as improvement in service quality through knowledge intake.
 - Introduction and operation costs
 - ✧ Introduction and utilization cost (e.g. unit cost of generative AI usage token and monthly usage fee based on it, etc.).
 - ✧ Cost incurred when generative AI is actually operated after introduction (e.g. costs incurred for switching models and maintenance such as replacing the data, etc.)
- In terms of the structure of the generative AI model in use, manage the type, version of the model, and prompt assigned to the model in a repository. As for the structure of the generative

AI service, manage the code of the program being controlled, the various settings including hyperparameters for invoking the model and the infrastructure-related setting values, and the combination of the environment used in a repository.

3.8.5. Applied GenAI Capability: Level 4

Goals

- The generative AI models and services are quantitatively and periodically assessed based on the assessment dimensions, and are monitored at all times, enabling the organization to select higher quality models and services.
- The structure (prompt, code, settings, environment, etc.) of the generative AI model and service is managed, and it can be tracked and rolled back. In case of any unstable situation, it can be restored to the original version.

Practice examples

- Enable tracking of changes and rollback by managing the various versions of prompt, code, settings, environment, etc.
- Carry out repeated assessment based on assessment metrics such as relevance, justification, and similarity with various combinations of prompts, codes, settings, and environment to make a selection that gives a better-quality output (select the combination of prompt, code, settings, environment, etc. that scores higher on the metrics than others).
- Acquire the operation metrics such as token consumption in production environment, error rate, and waiting time, track them, and carry out root cause analysis in the cases such as when anomalies are detected.
 - For example, upon detecting sharp rise in token consumption, it is possible to track what input caused that, what combination of prompt, code, settings, and environment were being used, and analyze the root cause of the problem.

3.8.6. Applied GenAI Capability: Level 5

Goals

- The generative AI models and services are monitored at all times, and early signs of problems are detected.
- The generative AI models and services are optimized based on the monitoring results.
- Immediate restoration of the generative AI system is ensured in anticipation of any problems that may occur.

Practice examples

- Constantly monitor the output results generated by the generative AI models and services and enable automatic detection if there is any issue with the output results. If an issue occurs, recover the system with human involvement and analyze the root cause, and take measures to

enable detection from the next time onwards.

- Use AI to achieve the automatic detection of whether there are issues with the output result. Use the data from past problems and also data when there were no issues to build and improve the AI, and continuously improve it through the day-to-day business operations.
- In order to identify the root cause of the problem related to the output accuracy (potential drift, bias, or quality) of generative AI, log detailed queries and responses across the entire application, and also implement tracing, and then establish a mechanism that would automatically alert when the result exceeds or falls below a certain standard in respective automatic measurement in A/B testing.
- Based on the above measurement results, compare quality with generative AI models and services used in the past and also with the trial results on new models and services to review the model and service to be used.
- Manage the deployment of applications through versioning based on pre-defined standard and automatic approval processes, and establish a rollback process for any emergency.

3.9. Assessment Dimension 7: Integration into Business Processes

This assessment dimension assesses how the generative AI is incorporated in the business processes and whether the overall business operations are optimized by that. Specifically, it assesses, in a phased manner, whether generative AI can function in the business processes, whether the processes are visualized in a procedure manual that guarantee quality where AI can be utilized, and whether the AI is effectively functioning and continuously optimizing the business processes. The business processes are premised on the use of AI, and the procedure manual for that has been visualized and clearly defined, making AI an important factor to continuously pursue optimization of the business processes with generative AI functioning as the method for business transformation.

3.9.1. Integration into Business Processes: Level 0

State

- The organization is not utilizing generative AI or is unaware of whether generative AI is being used.

3.9.2. Integration into Business Processes: Level 1

Goals

- While generative AI is used in the business processes, there are no codified, fixed procedures, but its use relies on tacit knowledge and is fluid.
- Individual employees examine the operation procedures as needed and enter them in generative AI based on the business operation manual, in which the tacit knowledge is not included.

Practice examples

- Read and comprehend the operation manuals and identify tasks that can be performed by or supported by generative AI.
- Take into consideration the insights on operations held by individuals that are not described in the operation manuals and instruct the business operation procedures to generative AI.

3.9.3. Integration into Business Processes: Level 2

Goals

- While the business operation procedures are stated in a format understandable to AI, the format and granularity vary by business operation.
- The rules, input and output items, and restrictions are available under the Business Operation Rules Definitions, which can be referred by generative AI.

Practice examples

- The version management of the procedure manuals and the approval flow are defined clearly with the department and person in charge assigned.
- Entrust generative AI with partial automation tasks (preparation of proposals and preliminary drafts), making it play a supporting role for work done by humans, with humans carrying out the main work and making the final decisions.
- Register the prompt examples and guardrail examples of generative AI in the knowledge base and share them across departments and employees.

3.9.4. Integration into Business Processes: Level 3

Goals

- All the business operation procedures in the organization are stated in a format that AI can read and comprehend with the description method, naming convention, labeling system, etc. complying with a unified guideline.
- Consistency going beyond the department or project is maintained through standardization and the process assets (templates and best practices) are reused throughout the organization.

Practice examples

- Centrally manage the business operation procedures in a central repository, automate the registration update, and automatically detect syntax and policy violations.
- Stipulate the tailoring guidelines and customize individual projects within acceptable limits.
- Develop an organizational process asset library of a dictionary integrating AI terms and business operation terminology, AI prompt, assessment aspects, and examples of failures, and ensure they are reusable.
- Incorporate generative AI in the orchestration of procedure execution, and pursue automation of processes over multiple systems.

3.9.5. Integration into Business Processes: Level 4

Goals

- The organization has set forth the quantitative targets regarding quality and performance of the business processes in which generative AI has been integrated and it can grasp the status and cause of the change in the implementation status of the business processes.
- Effects of the procedure manual update or AI model update are verified in A/B testing and the significance is assessed in a statistical manner.

Practice examples

- Define metric hierarchy (organization -> project -> task), monitor KPIs in real time on dashboard, and carry out drill-down analysis.
- Collect the difference between AI output and design output automatically, and quantify and identify bottlenecks through process mining.
- Operate Ops cycle that periodically executes feedback loop (AI -> data -> insight -> AI and procedure manual revisions).

3.9.6. Integration into Business Processes: Level 5

Goals

- The organization continuously implements gradual and innovative process improvement and procedure manual revision based on quantitative data, and minimizes fluctuations caused by generative AI integration or improvement.

Practice examples

- Generative AI carries out simulation of multiple procedure candidates, automatically recreates the scenario, and recommends the optimum proposal.
- Monitor the trend in business operation KPIs in real time, and if it exceeds the threshold, AI recommends corrective action.
- Model the interactions between AI, process, and humans and reflect them swiftly following simulation on a safe sandbox and improvement inspection in A/B testing.

4. Procedure for Maturity Assessment

This chapter explains the procedure for clarifying the policy for future initiatives by assessing the current state of the organization using MA-ATRIX. MA-ATRIX not just grasps the current state but also drafts strategic action plan and is aimed at assisting continuous improvement. The utilization of generative AI is not something that is complete with its introduction. It is necessary to raise the maturity of the entire organization through repeated assessments and improvements.

Step 1: Preparations

In order to effectively pursue maturity assessment, it is indispensable first of all to clearly set the diagnostic objectives and expected outcomes. It is ideal to sort out why the assessment is being done and what kind of decision-making it is used for, explain it to the management layer and involved departments, and gain their understanding and cooperation. As a prerequisite, it is important to gather information necessary for the assessment such as organizational policy, business processes, data management status, systems, mechanisms, and other matters and to share them among concerned parties. If these preparations are insufficient, it could likely lead to loss of reliability and effectiveness of the assessment results.

Step 2: Selection of the scope of diagnosis

Next, the scope of the diagnosis is made clear. There are two scopes of diagnosis—a scope based on organization such as the entire organization or a specific department and a scope based on business operation such as a specific operation or a specific activity in an operation. It is necessary to stipulate the scopes based on the respective items. It is important to select the scope depending on the objective of the assessment and the extent to which consensus can be formed.

(1) Granularity and characteristics of diagnostic target

For example, a bird's-eye view of the current state and issues of company-wide generative AI utilization can be grasped by diagnosing the entire organization. On the other hand, narrowing down the diagnosis to a specific department or business operation makes it easier to identify concrete improvement points and successful examples. Further, carrying out diagnosis by department and by business operation and comparing the results enable to clearly identify the variations in maturity level within the organization and areas that require focused efforts.

(2) Concept of scope selection and diagnostic perspectives

MA-ATRIX aims to visualize the maturity of an organization's generative AI utilization and support the development of a roadmap corresponding to the current state. The maturity level visualized and the road map formulated may change depending on the scope of diagnosis. So, it is necessary to configure the settings with due care. Upon setting the scope, bear in mind that the improvement measures derived and the policy for future initiatives may change significantly depending on the scope of the diagnosis. For example, if it is a company-wide scope, it becomes easier to identify the trend

across the organization and the common issues, while a department or business operation-wise diagnosis would yield specific improvement points.

On the other hand, it does not mean that utilizing generative AI in all business operations will necessarily be the most optimum just because the scope was broadened. It is important to carefully judge the necessity of applying AI, the scope of application, and the order of application in which it should be applied for each business operation. Rather than seeking to immediately apply generative AI across the board for the entire scope, MA-ATRIX assesses the aspects such as whether there are grounds for the scope of application that was decided rather than setting the width of the scope of generative AI application as the metric for maturity. This, instead of just setting expansion of the scope of application as the goal, will enable the formulation of a policy for the optimum utilization of generative AI.

Therefore, it is important to clarify the range for which the policy for the optimum utilization of generative AI is to be formulated and to decide the scope based on that.

Step 3: Assessment of the level of each dimension

In this step, the current state of the organization and business operations is assessed for the multiple assessment dimensions defined in MA-ATRIX.

In the assessment, the goals and requirements of each of the dimension are confirmed first to determine the level in which the organization's current state falls. It is desirable to use objective evidence such as documents, regulations, records of business processes, system configuration information, and proofs of past acquisition of certifications for determining the level. Further, concerned parties should be interviewed as needed to grasp the actual status. The assessment is not a mere self-reporting. It is important to ensure objectivity as much as possible.

The standard for the judgment is: Only if the all the requirements stated in the goal for a said level for a said dimension are met, it would be considered as reaching that level. If only some of the requirements are met, then the level is set as the one immediately before that, instead of the said level. This strict standard prevents over-assessment and enables assessment that reflects the actual status. Further, it is desirable to gather the opinions of multiple involved employees and departments to confirm the adequacy of the assessment results.

Step 4: Overall assessment and analysis of strengths and improvement points

Once the assessments of the various dimensions are over, carry out the overall assessment. Overall assessment is not to be considered as the average level of achievement of each dimension. What is important is to clarify the strengths and weaknesses of the organization by taking into account the assessment results of the dimensions.

This analysis will clarify which areas should be improved with priority and which areas are to be strengthened. For example, in a case where the technological foundation is established but governance and human resource development are lagging behind, the next action should be focused on nurturing of human resources and establishment of rules. Visualizing the assessment results in diagrammatic form

such as a radar chart is effective for supporting the above determination. The balance of maturity and the overall picture can be intuitively grasped by using diagrams, which is also easy to share with the management layer and involved departments.

Step 5: Formulation of action plan

Formulate the next action plan taking the results of the overall assessment into account. This is an important process for leveraging the assessment results to the actual improvement action. It is ideal for the action plan to include both measures that can be implemented in the short term and those that should be addressed in the medium- to long-term in a well-balanced manner.

Organizations may refer to examples of practices for each level in MA-ATRIX for formulation of an action plan. However, they are just for reference purposes. It is effective also to consider unique measures corresponding to the organization's status and objectives. Further, it is indispensable to share the action plan with the management layer and involved departments and form a consensus across the organization. Once the consensus is formed, this has to be translated into an implementation plan that clearly states the feasible schedule of implementation and division of roles.

Step 6: Implementation of the action plan and reassessment

It is important to note that implementation of an action plan does not end with the first round. Generative AI utilization keeps evolving along with the changes in technology and business operation environment, and therefore periodic reassessment and improvement are indispensable.

After the implementation of the action plan, assess the impact and add new measures as needed. By repeating this process, the maturity of the organization improves in stages, enabling it to gain sustainable competitive edge. MA-ATRIX is premised on the cycle of assessment to improvement to reassessment and it is important to position it as a part of continuous improvement activities.

5. In Conclusion

We hope the MA-ATRIX we introduced in this document will be of assistance to you in steadily promoting initiatives as you push forward with utilization of generative AI in your organization.

Going forward, MA-ATRIX aims to continuously improve and develop by referring to the knowledge gained through actual use and the opinions received from everyone.

We welcome your views as well as any queries you may have regarding this document.