Press Briefing on AI-Driven Development Transforming System Development

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Fujitsu Limited
Fujitsu Japan Limited

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Program

- **Presentation**

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- **Q&A**
- **Photo session**

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Unexplored areas Fujitsu should venture towards

Tackling the problem of 'understanding and automatically refactoring complex legacy systems' that AI has yet to crack

Takane-Driven Initiative

An initiative to automatically streamline system modifications from requirements definition to integration testing using AI for Fujitsu healthcare and administration package products, specifically when legal and regulatory frameworks change

Healthcare

Medical information systems centered around electronic health records for hospitals and clinics

30 Packages

Government administration

Addressing a wide range of tasks for local governments, including taxation, resident information, welfare, and childcare

37 Packages

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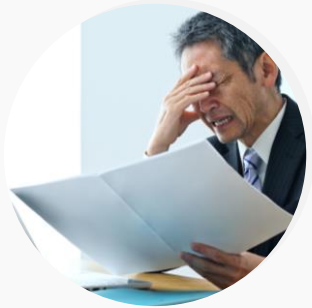
Why healthcare and government administration?

The need to update massive and ever-changing systems to keep pace with legal and regulatory amendments is one of the most challenging areas. The goal is to reduce the burden on the ground, ensure the continuous operation of societal infrastructure, and move towards sustainable operations.

System modifications in response to legal and regulatory changes

- In addition to regular revisions such as medical fee reforms, legal amendments aimed at resolving societal issues have been increasing in recent years
- Even staff find it difficult to interpret and respond to laws and regulations

System development and administrative operation period within a limited timeframe

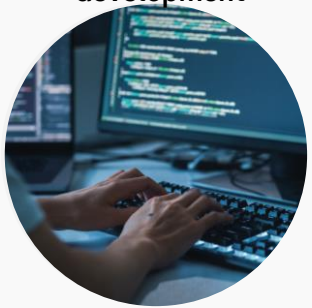


- Responding within a short period without sufficient consideration for exceptional cases can lead to administrative errors
- The period of legal and regulatory amendments overlapping with peak busy seasons at the end of the fiscal year places a significant physical and psychological burden on staff

System complexity due to the diversification of regulations/systems

- Each system grows in size due to annual change requests, and the volume of maintenance work increases year by year
- A massive software asset comprising 67 packages and extending to 150 MS

Phased workflows and not enough time for development



- There are cases where the development of all functionalities cannot be completed within the period from the announcement to the enforcement of legal revisions
- Revisions often involve a lot of rework because the details are clarified incrementally, sometimes right up until the enforcement date

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Takane-Driven Initiative outline

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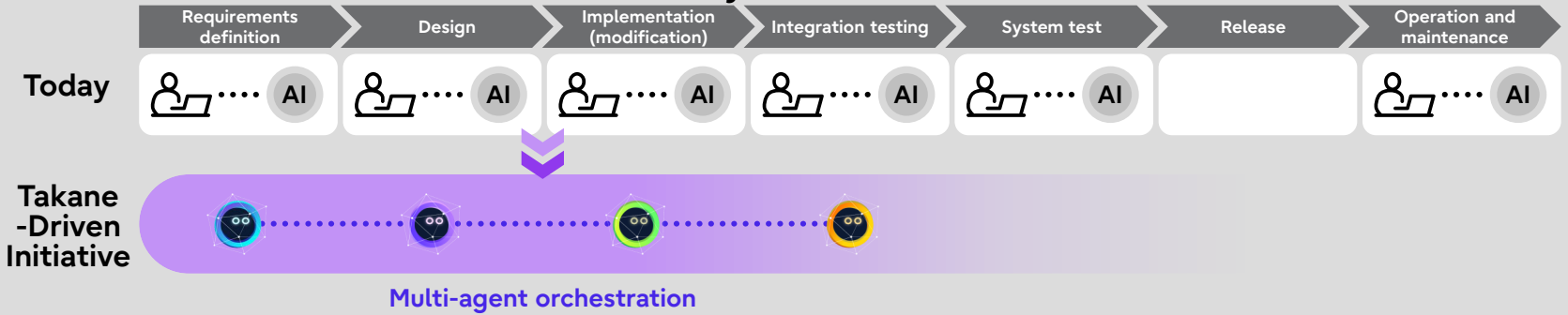
Achieving end-to-end automation from understanding legal frameworks and requirements definition to design, implementation (modification), and integration testing, all powered by AI, with the domain-specific model Takane at its core.

- Orchestrating end-to-end (from requirements definition to integration testing) with multi-AI agent technology
- Formalizing tacit knowledge and exceptional operations, integrating them as AI-referable Ground Truth
- AI agents identify the scope of impact and comprehensively design and implement (modify) accordingly

Transitioning from continuous human-AI dialogue in development to non-stop development driven by autonomous AI



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Outstanding results

System modifications: from human work to AI work

3 person-months » **4** hours

around 100-fold increase in productivity

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AI automates everything from advanced legal comprehension to requirements definition

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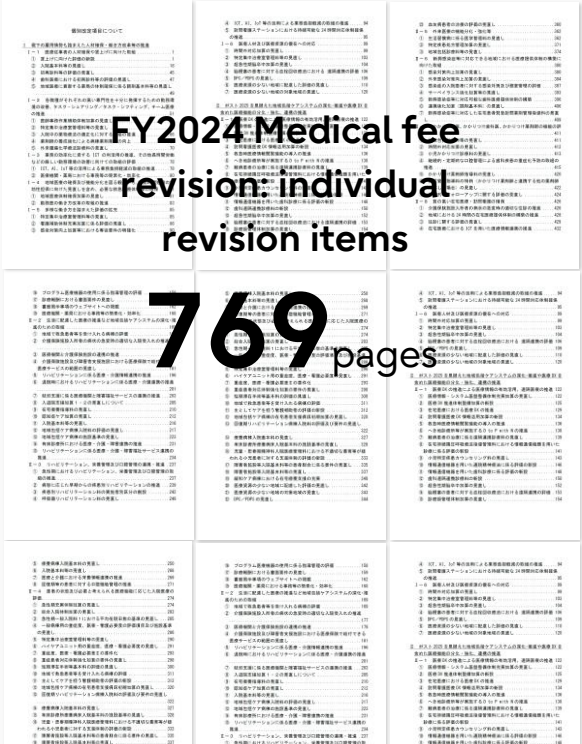
01 Legal documents that are too complex for humans to understand



FY2024 Medical fee revision: individual revision items

769 pages

02 AI agents automatically understand

Deeply understand legal documents down to the minute details, and grasp the content of legal changes

Compare the changes with the design document and identify the system's modification points.

Automated generation to external specification level requirements

Source: Japanese Ministry of Health, Labour and Welfare

03 Automatically generate external specification-level requirements

-Public master settings (check): Change all instances of the term “poultice/patch” registered in the master data to “plaster/patch”; Additionally, revise the definition logic to limit the scope of “plasters/patches” to use for pain relief and anti-inflammatory purposes (excluding narcotics/psychotropics and those exclusively for skin conditions); Also, change the determination target for refill limits to “plasters/patches with a defined limit” and add logic to exclude cases used for 'pain relief in cancer patients”

-Prescription instruction tool (prescription instruction screen): Replace all instances of “poultice/patch” displayed on the screen with “plaster/patch”; Revise the refill prescription eligibility logic in accordance with the “plaster/patch” definition, and modify the conditions so that refills are not permitted except for “plasters/patches with a defined limit” and for “pain relief in cancer care"

-Outpatient prescription printing: Change the medication type notation output on prescriptions from “poultice/patch” to “plaster/patch”; Also, review the entry specifications and printed content for refill counts and refill eligibility fields in accordance with the new “plaster/patch” standards

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A mechanism to elevate the quality of AI output to the “expert level”

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Multi-layer Quality Control

A mechanism that elevates design quality to a level usable in practical work by ensuring tacit knowledge, procedures, and rationale are complete, and by automatically prompting recalculation/re-doing when there is ambiguity or omissions

Autonomous design layer (ReAct loop)

Observation→ thought → action/searching/investigating → concretizing design → identifying the next reference point

Enhancing the decision accuracy of requirements definition and design agents

Guardian layer (meta-cognitive check)

Audits the AI's thought process and conclusions against quality criteria (rationale, consistency, clarity). If there are deficiencies, ambiguities, or contradictions, it instructs a “redo”

Stopping the “plausible-sounding but inaccurate answers” that AI can sometimes give

Knowledge layer (inputting on-site practices/conventions)

Structures common on-site practices—such as naming conventions, exceptional operations, and screen ID-to-code mapping—as guides and rules, inputting them into the search index and design context

Enabling AI to reproduce company-specific system development practices

Information access layer (large-scale document and code understanding)

Patent pending

Extracts, summarizes, and excerpts only the necessary parts from large volumes of documents and millions of lines of code for AI's reasoning

Enabling the handling of large-scale information without compromising accuracy

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Non-stop development by AI agents

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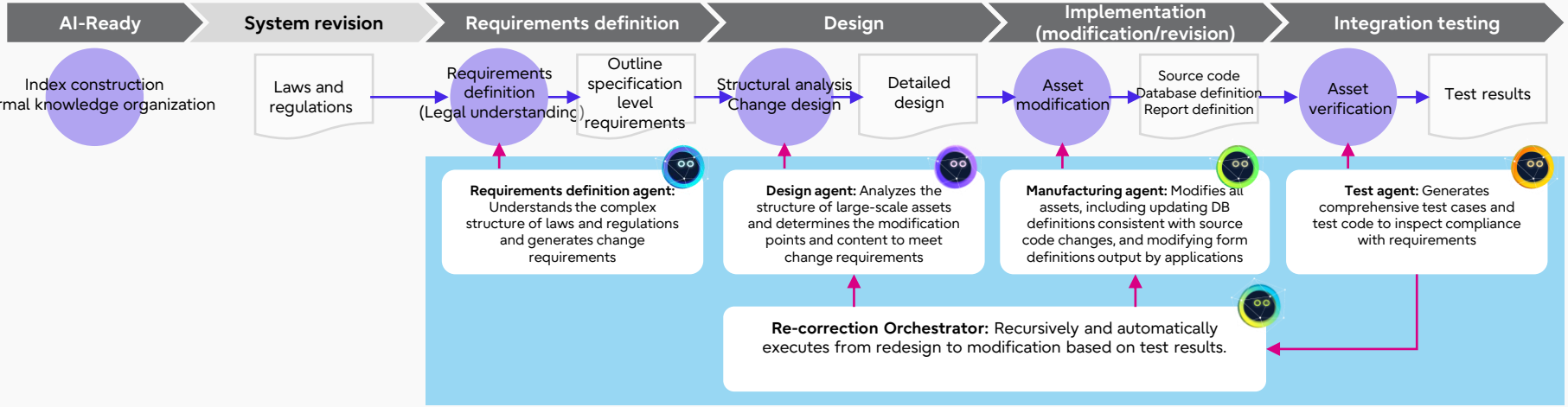
Once the content of a legal revision is input, AI agents, without human intervention, will repeatedly refine the development process until it reaches "human software engineer quality standards," completing the entire process up to the integration testing



Domain knowledge	Existing code, design information, business knowledge, development procedures, naming conventions, design practices, testing perspectives, etc.
AI / DevSecOps platform	Takane / LLM · AI search service · Source repository · CI/CD pipeline · SAST tool

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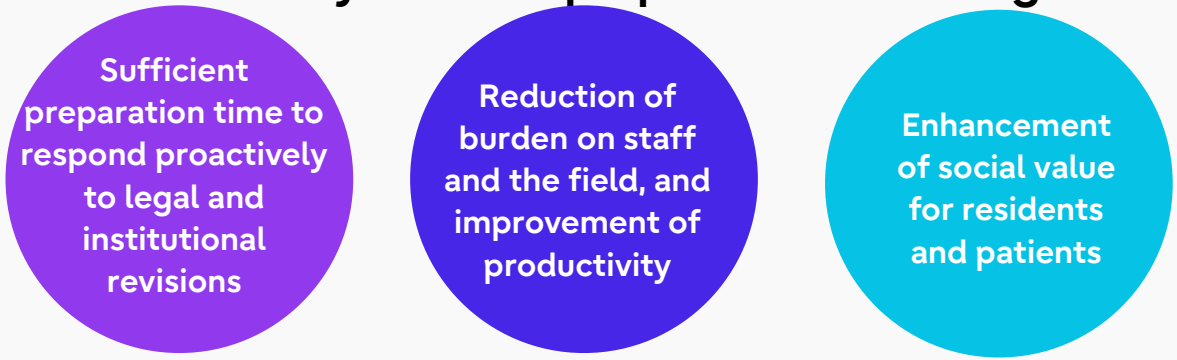
Value assessed by government and medical professionals: Responsiveness and accuracy that keep operations running



Fujitsu's announcement shows a practical and robust approach to the long-standing challenges faced by medical institutions: the increasing complexity of medical fee calculations and the growing workload of claims processing.
The mechanism where AI analyzes legal documents and extracts the relevant areas, while explicitly highlighting points open to interpretation to supplement human judgment is particularly impressive. This design demonstrates a deep understanding of on-site operations and is highly commendable. Furthermore, the Japanese-specific LLM and the consideration for safety are indispensable elements for AI utilization in the medical field. Beyond medical fee claims, this technology with related areas such as bed management and understanding performance requirements, making a strong contribution to overall hospital operational efficiency in the future.
This is a promising initiative that warrants positive consideration for adoption to alleviate the burden on medical professionals.
Shimane Prefectural Central Hospital

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Future outlook

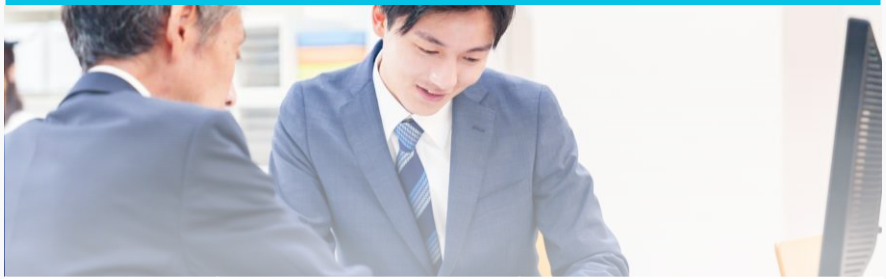
Expand application to all 67 packages, rapidly evolving services with significant increased productivity.
Drastically reduce Time to Market, achieving expansion in sales and market share.
The domain knowledge accumulated in LLMs will lead to the resolution of customers' more advanced business challenges.

Healthcare

- HOPE Series
  - LifeMark-HX
  - LifeMark-HX Cloud
  - LifeMark-MX
  - LifeMark-SX
  - Cloud Chart
  - Cloud Chart II
  - EGMAIN-GX
  - LifeMark-Type G
  - LifeMark-SX Cloud
  - LifeMark-TX
  - LifeMark-GRID
  - PocketChart
  - 看護ライブラリ
  - 看護連携ライブラリ
  - 重症病棟記録システム
  - 麻酔記録システム
  - 歯科ライブラリ
  - 歯科再診予約
  - 統合部門機能
  - BLAD ライブラリ
  - 生体検査ライブラリ
  - 感染管理ライブラリ
  - 治験管理HOPE
  - HealthAssist
  - 医事会計
  - WINCARE Cloud

- Electronic medical record
- EHR/EMR options
- Department management
- Clinical trial management
- Health information
- Medical accounting
- Nursing care

Government administration



- MICJET Series
  - 住民記録
  - 税務情報
  - 国民年金
  - 戸籍
  - 証明書交付
  - 住宅管理
  - スマート窓口
- MCWEL Series
  - 子供・子育て支援
  - 医療費助成
  - 児童手当
  - 児童扶養手当
  - 特別自動扶養手当
  - 障がい者福祉
  - 障がい者自立支援
  - 介護保険
  - 後期高齢者医療
  - 高齢者福祉
- IPKNOWLEDGE Series
  - 公営企業会計
  - 独立行政法人会計
  - 契約管理
  - 財務情報
  - 文書管理
  - 旅費管理
  - 人事給与
  - 庶務事務
- SuperCALS Series
  - 入札参加資格申請
  - 電子調達
  - 設計積算
  - 事業執行管理

- Resident information
- Internal information
- Public enterprises

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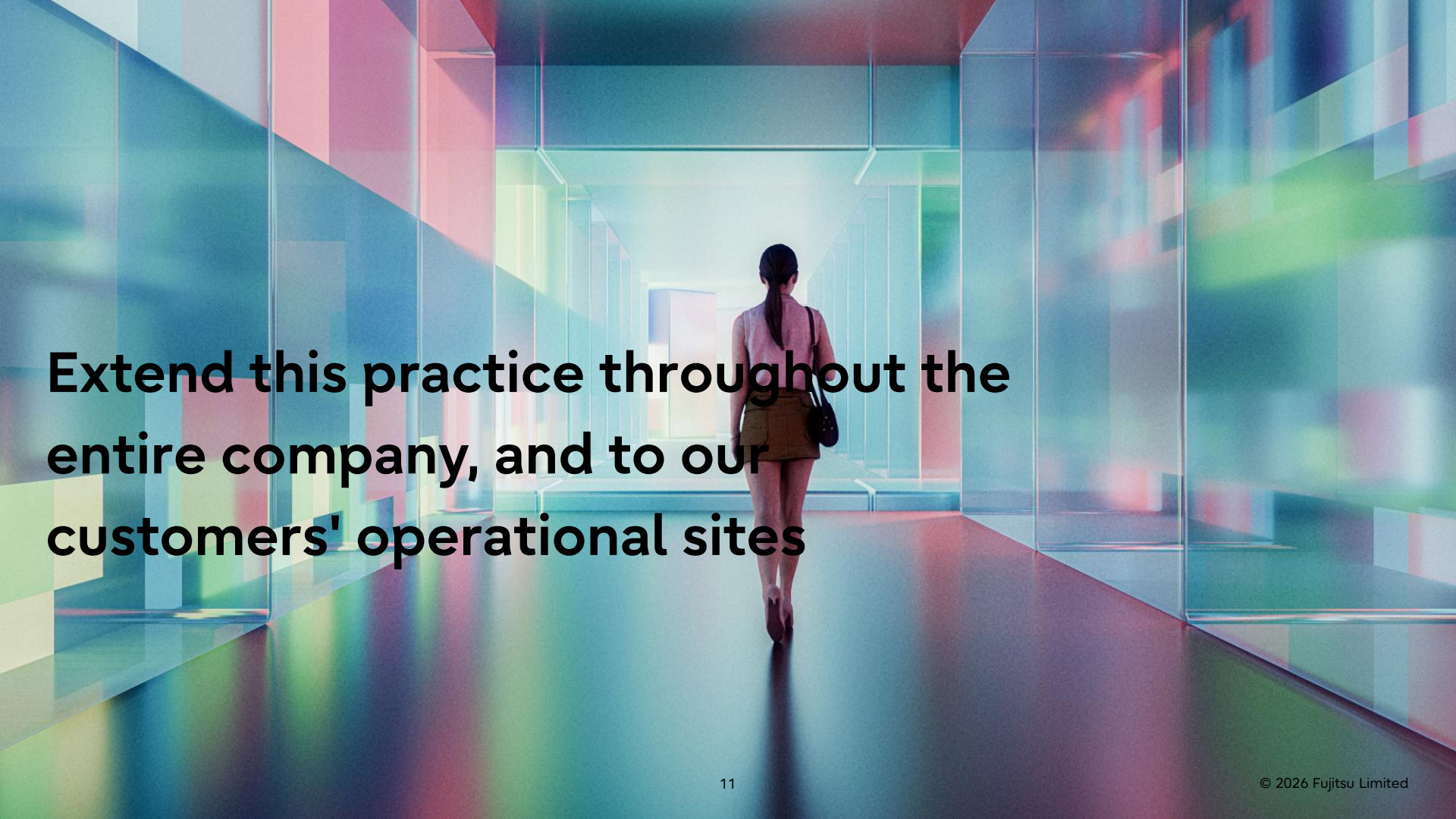

Extend this practice throughout the entire company, and to our customers' operational sites

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Beyond Takane-Driven Initiative

Expansion to all system development projects

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AI-Driven Software Development Platform for systems that continuously change

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Deployment target: systems that continuously change

Systems that consistently require significant resources for modifications, and where reliance on human effort is a bottleneck. Systems where change speed dictates competitiveness, and improvement in Time to Market directly correlates to business value.

Continuous modification becomes the norm

Legal compliance, product and pricing logic updates, external service integration

High frequency of changes and rapid releases

Monthly releases and agile development are the norm

Assets that have grown large and complex due to years of modification

Many dependencies, proprietary specifications, and a significant amount of tacit knowledge.

High demands for audits and accountability

Traceability of change reasons is necessary

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AI-Driven Software Development Platform

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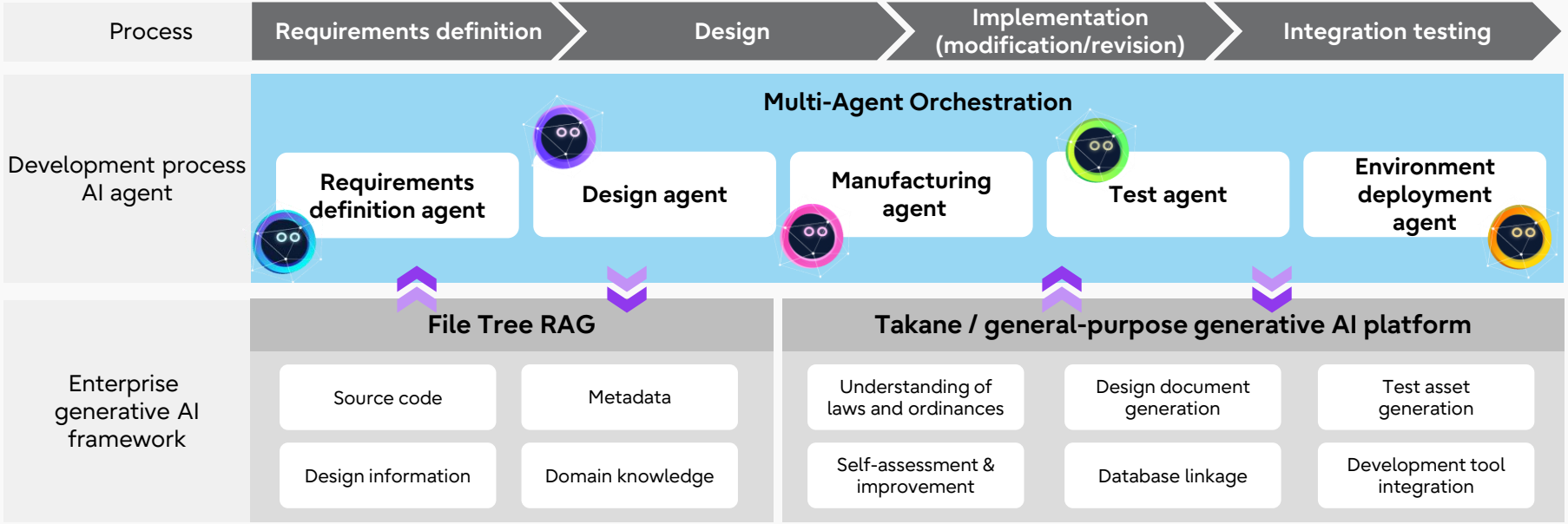
An AI-driven development platform that integrates Fujitsu's research laboratory technology with business expertise. Multiple AI agents collaborate automate the entire process from requirements definition to integration testing



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Significantly increased productivity and work-style reform for engineers

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AI that does not assist, AI that executes autonomously

Maximum **100**-fold productivity increase

General generative AI tools: Task automation	AI-Driven Software Development Platform: Process innovation
Interactive development support	Fully autonomous development execution
Premise of ongoing human control	No human involvement once input is provided
Development only progresses while humans are working	Development continues until the goal is achieved, even when people are away
Work progresses intermittently	Development continues 24 hours a day

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What is AI-Ready Engineering?

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The process of preparing assets, knowledge, and quality so that AI can correctly understand existing systems and execute reliable automation. The maturity of this preparation determines the accuracy of automation

AI-ready

The preparation that determines the success rate of automation

Asset understanding

- Structuring and search indexing of existing system assets
- Formalization of tacit knowledge (e.g., business knowledge, development procedures, asset dependencies)

Engineering conventions

- Organization of naming conventions, design practices, and testing perspectives
- Reorganization into a structure that is easy to modify

Ground truth

- Conversion of past modifications into correct data
- A mechanism to compare and evaluate AI results against correct data

Execution readiness

- Mechanisms for automated build, automated testing, and automated deployment (CI/CD)
- Integrating AI-generated deliverables with the CI/CD platform

Fitting

Correctly integrate AI into the system

AI × Adaptation of existing Systems

- Evaluate the gap between correct data and AI modification results, and tune context and prompts (review of formal knowledge, enrichment of search index)
- Optimize AI's decision quality through Takane tuning

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AI-Ready Engineering – Fujitsu‘s strength -

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The ability to integrate human practical knowledge with AI's executable knowledge

Human knowledge

The practical knowledge accumulated by Fujitsu's on-site engineers

The ability to interpret large and complex existing systems
- Responsible for complex domains including government, finance, and healthcare for over 40 years
- Understands the structure, history, and operation of code assets on the scale of tens of thousands of files
- On-site capability to discern variations in expression that can confuse AI

The ability to interpret tacit knowledge and exception handling
- Understands industry practices, exception handling, and operational judgments not documented in design specifications
- Experience in continuously bridging specification gaps in a world where the *gemba* is right, not the specs

Accumulation of standardization and quality management
- Years of accumulated naming conventions, development standards, and testing perspectives
- Know-how to make modifications while adhering to customer-specific practices

Machine knowledge

A mechanism for AI to operate at human-level quality

Formalization and input of tacit knowledge
- Structuring undocumented business rules, exception handling, and decision intent
- Converting invisible bridges connecting requirements, design, and code into a form AI can follow
- Transforming judgment domains that were human-only into AI-processable input

Execution platform capable of reproducing human knowledge
- A group of agents that progressively evaluates design, coding, and testing results, and autonomously enhances completeness and specificity
- An AI execution structure centered on Takane, which excels in Japanese comprehension and mission-critical domains

Orchestration of the entire modification process
- Connecting requirements definition, design, implementation, and integration testing, and running continuously until completion

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The twin-drivers that achieve end-to-end system development automation

Creating a state where AI can make judgments without hesitation — Asset understanding, tacit knowledge, and quality standards

Autonomous development execution by AI — Automation from requirements definition to integration testing

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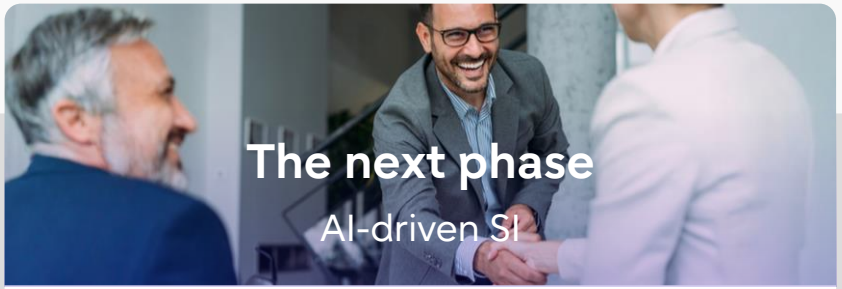
Fujitsu's time for business transformation

A decisive turning point that will divide the future of system development.

Traditional system development

Conventional SI

- Productivity improvements through the utilization of generative AI are advancing, accelerating price competition
- The democratization of generative AI is expanding customer-led in-house development
- Simple development and modifications are areas where it's difficult to create added value
- Technology selection and tool discussions take precedence, making differentiation difficult



The next phase

AI-driven SI

- Fujitsu's new value proposition is **speed** (Time to Market) and **continuous adaptability**
- AI-Ready Engineering x AI-Driven Software Development Platform
- A service model where **AI and humans divide roles and progressively evolve towards AI-led development**

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Endorsements from our customers and partners

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> This initiative is expected to provide a practical pathway for many domestic enterprises facing the ongoing challenge of maintaining and operating legacy assets.
>
> **IDC Japan**

> I see great potential, especially in targeting business packages that undergo complex system changes every year.
>
> OPT 株式会社オプティマ

> This is not merely about improving development efficiency; we recognize it as a significant challenge to pass on and evolve the extensive business knowledge and design philosophies cultivated by companies over many years to the next generation.
>
> **Kawasaki Heavy Industries, Ltd.**

> We are confident that this mechanism, where AI itself audits quality and autonomously repeats processes, will dramatically enhance the reliability of system development.
>
> **Kewpie Digital Innovation Co., Ltd.**

> What is particularly noteworthy is the AI's ability to autonomously learn "human intelligence," thereby dramatically enhancing the accuracy of requirements definition.
>
> 近鉄情報システム株式会社

> This initiative to achieve comprehensive, one-stop automation spanning from requirements definition to system validation is a groundbreaking innovation for the industry.
>
> Google Cloud

> This mechanism also has the potential to dramatically change the traditional SI business model, and we are watching future developments closely.
>
> **Sakura KCS Corporation**

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Endorsements from our customers and partners

FUJITSU

> This is a major step towards advanced and efficient system operations, with the potential to change the very nature of system development.
>
> 静岡新聞 SBS

> This technology aligns closely with IBM Japan's vision and represents an important initiative that will help shape the future of the industry as a whole.
>
> **IBM Japan**

> This approach autonomously executes processes seamlessly from requirements definition through system modification. It has the potential to provide an effective solution to the core challenges posed by legacy systems faced by many Japanese enterprises.
>
> Panasonic

> Since 2024, we have been working with Fujitsu in some areas of this field. Through these initiatives, we are confident that the entire development process will be automated end-to-end in the near future.
>
> dNEOBANK 住信SBIネット銀行

> We strongly expect this bold effort to drive the evolution of Japan's system development business and to grow into a transformation model with global relevance.
>
> Microsoft

> We sincerely hope that the co-creation between the knowledge-inheriting AI and on-site personnel will generate new value and form the cornerstone for innovation in the system development industry, and indeed, across all industries.
>
> **A major manufacturing company's IT subsidiary**

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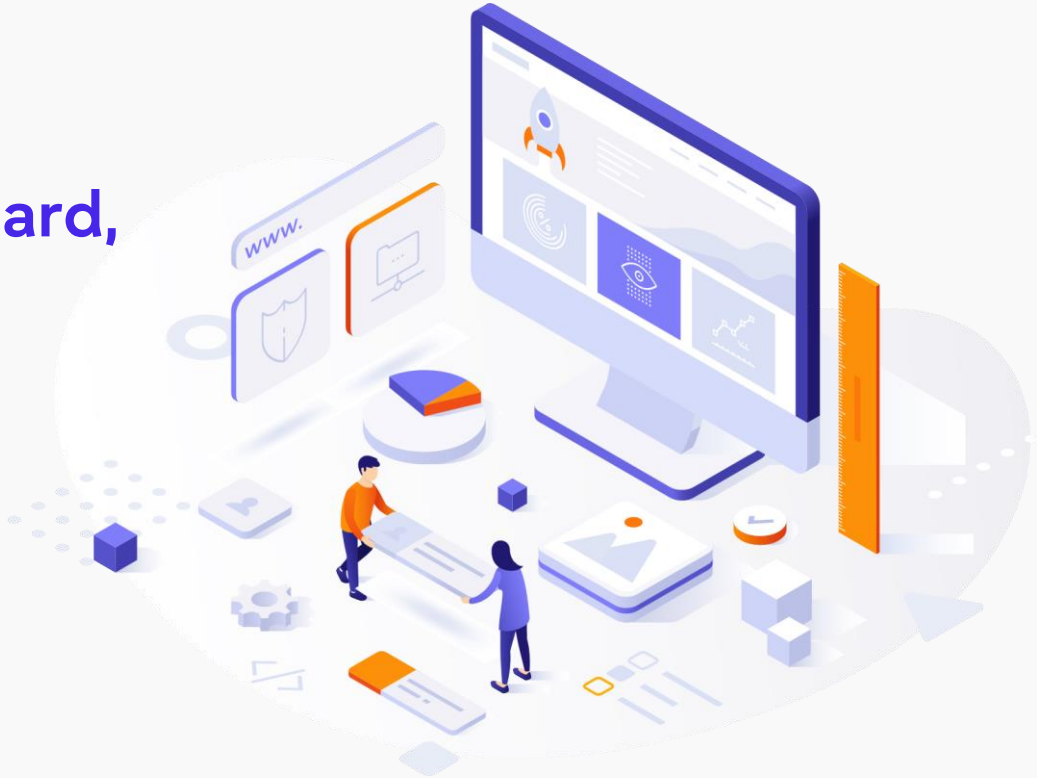
Building the next standard, together

Customers. Partners. Developers.



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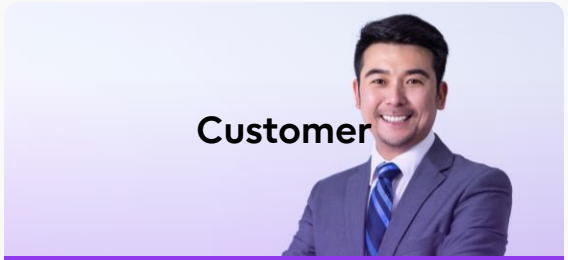
The value brought by Fujitsu's business transformation

Co-creating the next growth model.



Accelerating our customers' business transformation

- Massive reduction in Time to Market
- Rapid and reliable response to market changes and institutional reforms
- Advancement of business and management decisions utilizing data and AI
- Fujitsu evolves from a "making" vendor to a partner guiding customers' transformation

Redefining the competitiveness of engineers

- Liberation from high-load tasks, such as responding to institutional reforms
- Substantial reduction in acceptance testing burden for customers
- Engineers reallocate newly freed time to future value creation (evolving into specialists in AI-Ready Engineering / FDE* and other areas)

Evolution of the ecosystem

- In line with Fujitsu's business transformation, sharing new roles and growth opportunities with partners
- Expanding beyond the person-month model to offer value through AI-Ready Engineering and FDE-type services
- Leveraging the platform for AI-driven software development as a starting point, moving towards an ecosystem that scales with customers and partners

*Forward Deployed Engineer（FDE）：
An engineer who integrates problem identification with implementation using data and AI

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Towards a future of adaptive system development

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Our goal isn't merely "development efficiency."
It's to create the very mechanism that enables systems to continuously adapt to evolving business processes and society.

AI-led automation of requirements definition to integration testing for large-scale existing systems

Automation

Transforming to a value-based development model through AI-Ready Engineering × AI-Driven Software Development Platform

Modernization

Systems will no longer be “made and done,” but will continuously adapt to change

Transformation

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Thank you

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