FPT Software

FPT Legacy Modernization Services

2024/2/28

Overall picture of legacy modernization services (1/3)

FPT experience

Since 2006, we have implemented legacy migrations for customers in various countries. We have successfully implemented our customers' projects with our accumulated experience and extensive human resources.

- ☑ More than 17 years of experience
- ☑ Experience of deploying projects in many countries around the world, including Japan
- ☑ Experience with nearly to 200 migration projects
- ☑ Validated methodologies and work processes through many projects
- ☑ Provide consulting to help customers choose the most effective plan for them with different migration implementation methods.
- ☑ A set of tools used in the assessment and migration process that we have created and improved in-house over many years.

FPT initiatives

From 2023, we have positioned “Legacy Modernization" as an important program and have established a specialized organization.

Strengthen contribution to market needs

- Increased need for de-hosting (legacy migration)
- Increased need to address the shortage of host engineers (increased consultation on “skills and know-how transfer” as engineers retire)

Legacy Modernization Initiatives

1. Expansion of mainframe experts and people with experience, including the establishment of CoE and building knowledge pool.
2. Expansion of in-house tools and methodologies
3. Strengthening of alliances (tools from other companies): Tools made by company K in Japan, tools made by company A in the US, tools made by company B in Spain, etc.

Overall picture of legacy modernization services (2/3)

We are significantly strengthening our mainframe human resources in order to "maintain current systems on mainframes" and "implement legacy modernization."

Number of mainframe resources

2023	2024	2025
	+1000 people	+1000 people
1,500+ people	2,500+ people	3,500+ people

Senior Resource Development

In 2024, we are developing 300+ senior resources.

Member selection

Selection criteria:
- Best performing human resources
- Japanese level N3+ or TOEIC 800+

Trainning

Training with FPT DX Academy framework

OJT On-the-Job TRAINING

Assign to actual project and conduct OJT

Step 1: Coaching by mentor
Step 2: Coaching by Quality Officer

Evaluation

Program Path Conducting Interviews

COBOL Academy

We will develop 2000+ mainframe engineers by 2025.

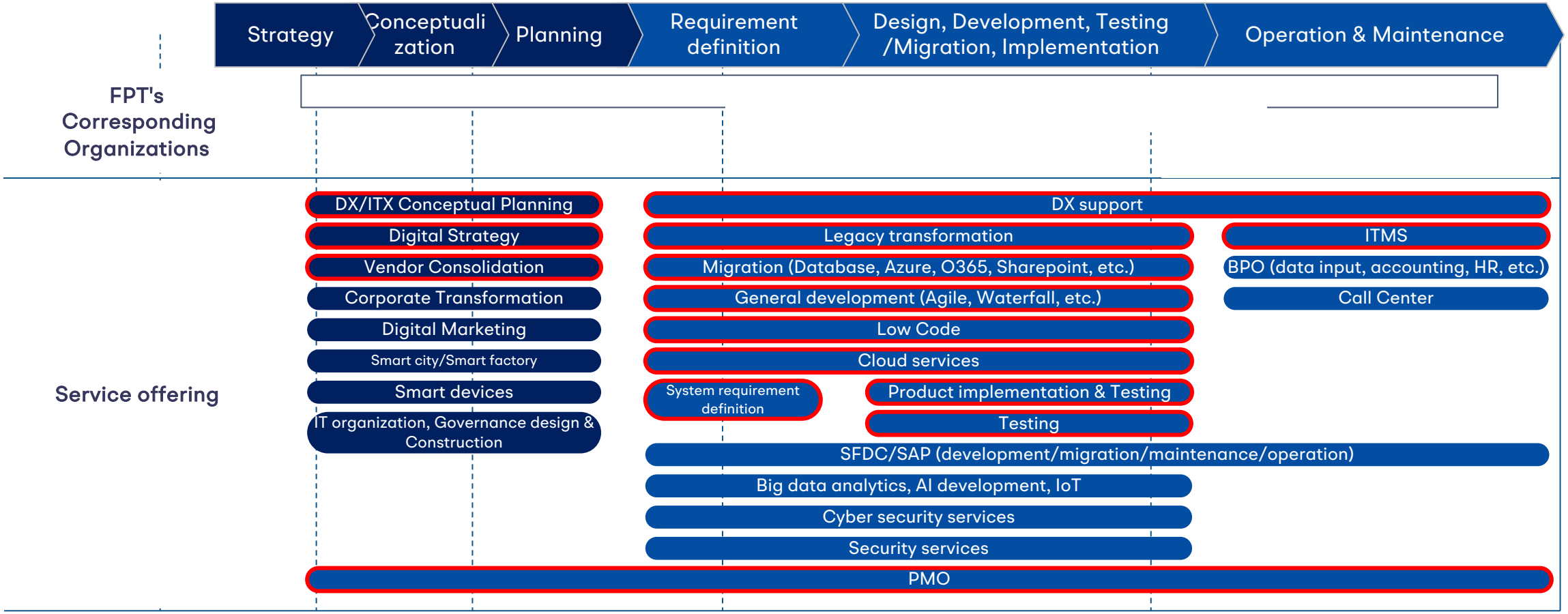
2024		2025	
CoE (Expert)	: 10+ people	CoE (Expert)	: 20+ people
Trainer of designers	: 100+ people	Trainer of designers	: 100+ people
Senior programmers/testers	: 100+ people	Senior programmers/testers	: 300+ people
Programmers and testers	: 500+ people	Programmers and testers	: 600+ people

FPT Legacy Migration End to End Service

For legacy migration, **FPT provides consistent services from consulting to development, maintenance and operation.**
We implement projects while optimizing costs by taking advantage of offshore's extensive resource supply.

[Legend]
Strong services related to legacy migration

FPT Service map



Overall picture of Modernization services (2/2)

FPT provides migration services in four areas.
In projects, we combine these services and scratch development to provide a total service tailored to the customer's needs.

①LEGACY MIGRATION

- COBOL → Java
- COBOL/PLI/ASM → COBOL (Open platform)
- RPG → Java/.NET
- COBOL → C#

②Database Migration

- DB2/Sybase/Oracle → PostgreSQL
- Database Upgrade (SQL, Oracle, MySQL, DB2)
- Oracle → MySQL
- Hierarchical/Network DB → Mongo DB

③Open Migration

- Java/Framework Version up
- Struts/JSF → Spring
- VB Migration
- Flash/Flex → HTML5

④Groupware Migration

- SharePoint (On-Premise) → SharePoint Online
- Lotus Notes Migration
- Google Suite Migration
- Cybozu Migration

Migration method of modernization

Cost reduction Staged migration	Maintainability improvement	Business process innovation and specification information available		Applications Staged expansion
Emulator usage Example: zOS → Linux COBOL → MFCOBOL	Platform/source code changes Example: zOS → Linux COBOL→Java	Application rebuilt		Mainframe coexistence Staged migration
		Applications Specifications:	Specification generation through reverse engineering	

	Re-host/Re-platform/Re-architecture/ Rewrite (conversion)/Remake/Re-factoring		Rebuild	Rebuild (LCP*)	
Overview	• Inheritance of existing program specifications • Example of platform change From mainframe to open system (zOS →Linux) Product example • akaFrame tool (Developing) • Microfocus Enterprise Server • Tmax	• Basic inheritance of existing program specifications • Language changes • DB changes • Platform changes • COBOL2Java Tools	• Legacy system disposal • Full restructuring • Data migration	• Full restructuring • Business requirements hearing • Or visualize the existing environment using reverse tools • Business and data modeling base • Automatic code generation • Integrated environment Automatic linkage of development, testing and production	• Use of cloud technology and other technologies on mainframes • Staged modernisation migration
Advantages	• Inheritance of existing program specifications • Only correction of incompatibility range • Staged modernisation possibilities • Containerization possibilities (cloud native)	• Inheritance of existing program specifications • Containerization possibilities (cloud native)	• Implementing new requirements • New environment. Example: Use of Cloud, etc. • Containerization possibilities	• Development in a short period of time • Adding new requirements • Use of new technology Containerization possibilities *LCP: Low Code Platform Example: Outsystems, Mendix	• Staged migration • Use of new technologies, etc. • Use of existing DB from new functions • Containerization possibilities • Low risk
Risks	• Application continues legacy • Operations partially changed • Vendor lock-in	• Application continues legacy • Program maintainability degraded • Operations will be rebuilt	• Increased in migration costs • Longer migration time • Disposal of old software assets	• Unclear requirements • Data migration (when changing data model) • Quality of reverse tool deliverables	• Continued mainframe costs • Retraining of existing technical staff • Some vendor lock-in

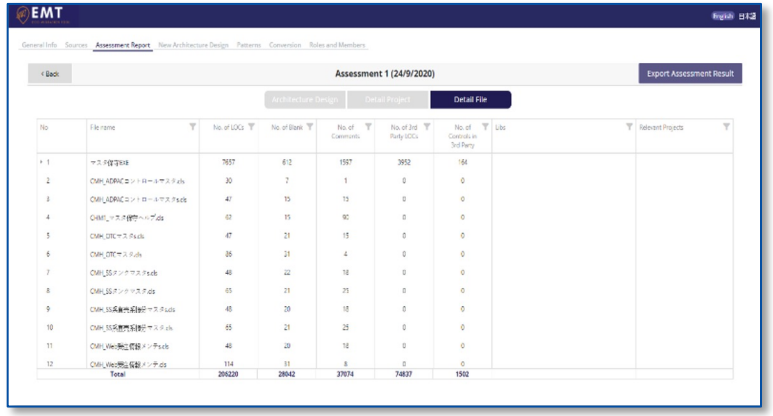
Introduction of FPT's tool “EMT”

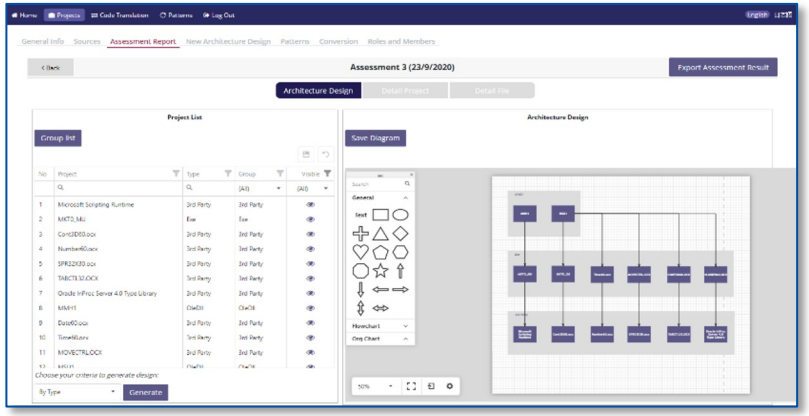
FPT **has developed the tool “EMT” in-house** and **has used it in more than 50 projects in recent years.**
The migration tool **places great importance on the ability to customise** the conversion patterns for the inherent logic during project execution.

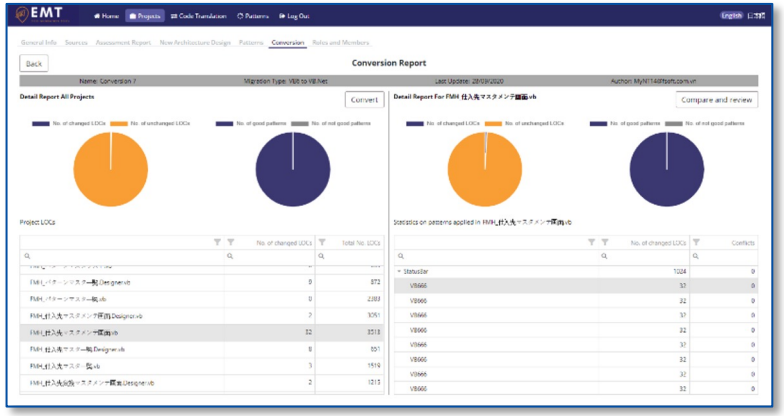
EMT
ECO MIGRATION TOOL

- Through long-term mainframe migration work, FPT has developed an ecosystem, which has been used in more than 50 projects in recent years.
- The tool has been integrated and tested with all the tools used in previous projects and reviewed by the customer, resulting in an 80% reduction in man-hours and a 90% reduction in errors.
- During the operational process, new functions are continuously added to meet new conversion patterns and challenges, improving the accuracy and speed of the tool.
- Assessment tools and Reverse engineering tools have also been created alongside the migration function.

EMT tool’s screen example:







Cloud Services

FPT **can provide the total services necessary for cloud usage** from start to finish.

Cloud Security

Security safeguards
Security monitoring
Infrastructure security testing
SecOps

Cloud Operations

Cloud Operation Management Service
24/7 monitoring and fixing infrastructure bugs
BCP & Disaster Recovery

Cloud Optimization

Cost Management & Optimization
Performance optimization

Cloud Discovery

ITX Consulting Service
Cloud Discovery & Assessment
Cloud Strategy & Roadmap
Security governance

Cloud Migration

Lift & Shift
Containerization
Automation & Optimization
DevOps/CICD

Cloud Modernization

Legacy System Modernization
Cloud-native & Refactoring
System & Data Modernization
Cloud-based Big Data Solution
DataOps

Cloud Operation Management Service

Cloud Professional Service

Key points of application development in the cloud

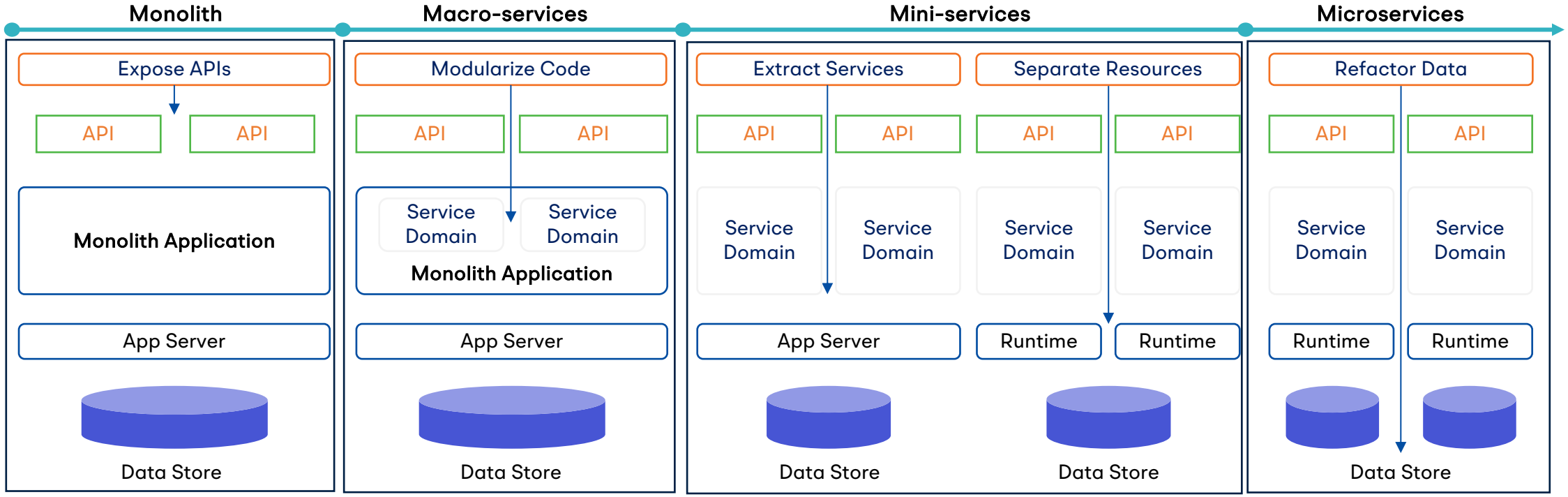
The following points will be promoted as key points in application development

Key points	Response policies
Selection of development method	• Select the optimal target development method such as waterfall or agile development for the requirements, and start full-scale work after small-scale trial verification.
Application Foundation	• Strengthening security operations and protection • Enhance the automation and efficiency of software development by implementing CI/CD pipeline
UI/UX design	• Understand user needs and requirements, adopt our processes, and proactively gather user feedback to improve the UI.
De-monolithic, architectural changes	• When building more scalable applications, consider migrating from current system to a microservices architecture using cloud-native implementation and containerization.
Security measures	• Enhance security to ensure early detection and prevention of risks (SQL injection attacks and DDoS attack countermeasures, threat detection and prevention, vulnerability assessment, unauthorised activity monitoring).
Performance measures	• Distribution, caching, etc. are designed in advance to increase the speed of the system and to cope with the increase in the number of users.
Implementation of CI/CD	• Implementation of CI/CD flows to facilitate automation and efficiency in the software development process, ensure efficient and rapid application development and quality improvement from development to operation.

Application development ~ De-monolithic, containerization ~

When building more scalable web applications, the migration from the current system to a microservices architecture with cloud-native implementation and containerisation is carried out.

- Optimizing the application modernization process by combining macro-services, mini-services and microservices using FPT-developed M*-services tools
- Experienced engineers with expertise in microservices conversion from current systems, which can be sophisticated and complex



Ease of coupling, Increased development agility, Increased portability/flexibility of deployment
Improved scalability accuracy

Addressing the “Human Resources Shortage”

We are currently receiving inquiries from a variety of customers regarding “de-hosting (legacy migration)". Some common issues have been observed, and it is assumed that this is becoming a common issue in the IT market. FPT has developed a methodology to deal with this issue.

Main Challenges (examples)

- No Host engineer
- No specifications (not up-to-date) and no members of the team know the specifications
- Each system, data, and program is tightly coupled
  (It is necessary to implement de-hosting while resolving the tight coupling).
- Multiple large-scale systems are mixed together and it is not organized how to migrate them.
  (Difficult to switch between big bang and large lots).
- A migration policy for de-hosting has not been determined
  (Investment in core and competitive areas can be made to develop new systems, but investment in other areas is limited and a migration policy cannot be determined).
- A host-open data integration infrastructure is needed, but no concrete method has been decided.

Countermeasures (proposal)

1 Human resources transformation

Develop and implement a human resources plan for the transformation of human resources

2 Establishment of a lab-based system

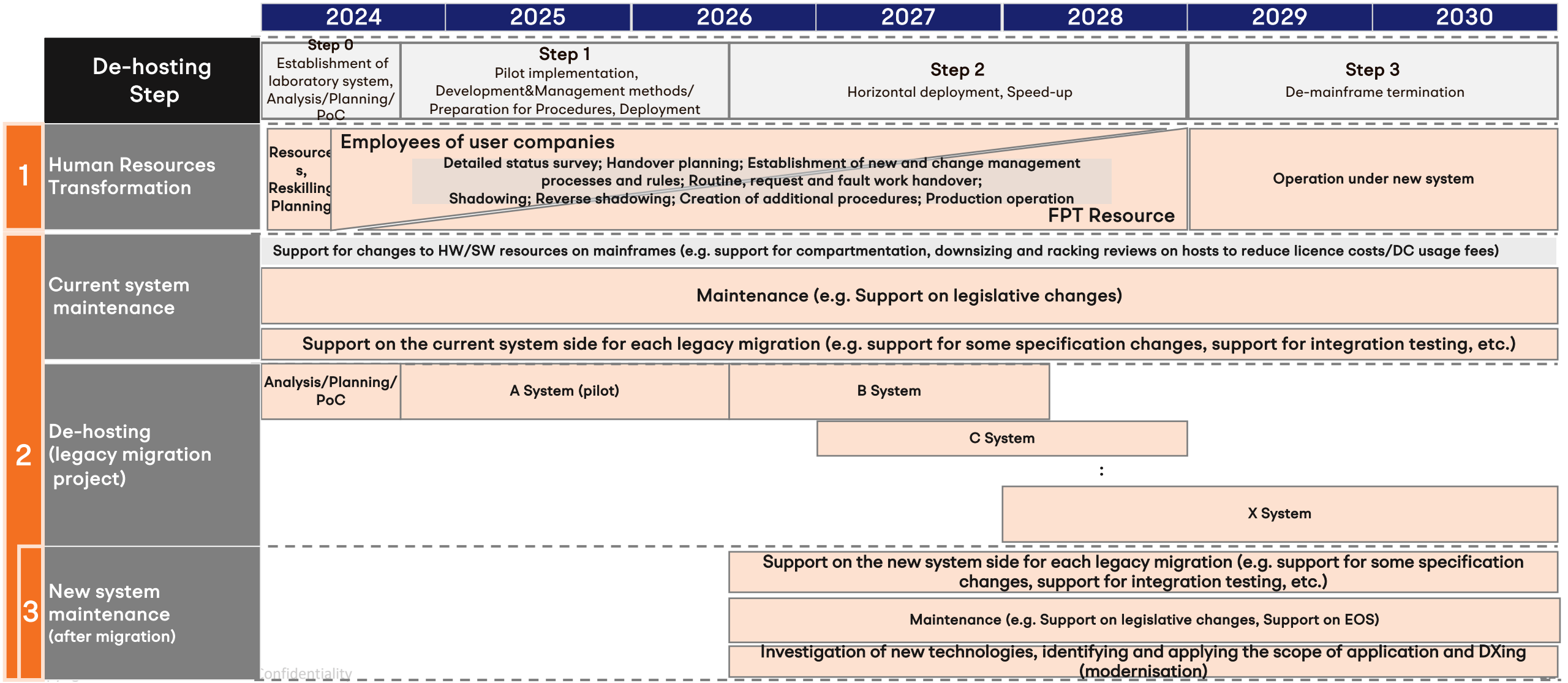
“De-hosting (legacy migration)” and “Maintenance of current systems” at the same time.

3 Promote the application of new technologies and DX.

In addition to “maintenance of new systems” after migration, determine and apply the scope of application of new technologies and promote DX at the same time.

Addressing the “Human Resources Shortage”- Overall roadmap (image) -

A lab-based system is **established** and handled to **make effective use of the limited time of current system experts** and to implement both “skill and know-how transfer” and “legacy migration”, plus “maintenance of current and new systems”.



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Thank you.

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