

The **MODERN** Way to Modernize IBM i: As a Service. On Your Terms.

Part 1: Code Transformation

March 27, 2025

Housekeeping



Slides & session recording will be e-mailed to you



Ask questions



Share your thoughts

Q & A

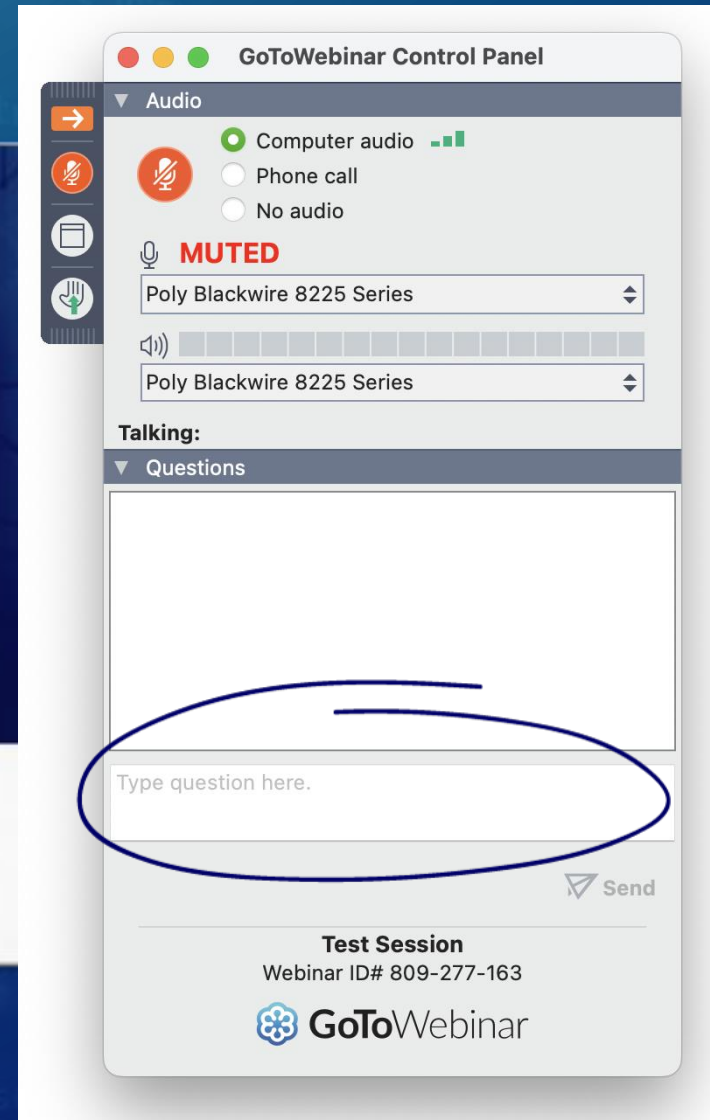


FRESCHÉ SOLUTIONS

The Modern Way to Modernize IBM i

Part 1: Code Transformation

March 27, 2025



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Audio

- Computer audio
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Talking:

Questions

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Test Session
Webinar ID# 809-277-163

 **GoToWebinar**

Today's Speakers



Chris Koppe

SVP, Strategic Transformation
Fresche Solutions

36+ years at Fresche



Marcel Sarrasin

GM, Modernization
Fresche Solutions

24+ years in the IBM i market



Welcome to the 3-Part Modernization As a Service Series



Transform Your Code

Thursday March 27
11am PT / 2PM ET



Modernize Your Database

Thursday April 10
11am PT / 2PM ET



Reimagine Your UI

Thursday April 24
11am PT / 2PM ET



Agenda

- **Why Modernize**
- **The Modern Way: Modernization as a Service**
- **AI-Accelerated Application Transformation**
- **Discovery**

Why Modernize?

Challenges Affecting Business Performance

A 3D maze made of white concrete blocks, viewed from an elevated perspective. A small figure of a person in a dark suit stands in the center of the maze, looking out. The maze is filled with various business challenges, each written in bold blue text on a white banner that follows the path of the maze. The challenges include: lack of agility, aging applications, dated look, data access, business continuity risks, business continuity, difficulty onboarding, and skill set shortages.

lack of agility

aging applications

dated look

data access

business continuity risks

difficulty onboarding

skill set shortages

business continuity

Why Modernize: Business Drivers

Modernize

Stagnate

slow to
market

high
costs

lost
customers

Growth

Agility

Innovation

Why Modernize: Technical Drivers



Why Modernize: What's Changed



Evolution in
business approach
to IT projects

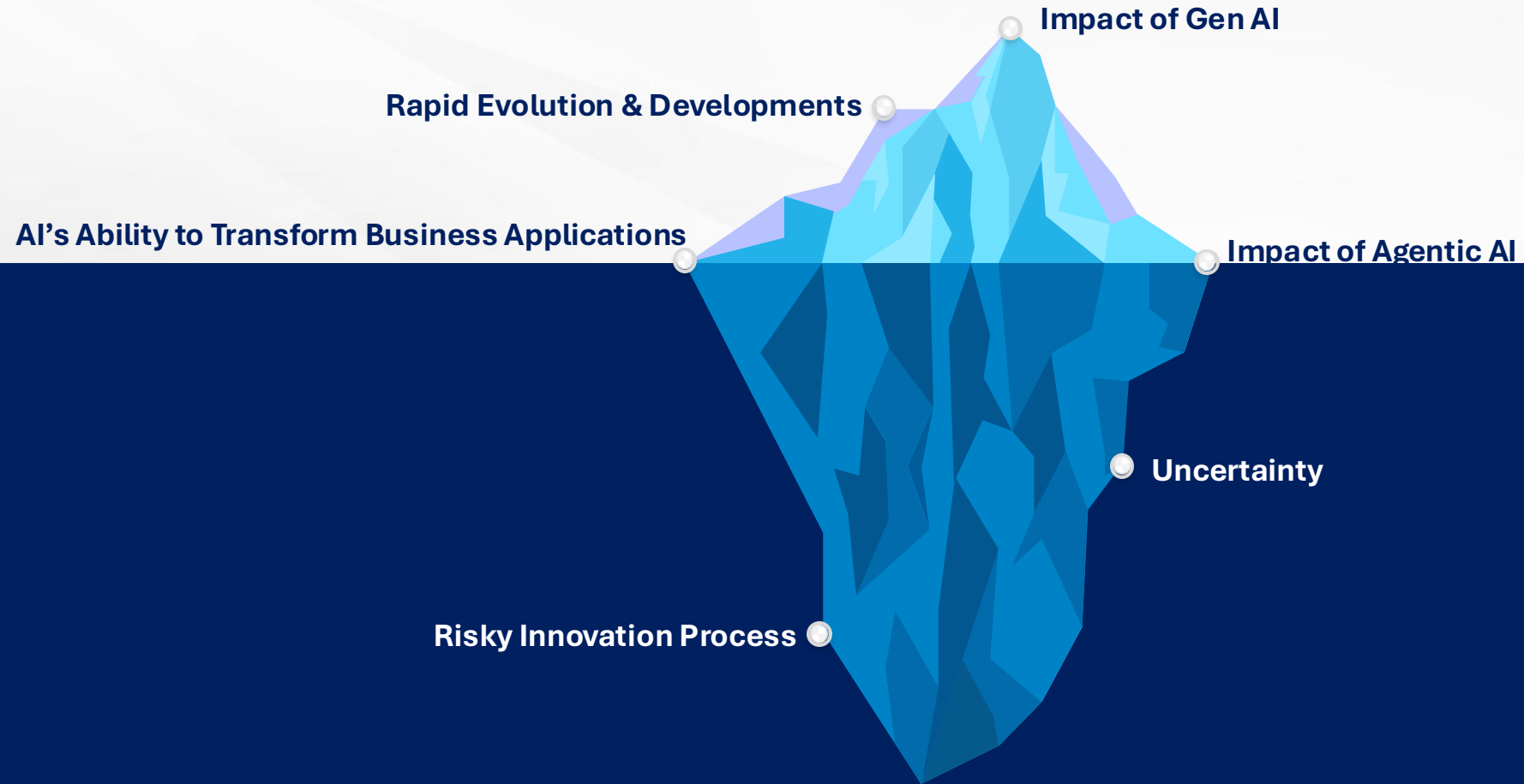


No appetite for
large projects



More
reimagine

Impact of AI



Poll:

What are your primary reasons for modernizing your IBM i applications?



Address RPG developer shortage



Improve scalability and flexibility



Enhance the user experience



Reduce technical debt and reliance on legacy code



Integrate with modern technologies and systems

The Modern Way: Modernization as a Service

What is Modernization As a Service

- ✓ **UI Modernization**
- ✓ **Reimagine Applications**
- ✓ **Application Transformation**
- ✓ **Database Transformation**



Subscription Model

Scale up or down



Outcome Driven Results

Value-based Milestones

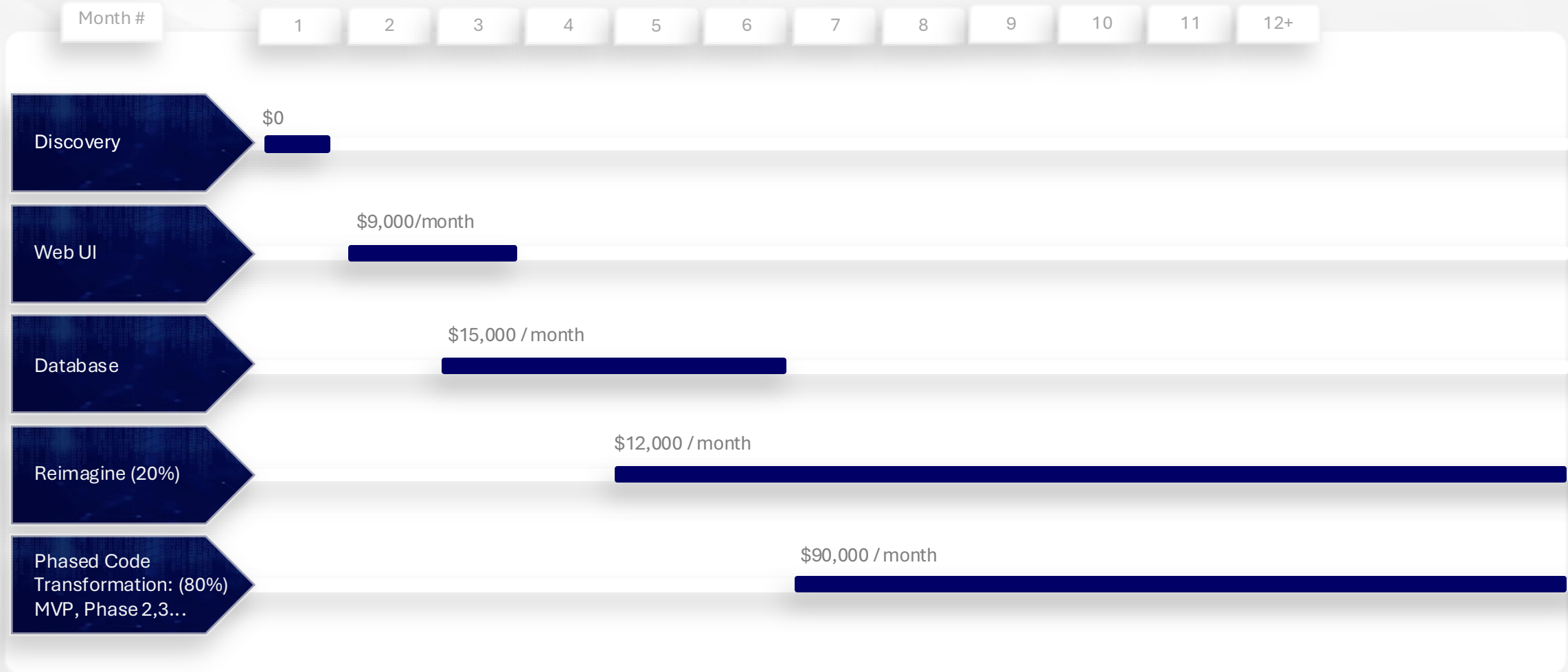


AI-Accelerated

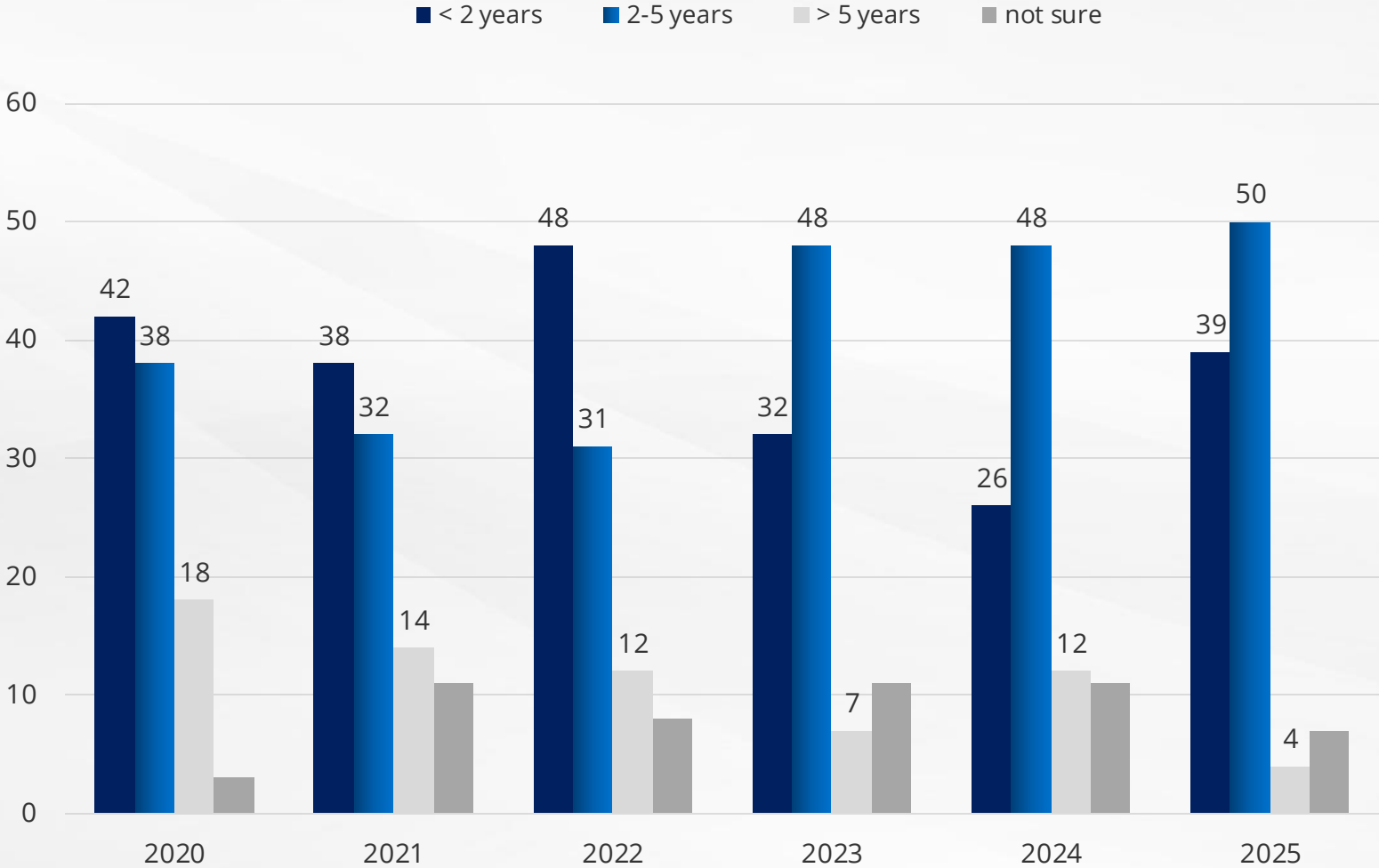
Tools and Processes



IBM i Application Modernization as a Service



When Will You Migrate All Applications From IBM i?



Source: Fortra's 2025 IBM i Marketplace Survey

AI-Accelerated Application Transformation

Modern User Experience

ARF6070 001 MINCRON DEMO COMPANY

Phone # 281 888 2476 Name Dallas Distributing Cust # 35975

Salesperson	31	Avg Days To Pay	Cust Mkt Class
Date Account Opened	9/25/94	.0	Cust Mkt Type
Customer ABC Rank	A A A		Discount %
Contracts In Effect		D.S.O.	Discount P
Credit Limit	1,999,900.00	77.7	Unrec'd Holds
Total Balance Owed	630,016.84		Last YTD Holds
Total Past Due	630,016.84		Last Pur Date
MTD Purchases	.00		Last Pmt Date
Futures	.00		High Bal YTD
Uninvoiced Orders	655,659.16		Avg Mo Sales
	Stmt Due	Balance Due	High Mo Sales
Current Due	39,954.56	.00	MTD G/P
30 Days Past Due	29,518.07	.00	12 Mo Sales
60 Days Past Due	68.33	.00	12 Mo G/P
90 Days Past Due	.00	630,016.84	YTD Serv Chg
	Total Due	630,016.84	YTD Serv Chg W/O

F3=Exit F9=Enterprise F13=Contacts F14=Futures F15=History F16=Jobs
F17=Open invoices F18=Uninvoiced orders F24=More keys

Click to search

My Lists 13

SEC APPTS AUTUMN

FE Calling Aut 12

- Caroline Taylor
- Jenny Gowin
- Jose Bloice
- Judith Hooley
- Kizzy Allott
- Natasha Keirby
- Rachael Anstey
- PP Eng to 14 Series Autumn 12
- PRI Scotland
- Matt

Advanced Search

Establishment Name: Oxford Spire Academy

Address Part: Postcode: Country:

Account No: Telephone: Adam Malpas Establishment Type:

Local Authority: Establishment Email: Adam Malpas

Title: First Name: Surname: Email:

Contact Type:

Profile Search

Profile Type: Profile: Profile Level 2

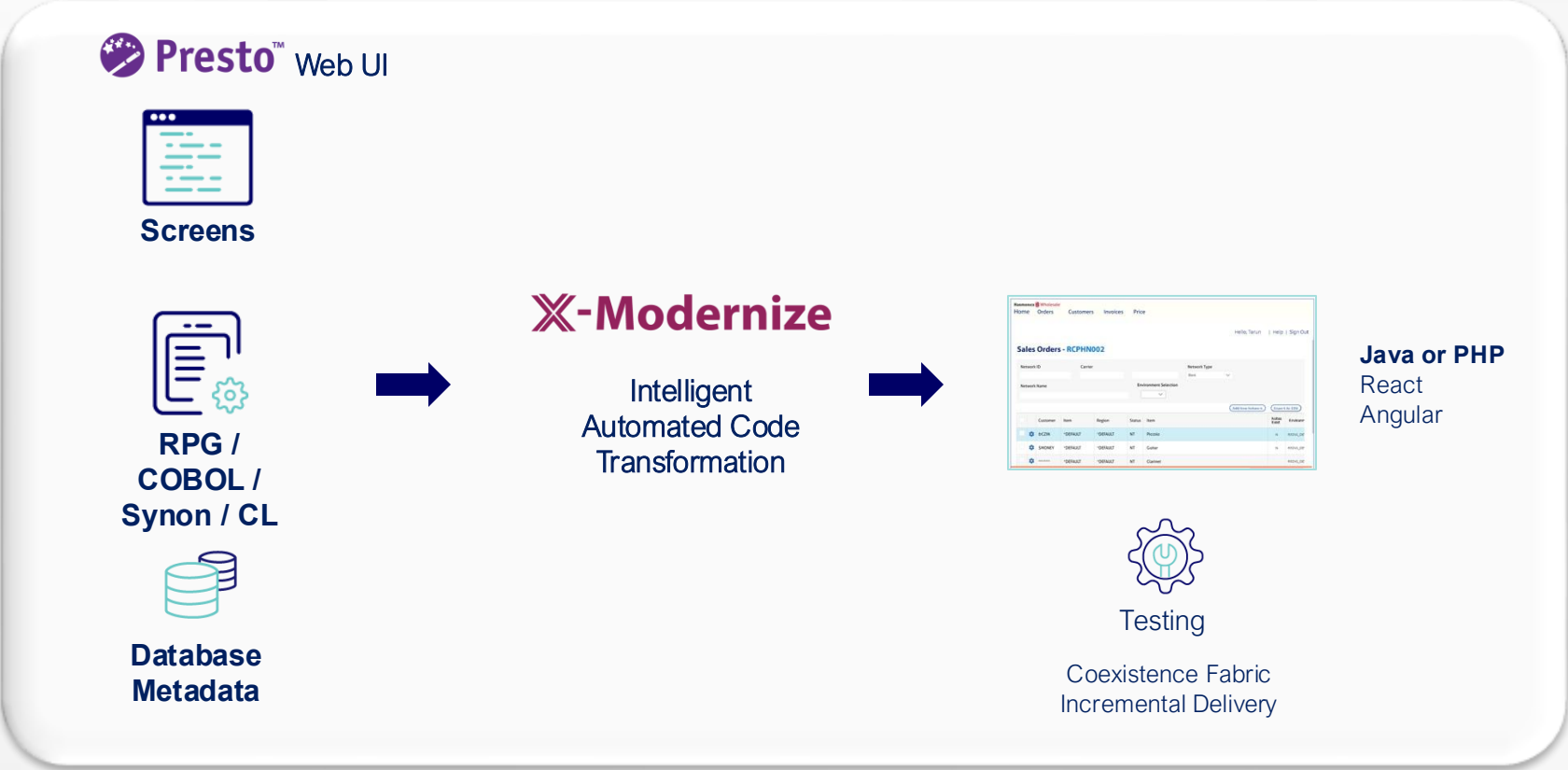
Questionnaire Search

Enable Disable Select Questionnaire

Search >

Fresche Transformation Factory

Discovery



Future End State

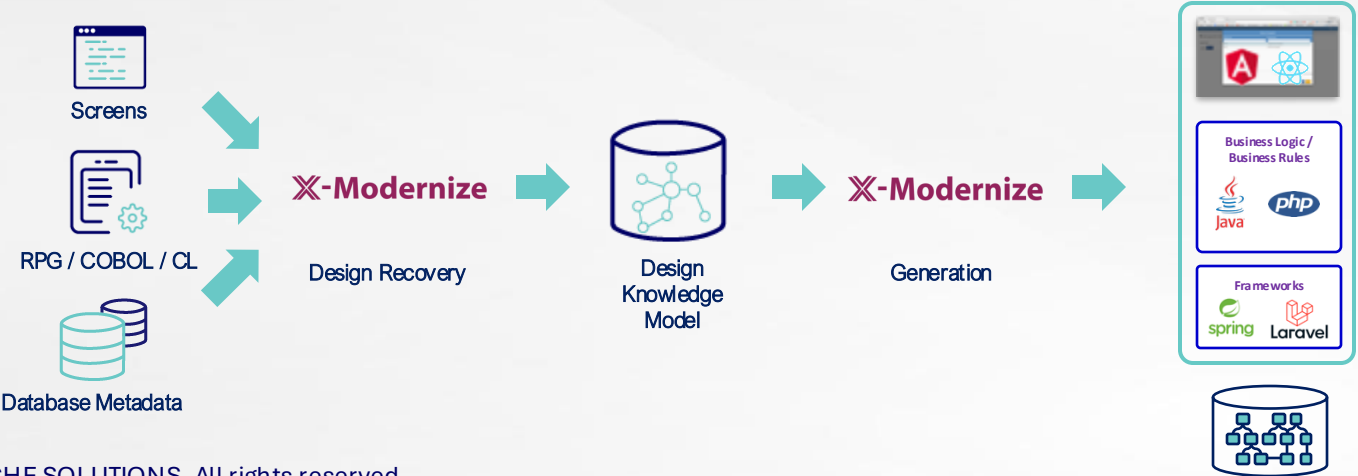
- Cloud Ready
- Portable
- Analytics/BI
- Business Process Innovation
- AI Readiness

Code Conversion vs. Code Transformation

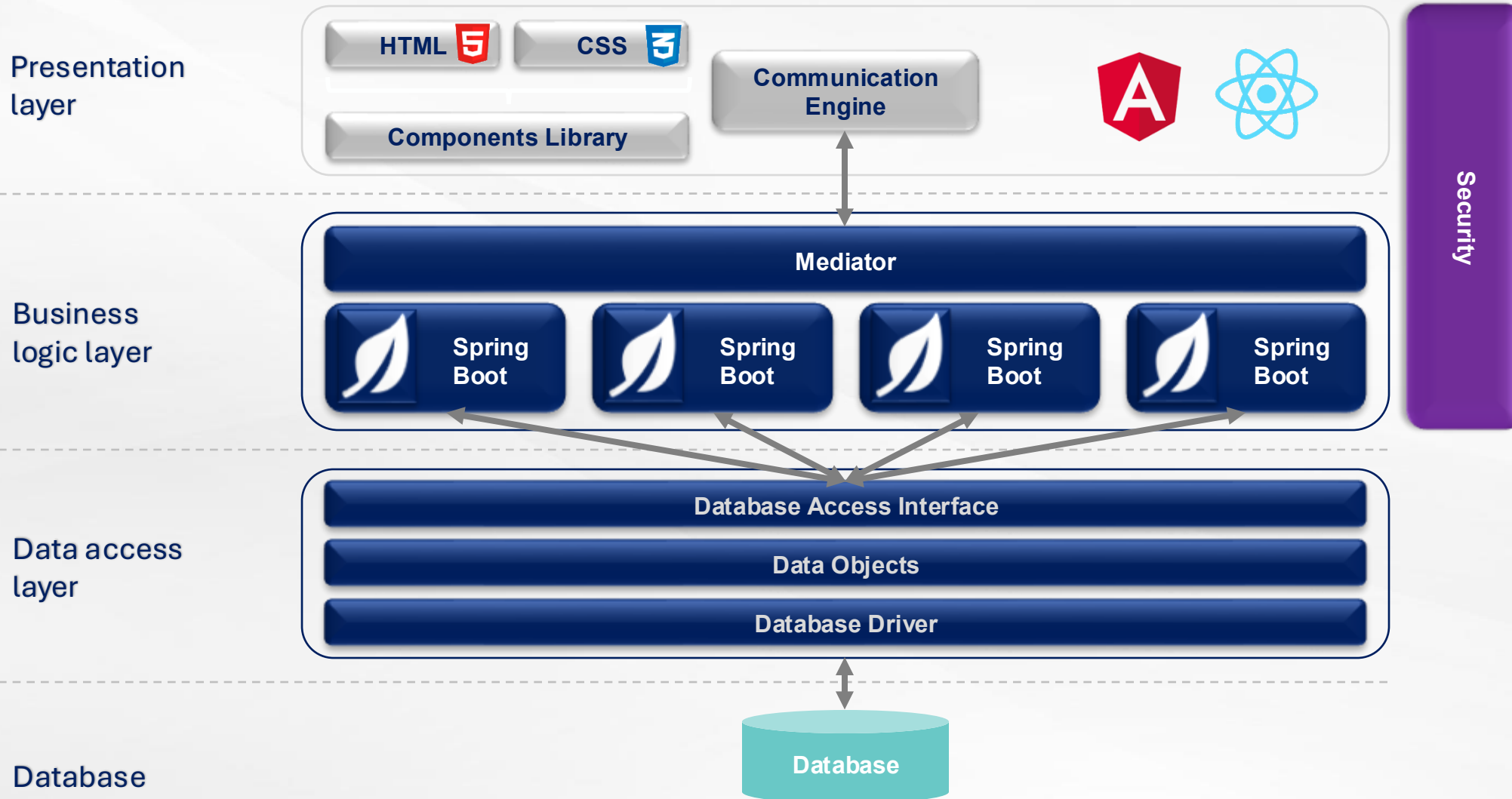
Code Conversion (line-by-line)



Code Transformation



Target Reference Architecture - Java



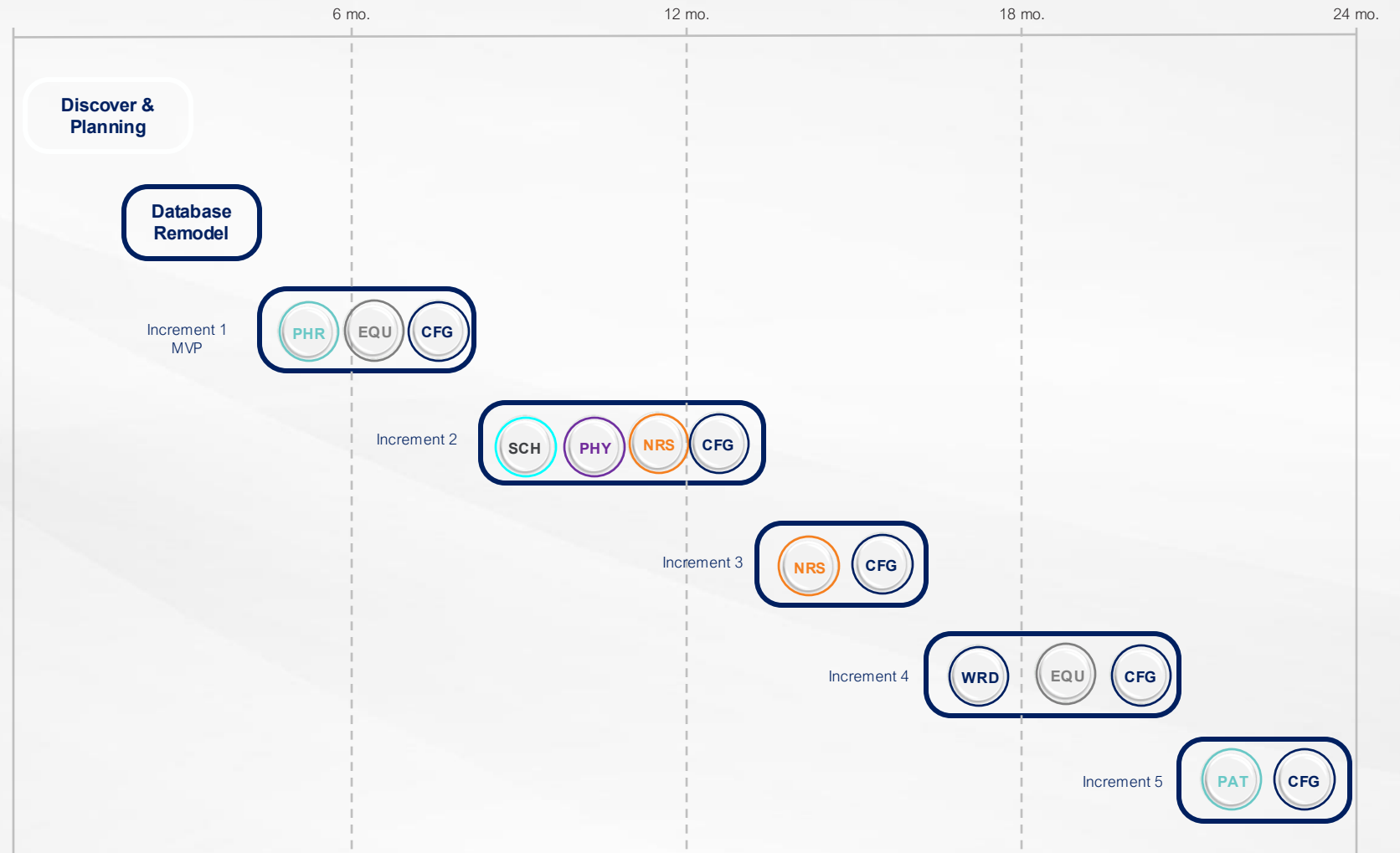
Automated RPG to Java Transformation

```
C*****  
C  CHGREC      BEGSR  
C*****  
C*-Subroutine: Change a record  
C*****  
C          MOVEL  ' UPDATE'  ACTDSP  
C          MOVE   '0'        *IN94  
C          MOVE   '0'        *IN96  
C          MOVE   '0'        *IN97  
C          EXSR   OFFIND  
  
C          EXSR   GETREC  
  
C*-If no record or file error  
C  *IN99      IFEQ      *OFF  
C  *IN66      ANDEQ     *OFF  
  
C  *IN03      DOWNE    '1'  
C  *IN12      ANDNE    '1'  
  
C          EXFMT  ZZFT01  
C          EXSR   MVSCDB
```

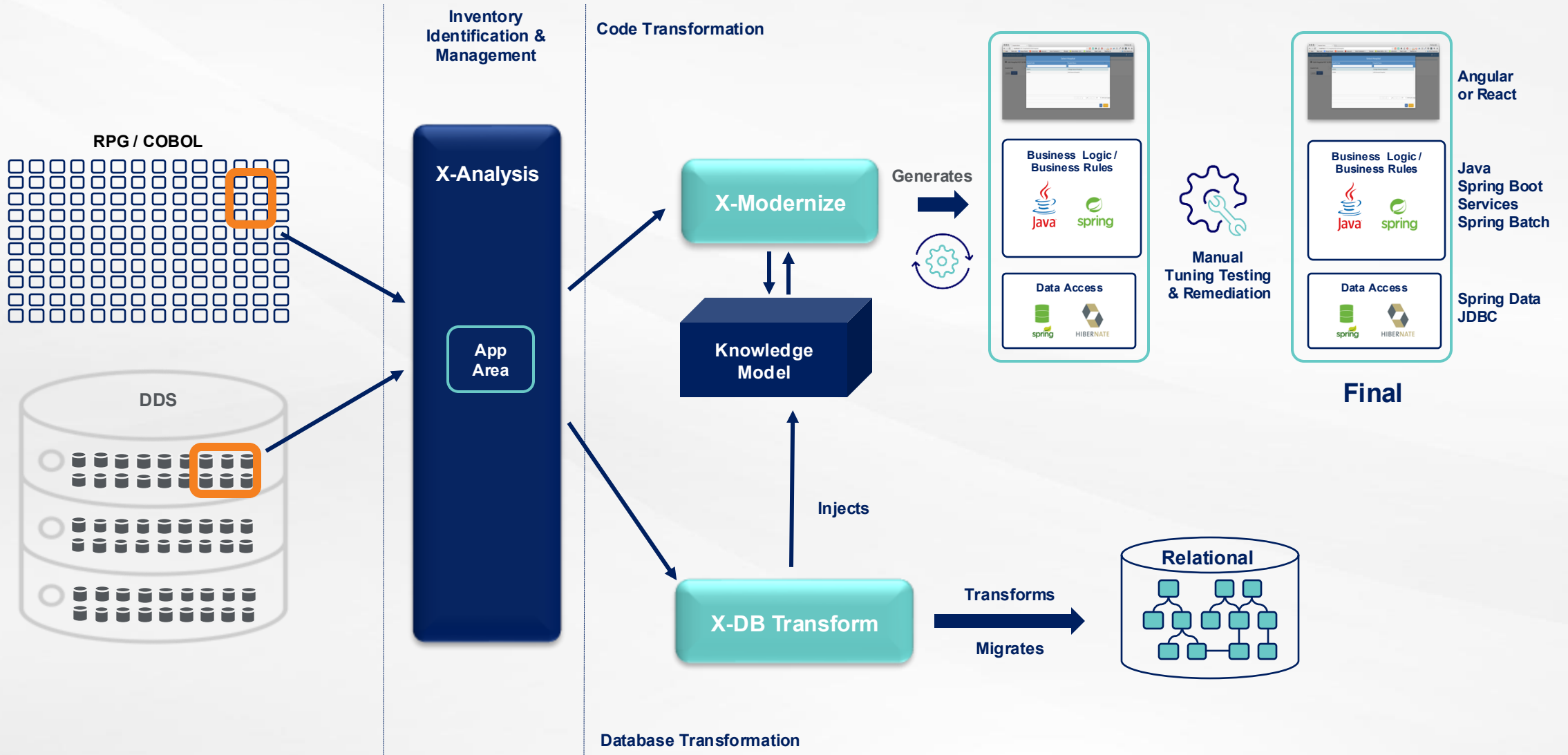
```
// *****  
private void chgrec() {  ± Maxence Lefort +1 *  
  
    // *****  
    // * Subroutine: Change a record  
    // *****  
    this.state.getActdsp().moveRawValueLeft( value: " UPDATE", isPadded: false);  
    this.state.setIndicator( indicator: 94, value: false);  
    this.state.setIndicator( indicator: 96, value: false);  
    this.state.setIndicator( indicator: 97, value: false);  
    offind();  
    getrec();  
  
    // * If no record or file error  
    if (!this.state.getIndicator(99) && !this.state.getIndicator(66)) {  
        while (!this.state.getIndicator(3) && !this.state.getIndicator(12)) {  
            writeTo(  
                this.state,  
                this.workWithCustomerDisplayFileScreen.getWorkWithCustomerDisplayFileZzft01DT0(),  
                catchErrors: false);  
            displayScreen(this.state, this.workWithCustomerDisplayFileScreen, catchErrors: false);  
            readto(  
                this.state,  
                this.workWithCustomerDisplayFileScreen.getWorkWithCustomerDisplayFileZzft01DT0(),  
                catchErrors: false);  
            mvscdb();  
        }  
    }  
}
```

Incremental Modernization Methodology

- PAT** Patient Management
- PHY** Physician Management
- WRD** Ward Management
- NRS** Nurse Management
- PHR** Pharmacy Management
- EQU** Equipment Management
- SCH** Schedule Management
- CFG** Configuration Tables



RPG / COBOL to Java Transformation Process

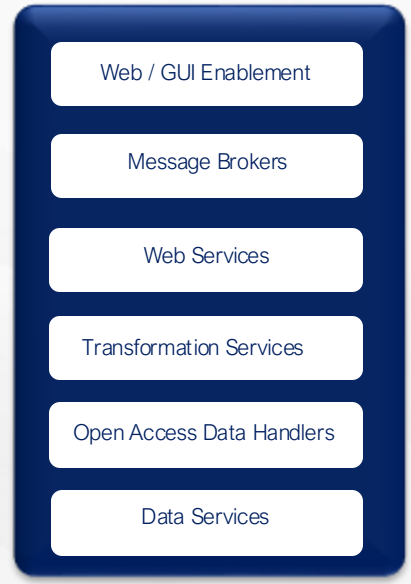


Incremental Modernization – Managing Coexistence

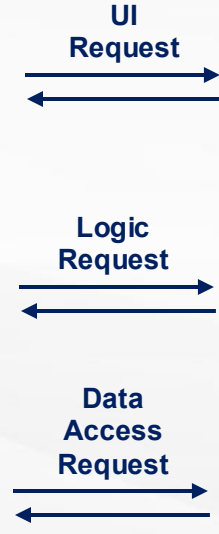
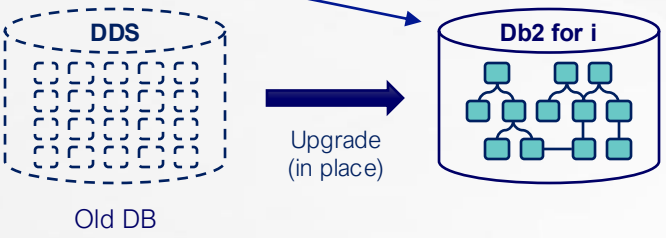
Current State Application



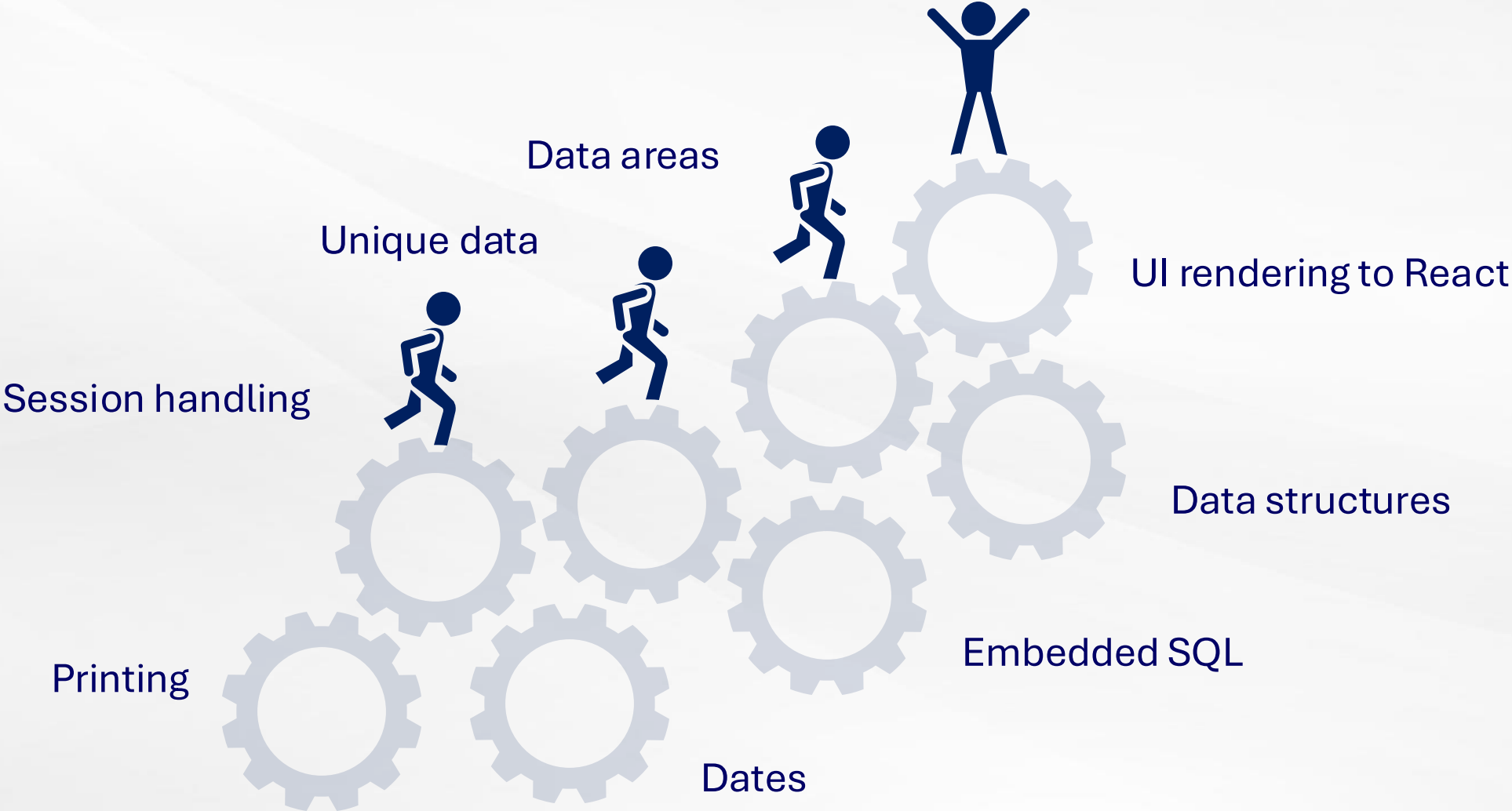
Coexistence Fabric



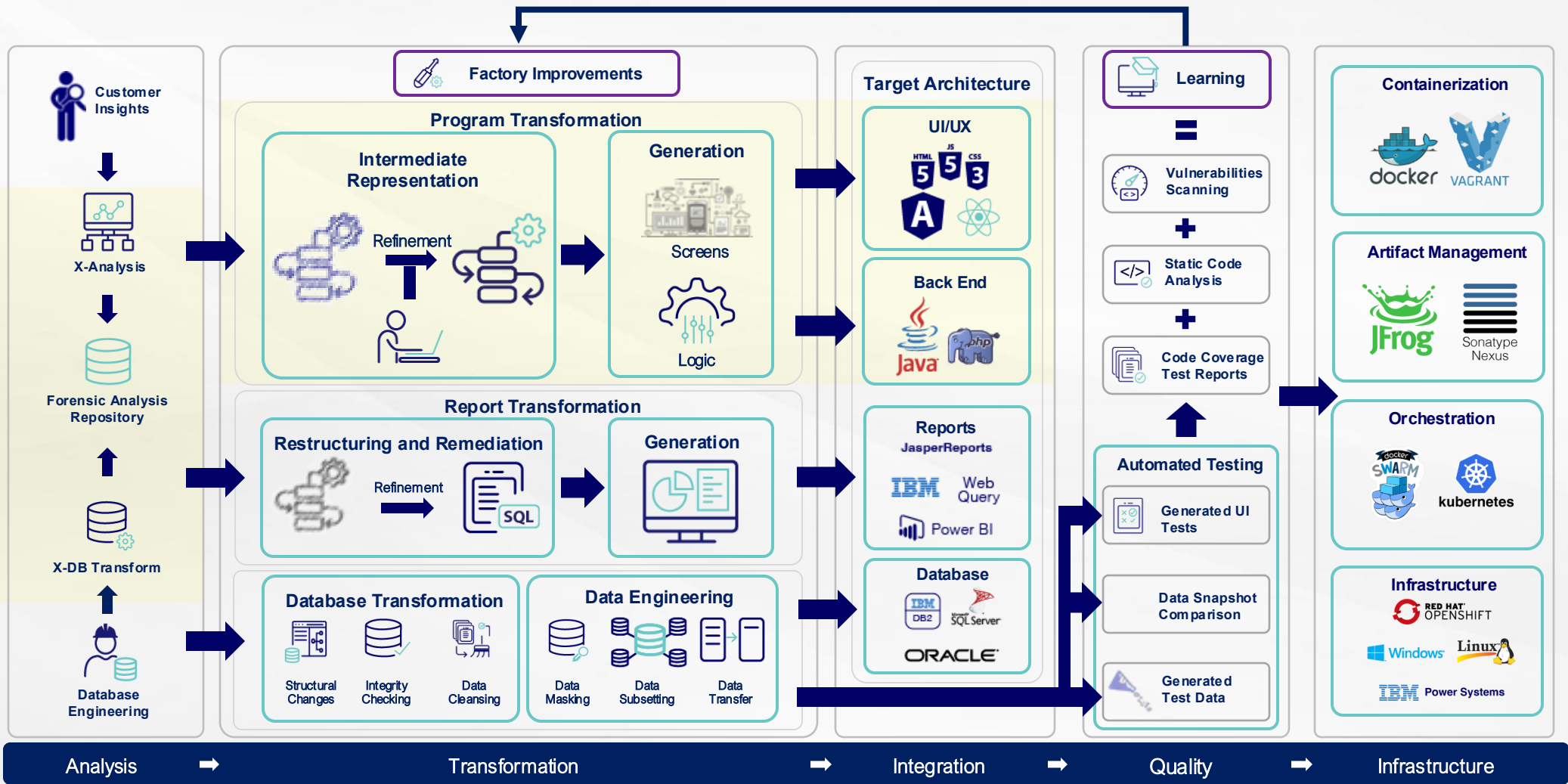
Modernized Application



Transformation Framework



A Behind the Scenes View of the Transformation Factory



powered by
X-Modernize

AI for Application Understanding

X-Analysis

Repository: ALPHA_NLP App Area: N/A

provide detailed explanation of wwcusts

Based on the program description, WWCUSTS in the ALPHA_NLP repository is a customer management program that serves as a key component in the system's customer data handling functionality.

Here's a detailed explanation of WWCUSTS:

Purpose and Functionality

WWCUSTS is designed to manage customer information within the system. It likely handles:

- Customer record creation, retrieval, updating, and deletion (CRUD operations)
- Customer data validation and business rule enforcement
- Customer information display and reporting
- Integration with other business processes that require customer data

Technical Characteristics

- Written in RPG (Report Program Generator), a programming language commonly used in IBM i environments
- Likely interfaces with customer data files/tables
- May include subfile processing for displaying multiple customer records
- Contains business logic for customer data validation and processing

Chat

Type your message...

X-Analysis Assistant can make mistakes. Check important info.

Repositories x WWCUSTS x

```
93 C*****
94 C* Delete subfile
95 C          IF          SFLRRN = 0
96 C          SETON              74
97 C          SETOFF             717281
98 C          WRITE          ZZCT01          99
99 C          SETOFF             74
100 C* Write subfile
101 C          MOVE          *ZEROS          SFLRRN
102 C          XWBCCD          SETLL          CUSTS
103 C          ENDIF
104 C*
105 C          MOVE          *ZEROS          SFLCTR
106 C          *IN81          DOWEQ          '0'          B-----01
107 C          SFLCTR          ANDLT          12
108 C          READ(N)          CUSTS          81
109 C          *IN81          IFEQ          '0'          B-----01
110 C          ADD          1          SFLRRN          |
111 C          ADD          1          SFLCTR          |
112 C          IF          SFLCTR = 1
113 C          Z-ADD          SFLRRN          SHWREC
114 C          ENDIF
115 C          MOVE          *BLANKS          DSSSEL          |
116 C          WRITE          ZZSF01          99
117 C          ENDIF
118 C          ENDDO          E-----01
119
120 C          SFLRRN          IFGT          0
121 C          SETON              71
122 C          ENDIF          E-----01
123 C          SETON              72
124
125 C          ENDSR
126 C*****
127
128 C*****
129 C          CMDKEY          BEGSR
130 C*****
131 C* Subroutine: Action command keys
132 C*****
```

AI for Application Understanding



Repository: ALPHA_NLP App Area: N/A

Line 106-118:
- This is a DO loop that continues until either indicator 81 is turned on (indicating end-of-file) or SFLCTR reaches 12 (maximum records to display)
- Line 108 reads the next record from CUSTS file; if end-of-file is reached, indicator 81 is set on
- Lines 109-117 process each record read from CUSTS:
- Increment SFLRRN and SFLCTR by 1
- If this is the first record (SFLCTR = 1), store its position in SHWREC (likely used for positioning the cursor)
- Clear the DSSEL field (likely a selection field for each record)
- Write the record to the subfile format ZZSF01

Line 119:
- Blank line for readability

Line 120-122:
- Checks if any records were loaded into the subfile (SFLRRN > 0)
- If records were loaded, indicator 71 is turned on (likely used to display the subfile)

Line 123:
- Sets indicator 72 on (likely used to enable subfile display mode)

Line 124:
- Blank line for readability

Line 125:

Type your message...

Chat



X-Analysis Assistant can make mistakes. Check important info.

Repositories x WWCUSTS x

```
88 C*****
89 C SFLWRT BEGSR
90 C*****
91 C Subroutine: Write data to subfile
92 C*****
93 C Delete subfile
94 C*****
95 C IF SFLRRN = 0
96 C SETON
97 C SETOFF
98 C WRITE ZZCT01
99 C SETOFF 74
100 C Write subfile
101 C MOVE +ZEROS SFLRRN
102 C XWBCCD SETLL CUSTS
103 C ENDIF
104 C*****
105 C MOVE +ZEROS SFLCTR
106 C *IN81 DOWEQ '0' B-----01
107 C SFLCTR ANDLT 12
108 C READ(N) CUSTS 81
109 C *IN81 IFEQ '0' B-----01
110 C ADD 1 SFLRRN
111 C ADD 1 SFLCTR
112 C IF SFLCTR = 1
113 C Z-ADD SFLRRN SHWREC
114 C ENDIF
115 C MOVE +BLANKS DSSEL
116 C WRITE ZZSF01 99
117 C ENDIF E-----01
118 C ENDDO E-----01
119
120 C SFLRRN IFGT 0 71
121 C SETON 71
122 C ENDIF E-----01
123 C SETON 72
124
125 C ENDSR
126 C*****
127
```

Explain
Copy

AI for Application Understanding

X-Analysis

Repository: ALPHA_NLP App Area: N/A

what does move do

MOVE is an RPG operation code used for data movement operations. Here's an explanation of what MOVE does:

****MOVE Operation:****

- **Basic Function:**** MOVE transfers data from a source field to a target field.
- **Right Justification:**** Unlike MOVEAL, the MOVE operation right-justifies the data in the target field. This means:
 - If the source is shorter than the target, blanks (or zeros for numeric fields) are padded on the left
 - If the source is longer than the target, the leftmost characters are truncated
- **Syntax:**** In fixed-format RPG, it typically appears as:
...
MOVE source target
...
In free-format RPG:
...
MOVE(P) source target;
...

Chat

Type your message...

X-Analysis Assistant can make mistakes. Check important info.

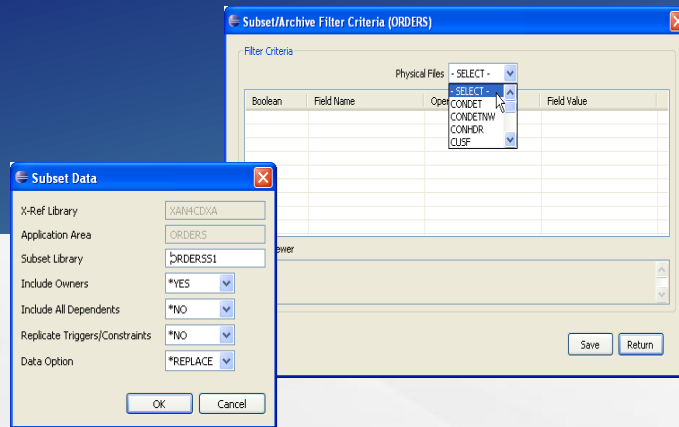
Repositories x WWCUSTS x

```
93 C*****
94 C* Delete subfile
95 C          IF          SFLRRN = 0
96 C          SETON
97 C          SETOFF          74
98 C          WRITE        ZZCT01          99
99 C          SETOFF          74
100 C* Write subfile
101 C          MOVE        +ZEROS          SFLRRN
102 C          XWBCCD      SETLL          CUSTS
103 C          ENDIF
104 C*
105 C          MOVE        +ZEROS          SFLCTR
106 C          *IN81      DOWEQ          '0'          B-----01
107 C          SFLCTR      ANDLT          12
108 C          READ(N)    CUSTS          81
109 C          *IN81      IFEQ          '0'          B-----01
110 C          ADD          1          SFLRRN          |
111 C          ADD          1          SFLCTR          |
112 C          IF          SFLCTR = 1
113 C          Z-ADD      SFLRRN          SHWREC
114 C          ENDIF
115 C          MOVE        +BLANKS          DSSEL          |
116 C          WRITE        ZZSF01          99
117 C          ENDIF
118 C          ENDDO          E-----01
119
120 C          SFLRRN      IFGT          0
121 C          SETON          71
122 C          ENDIF
123 C          SETON          72
124
125 C          ENDSR
126 C*****
127
128 C*****
129 C          CMDKEY      BEGSR
130 C*****
131 C* Subroutine: Action command keys
132 C*****
```

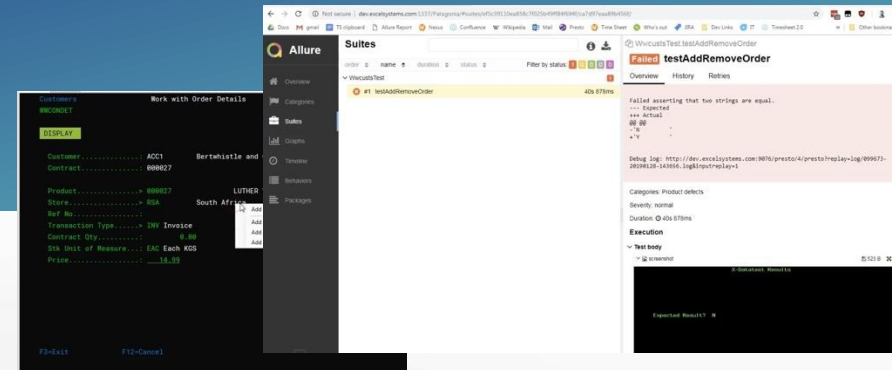
Microsoft Word

End-to-End Testing Framework

Guaranteed test validation in UI, DB & test coverage, Record in Green Screen, Transform to Cypress



Data Comparison Test Automation



User Interface Test Automation

The Unique Fresche Transformation Approach



Preserve client investments and AI Application Understanding



Modern architecture



Transform from the application design information and leverage a Knowledge Model



Integrate database and data model transformations



Available as Modernization as a Service (MaaS)

Poll:

Which area(s) of modernization are you most focused on?



Code transformation



Database modernization



Reimagine UI

Discovery Up Front

Discovery Up Front

Metrics Analysis for XANCDXA (Double Click to View History)

Complexity Level	Class	Test	Source Type	Source Lines	Cyc. Complex.	HitRate	MaxIndex	File	Device File
Grand Total	128			11,881	1,755	96.632	7160	225	51
Interactive Source Members	50			9,942	1,594	81.400	5594	181	51
High Total	0			0	0	0	0	0	0
Average Total	18			7,579	809	41.619	2812	80	18
Average	CRTCMABNT	Contacts Maintenance	RFQLE	286	33	1,160	178	2	1
Average	CUSTOMRT1	Customer Detail Maintenance	RFQLE	336	25	2,837	186	7	1
Average	WVCONDET	Work with Order Details	RFQLE	885	77	3,614	284	6	1
Average	WVCON4DR	Work with Order	RFQLE	761	95	4,772	220	6	1
Average	WVUCUST5	Work with Customers	RFQLE	753	84	4,655	132	7	1
Average	WVTRMDET	Work with Transaction History	RFQLE	565	62	3,614	153	5	1
Average	ORDEL	Order Entry	RPL	240	18	1,674	176	2	1
Average	CONRDE	Contract Entry	RFQLE	271	22	1,205	162	2	1
Average	PRDZ	Purchase Order Entry	RPL	254	17	1,128	176	8	1
Average	CUSTOMRT	Customer Site Maintenance	RFQLE	330	34	1,776	127	2	1
Average	CUSTOMOLD	Customer Site Maintenance	RFQLE	333	34	1,802	186	2	1
Average	WVUCUPP	Work with Customer Sites	RFQLE	431	42	2,091	167	2	1
Average	WVCONCOG	Work with Customer Contacts	RFQLE	264	16	943	151	1	1
Average	WVRFARAS	Work with Prop. Delivery Areas	RFQLE	246	16	729	164	1	1
Average	CUSTOMR	Customer Menu	RFQLE	259	46	2,073	152	2	1
Average	CUSTOMZ	Customer Menu	CLP	223	0	0	0	0	1
Average	WVCONDET	Work with Transaction History	RFQLE	463	80	2,758	138	0	1
Average	WVUCUSTQ2	Work with Customer Sites	RFQLE	979	104	5,178	129	7	1
Low Total	32			2,263	285	40.211	2867	81	33
Batch Source Members	78			2,029	161	6.892	1466	62	0
High Total	0			0	0	0	0	0	0
Average Total	1			421	33	3,488	99	4	0
Low Total	77			1,618	128	5,394	1767	58	0

Application Area Breakdown

Application Area	Count	Source Lines	Cyc. Complex.	HitRate	MaxIndex	File	Device File
ACCOUNTS (1)	35	5,846	376	36.240	128	77	17
High Total	0	0	0	0	0	0	0
Average Total	1	246	23	1,240	178	2	1
Low Total	1	23	0	0	0	0	0
CONTRACT	47	2,449	138	46.343	3971	111	22

01

Scope Analysis (Actively Used, 1st Slice)

02

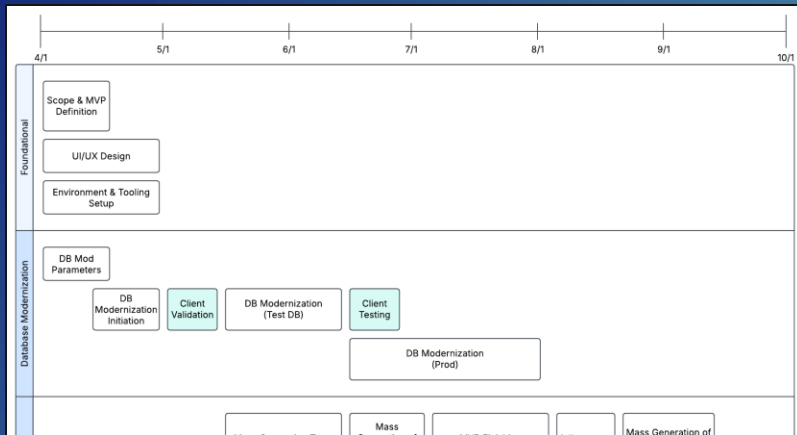
Milestones and Definition of Success

03

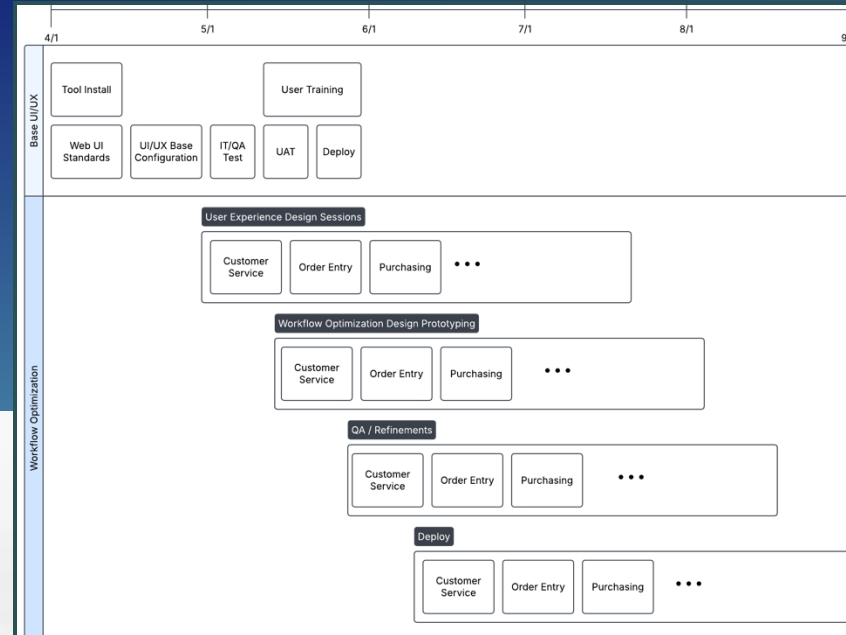
Constraints

04

Make a Plan



MaaS Example: User Experience & Workflow Optimization In Action

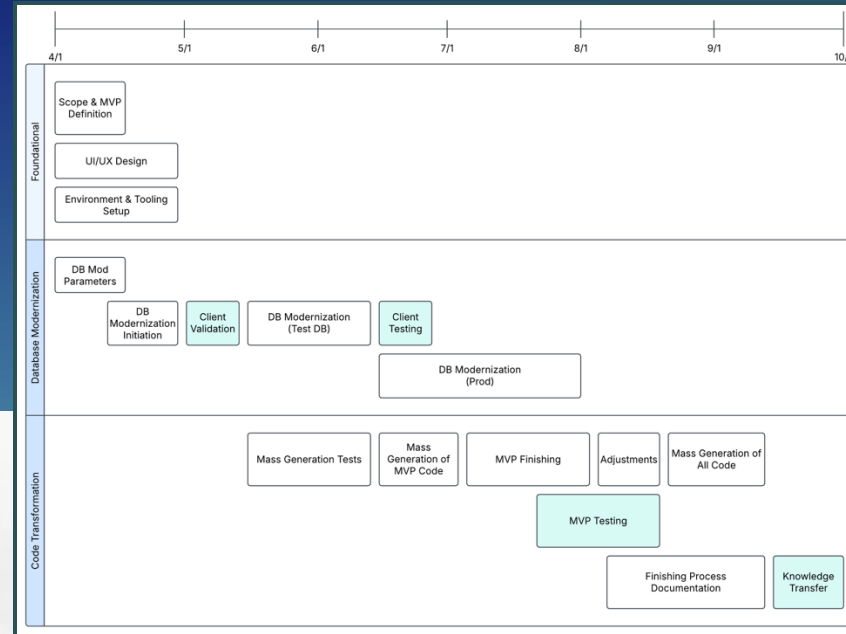


Deliver a Web-enabled application compatible on tablets.

- Optimize the data entry workflows by module.
- Work with Business Users for optimization
- Release incrementally
- Capture efficiency savings

Major Milestones	Month
Web-Enabled of System Ready	1
Web-Enabled System Deployed	2
Customer Service Optimization Deployed	3
Order Entry Optimization Deployed	4
Purchasing Optimization Deployed	5

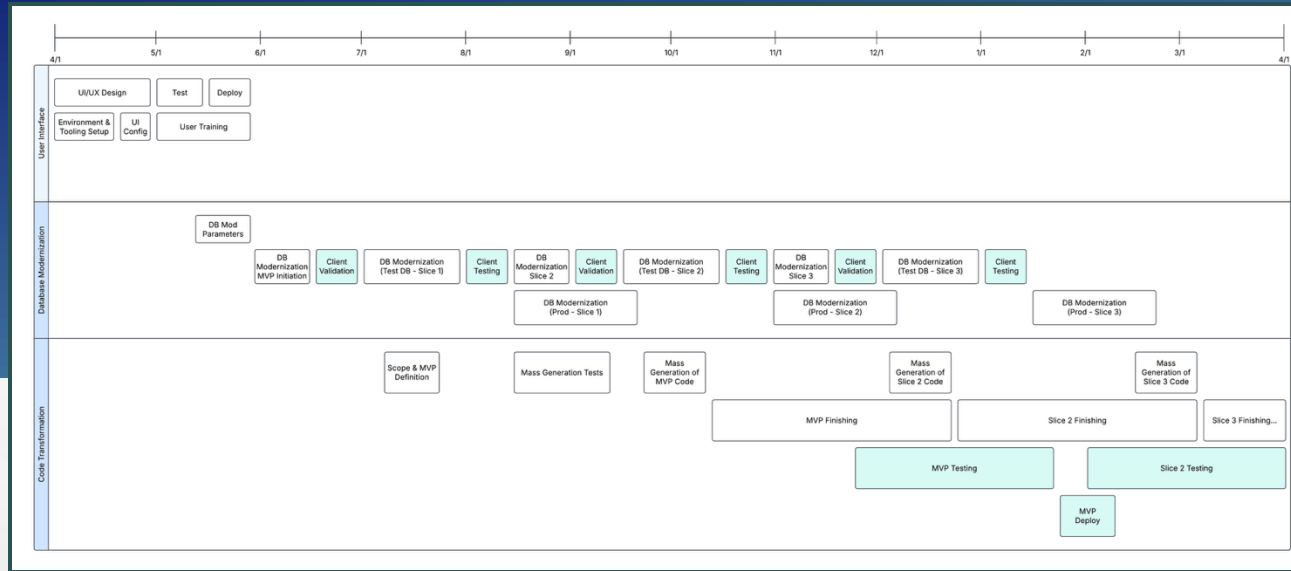
MaaS Example: Client-led RPG to PHP Transformation



- **Modernize** database to DDL with long names and foreign key constraints.
- **Transform** RPG to modern PHP
- **Maintain** the project in-house using vendor-provided transformed code.
- **Transfer** knowledge on how to complete the transformation using MVP slice
- **Document** finishing process

Major Milestones	Month
Test DB Modernized	2.5
MVP Code Ready for Testing	3
MVP Validated	4.5
All Transformed Code Delivered	5.5
Knowledge Transfer Documentation Ready	5.5
Knowledge Transfer Complete	6

MaaS Example: RPG to Java Transformation



- **Modernize** Db2 to portable DDL
- **Transform** from RPG to Java
- **Be portable.** Have options to exit IBM i
- **Start** with vendor-led, gradually bring in-house

Major Milestones	Month
Web UI Deployed	2
DB Modernization – Slice 1	4
DB Modernization – Slice 2	7
DB Modernization – Slice 3	9
Code Transformation – MVP	9
Code Transformation – Slice 2	11
MVP Deployed	11

FRESCHÉ SOLUTIONS

webinar series

The **MODERN** Way to Modernize IBM i: As a Service. On Your Terms.

Code

March 27 | 11am PT / 2pm ET

Database

April 10 | 11am PT / 2pm ET

UI

April 24 | 11am PT / 2pm ET

REIMAGINE NOW

About Fresche

IT & IBM i experts with proven solutions to manage and modernize business-critical systems for results.



IT Advisory



AI-Accelerated Modernization



Cloud



Analytics



Security



Managed Services

Q & A with the Speakers

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