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Enterprise Architecture
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ORACLE FORMS & REPORTS STRATEGY



Executive Summary

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Context: Currently, The Hartford has sizable (24) core business application built on Oracle Forms and Reports (OFR) technology. These applications spread across multiple lines of business. The objective of this document is to define the impacts of declining OFR technology, analyze options, provide recommendation and propose future architecture.

Drivers: OFR is a legacy 2-tier technology popular in 1990’s, that was later web-ified but retained 2-tier architecture. Base drivers for OFR strategy are

Supportability	Simplification	Risk Mitigation	Modernization	Business Agility
Unsupported components; major user impacts starting in 2022	Reduce legacy tech and standardize on platforms	Financial risk with increasing cost and spare skillset	Migrate to cloud ready technology and platform	Increase speed to market and turnaround time

Recommendation: Migrate Oracle Forms and Reports applications by 2023

Benefits:

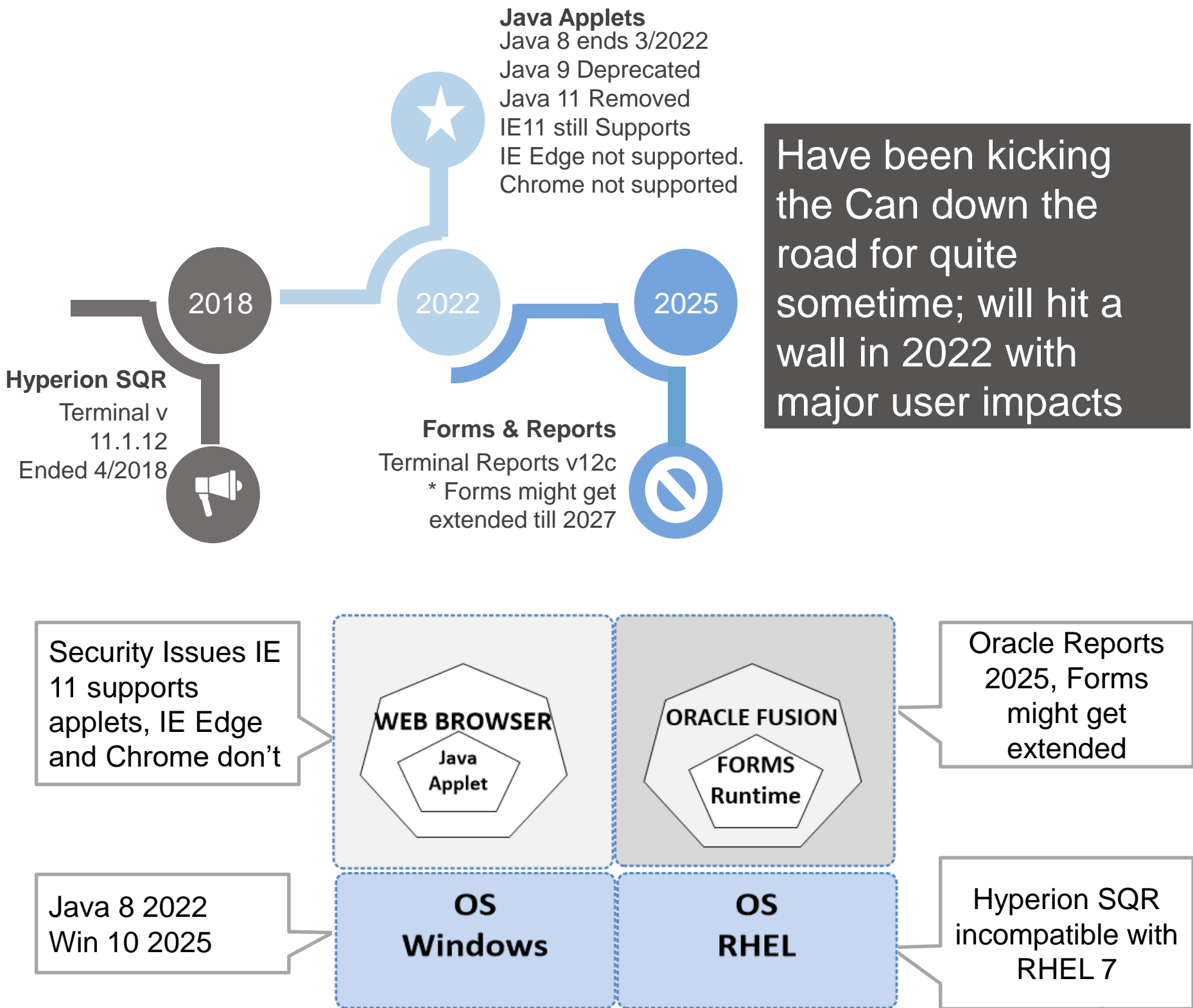
- Reduced Technical Debt
- Reduced Operational Risk
- Increase Business Agility
- Reduced Financial Risk
- Supportable and Cloud Ready Platforms

Critical User Impacts

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Context	<ul style="list-style-type: none">Oracle Forms and Reports (OFR) is a legacy client/server 2-tier technology popular in 1990's.Over the years technology was web-ified using Java Applets. Retained 2-tier application architecture.The Hartford has 24 core business applications across multiple LOB's built on Oracle Forms and ReportsDeclining and non-strategic technologyIncreasing risks (operational, supportability)Increasing financial costs (licensing and infrastructure)Increasing technical debt (migration, enhancements)
Support Dates	<ul style="list-style-type: none">Hyperion SQR used for queries/reports/integration support ended 4/2018HIG's current Java v8, support ends in 3/2022OFR v12c ends of life in 2025 (Oracle is indicating Forms end of life might extend till 2027)
Impacts	<ul style="list-style-type: none">RHEL OS 7 Upgrades incompatible with legacy SQR (Issues with DB authentication using oracle wallet)End users (desktop/laptops) functionality impacted with Java 8 Support ending in 3/22 - Java 9 (short term release) Java 11 (sustainable release)Increased licensing cost for Oracle Fusion starting in 2022No security patches and upgrades for Hyperion SQROFR Remediation for Applets and SQR requiredExtensive OFR footprint and unsupported technologies necessitates immediate action.




Current Footprint

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Infrastructure
\$3.5 million



License
\$2 million + \$500K
(2022)

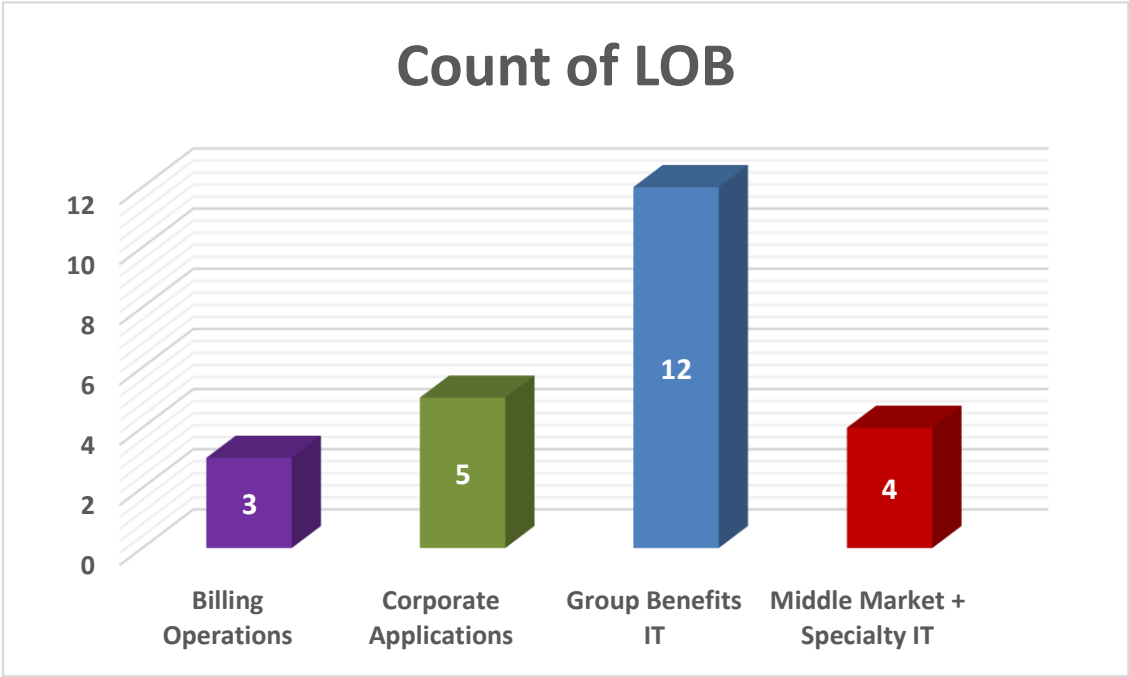


Prod Support
\$6 million

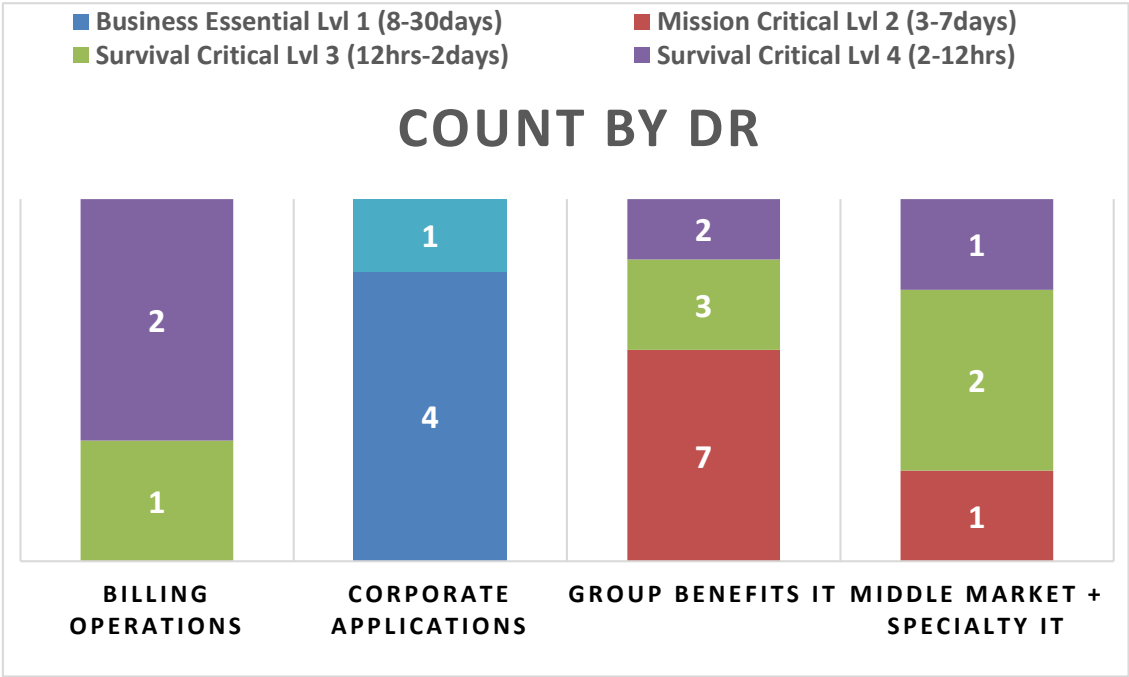


Non-discretionary
\$2 million

LOB	FORMS (# fmb)	REPORTS (rdf)
GROUP BENEFITS	1350	110
CORPORATE	450	100
COMMERCIAL	1200	200
BILLING	530	330



GROUP BENEFITS (12) (8)	CORPORATE (5) (2)	COMMERCIAL (4)	BILLING (3)
<ul style="list-style-type: none">• Survival Critical (5)• Mission Critical (7)• All on Citrix using Applets• DCS (3), Case Management (2) & Loss Processing (2) shares same codebase	<ul style="list-style-type: none">• Survival Critical (1)• Business Essential (4)• Internet Browser Applets• Expense Apps (4) shares the same code base	<ul style="list-style-type: none">• Survival Critical (3)• Mission Critical (1)• Internet Browser Applets• Reports are slowly being rationalized and retired	<ul style="list-style-type: none">• Survival Critical (3)• Commercial (2)• Personal (1)• Internet Browser Applets• TABS PI and BI shares about 80% of same code base



Options and Recommendation

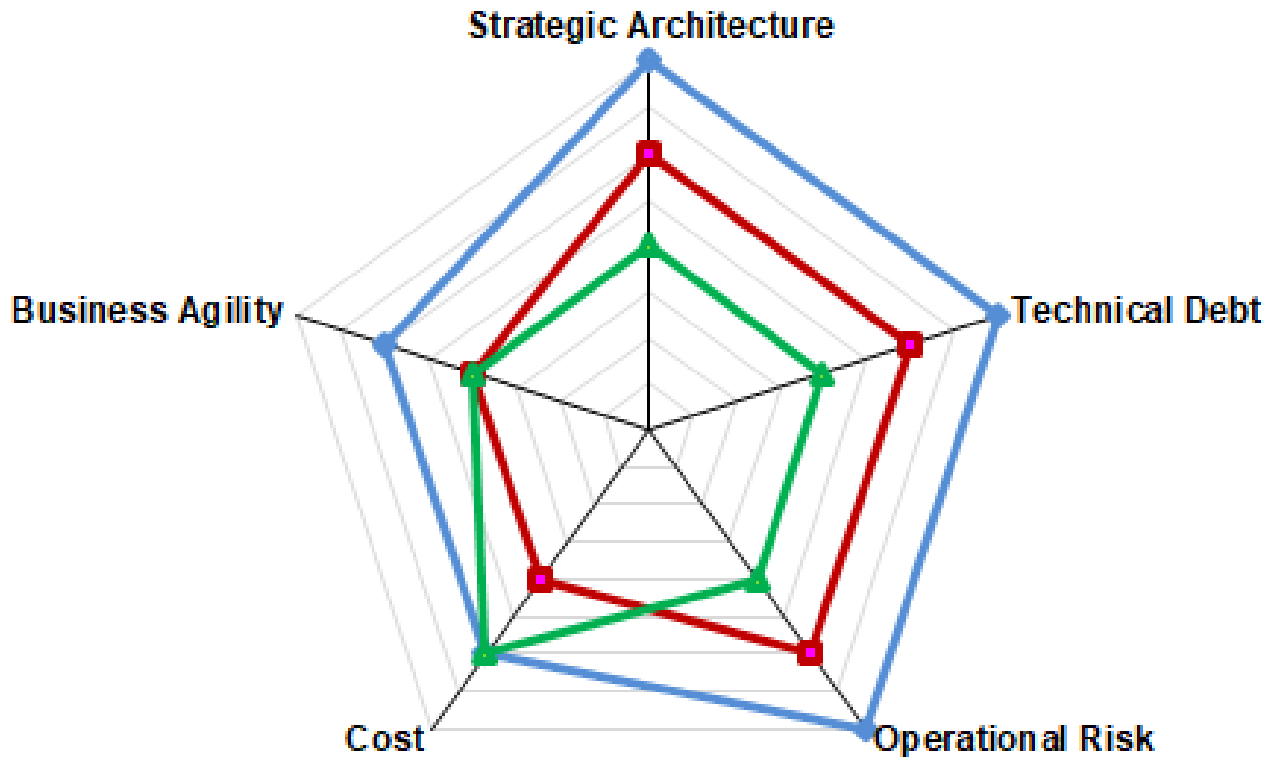
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Options	
Migrate	Migrate to n-tier architecture utilizing marketplace tools/services where applicable
Contain	Contain existing footprint and surgically rewrite non-rationalize-able applications
Do Nothing	Continue to maintain the applications and and tactically remediate tech currency

While it is technically feasible to pursue each of the all options, our Oracle Forms & Reports strategy considered the following evaluation criteria:

Technical Debt	Ease to maintain, support and enhance
	No legacy application code constructs and black box logic
	Easy to upgrade and maintain technology currency
Business Agility	Ease to maintain, support and enhance
	Quick time to market and time to delivery
	Extensible technology and application platform
Operational Risks	Support current infrastructure and technology stack
	Ability to easily find technical resources
	Supports ease of recovery and provides stable application platform
Cost	Cost of infrastructure (on-prem and/or cloud)
	High Level ROM cost of migration/implementation cost
	Does not include on-going run costs.
Strategic Architecture	Cloud Ready technology and n-tier architecture
	Easily scalable and portable technology
	Align with HIG business and IT strategic



Recommendation : Option 1 – Migrate to n-tier architecture

Options Comparison

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Option 1 – Migrate

- ↑ Phased migration into SPA, .NET/Java – Cloud Ready
- ↑ Increase supportability and ease of enhancements
- ↑ Prevents application sprawl and point solutions
- ↑ Contain applets and freeze changes during migration
- ↑ Utilize migration tools and vendor services
- ↑ Utilize low cost rationalization opportunities
- ↑ Technical Debt eliminated
- ↑ License and Support cost savings
- ↓ Might have dependencies on vendor proprietary libraries
- ↓ Need upfront investment

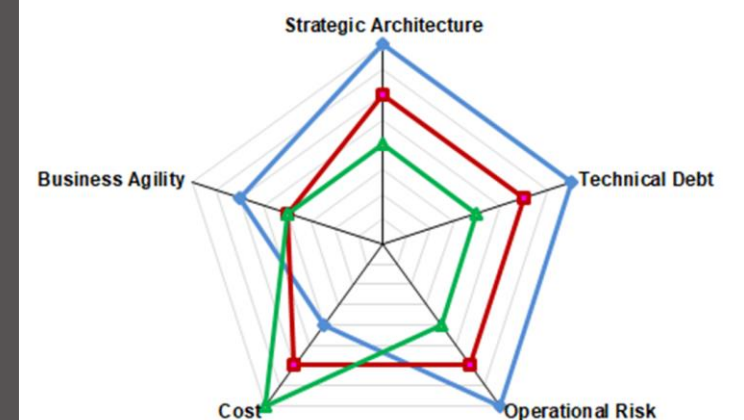
Option 2 – Contain

- ↑ Contain existing application footprint, freeze changes
- ↑ Stand-up parallel environment (SPA, .NET/Java)
- ↑ Opportunistic, phased and incremental rewrite
- ↑ Minimal technological remediation (Applets)
- ↓ Extended delivery and migration timeline
- ↓ Disjoined functionality across multiple applications
- ↓ Constant investments \$\$ over several years
- ↓ Persistent Technical Debt
- ↓ Continuous disruption to end users

Option 3 – Do Nothing

- ↑ Remediate SQR/Reports, Applets and Keep lights on.
- ↑ Requires less upfront investments
- ↓ Increases technology & application sprawl overtime
- ↓ Increasingly difficult to migrate
- ↓ Technological limitation to meet business needs
- ↓ Non contemporary UI & Not cloud ready technology
- ↓ Increasing Technical Debt
- ↓ Increasing licensing and support costs \$\$

- Option 1 scores well on Strategic Architecture, Technical Debt, Operational Risk, Business Agility
- Option 2 scores medium on all the dimensions
- Option 3 scores well on cost but lower on strategic architecture, technical debt and operational risk



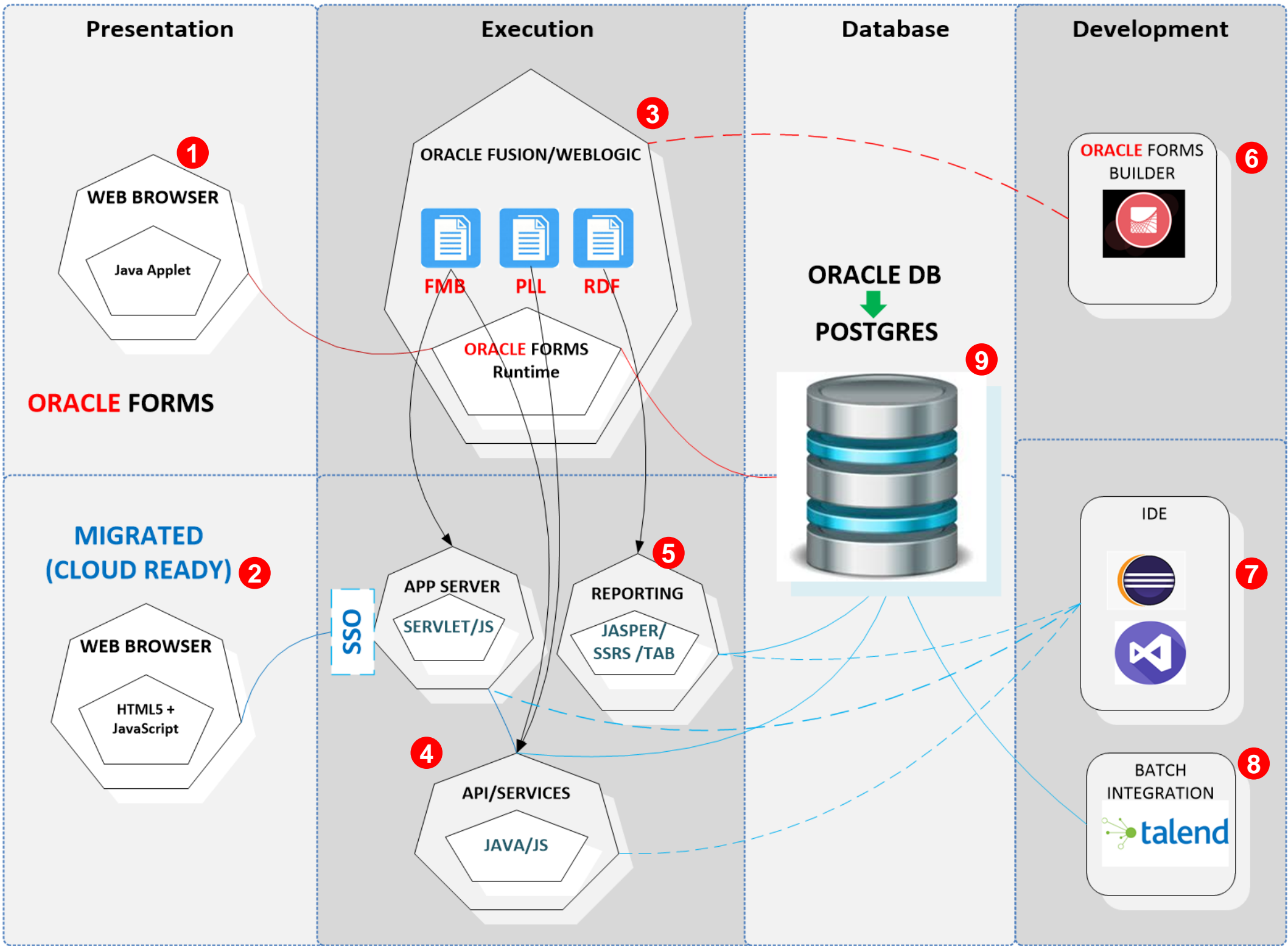
Recommendation : Option 1 – Migrate (POC in Q4 2020)

Option 1 – Migrate - Proposed Architecture

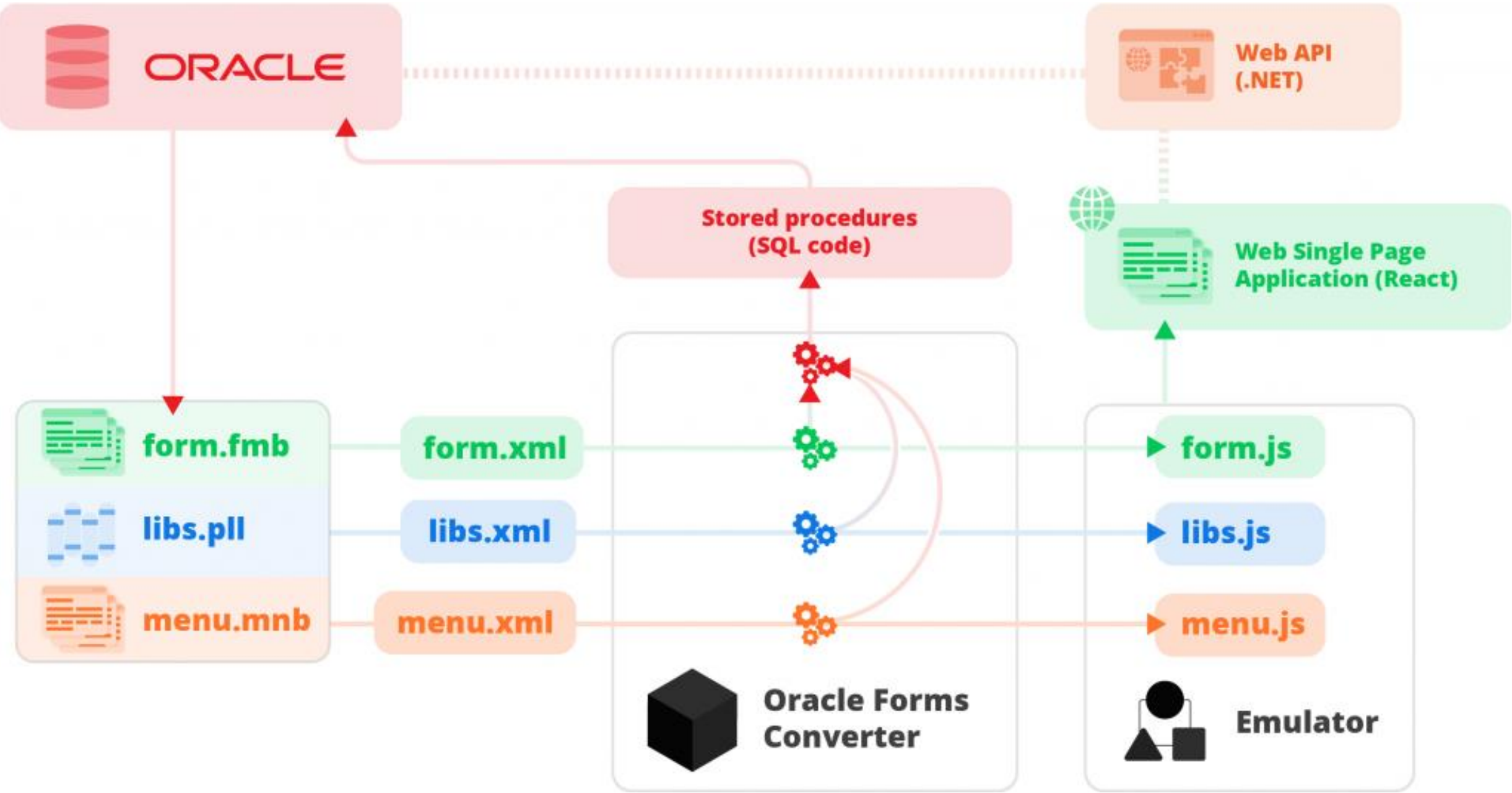
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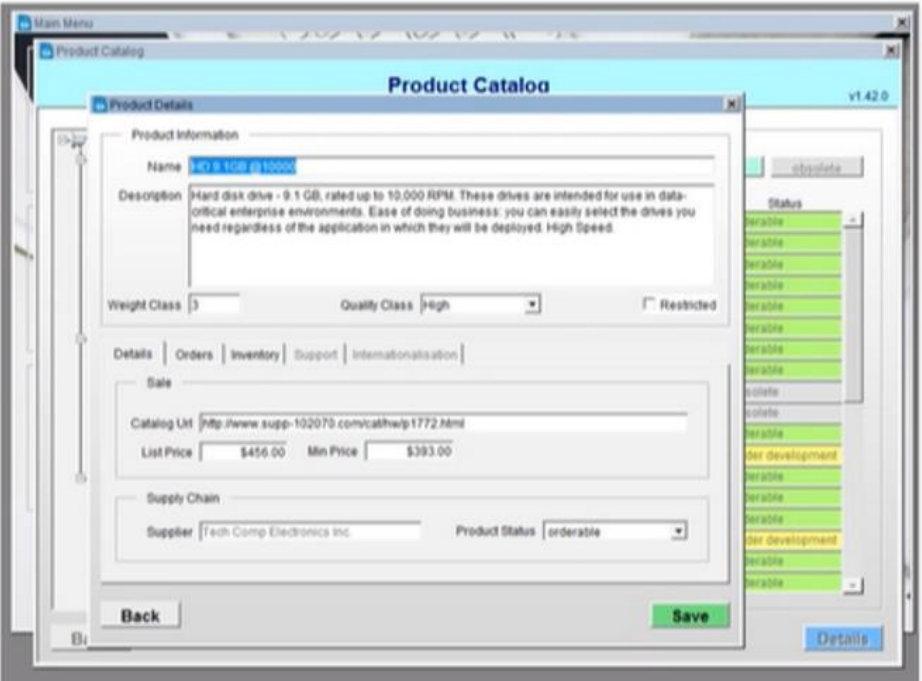
- 1 Currently, OFR applications are accessed via Web Browser using applets either directly or via Citrix
- 2 Migrated Cloud Ready application will be accessed using Web Browser using standard HTML 5 and JS without the need for Applet plug-in and/or Citrix
- 3 Currently OFR application combines the presentation layer and business logic
- 4 Migrated Cloud Ready application splits up the presentation tier and business logic using Servlets/JavaScript and API/Services. This approach provides the flexibility to start with Like for Like UI and replace the UI later without rework of business logic. SSO is part of the solution.
- 5 Operational reports are move to Jasper reporting framework or SSRS or Tableau (DR and Need). This includes SQR based batch reporting
- 6 Currently the development of OFR application are developed using OFR Builder
- 7 Migrated application will utilize Eclipse Java IDE for Java based application development including API tier
- 8 Integrations that currently use SQR/PLSQL is moved to Talend based integration platform
- 9 Current application's Oracle DB is used during the migration to minimize database migration need and subsequently migrated to Postgres cloud DB



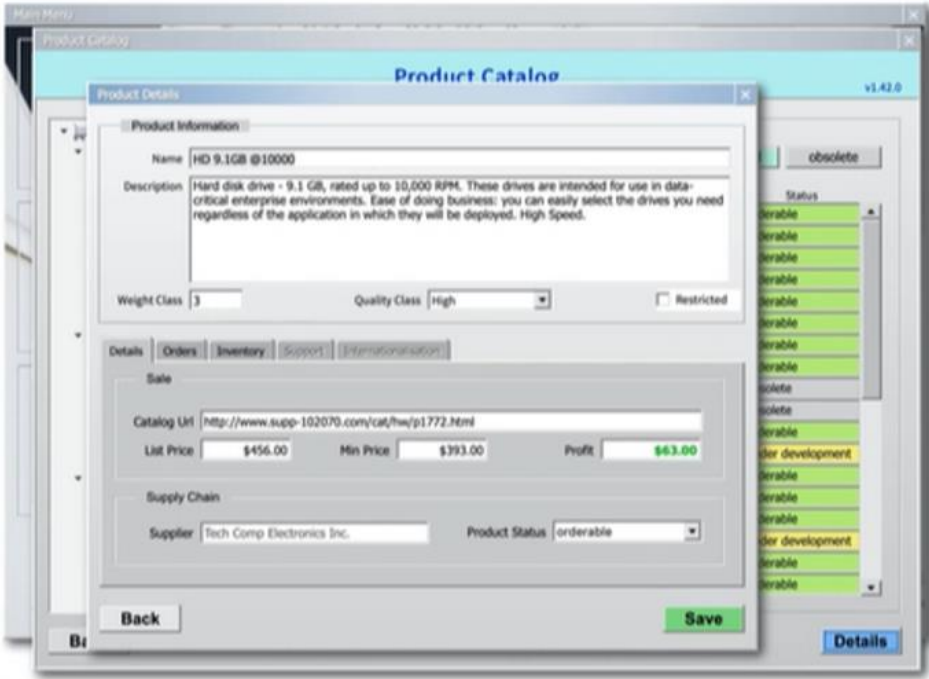
Typical Tool based Migration Approach



BEFORE



AFTER



Cost Projections

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Current Costs						
	2021	2022	2023	2024	2025	Total
Production Support and Non-discretionary	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 8.00	\$ 40.00
Oracle Fusion License Cost	\$ 2.00	\$ 2.50	\$ 2.50	\$ 2.50	\$ 2.50	\$ 12.00
Infrastructure Costs	\$ 3.50	\$ 3.50	\$ 3.75	\$ 3.75	\$ 3.75	\$ 18.25
Total	\$ 13.50	\$ 14.00	\$ 14.25	\$ 14.25	\$ 14.25	\$ 70.25
Migration All-in Costs						
One-time	2021	2022	2023	2024	2025	Total
Migration Cost (Tool and Labor)	\$ 2.00	\$ 2.50	\$ 2.00	\$ 0.25	\$ -	\$ 6.75
HIG App Dev, QA, Program	\$ 1.00	\$ 1.50	\$ 1.25	\$ 0.50	\$ -	\$ 4.25
On-Going Costs						
Production Support and Non-discretionary	\$ 8.00	\$ 8.00	\$ 6.50	\$ 6.50	\$ 6.50	\$ 35.50
Oracle Fusion Licensing Cost	\$ 2.00	\$ 2.50	\$ 2.50	\$ 1.00	\$ -	\$ 8.00
Current Infrastructure Costs	\$ 3.50	\$ 2.50	\$ 2.00	\$ 1.00	\$ -	\$ 9.00
Cloud Deployment	\$ 0.50	\$ 1.00	\$ 1.00	\$ 1.00	\$ 1.00	\$ 4.50
Total	\$ 17.00	\$ 18.00	\$ 15.25	\$ 10.25	\$ 7.50	\$ 68.00
Assumptions						
2021 Migration of Business Essential (4) and Mission Critical (8) ~ 1700 @ \$1200/form						
2022 Migration of Survival Critical Level 3 (6) and Survival Critical 4 (3) 2000 @ 1200/form						
2023 Migration of Survival Critical Level 4 (2) and Survival Critical 5 (1) - Remaining forms and Support						
2024 Transistion and Decommisioning Costs and Renegoitiatin of Oracle Fusion License						
Cloud Deployment costs are ROM estimates @\$1200/BE @\$2400/MC @\$4800/SC per month						

- Form Complexity and gaps in institutional knowledge could extend migration effort and timeline
 - **Mitigation:** PoC, current state documentation and BE migration will provide valuable lessons
- Like for Like - No enhanced business capabilities
 - **Mitigation:** New app architecture provides the platform for improved business capabilities. Also look for opportunities to address long-running and quick fix business capability pain-points based on priority and business benefits
- End user rollout disruption and change management might increase the timeline
 - **Mitigation:** Migration planning and collaboration with CIO app teams
- Business logic migration (Forms/PLSQL) to API/Services Layer could be complex
 - **Mitigation:** Separating business logic into API layer decision is done on case by case basis that addresses reduction in technical debt

Next Steps

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- Proposed POC with couple of vendors – Q4 2020
 - Need funding and approval to move forward
 - Helps in refining the cost, approach and timeline
- Migration approach
 - Business Essential Application (Corporate Expense)
 - LOB Mission Critical and then Survival Critical
- Work with LOB CIO's and App Teams on timing of migration

APPENDIX



Proposed disposition per LOB

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LOB	APPID	APP NAME	DR Class	Proposed Disposition
GB	APP-1047	DCS Eligibility	Survival Critical Lvl 3	Potential rationalization with THAA. Otherwise Migrate
GB	APP-1105	Participant Admin	Mission Critical Lvl 2	Replacement in 2020/21. No need for migration
GB	APP-1283	Rating & Quote Tracking	Survival Critical Lvl 3	Replacement in 2020/21. No need for migration
GB	APP-1300	SOLAR	Mission Critical Lvl 2	Migrate
GB	APP-1443	Case Management - Direct	Mission Critical Lvl 2	Potential rationalization with THAA. Otherwise Migrate
GB	APP-1448	Case Management - Private Label	Mission Critical Lvl 2	Potential rationalization with THAA. Otherwise Migrate
GB	APP-1630	Disability / Life Claims - Direct	Survival Critical Lvl 3	Potential rationalization with THAA. Otherwise Migrate
GB	APP-1642	Disability / Life Claims (DCS) - Private Label	Survival Critical Lvl 4	Potential rationalization with THAA. Otherwise Migrate
GB	APP-2176	Legacy Single Sign-On	Survival Critical Lvl 4	Will be retired if the all the GB OFR apps are migrated
GB	APP-890	Licensing	Mission Critical Lvl 2	Migrate.
GB	APP-912	Loss Processing - Direct	Mission Critical Lvl 2	Potential rationalize with THAA? Migrate
GB	APP-923	Loss Processing - Private Label	Mission Critical Lvl 2	Potential rationalize with THAA? Migrate
Billing	APP-232	TABS - BI	Survival Critical Lvl 4	Migrate.
Billing	APP-233	TABS - PI	Survival Critical Lvl 4	Migrate.
Billing	APP-234	PACER	Survival Critical Lvl 4	Migrate.
Commercial	APP-2190	Commercial Dividend Adjustment	Survival Critical Lvl 4	Migrate.
Commercial	APP-377	SNAQS	Survival Critical Lvl 3	Rationalization Opportunity? Otherwise migrate
Commercial	APP-379	SNAPI	Survival Critical Lvl 3	Rationalization Opportunity? Otherwise migrate
Commercial	APP-381	Postsale	Mission Critical Lvl 2	Rationalization Opportunity? Otherwise migrate
Corporate	APP-625	Banking And Cash Integrated System	Survival Critical Lvl 5	Migrate
Corporate	APP-630	Expense Control Tables	Business Essential	Potential rationalization ODS/SubModules. Otherwise Migrate
Corporate	APP-678	Budget Consolidation	Business Essential	Potential rationalization ODS/SubModules. Otherwise Migrate
Corporate	APP-681	FEED - Front-end Expense Edit	Business Essential	Potential rationalization ODS/SubModules. Otherwise Migrate
Corporate	APP-2331	Executive Accountability	Business Essential	Potential rationalization ODS/SubModules. Otherwise Migrate