Agile Transformation for IBM Mainframe Application Portfolios – Part 2

Abstract

Organizations are keen to leverage Agile methodologies and DevOps practices for their mainframe portfolios, to catch up with the pace of digital transformations and to fully realize the benefits of the Agile transformations of their distributed portfolios.

Part 1 of this paper listed the trends observed in Agile transformation for mainframe portfolios and provided the factors that can help in creating a roadmap. When enterprises are willing to invest on tools and technologies for this transformation journey, they are still mulling over implementations due to the technology debt and return on investment expectations.

Traditional mainframe product vendors, have enhanced their product offerings to enable DevOps implementation. In this part, we list the DevOps tools along with a guideline for implementation. We also highlight some of the success stories of Agile transformations.

Choosing the right Agile transformation tools

IBM, CA, Compuware and Micro Focus are some of the key vendors that provide DevOps tools for the software development life cycle (SDLC) and application lifecycle management (ALM) of mainframe portfolios. The choice of the DevOps tools depends on the application technology and the software stack used for configuration management in particular and other peripheral software such as file management, debugging, test automation and monitoring. Table 1 illustrates the different DevOps tools currently available for IBM mainframe.

Only products from IBM, CA, Compuware and Micro Focus are listed in the below table due to their product coverage across SDLC. It is to be noted that **BMC products and ServiceNow products** have wide acceptance among mainframe portfolios for incident/ service management and **Atlassian products** are increasingly getting adopted for collaboration especially as part of Agile process implementations.

Vendor	SDLC											ALM		
	Analysis		Build		Test				Deployment			ALM		
	Program Analysis	File/DB Management	Integrated Development Environment	Development and Test Offload	Test Management	Test Automation	Debugging	Test Data Management	Release Management / Deployment	Job Scheduling	Monitoring	Configuration Management	Service Management	Colloboration
CA		File Master Plus	Development Environment for z			Service Virtualization Application Test Verify	InterTest	Test Data Manager	**Release Automation Application Lifecycle Conductor	**Workload Automation	#APM #MAT SymDump	Endevor	Service Management	Agile Central Continuous Delivery Director
Compuware	Topaz for Program Analysis	File -AID Topaz for Enterprise Data	Topaz Workbench			Hiperstation Topaz for Total Test	Xpediter	File -AID/EX	ISPW		Abend -AID Strobe	ISPW		
IBM	Application Discovery and Delivery Intelligence	File Manager	IBM Developer for z (Rational Developer for z)	z Systems Development and Test Environment	Rational Quality Manager	Rational Test workbench XaTester	Debug	Optim	UrbanCode Deploy	Tivoli Workload Scheduler	Fault Analyzer Service Management Suite for z/OS	Rational Team Concert	Control Desk	Rational Team Concert
Micro Focus	Enterprise Analyzer	Data File Tools		Enterprise Developer for z Enterprise Test Server	Silk Central *Quality Center / Application Life cycle Management	Silk Test Silk Performer *Unified Functional testing *Load runner	Debugger	Data Express	Release Control Deployment Automation		Profiler Consolidated Tracing Facility	ChangeMan ZMF Dimensions CM Enterprise Sync AccuRev	*IT Service Management Automation	Rhythm

Table 1: DevOps tools from vendors for SDLC phases and ALM
* HP products acquired by Micro Focus. Throughout the paper, these are referred as Micro Focus products.
** Automic products acquired by CA in the same category
 # Application Performance Management (APM),Mainframe Application Tuner(MAT)

- Fundamentally, DevOps tools should enable enterprises to become agile by filling in the gaps in the processes.

- Such tools should easily integrate with existing software stack. New investments and migrations must be kept to a minimum.

- For ALM functions that require enterprise-wide visibility and tracking, organizations need common software products across the enterprise. In such cases, the mainframe portfolio does not require any specific software.

Organizations will benefit by establishing an architectural core group with demonstration labs for tool selection, implementation of proof of concepts (PoC) and phased roll outs.

Driving successful adoption of DevOps tools

Table 2 provides the DevOps tools for mainframe portfolios and the resulting benefits.

No.	DevOps toolset	Components	Benefits	Recommendations
1	Test suites	- Test case management - Test data management - Test automation - Test virtualization	Reduced testing cycle times Fewer integration constraints	Leverage the available test automation and management suites in the enterprise to cover the mainframe portfolio - Micro Focus Application Lifecycle Management / Quality Center, Micro Focus Unified Functional Testing / QuickTest Professional, Micro Focus Silk Test suite, IBM Rational Test Workbench, CA Test Data Manager, CA Service Virtualization. Apart from these products, using scheduler-driven batch schedules in the test regions is also helpful.
2a	Integrated Development Environment (IDE)	- Program analysis - Code checking - Editor and compilers - File management - Unit testing - Debugging - Deployment tool for software configuration management (SCM) - Monitoring	User actions can **flow seamlessly through the tasks for improved productivity and quality delivery** during the maintenance life cycle **Helps the next generation developers for easy adoption of mainframe development tasks**	For the standard technology stack COBOL, PL/1, HLASM, DB2, IMS DB, VSAM, CICS and IMS DC both IBM Developer for z systems and Compuware Topaz workbench can be used. For Natural/Adabas technology stack, Natural One from Software AG can be chosen. For 4GLs such as CA Gen, CA Telon etc., existing model-based development products can be reused for analysis and development. At present, IDE support is not there for technologies such as CA IDMS, ADSo, Ideal and Datacom, Cincom Mantis and Supra
2b	Development and test offloading products	- Program analysis - Code checking - Editor and compilers - File management - Unit testing - Debugging - Deployment tool to SCM - Monitoring	Reduced constraints in environment availability Reduced costs due to offloading of MIPS **Helps the next generation developers for easy adoption of mainframe development tasks**	IBM z Systems Development and Test Environment; Micro Focus Enterprise Developer for z and Test server
3	Release management and release automation products	- Release management - Integration to SCM products - Integration to test management and test automation products - Deployment facility to Mainframe sub systems / environments - Integration to ITSM / change management products	Manages the release processes and links the outcomes of the assurance activities to the code promotion in the SCM environment and deployment of the loads in associated mainframe environments Helps achieve continuous delivery – the last mile in the Agile transformation journey	Products with connectors to SCM products, test automation products and deployment products for both mainframe and distributed technologies should be judiciously chosen so that benefits are achieved enterprise-wide.

Table 2: Benefits of the DevOps tools[1]

1] Integrated Development Environment (IDE) and Development and Test Offload products are of the same priority and either of them can be chosen

Figure 1 outlines a roadmap to adopt DevOps tools as part of the Agile transformation. The roadmap indicates the conditions for adoption and how selected application technologies have an advantage over others.
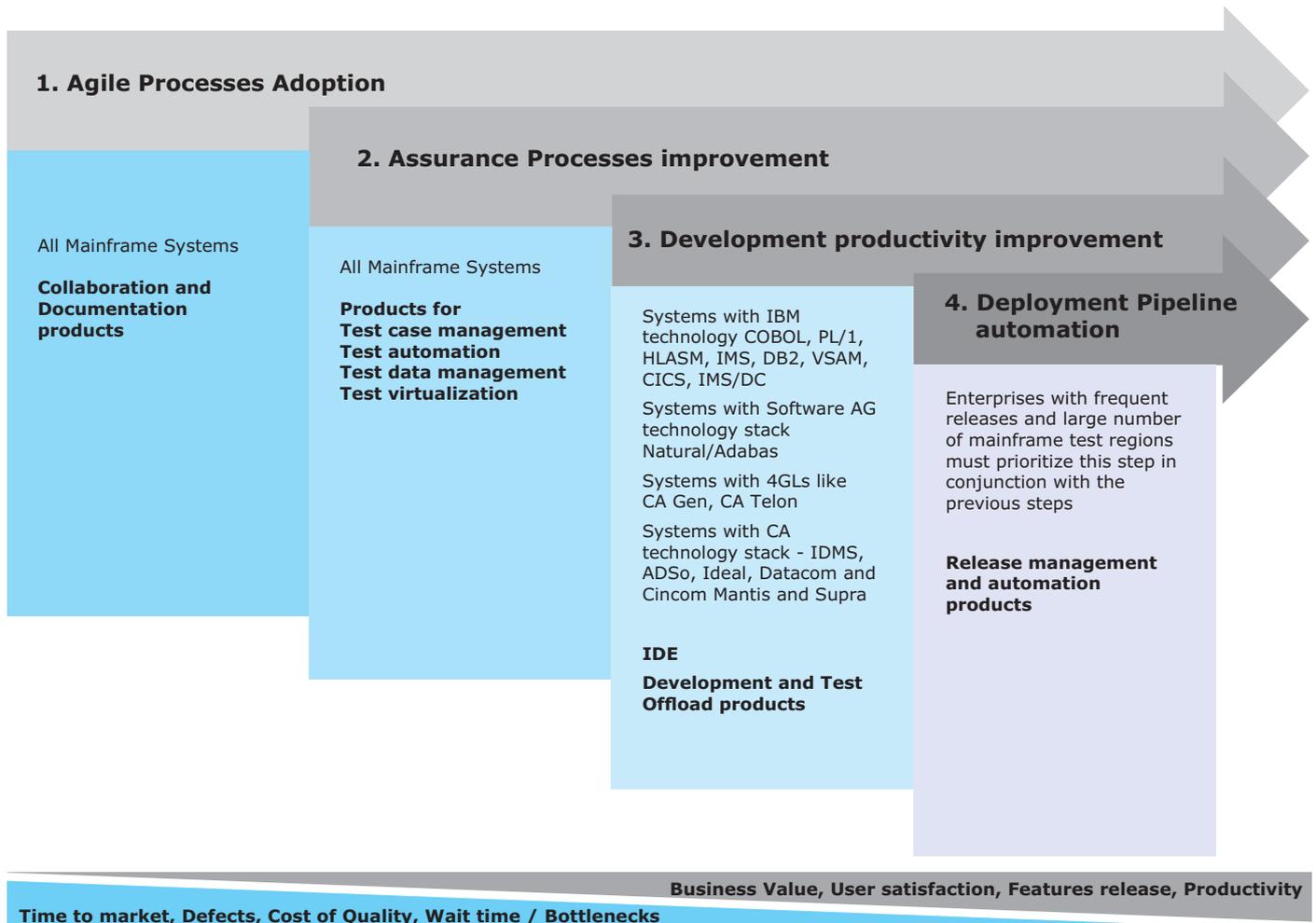
1. Agile Processes Adoption

2. Assurance Processes improvement

3. Development productivity improvement

4. Deployment Pipeline automation

All Mainframe Systems

Collaboration and Documentation products

All Mainframe Systems

Products for Test case management Test automation Test data management Test virtualization

Systems with IBM technology COBOL, PL/1, HLASM, IMS, DB2, VSAM, CICS, IMS/DC

Systems with Software AG technology stack Natural/Adabas

Systems with 4GLs like CA Gen, CA Telon

Systems with CA technology stack - IDMS, ADSo, Ideal, Datacom and Cincom Mantis and Supra

IDE Development and Test Offload products

Enterprises with frequent releases and large number of mainframe test regions must prioritize this step in conjunction with the previous steps

Release management and automation products

Business Value, User satisfaction, Features release, Productivity

Time to market, Defects, Cost of Quality, Wait time / Bottlenecks

Figure 1: Roadmap to roll out DevOps tools for mainframe organizations

Enhancements to the DevOps tools

Universal adoption of mainframe DevOps tools requires further value additions to the software ecosystem. These enhancements will accelerate the adoption of DevOps tools.

- **Cross-vendor product support for IDE components** will mitigate the new investments and migrations.

- **Comprehensive integration of software configuration management products, mainframe transaction processing and database environments, test automation products and schedulers with release**

automation products will enable a continuous delivery pipeline.

- **Development and test offloading products with built-in test virtualization features** will help simulate system or system integration tests, thereby, reducing the environment constraints.

- **Cloud model for the development and test offloading products with clear pricing models** will ease out the investments.

Successful Agile transformations

Tables 3 to 5 describe the outcomes organizations have achieved by traversing the path of mainframe Agile transformation. The success stories range across pure process changes with no SDLC tooling, usage of DevOps tools at specific portfolio level and an ongoing Agile transformation roll out across the mainframe.

Client	Large US retailer
Scope of initiative	Enterprise-wide initiative including IBM mainframe portfolios. Agile practices were implemented after pilots.
Organizational changes	▪ Business centric product teams for each portfolio. ▪ Teams consist of people with domain, technology and testing expertise. ▪ Each product team works on enhancements and support across technologies.
Tools adoption	▪ Atlassian JIRA for collaboration. ▪ No investment in additional SDLC tools for mainframe portfolio as an extended life is not expected for mainframe.
Best practices	▪ Work known in advance of four sprints – ahead of two months. ▪ Ensured process simplification leading to lean documentation.
Outcomes	▪ Increased release frequency from 3 per year to 15 per year. ▪ Increased defect-free sprint delivery to 99.5%. ▪ Saved USD 3 million from budgeted amount, using distributed agile. ▪ Improved customer change requests servicing from three months to two to three weeks.

Table 3: Large retailer gains benefits with Agile transformation

Client	UK bank
Scope of initiative	Initiative specific to IBM mainframe core banking portfolio. Agile practices are currently being rolled out after a detailed assessment and pilots.
Organizational changes	▪ Started initiatives for organizational level changes and processes by creating a flexible pool of project managers to take care of Agile delivery. ▪ All large scale and BAU work examined using an Agile suitability assessment checklist and a scoring model. ▪ Agile coaches deployed and trainings conducted for the teams.
Tools adoption	▪ Atlassian JIRA for collaboration. ▪ Atlassian Confluence for documentation. ▪ Micro Focus Unified Functional Testing/QuickTest Professional will be used for Automation. Atlassian Zephyr and Micro Focus Silk Central under consideration for test case management. ▪ Compuware Topaz and IBM zD&T identified for usage and rollout is in progress.
Best practices	▪ Applied value stream analysis to improve challenging processes. ▪ Assurance automation is in progress.
Outcomes	Outcomes delivered based on ongoing projects: ▪ Increased number of releases by 25%. ▪ Reduced defect density by 30%. ▪ Improved requirements predictability in the range of 40 to 75%.

Table 4: UK bank increases releases by 25%

Client	Global bank
Scope of initiative	Agile and DevOps pilots specific to a line of business. 60% of the applications in this portfolio are based on mainframe. Both Waterfall and Agile methodologies co-exist in the portfolio.
Organizational changes	▪ Portfolio has Agile team structure in place.
Tools adoption	IBM Rational Developer for z Systems and Rational Team concert are used for continuous integration and Micro Focus ChangeMan package is used for deployment ▪ IBM Rational Developer for z Systems used as IDE. ▪ Rational Team Concert used for managing the configuration to deploy the code in ChangeMan in mainframe.
Best practices	▪ Detailed training sessions on IBM Rational Developer for z Systems and Rational Team concert.
Outcomes	▪ Effort saving in the range of 6 to 8% in the development phase with the use of Rational Developer for z Systems. ▪ Reduced project lifecycle to six months from nine months to positively impact time to market.

Table 5: Global bank improves time to market with Agile methodologies

Mainframes and Agile DevOps can go hand in hand

IBM Mainframe systems containing the core System of Records need to be part of the Agile DevOps initiatives of an enterprise. Organizational changes and process simplification, coupled with a clear definition of working software and Definition of Done (DoD) for the mainframe portfolio, are key prerequisites for such enterprises to achieve their Agile objectives. Additionally, agility driven by a modern integrated development environment and sustained automation in the assurance process can increase the benefits of Agile transformation. Even though a fully automated, continuous integration and delivery pipeline for mainframe portfolios can take time to materialize due to many factors inclusive of tools and technologies, their versions and integration capabilities, it is essential for a modern digital enterprise to include the IBM mainframe systems in the Agile journey. This will lead to improved business agility agnostic of the underlying technology platforms.

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Acknowledgements

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