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Test Harnessing – An Automated Model Based Testing Approach

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Agenda

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- Introduction
- Business Overview
- Model Based Testing(MBT) for Test Harnessing
- Conclusion

Testing Challenges for Life-Science Software Product Vendor

- Stringent timeline for compliance to regulatory changes
- Meeting GxP guidelines for Computer System Validation(CSV)
  - Installation Qualification
  - Operation Qualification
  - Performance Qualification
  - Up-to-date test documentation for Audit Compliance of Regulatory Authority
- Domain knowledge for testers
- Reuse of test artifacts
- Generation of Automated Test Scripts and maintenance

Business Overview

agXchange IRT ™ is a software product from Aris Global Software that enables pharmaceutical company in global collection of drug safety data, assessment and tracking

ARISg ™ is a software product from Aris Global Software that enables pharmaceutical company in maintaining critical drug safety data and reporting adverse events periodically to authority as per regulatory guidelines

Engineering Metrics	ARISg	IRT
Total No. of Java Packages	527	162
Lines of Code(LOC)	585,036	318,830
No. of Classes	3,789	957

- **Validate the products in conformance to the "intended use"**
- **Maintain signed copy of test execution evidences for audit purpose**
- **Develop and maintain automated test scripts for regression testing**

Test Harnessing Framework

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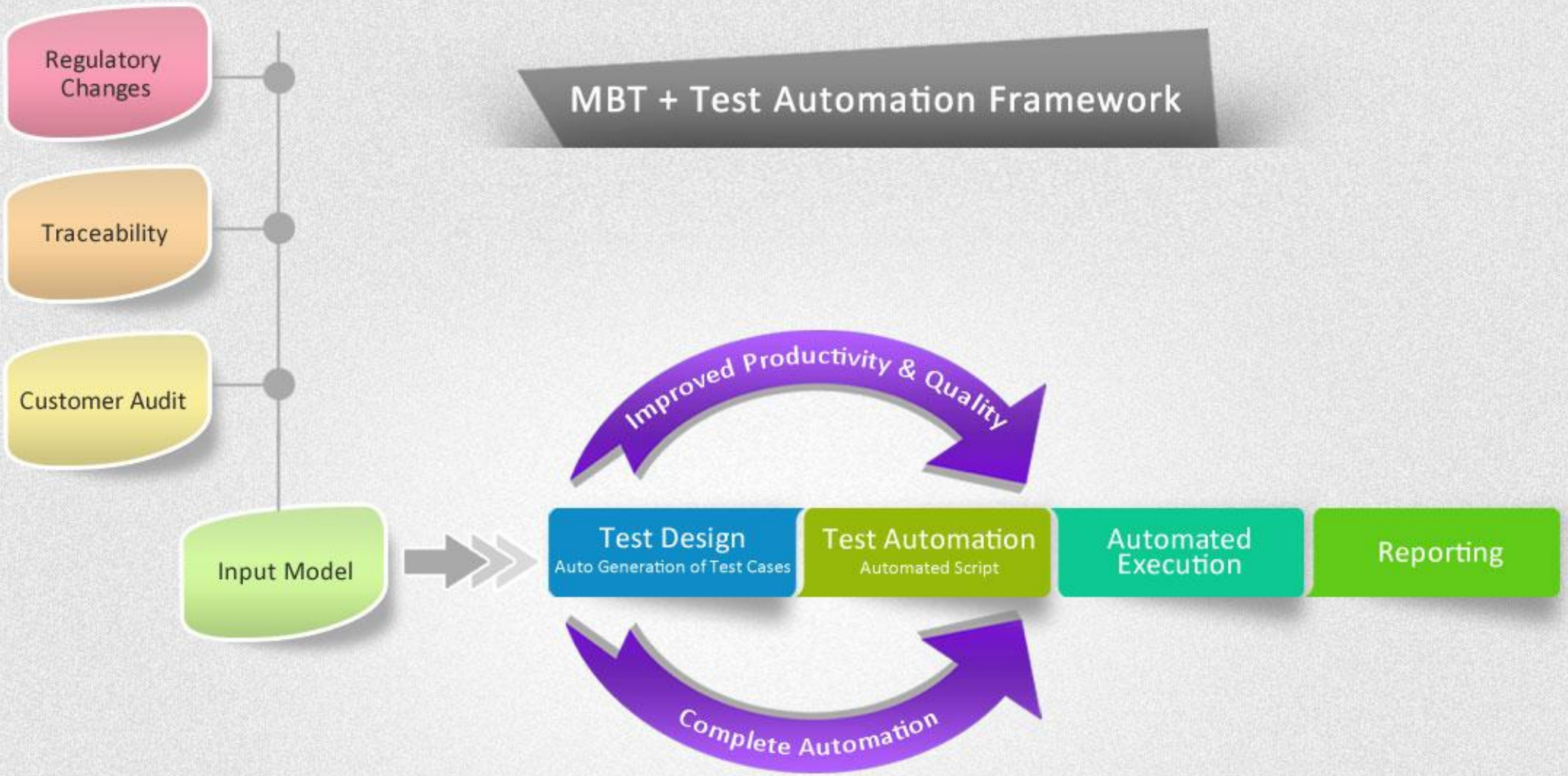

MBT Approach for Test Harnessing

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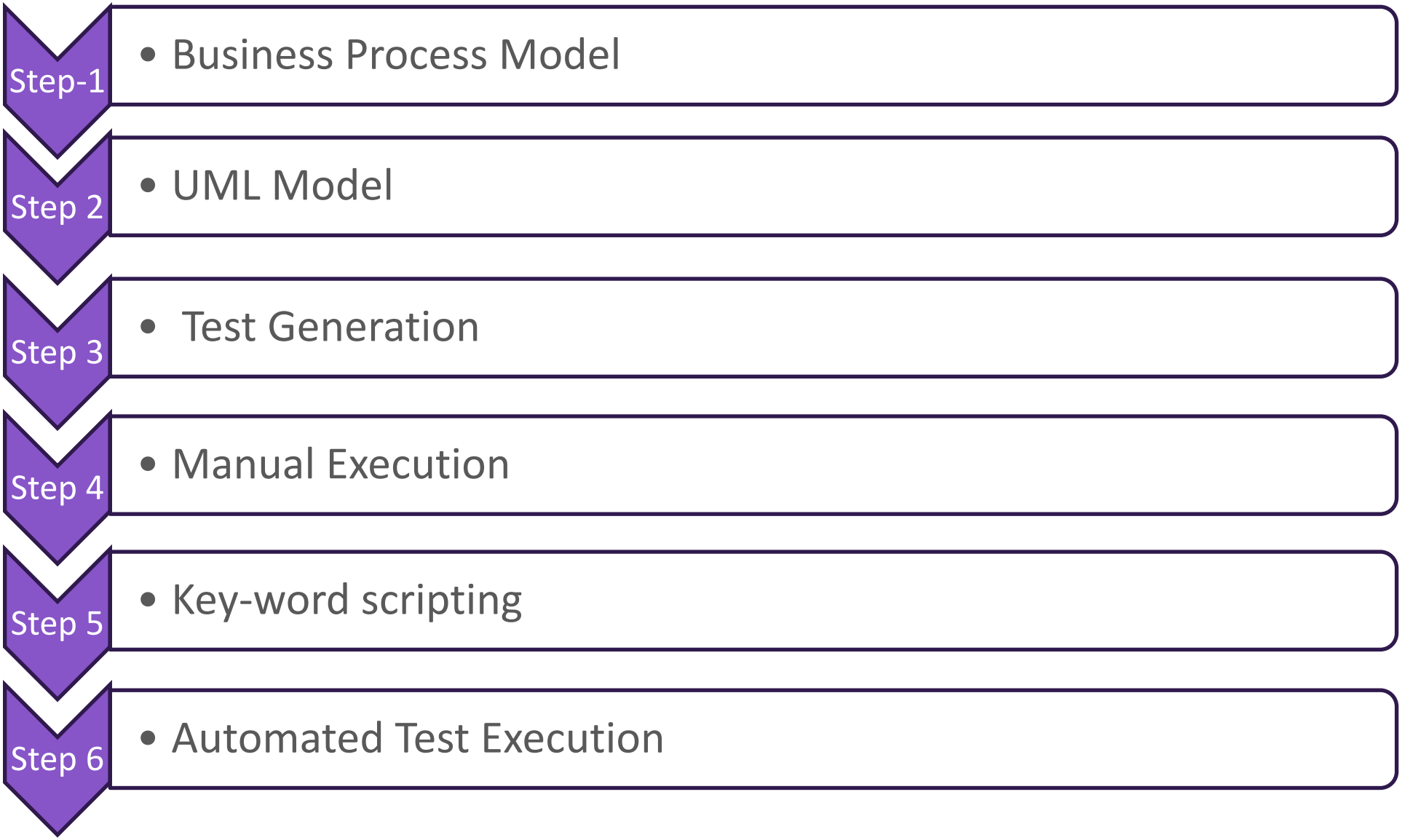
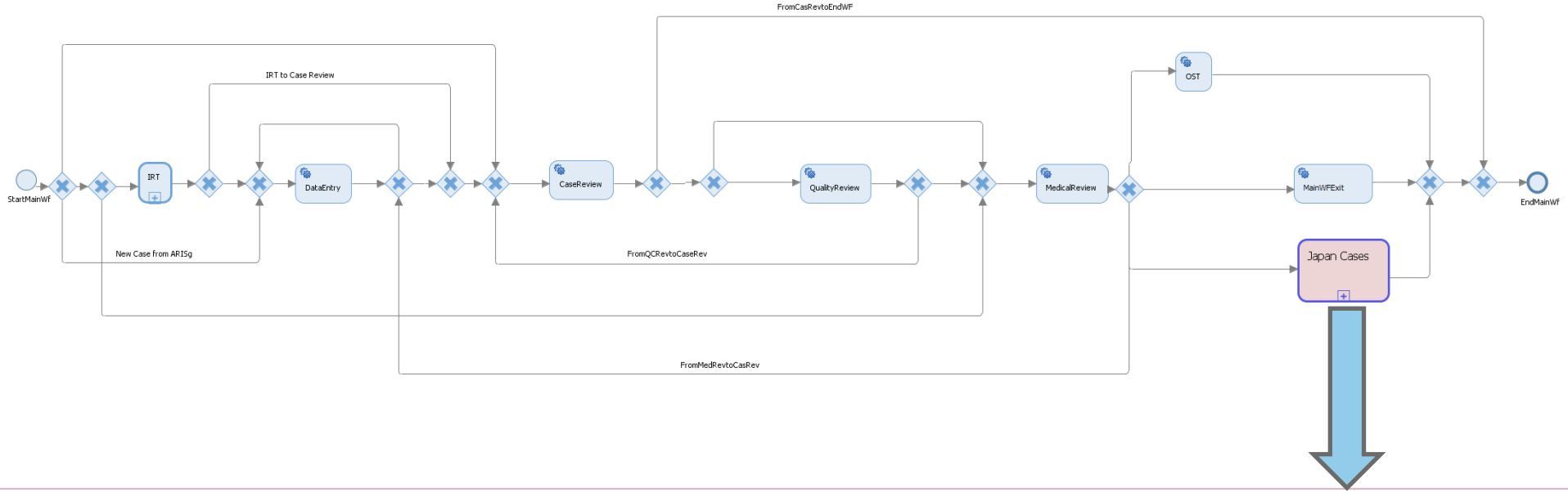
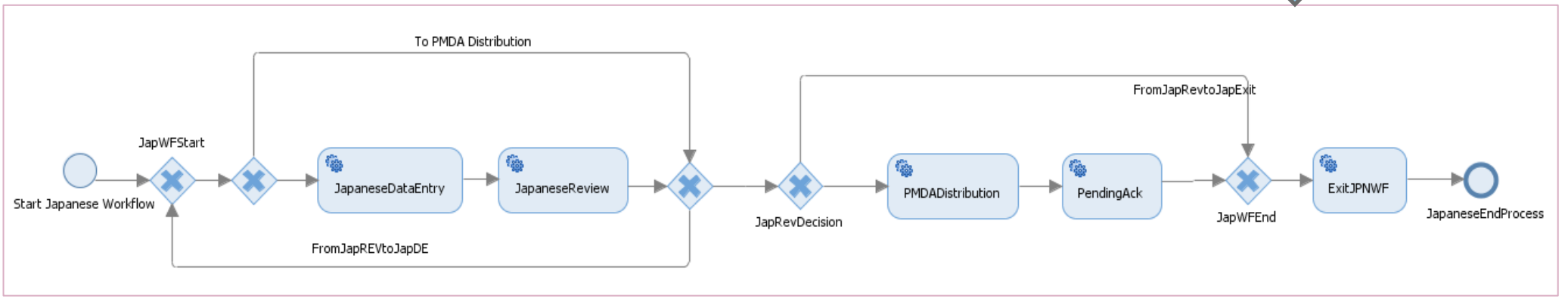
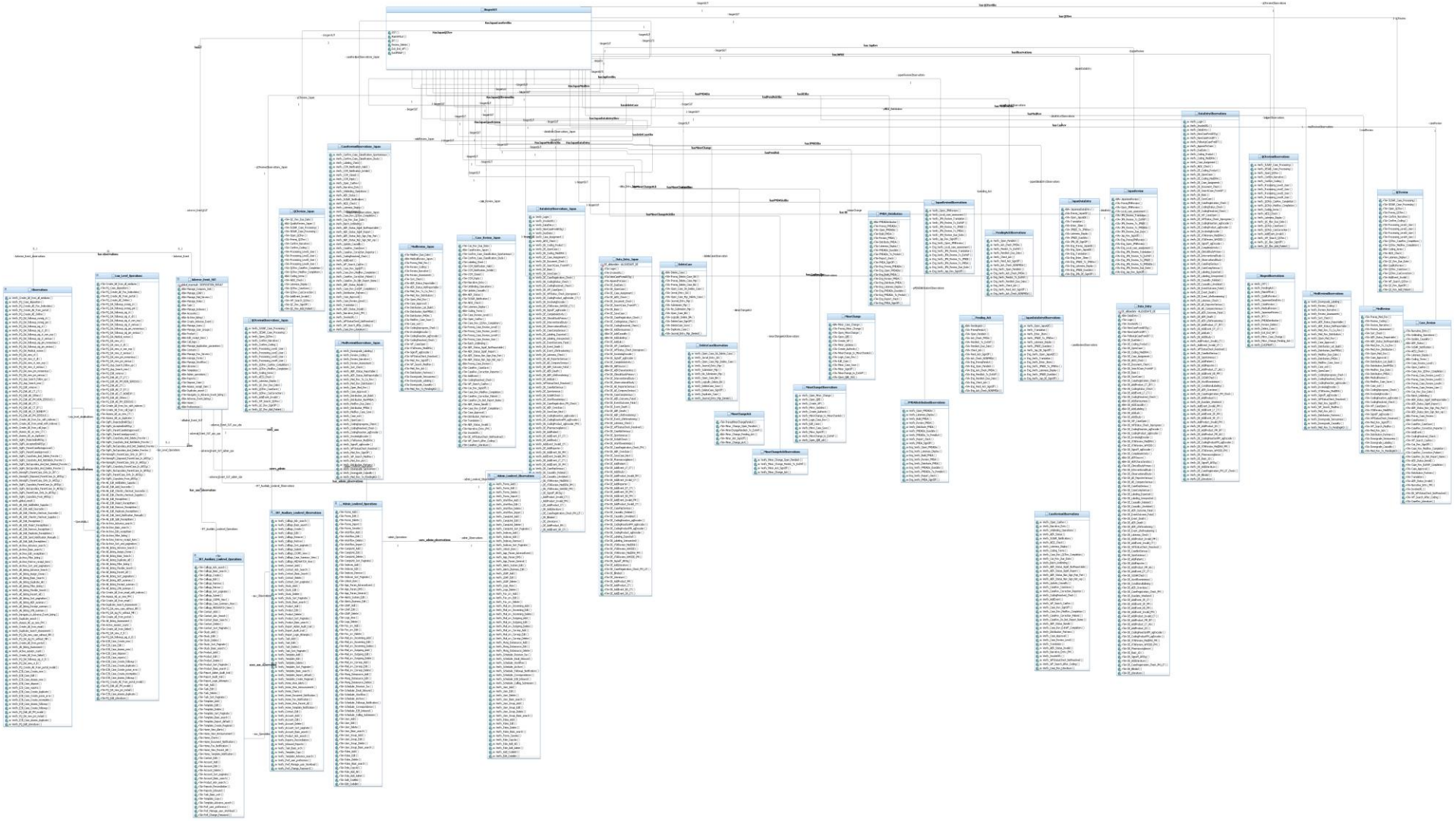


Case Study-Business Process Model





Case Study-UML Model



Case Study-UML Model Metrics

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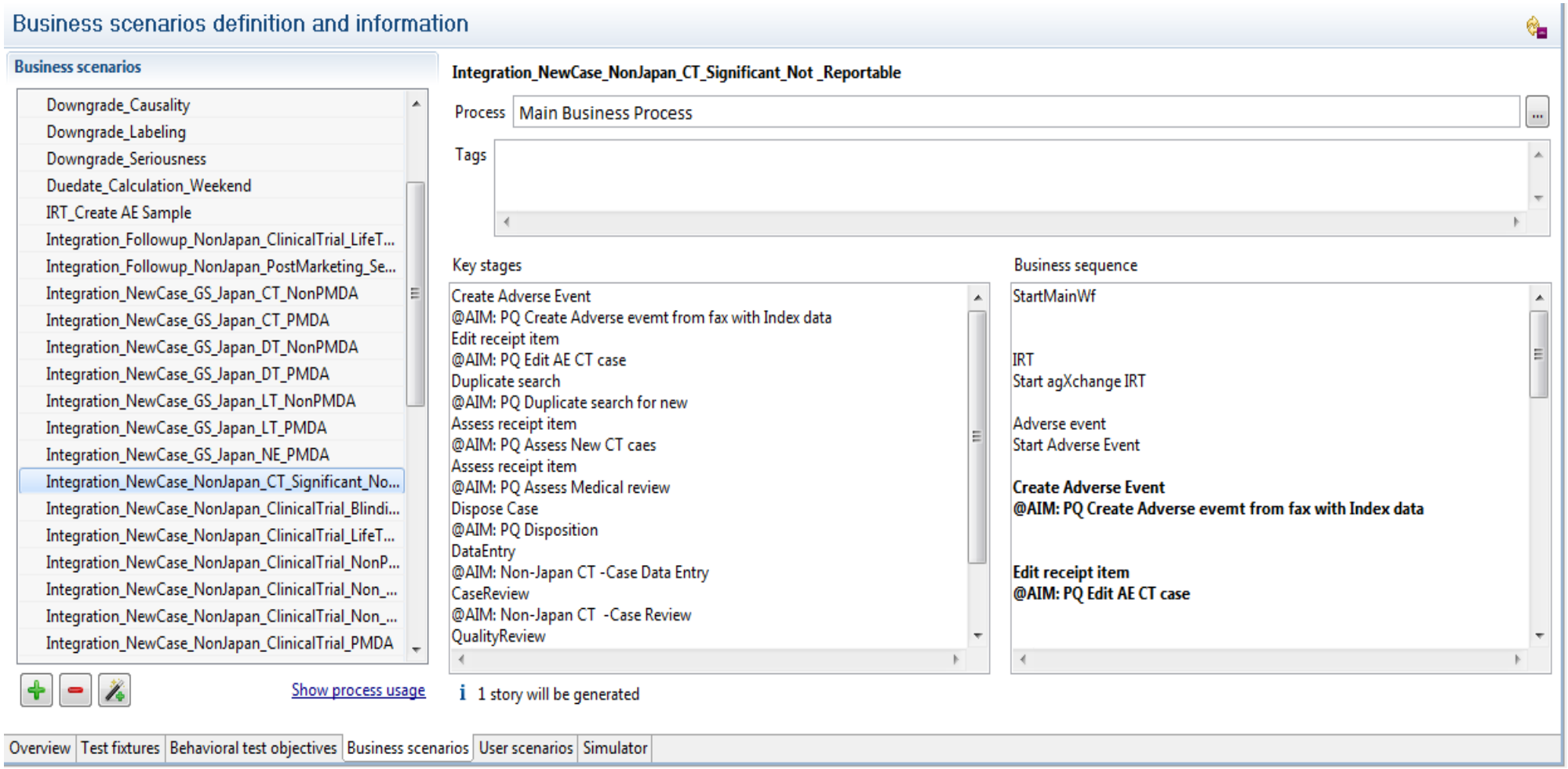
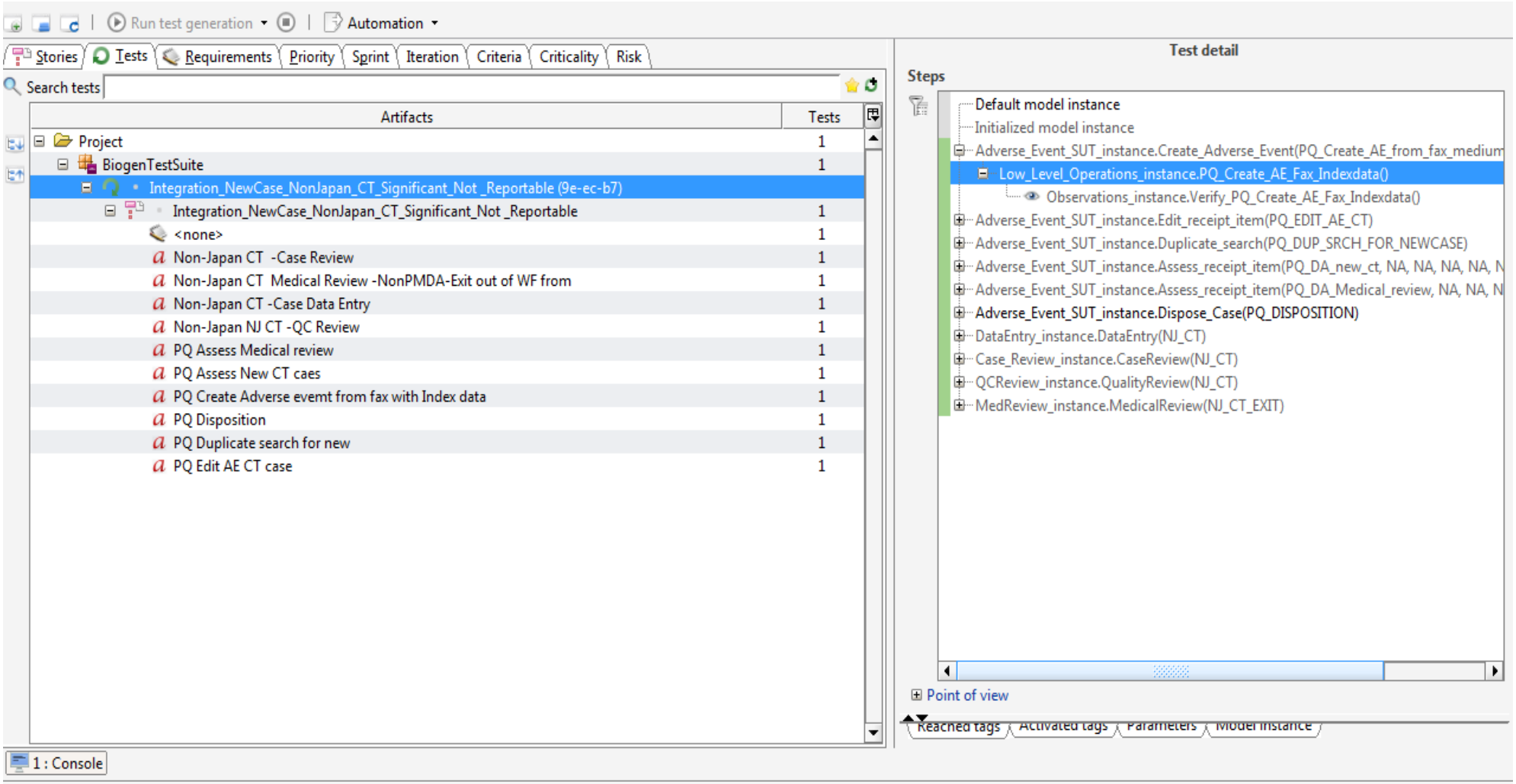
Model Elements	No. of Components
BPM diagrams	8
Classes	67
Operations	755
Enumeration	44
Associations	70

Case Study-Business Scenario Development



Case Study-Test Case Generation



Auto-Generated Test Script – for Manual Execution

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Step No	Procedure Steps	Test Data	Expected Results	Actual Results	Status
1.1.198	Enter the Login credentials of the **Medical Reviewer** User and Click on **Login** button. 'PS'		The **ARISg Home page** with the **Workflow Status** window is displayed.		Pass: Pass with Exceptions: Fail: NA:
1.1.199	Click the **Filter** button and Enter AER no as specified in the test data column and click **Refresh** button in **Workflow Status** window. 'PS'**Note:**Ensure that the **Work in progress** option is selected.	**AER No:** < Case created at Step no: >	The case is displayed in the list box with the activity as '**Medical Review**'.		Pass: Pass with Exceptions: Fail: NA:
1.1.200	Verify the **Activity due date**,**Case due date and Submission due date** for the case selected as specified in the test data column. 'PS'	**Activity due date:** LRD+2day **Case due date:** LRD+9days **Submission due date:** LRD+9days	The case is displayed in the list box with the activity as '**Medical Review**' and the Activity due date ,Case due date and Submission due date is displayed.		Pass: Pass with Exceptions: Fail: NA:

Comments:

Comment Form Number :

Initials: _____

Date (DD-MON-YYYY): _____

Auto-generated Key-Word Test Script – for Automated Execution

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	A	B	C	D	E	F	G	H	I	J	K
1		Automated Test Case Document			Project Name				TCD Ver No.	1	
2	Template Version 1.0/26-Mar-2013(Do not edit/delete)										
3	**TestCaseID**	**Case Description**	**Test Procedure**	**Test Object**	**Test Value**	**Expected_Result**	**Test_Status**	**Remarks**	**Error Log Ref. No.**	**Person _Tested**	**Test_Date**
62	TCD-059	Click on Sign off link.'PS'	AppName_QCRevSignOff			The User is logged off and the Login page is displayed.					
63	TCD-060	Enter the Login credentials of the Medical Reviewer User and Click on Login button. 'PS' Click the Filter button and Enter AER no as specified in the test data column and click Refresh button in Workflow Status window. 'PS' Note:Ensure that the Work in progress option is selected. **#testdata#** **AER No: < Case created at Step no: >** **#endtestdata#**	AppName_WFSearchMedRev			The ARISg Home page with the Workflow Status window is displayed. The case is displayed in the list box with the activity as 'Medical Review'.					
64	TCD-061	Verify the Activity due date,Case due date and Submission due date for the case selected as specified in the test data column. 'PS' **#testdata#** **Activity due date: LRD+2day** **Case due date: LRD+9days** **Submission due date: LRD+9days** **#endtestdata#**	AppName__MedRevDueDate		$p_duedate=NJ_CT_DUEDATE	The case is displayed in the list box with the activity as 'Medical Review ' and the Activity due date ,Case due date and Submission due date is displayed.					

Test Procedure | Object Repo | Custom Keywords | Variables | ImageC | Review | DataSheet | StandardKeywords

Case Study- Test Metrics & Business Impact

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Product	Scope	Planned Test Design effort w/o MBT	Actual Test Design effort w/ MBT	Test Effort saving	Remarks
Safety Suite of product	Computer System Validation (CSV)	128 days	55 days	57%	The same models is used to generate other test scripts based on customer business process
Regulatory	New Features & Regulatory change	91 days	48 days	47%	In addition to this, the same models will be used for CSV script generation and key-word based automated test script generation

Business Impact

- ✓ Test productivity improvements of nearly 25%(considering the test design effort along with automation test design effort is approx 50% of the total test effort) where ever MBT approach has been adopted in test strategy
- ✓ Identification of more defects in beta testing due to quick business scenario creation and execution
- ✓ Meeting the compressed release deadline without compromising on testing
- ✓ Reusable assets creation for future releases
- ✓ Quick design of test scripts based on SMEs inputs

Conclusion

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A comprehensive test strategy involving 'Right' MBT approach and Automation helps in achieving

- Harnessing test generation and publication of test scripts for functional testing
- Harnessing test generation and publication of test scripts based on business scenario
- Publishing Key-word based test scripts ready for Automated Test Execution
- Easy maintenance of automated test scripts

Q & A?

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