

# Test Harnessing – An Automated Model Based Testing Approach



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Introduction

Business Overview

Model Based Testing(MBT) for Test Harnessing

Conclusion

## Testing Challenges for Life-Science Software Product Vendor

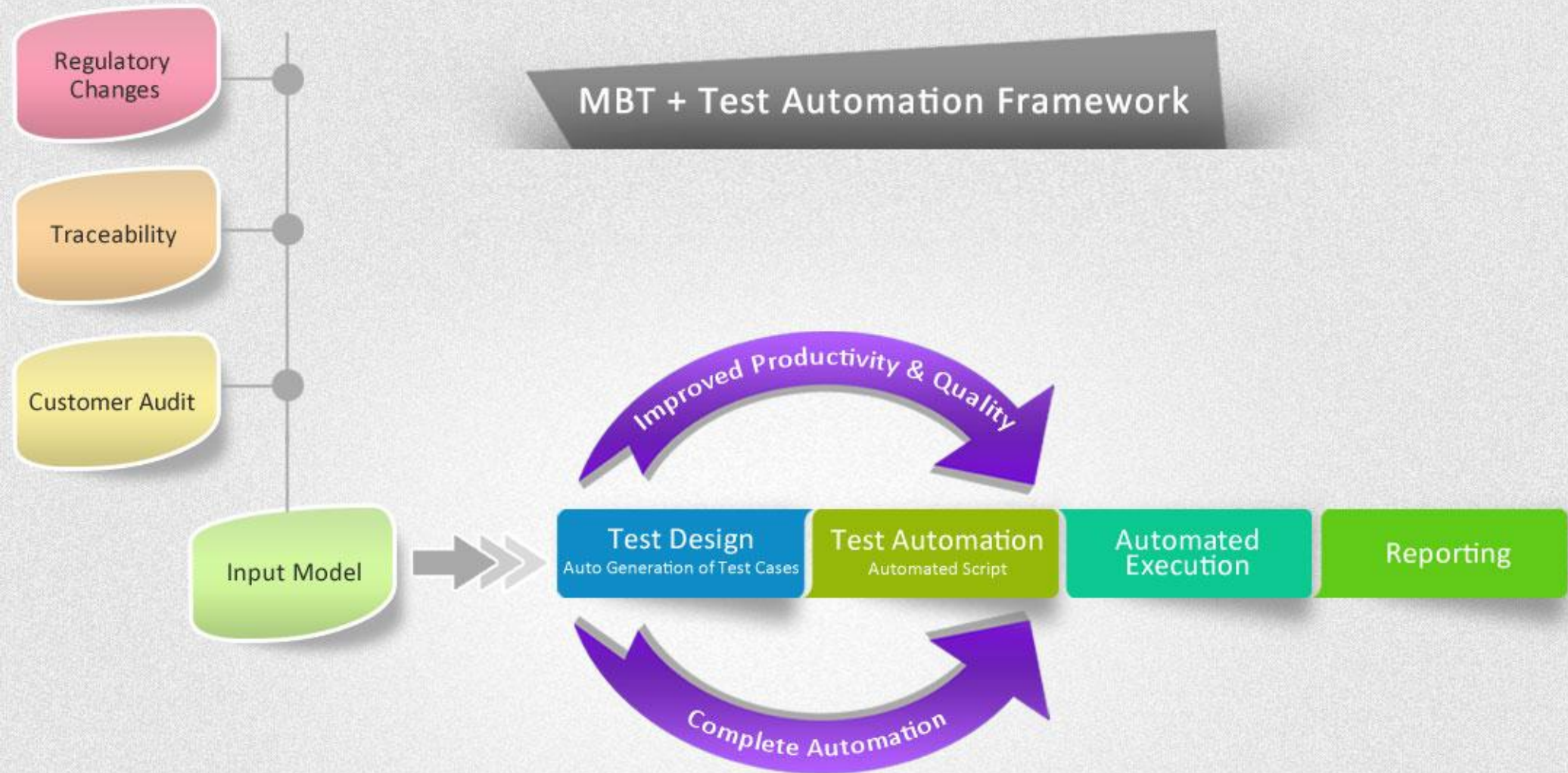
- Stringent timeline for compliance to regulatory changes
- Meeting GxP guidelines for Computer System Validation(CSV)
  - Installation Qualification
  - Operation Qualification
  - Performance Qualification
  - Up-to-date test documentation for Audit Compliance of Regulatory Authority
- Domain knowledge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

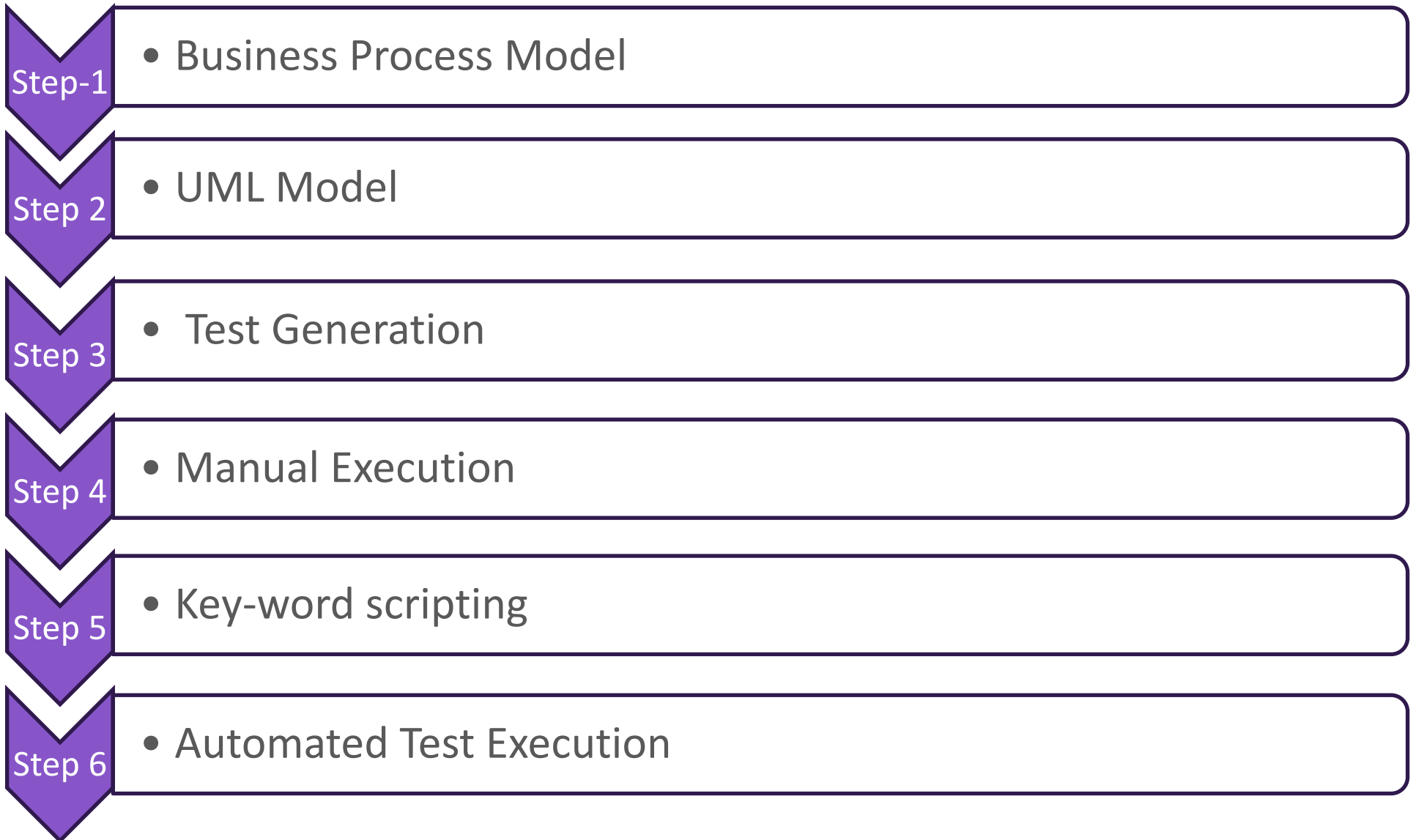
**agXchange IRT<sup>™</sup>** is a software product from Aris Global Software that enables pharmaceutical company in global collection of drug safety data, assessment and tracking

**ARISg<sup>™</sup>** 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

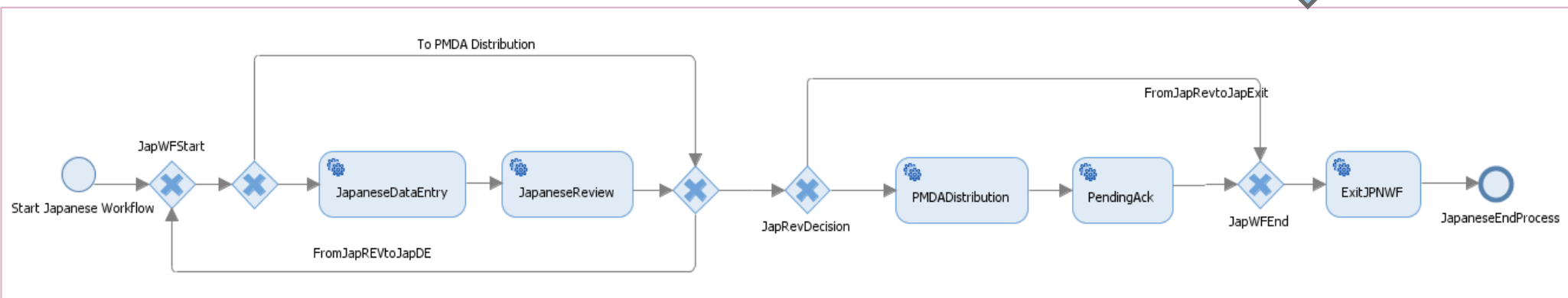
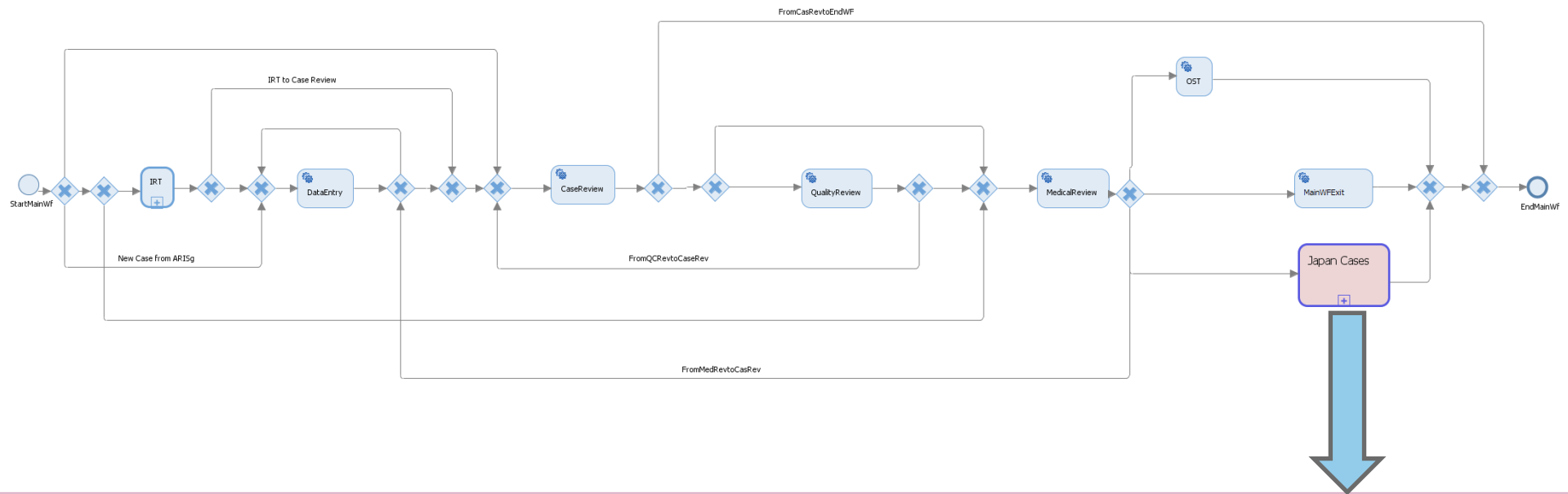
Engineering Metrics	ARISg	IRT
Total No. of Java Packages	527	162
Lines of Code(LOC)	585,036	318,830
No. of Classes	3,789	957

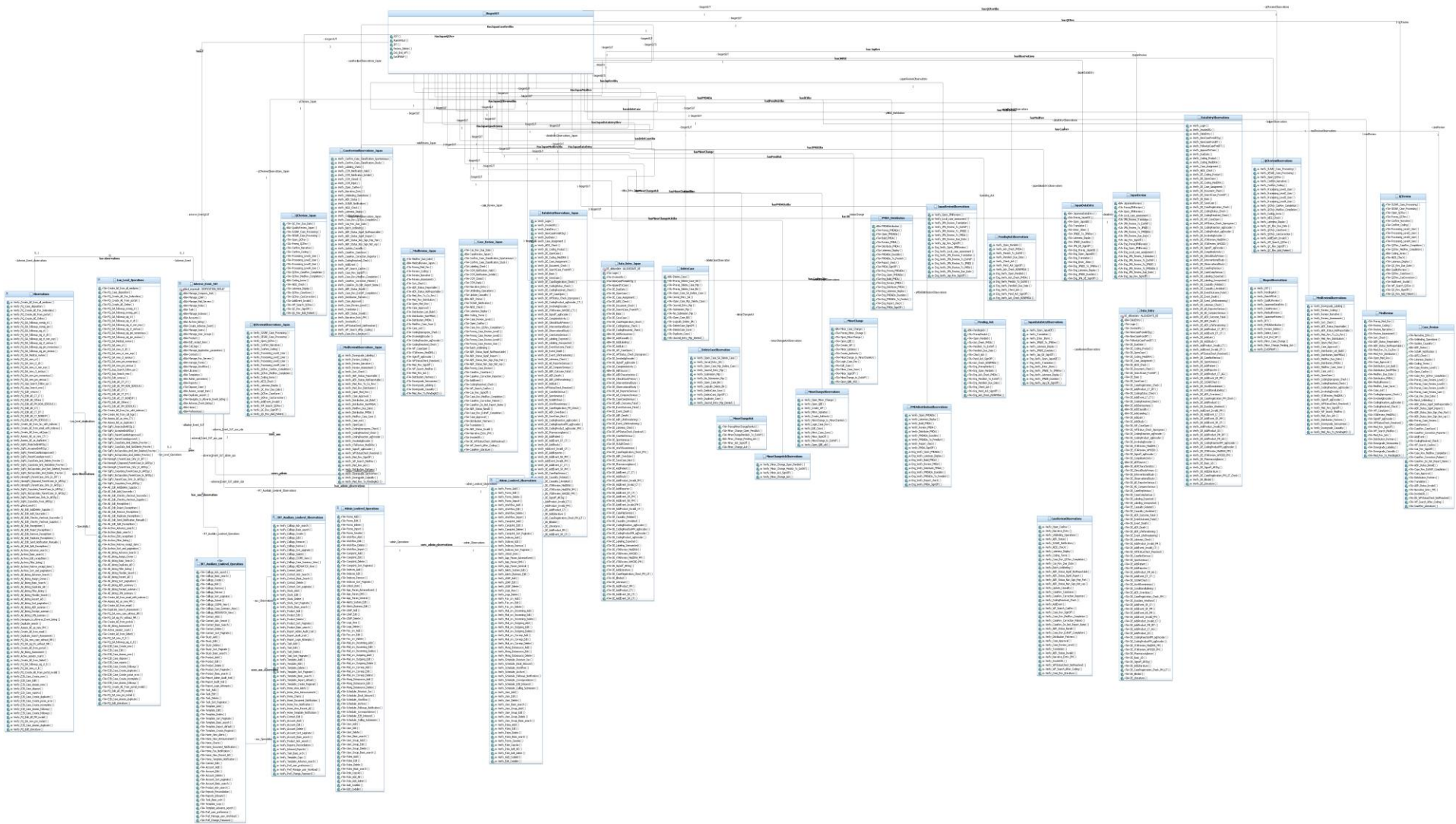
- **Validate the products in conformance to the “intended use”**
- **Maintain signed copy of test execution evidences for audit purpose**
- **Develop and maintain automated test scripts for regression testing**





# Case Study-Business Process Model







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

## Business scenarios definition and information

**Business scenarios**

- Downgrade\_Causality
- Downgrade\_Labeling
- Downgrade\_Seriousness
- DueDate\_Calculation\_Weekend
- IRT\_Create AE Sample
- Integration\_Followup\_NonJapan\_ClinicalTrial\_LifeT...
- Integration\_Followup\_NonJapan\_PostMarketing\_Se...
- Integration\_NewCase\_GS\_Japan\_CT\_NonPMDA
- Integration\_NewCase\_GS\_Japan\_CT\_PMDA
- Integration\_NewCase\_GS\_Japan\_DT\_NonPMDA
- Integration\_NewCase\_GS\_Japan\_DT\_PMDA
- Integration\_NewCase\_GS\_Japan\_LT\_NonPMDA
- Integration\_NewCase\_GS\_Japan\_LT\_PMDA
- Integration\_NewCase\_GS\_Japan\_NE\_PMDA
- Integration\_NewCase\_NonJapan\_CT\_Significant\_No...**
- Integration\_NewCase\_NonJapan\_ClinicalTrial\_Blindi...
- Integration\_NewCase\_NonJapan\_ClinicalTrial\_LifeT...
- Integration\_NewCase\_NonJapan\_ClinicalTrial\_NonP...
- Integration\_NewCase\_NonJapan\_ClinicalTrial\_Non\_...
- Integration\_NewCase\_NonJapan\_ClinicalTrial\_Non\_...
- Integration\_NewCase\_NonJapan\_ClinicalTrial\_PMDA

**Integration\_NewCase\_NonJapan\_CT\_Significant\_Not\_Reportable**

Process:

Tags:

**Key stages**

- Create Adverse Event
- @AIM: PQ Create Adverse event from fax with Index data
- Edit receipt item
- @AIM: PQ Edit AE CT case
- Duplicate search
- @AIM: PQ Duplicate search for new
- Assess receipt item
- @AIM: PQ Assess New CT caes
- Assess receipt item
- @AIM: PQ Assess Medical review
- Dispose Case
- @AIM: PQ Disposition
- DataEntry
- @AIM: Non-Japan CT -Case Data Entry
- CaseReview
- @AIM: Non-Japan CT -Case Review
- QualityReview

**Business sequence**

- StartMainWf
- IRT
- Start agXchange IRT
- Adverse event
- Start Adverse Event
- Create Adverse Event**
- @AIM: PQ Create Adverse event from fax with Index data**
- Edit receipt item**
- @AIM: PQ Edit AE CT case**

[Show process usage](#)    **i** 1 story will be generated

Overview | Test fixtures | Behavioral test objectives | **Business scenarios** | User scenarios | Simulator

Run test generation | Automation

Stories Tests Requirements Priority Sprint Iteration Criteria Criticality Risk

Search tests

Artifacts	Tests
Project	1
BiogenTestSuite	1
Integration_NewCase_NonJapan_CT_Significant_Not_Reportable (9e-ec-b7)	1
Integration_NewCase_NonJapan_CT_Significant_Not_Reportable	1
<none>	1
Non-Japan CT -Case Review	1
Non-Japan CT Medical Review -NonPMDA-Exit out of WF from	1
Non-Japan CT -Case Data Entry	1
Non-Japan NJ CT -QC Review	1
PQ Assess Medical review	1
PQ Assess New CT caes	1
PQ Create Adverse event from fax with Index data	1
PQ Disposition	1
PQ Duplicate search for new	1
PQ Edit AE CT case	1

Test detail

Steps


- Default model instance
  - Initialized model instance
  - Adverse\_Event\_SUT\_instance.Create\_Adverse\_Event(PQ\_Create\_AE\_from\_fax\_medium)
    - Low\_Level\_Operations\_instance.PQ\_Create\_AE\_Fax\_Indexdata()
      - Observations\_instance.Verify\_PQ\_Create\_AE\_Fax\_Indexdata()
    - Adverse\_Event\_SUT\_instance.Edit\_receipt\_item(PQ\_EDIT\_AE\_CT)
    - Adverse\_Event\_SUT\_instance.Duplicate\_search(PQ\_DUP\_SRCH\_FOR\_NEWCASE)
    - Adverse\_Event\_SUT\_instance.Assess\_receipt\_item(PQ\_DA\_new\_ct, NA, NA, NA, NA, N
    - Adverse\_Event\_SUT\_instance.Assess\_receipt\_item(PQ\_DA\_Medical\_review, NA, NA, N
    - Adverse\_Event\_SUT\_instance.Dispose\_Case(PQ\_DISPOSITION)
    - DataEntry\_instance.DataEntry(NJ\_CT)
    - Case\_Review\_instance.CaseReview(NJ\_CT)
    - QCReview\_instance.QualityReview(NJ\_CT)
    - MedReview\_instance.MedicalReview(NJ\_CT\_EXIT)

Point of view

Reached tags Activated tags Parameters Model instance

1 : Console

# Auto-Generated Test Script – for Manual Execution

	Protect	<Product Name Version>	Document Title	PQ Script
			Document Version	X.Y
Document Name		Document ID	Page	70 of 79

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

Comments:


Comment Form Number :

Initials: \_\_\_\_\_

Date (DD-MON-YYYY): \_\_\_\_\_

Document Classification: Confidential

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

	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_DUED ATE	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.					
 <span>Test Procedure</span> <span>Object Repo</span> <span>Custom Keywords</span> <span>Variables</span> <span>ImageC</span> <span>Review</span> <span>DataSheet</span> <span>StandardKeywords</span>											

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

## 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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