# Magenic Test Automation Framework

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# Agenda

- About Magenic
- Traditional automation approach
- Framework based automation approach
- Types of frameworks
- Magenic Automation Framework
- Demo
- Implementation phases

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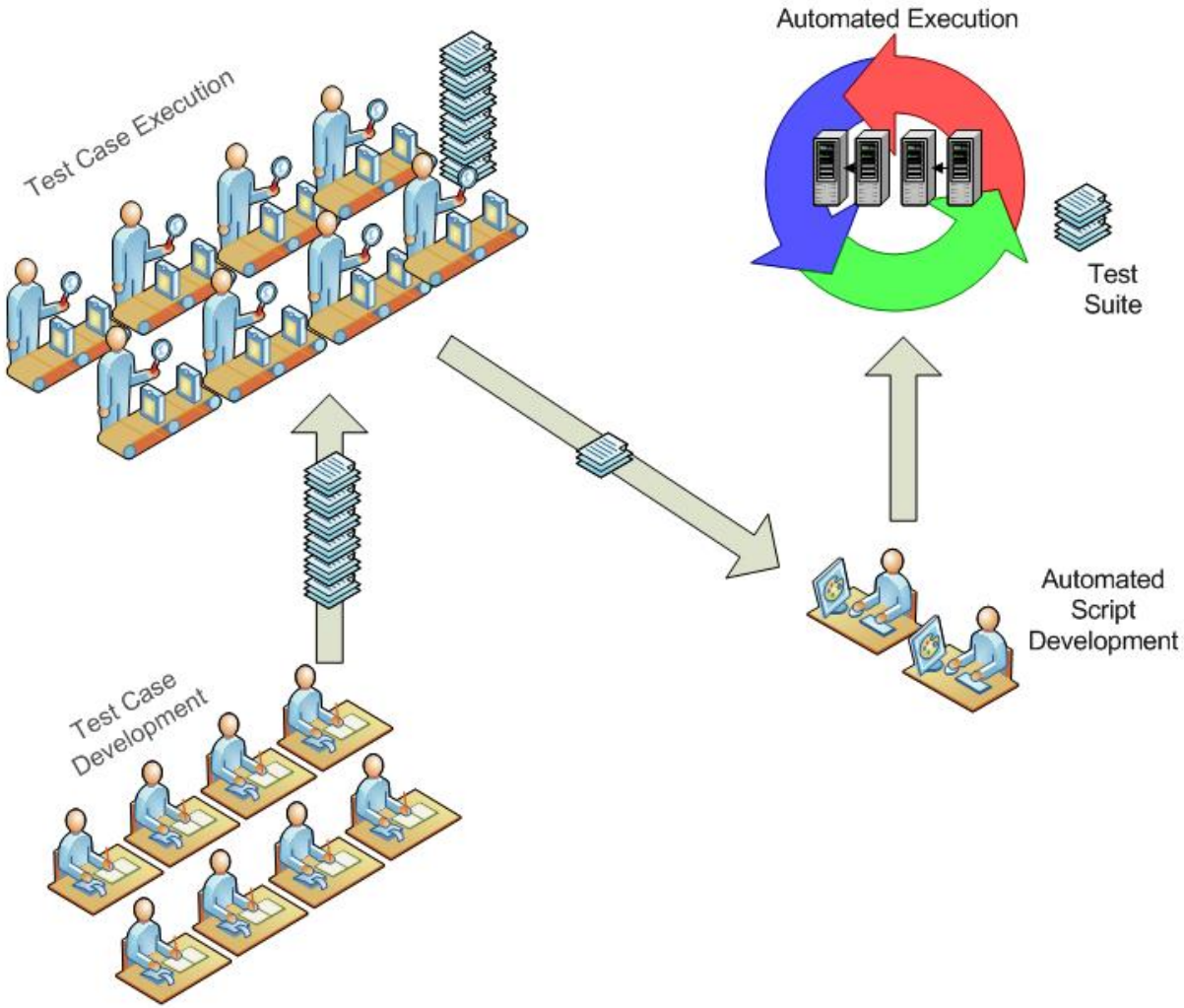
# Typical Automation Formula

1. Purchase an expensive GUI test execution tool. (HP, Borland, Compuware etc.)
2. Define a lot of paper test procedures.
3. Hire an automation team to automate each one.
4. Build a comprehensive test library.
5. Keep fixing it.

# Traditional automation approach

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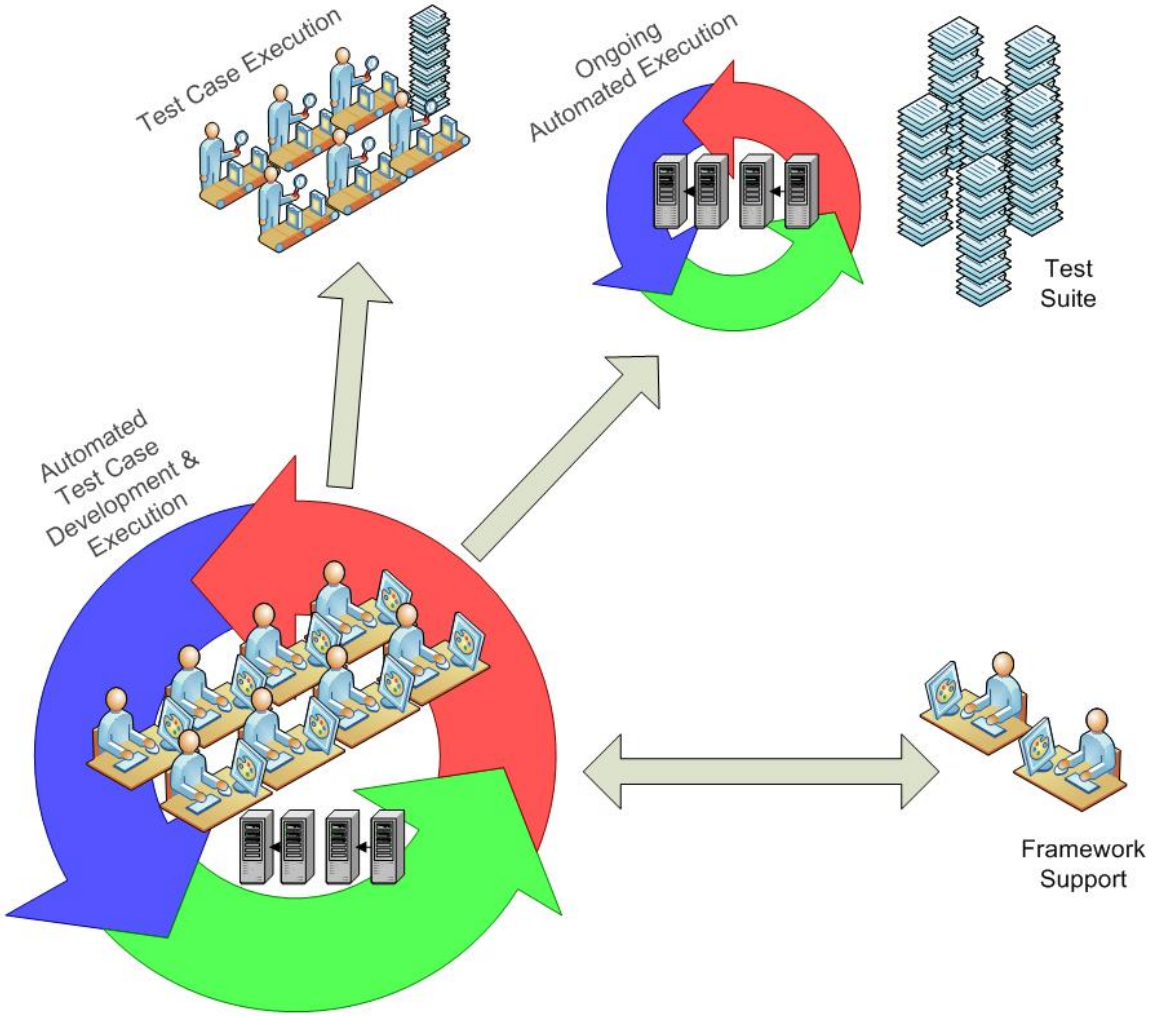
# Framework based approach

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# Types of Automation Frameworks

- Modular Test Scripts
- Test Libraries
- Data-Driven Testing
- Keyword-Driven/Table-Driven Testing
- Hybrid Test Automation

# Modular Test Scripts

- Begin with creating small, independent scripts that represent modules, sections, and functions of the AUT.
- combine the small scripts in a hierarchical fashion to construct larger tests.
- Modular framework yields a higher degree of modularization and improves overall maintainability.

# Test Library

- Very similar to the Modular test script framework and offers the same advantages.
- Divides the AUT into procedures and functions (or objects and methods) instead of scripts.
- Requires creation of library files that represent modules, sections, and functions of the AUT.
- These library files are called directly from the test case script.
- This framework also yields a high degree of modularity and overall maintainability of the tests.

# Data Driven Testing

- Test input and output values are read from database/files (ODBC sources, CSV/Excel files, DAO/ADO objects, etc.) and stored as script variables.
- Variables are used for both input and output.
- Navigation, reading the data files, and logging test status are all coded in the test script.
- In data-driven testing, only test data is contained in data files.

# Advantages of Data-Driven Testing

- Scripts may be developed while application development is still in progress
- Utilizing a modular design, and using files for both input & data verification , reduces redundancy and duplication of effort in creating automated test scripts
- When functionality changes, only the specific "Business Function" script needs to be updated
- Data input/output and expected results are easily maintainable
- Functions return "TRUE" or "FALSE" values to the calling script, allowing effective error handling and robustness

# Disadvantages of Data-Driven testing

- Requires proficiency in the Scripting language used by the tool (technical personnel).
- Multiple data-files required for each Test Case. There may be a many number of data-inputs and verifications required, depending on the number of screens accessed. This usually requires data-files to be kept in separate directories/database by Test Case.
- Apart from maintaining the Detailed Test Plan with specific data, testers may also need to re-enter data in all the required data-files.
- Script-processing errors occur due to incorrect format and/or content being incorrect.

# Keyword/Table driven Testing

- Independent of the test automation tool used to execute them and the test script code that "drives" the AUT and the data.
- Keyword-driven tests look very similar to manual test cases.
- Functionality of the AUT is documented in a table along with step-by-step instructions for each test.
- Entire process is data-driven, including functionality.

# Keyword/Table driven testing - Example

- In order to open a window, the following table is devised, and it can be used for any other application, just by changing the window name.

**Test Table for Opening a Window**

| Window | Control | Action | Arguments |
|---|---|---|---|
| Window Name | Menu | Click | File, Open |
| Window Name | Menu | Click | Close |
| Window Name | Pushbutton | Click | Folder Name |
| Window Name | | Verify | Results |

- A driver script reads in each step and executes it based on the keyword contained the Action field, performs error checking, and logs any relevant information

# Advantages of keyword driven testing

- The Detailed Test Plan can be written in spreadsheet format containing all input and verification data.
- “Utility" scripts are created by someone proficient in the automated tool’s scripting language
- Tester use the tool via the "spreadsheet-input" method; no need to learn the scripting language.
- Testers need to learn the required "Key Words" and format to use within the Test Plan. This allows the tester to be productive with automation very quickly.

# Disadvantages of keyword driven testing

- Development of "customized" (Application-Specific) Functions and Utilities require proficiency in the tool's Scripting language.

  (This is true for any method)

- If application requires handful of "customized" utilities, testers need to learn a number of "Key Words" and special formats.

  This can be time-consuming, confusing.

# Hybrid Method

- Combination of all the methods discussed. Mostly Keyword driven and Data driven
- Architecture involves storing the steps, data and validations in database
- Allows tool agnostic framework

- Magenic Automation is Hybrid Framework

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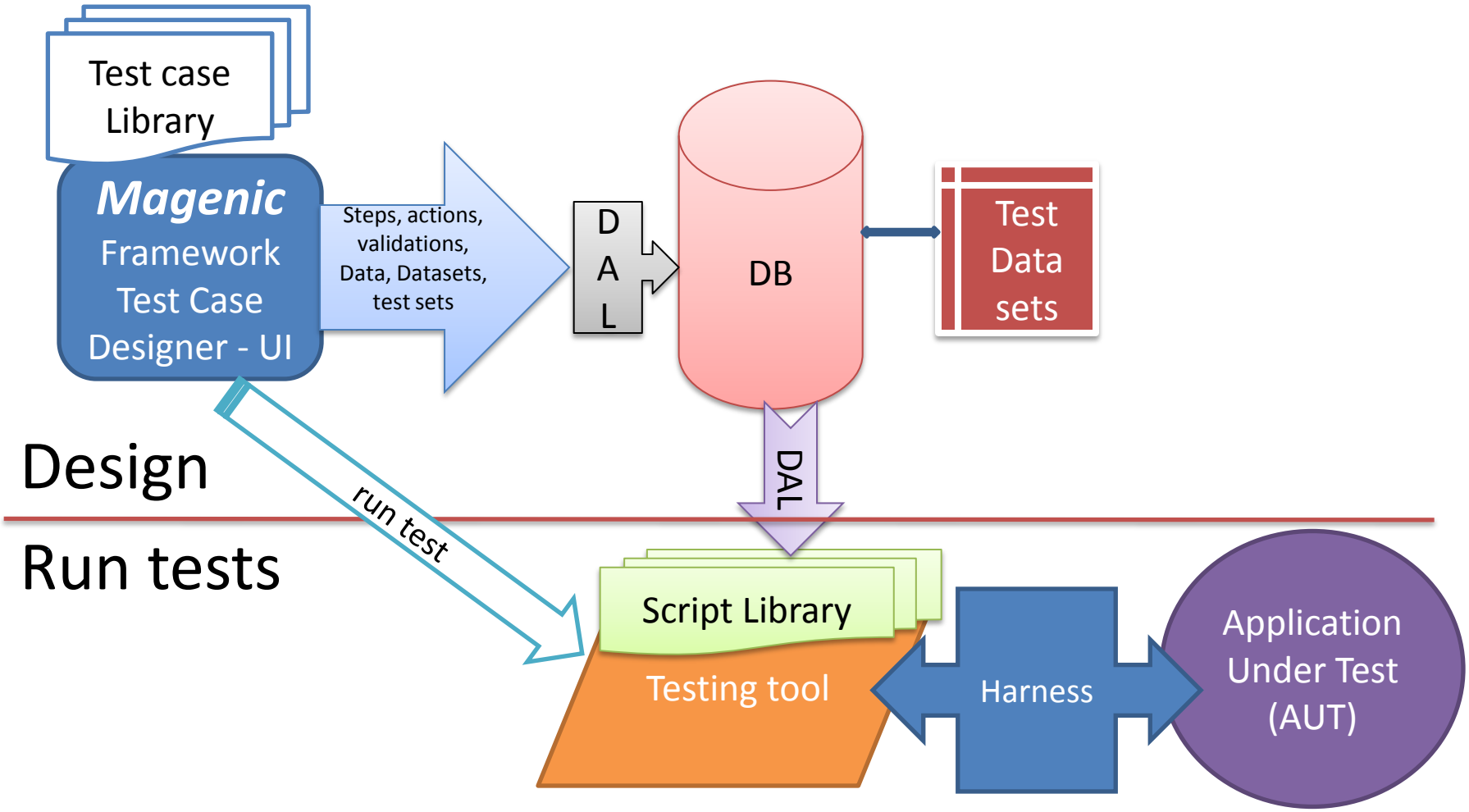
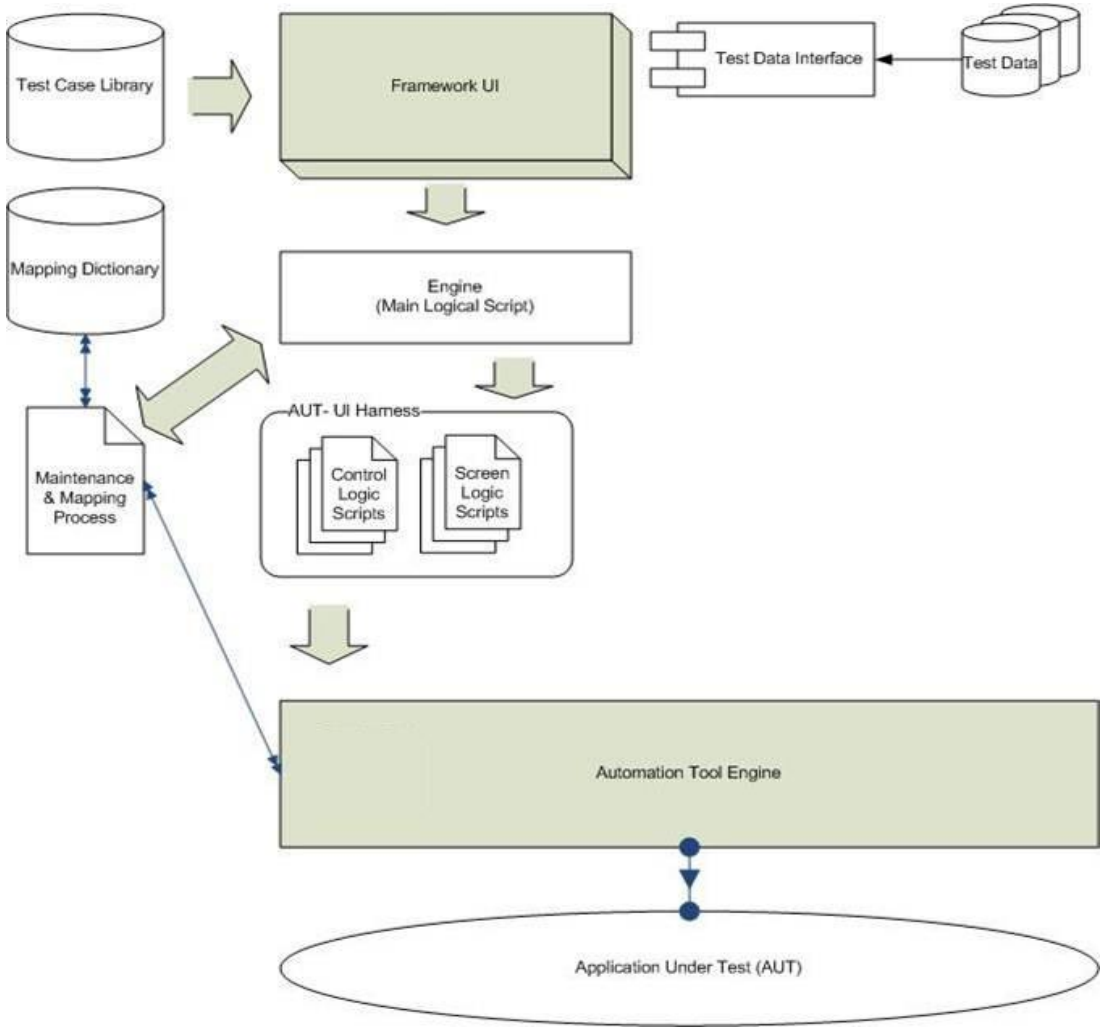
# Magenic Framework Objectives

- Provide a Tool Agnostic Framework
- Use Data Driven Scripts
- Define an Automation Independent Test Script Vocabulary
- Implement Reusable and Manageable Test Scripts
- Integrate Framework with Source Control
- Support for Execution across Code Branches and Multiple Environments
- Support Localization testing
- Provide Test Management and Productivity Utilities

# Magenic Framework Approach



# Automation Framework Design

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# Test Case

- Pre-conditions
- Input
- Process or action
- Output verification pass/fail criteria
- Post conditions

  – Test case is a set of steps in a sequence

# Test steps

- Event
- Objects/Controls
- Action
- Verify
- Validate

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# Step Types

- Event
- Verify
- Wait
  - A. For specified time
  - B. Specific event
  - C. until one of the above happens
- Run other test
  - Optionally store values and pass on to other tests.
- Conditional
  - If do this, else do other

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# Scripts

- ‘Event’ and ‘Verify‘ step types involve selecting a control
- Each control has a set of Actions/Properties to choose from, based on its type.
- A function for each action that can be performed on that control type
- The scripts find the correct function for the step, and perform the action on the control

# Test tool Scripts

- Driver Script
- Control Mapping Script
- Database / dataset access scripts
- Library Scripts
- Action Scripts
- Validation Scripts
- Test management scripts
- Reporting scripts

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# Demo

# Magenic Framework Advantages

- Automation Framework is re-usable
  - Implemented with base framework and database components
  - Customized components to support Clients' tools and process
  - Customized components for Application Under Test
  - Tool Agnostic Framework
  - Data Driven Scripts with Keyword driven approach
  - Intuitive test case designer and maintenance tool
- Multi browser compatibility for web based applications
  - Same test cases executed on multiple browsers
- Localization support
  - Framework supports multiple locales

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# Implementation Phases

- Initiation (4-6 weeks)
  - Understand the application functionality
  - Analyze test cases
  - Derive a strategy
  - Implement base framework
  - Create sanity tests
- Customization (6-10 weeks)
  - Tailored functions
  - Interface with build management
  - Interface with test management
  - Customized reporting
  - Creation of tests
- Training, and test case entry (6-10 weeks)
  - Test team training
  - Maintenance handover
  - Creation of additional tests

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# Questions

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