Software Quality Assurance with IB –ARM

It is the goal of all software development organizations to create and maintain high quality application software. But in many cases they have no clear plan for how to achieve this goal. Development staff and management alike are unclear whether the right approaches are being used and whether the right amount of testing is being done. Tools and approaches are available to assist software quality assurance practices based on detailed, up-to-date application understanding.

Software Quality Assurance Challenges

Some common software quality assurance questions are:

- What should be tested?
- Are we testing enough?
- Are we testing too much? Some organizations over-test in an effort to reduce the risk of missing some key aspect of the application.
- Are our test cases providing sufficient coverage?
- What is the quality of our software?

IB-ARM provides search, impact analysis and reporting capabilities to assist developers, testers and quality assurance (QA) staff in answering these questions.

Understand the Application

In order to understand what should be tested, development and QA staff need to understand the application. IB-ARM contains a number of analysis and search tools that provide application understanding.

- Understanding of application system components – IB-ARM provides a complete inventory of application software components.
- Understanding relationships between components, including interfaces and dependencies between software components – graphical diagrams, charts and reports are used to provide understanding of system flows, structures and dependencies.
- Impact analysis of changes being applied to application software – impact analysis capabilities are provided at simple and detailed levels to trace the impact of software changes.
- Extensive search capabilities – detailed search of components and source code allows hidden or obscure relationships to be uncovered quickly.

Understand what needs to be Tested

IB-ARM's detailed impact analysis facilities assist developers and testers in developing their test plans. These tools allow developers and QA to determine the right amount of testing to be performed.

- Database changes – relationships and CRUD views are used to understand where database objects are being used in the application. The extended search view provides a concise trail from database tables to programs, screens and jobs that use the table.

- Program changes – call trees and flowcharts provide visual diagrams of intra- and inter-program relationships. These provide a clear view of software components that need to be tested to verify the correctness of the program change.

- Variable-level program changes – program changes often involve changes at the field or variable level. Impact analysis allows the impact of these changes to traced, summarized and estimated. This again provides a clear view of the components that need to be tested to verify the field or variable change.

- Job / script changes – job scheduler dependency diagrams provide a detailed understanding of the application's scheduled processes, including dependencies between jobs and scripts. These dependency diagrams are used to determine the path required to test the changed jobs and scripts.

Test Coverage – what is covered by test cases?

IB-ARM can parse test cases stored in automated test tools, Excel spreadsheets or Word documents. These test cases can then be linked to application objects to understand the test coverage for application components such as web pages, windows, screens and batch jobs.

On the flip side, reports can provide an indication of application components that are not covered by test cases to allow these gaps to be filled. By linking test cases to implemented application components, a test plan can be easily derived based on the components that are being modified.

Software Quality Measurement

In addition to providing detailed assistance to quality assurance and testing, IB-ARM provides an automated method of collecting key software quality measures and distributing these measures throughout the IT organization via IB-ARM's web-based interface.

IB-ARM provides metrics about each application, including:

- Size – number of objects, lines of code, function points
- Complexity – cyclomatic complexity of source code, database complexity
- Quality – dead code, duplicate code, unreferenced objects, percentage of comments

These software quality metrics are based on detailed parsing of application components. The metrics are kept up-to-date using an automated refresh process. They can also be combined with additional information, such as defect statistics, to derive further application metrics.

About Information Balance, Inc.

Information Balance, Inc. develops software solutions to support large scale application development and maintenance practices across mainstream technology platforms. Its flagship product **Application Road Map (ARM)** is a unique Application Portfolio Management (APM) solution. The company's clients include leading financial services, insurance, telecommunications and retail organizations across North America.

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