Want to get to market quicker with new functionality while ensuring improved performance and reliability of your ATM network?

Optimise Your ATM Testing
An NCR White Paper

Experience a new world of interaction
Introduction

Today’s consumer demands ever-increasing levels of convenience when it comes to financial self-service technology, making the ATM an important interface between a financial institution and its customers. Inside the ATM is a complex set of application functions ranging from remote deposit, security controls, promotional messaging to personalisation. This complexity will continue as banks focus on optimising lower-value transactions and increasing the ATM channel functionality. According to a recent report by Boston Consulting Group, customers are “voting with their feet” if convenience and value of service are not provided. Financial institutions that recognise and address this trend and place value on the importance of improving the customer experience at the ATM will find themselves ahead of their competitors.

Testing is a critical component in the race to bring ATM applications to market quickly with production-quality reliability. Financial institutions can gain up to 80% in cost and time savings through solid ATM testing, according to ATM Marketplace. A CIO survey produced by Gartner also indicated that testing should measure business benefits of the applications being developed through more meaningful testing.

However, many financial institutions’ IT groups are struggling with resource allocation for ATM testing and with driving new functionality to market faster. Cutting corners leads to more costly production outages from code defects. IDC research found that developers often spend 37% of their time debugging and fixing problems. Besides the developer’s misallocation of time, the financial institution’s reputation and customer loyalty are often impacted. A pragmatic approach to ATM testing practices will address all these issues and ensure improved performance, reliability and usability.

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1 "The Road to Excellence", December 2010, The Boston Consulting Group
2 "The Importance of ATM Testing", Richard Slawsky, ATM Marketplace.com
3 "Hype cycle of IT Outsourcing, 2010", Document #G00205037, July 30, 2010, Gartner
4 "Managing the cost of complex sourcing: Driving business adaptability with quality", Document #221104, Melinda-Carol Ballou, December 2009, IDC
Get the requirements right

The function of ATM testing is to validate the alignment of the technical requirements for ATM applications to business objectives. Have you ever heard, “There’s no time for the requirements” or “Requirements are same as the previous version”? According to IDC research, 70–80% of projects fail because of poor requirements gathering, analysis or management. Too often, the testing group is not included during requirements gathering and definition.

“Requirements” are gathering needs from the financial institution. It is critical that the business analyst and tester have a deep understanding of the business, its pain points, and the financial institution’s customers and trends. The tester should also have a solid understanding of technology and self-service solutions.

The project manager and sponsor must consider “testing” as a key element in the requirements phase for the ATM application development cycle. During the requirements definition session, an experienced tester can begin to conceptualise the testing required and how to structure the test cases so that business objectives are met. Here is a real example of a situation where more rigorous testing was required in order for the project to succeed. A set of unique functions were required to be added within an ATM application program. Once the ATM application transferred control to this program, the financial institution would be connected to another server for the special transactions. When the solution entered integration testing, the tester was baffled at how to transfer control to the new program. Upon investigation, it was determined that touching the screen in a certain position enabled the new program. The ATM screen did not have a button or messaging, nor was anything in the design documents. The software was sent back to development and the button and supporting function were added. The project missed its release date and overran its budget.

Trust but verify

The testing group should be independent auditors of the solution’s functionality.

In order to ensure that testing runs smoothly it is important to trust but verify throughout the testing process. Most banking IT groups have a development lifecycle methodology with phase exits and a roles/responsibility matrix. It is the testing group’s responsibility, however, to ensure that early involvement and testing participation occurs in the requirements and development phases. For example, testing should be involved in final code reviews. There should be a defined hand-off code function list, which includes a detailed list of code function and components ready for test, and a complete software content list. This list should map back to design and requirement documents. It is also a good idea for testing to participate in the development team status meetings to ensure better communications and transparency.

Plan to test the entire solution

The key to success is to test the software that is going to be released in the manner that consumers will use it. ATM testing requires the application code, cards, appropriate test data, ATMs and peripherals, device simulations, host connections, certifications and security controls that mirror the eventual live placement location. The test environment must be carefully controlled to ensure the software code is the current software to be released.

Business pressures, aggressive schedules and cost constraints are common in application development. As a result, testers are sometimes given the advice to test only the code that has changed. This could be a small percentage of the overall code base representing only minor code changes with low risk. The test group must confirm that business function and interfaces are still working as expected. The goal of regression testing is to ensure that the existing codes continue to work properly with the new code.

*“Managing the cost of complex sourcing: Driving business adaptability with quality”, Document #221104, Melinda-Carol Ballou, December 2009, IDC*
Automate

Test automation must be considered and leveraged in order to truly drive speed and value from a test group. There will always be a need for manual testing, but a test group should attempt to automate as much as possible. Benefits from automation include better quality, reduced cycle times, reduced risk from human error, improved test coverage, formalised process, promotion of re-use and an earlier view of defects. Automation also allows more thorough testing of emergency fixes where time to delivery is critical.

Automation test strategy and process

A test group must consider automation as part of the overarching test strategy. Successful tool automation requires careful planning and work. The relevant test tool(s) must be selected based on the nature of the tests. The testing group’s management system must define and enforce the standards, process and procedures across the whole group and in particular with the development groups. When automating scripts, a test group must have processes and procedures for maintaining both manual and automated scripts. Maintenance of scripts often leads to test failures and can cost valuable time within a project schedule.

The test strategy must consider:

- Which test scripts will be automated versus manual
- Test architecture – whether keywords (business rules) will be used
- Guidance for separating complex scripts without losing integrity of the test
- Guidance for combined scripts
- Defect reporting and management
- Maintenance of test scripts

Automated testing frees resources to do more thorough and specialised testing. This added capacity allows expanded testing that can focus on areas difficult to test, negative tests and ad-hoc testing of new functionality.

Manual testing is still required

One of the major fallacies of automated testing is that manual testing is not required.

For complex tests, human observation of the steps and results is often necessary. Careful attention is required for creating test data, ensuring complete test steps and understanding test results. Ad-hoc testing can be performed using manual testing as well. Manual testing is necessary to fully test the interaction between the ATM hardware, software platform and the application.

Test script maintenance

Script maintenance can be costly and often forgotten during the push to deliver applications. Having large numbers of test cases fail unexpectedly due to poor maintenance is hugely inefficient. The test schedule becomes a disaster because of significant unplanned work required to “ready” the scripts.
To successfully implement test automation and reduce the risk of ongoing test script maintenance, these practices should be considered:

- A well thought-out approach to test scripts that incorporates:
  - Key word methodology
  - A defined framework
  - Supplement with tools
- Test automation recognised as a key component in the development process
- Clear responsibilities for maintenance
- Use of on-shore and off-shore resources to optimise cost and effectiveness
- Clearly documented test scripts that include business requirements, test scenario(s) and any special test environment or data considerations

A well run test group with a defined framework will have maintenance as a key part of its post-testing activities. Additionally, project post-launch reviews should include script maintenance.

Resource optimisation

In testing groups with less maturity, resource assignment and allocation are not performed in an efficient manner especially when offshore resources are involved. Additionally, this may include an inefficient use of automated tools. More mature test groups have a defined strategy that includes established processes, standards and a management system.

According to a recent report by Boston Consulting Group, banks are focusing on performance management across all aspects of their business. Efficiency and effectiveness of testing are keys to successful performance management. Here are some tips for better optimising testing resources:

- **Define your strategy and management system**
  ATM test groups must have a clear picture of their strategy and supporting resource management process. These should include process and guidance on manual versus automated testing; proper resource assignment; in-house versus offshore; proper tool usage; integrated development life cycle methodology and training. Many of the more mature test groups have a formalised Centre of Excellence (CoE), which is a proven way to drive consistency and efficiency.

A CoE is important for providing management system, leadership and advocacy to help an organisation optimise quality. A CoE also assists in quality issues for distressed projects. If you do not have a CoE, start small and grow. Defect management is an excellent place to start since software defects are both high profile and expensive. You could start with a centralisation of defect management tools and processes in order to achieve consistency. This would provide meaningful value to project teams and business units immediately, thus providing value to the CoE.

- **Separate your testing efforts**
  Engineers with a higher testing skill level should create the manual test scripts, automate the test scripts, define test sequences and oversee the execution and defect reporting. More advanced automated scripting involves the use of “keywords,” which are business-related functions within applications. Therefore, higher-level engineers should develop the keyword-testing framework. Testers with a lower skill level can prepare data and the testing environment, execute tests and make minor changes to test scripts.

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6 “Operational Excellence in Retail Banking”, February 2011, The Boston Consulting Group
• **Determine right staffing model**

There are different models for in-house and offshore resources. Ideally, collocating your development and test groups together works best for communications, collaborations and sense of team. When collocating is not possible (in-house and offshore), it is critical that a team structure be established. There must be team leaders who have the experience, expertise and training at the bank’s in-house location as well as at the offshore location(s). This enforces an accountability and internal escalation path.

• **Plan your work and work your plan**

Reducing the costs for testing requires increased planning and coordination. A solid test plan is critical to a successful delivery. Some key considerations are to: build in contingencies for both known and unknown risk; create clear assignments; interlock all dependencies; and validate the plan with other testing subject matter experts and project managers.

• **Don’t neglect training**

Training is an ongoing key to success. An article from CIO.com cited training as a key best practice for quality assurance. Test engineers are one of the most important positions within a development team. Successful testing involves test engineers who are detail-oriented and methodical. In many cases, the testers were former programmers. Business training should be conducted where engineers use ATMs and associated applications and talk with customers to gain their insight. Cross training between either more experienced to less experienced testers or across specialty areas is critical. Formal technology training and testing discipline should be part of personnel development to ensure your test group brings direct value.

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### Avoid duplication testing

The quickest way to suboptimize testers is through an uncoordinated activity where duplicate tests result. ATM applications are comprised of many different software components and interfaces. The test team must test and validate all different areas within an ATM application.

A partial list of areas within an ATM application that must be tested includes:

- The consumer flow or how the customer navigates from screen to screen
- Communication with the host, including sending the correct message to the host and ensuring the messages from the host are handled correctly
- Communication with the other servers used for management of the ATM network, processing cheques, advertisement management and personalisation
- Screens must be examined for correct placement of test and graphics as well as spelling
- The voice guidance for each screen as well as the voice guidance help function, including the instructions that change for each ATM model
- All transactions must be tested with and without receipts
- Internal logs, journals and tallies must be examined for correct entries and to ensure no missing entries
- All activities used to service the ATM tasks such as adding cash and settling
- Application response to possible hardware or communication errors
- Consumer errors such as inserting wrong media, incorrect PIN entry or insufficient funds

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Some tasks such as “time outs” and “cancels” are time consuming and can be performed by a lower skill level engineer. The higher level testers should not repeat the tests when they are testing their portion of the screen.

A test plan is the roadmap for avoiding duplicate or missed function testing. The plan is key to ensuring proper resource assignment and tool usage. The test cases should be related to business functions. In some organisations, the test group divides into sub-teams that focus on specific business systems. This not only deepens a tester’s understanding of how the systems should work, it gives them the expertise to identify problems that might not show up in the formal test document.

**NCR ATM Testing Services**

ATM application testing is a mission-critical activity needed to drive performance, reliability and usability. Behind-the-scenes complexity will increase; more functionality will be migrated into the ATM channel and must be integrated across other banking channels. NCR has developed a comprehensive portfolio of testing services based on NCR’s extensive years of experience in the ATM industry and of testing ATMs.

NCR ATM Testing Services takes your application code quality to a higher level. It ensures more reliable and user-friendly applications, resulting in an improved customer experience that retains existing customers and attracts new ones. The portfolio includes test strategy and planning; testing assessment; life cycle test execution and test automation. Through our test strategy and planning service, we uncover gaps within your in-house testing function by assessing the test process, standards, tool usage and resource skills. And, by performing life cycle test execution, specialised testing or automating the test process for you we assist you with your test execution.

NCR Testing Services provides a complete set of services that enables you to solve your business challenges, regardless of the depth and breadth of your ATM testing requirements.

**In-depth expertise**

Complex and multivendor solutions require specialised testing professionals.

NCR testing professionals are not just application testers but highly experienced with extensive ATM solution domain knowledge across multivendor applications.

The NCR testing team will help you deliver more reliable and user-friendly applications that your customers will find easy to use, resulting in competitive differentiation and increased customer loyalty.

NCR Testing Services has a global Centre of Excellence to ensure high quality and continuous improvements. Our Testing CoE provides the technical foundation for our testing labs, processes, standards and management. It is an effective way for our testing professionals to collaborate and share best practices with you. This is the framework that ensures our testing discipline and processes are structured and continuously improved. NCR’s global CoE ensures that you receive better test coverage, more reliable applications and self-service touchpoints that your customers can depend on.

**Proven globally**

NCR has been the global number one manufacturer of ATMs for more than 23 consecutive years. We have global experience as well as local country knowledge with testing facilities in eleven locations throughout the world. We offer flexible and scalable testing solutions ranging from providing expert testers as part of your development team, to running your testing program as a project, or completely taking over the total testing function for you. We have a testing solution to fit any of your requirements.
Why NCR?

With over 125 years of global experience and knowledge, 13,000 NCR-badged consultants and technical support experts and a network of customer care centres, NCR provides best-in-class services across multiple industries. We help our clients around the world improve their customer interactions, implement change quickly and proactively, and transform their businesses to become leaders and change agents. We can help you, too.