



Creating Innovative Solutions

Case Study on POS Testing



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1 About the Organization

NeST is an Original Design Manufacturer (ODM) service provider focused on delivering value, using appropriate technology and processes to develop and manufacture custom solutions to solve the problems of our customers, thus forging enduring partnerships.

As a company, we are committed to quality and responsiveness. We operate in a range of technologies and multiple geographies to offer the best service to customers.

NeST has an Independent Testing Team (ITT) as part of the Quality and Testing group, which takes care of the testing and SQA activities of the projects operating at NeST. The primary objective of ITT is to facilitate an independent validation of the software products, assess the reliability and improve the confidence level, before they are delivered to customer.

ITT at NeST typically acts as an internal customer and the software shall be tested and certified by this group before it is shipped to the customer. Independent testing team is comprised of certified Test professionals well versed in different testing tools and testing methodologies.

There are separate ITT units specialized in diverse domains and one among those is the POS Testing Team.

2 Overview

This document gives an overview regarding the testing of POS. It also describes the testing procedure followed in NeST.

In today's competitive landscape, the point-of-sale system is a key differentiator for retailers. POS systems need to meet changing business needs under tight budgets and aggressive timelines. With POS systems increasingly customized to retailer requirements, vendor tests may be insufficient, requiring retailers themselves to invest in testing.

Retailers recognize testing as a clear area of opportunity to shrink timelines, reduce costs and improve quality. Effecting tangible improvements in testing is often a daunting task given the unique challenges with POS testing landscape.

NeST has a dedicated independent test team with expertise in wide varieties of POS hardware and software; we follow matured work flows and stringent quality procedures, ensuring faster time-to-market and increased productivity. The team constitutes seasoned professionals with firsthand experience in Integration & system testing on POS hardware systems and server software.

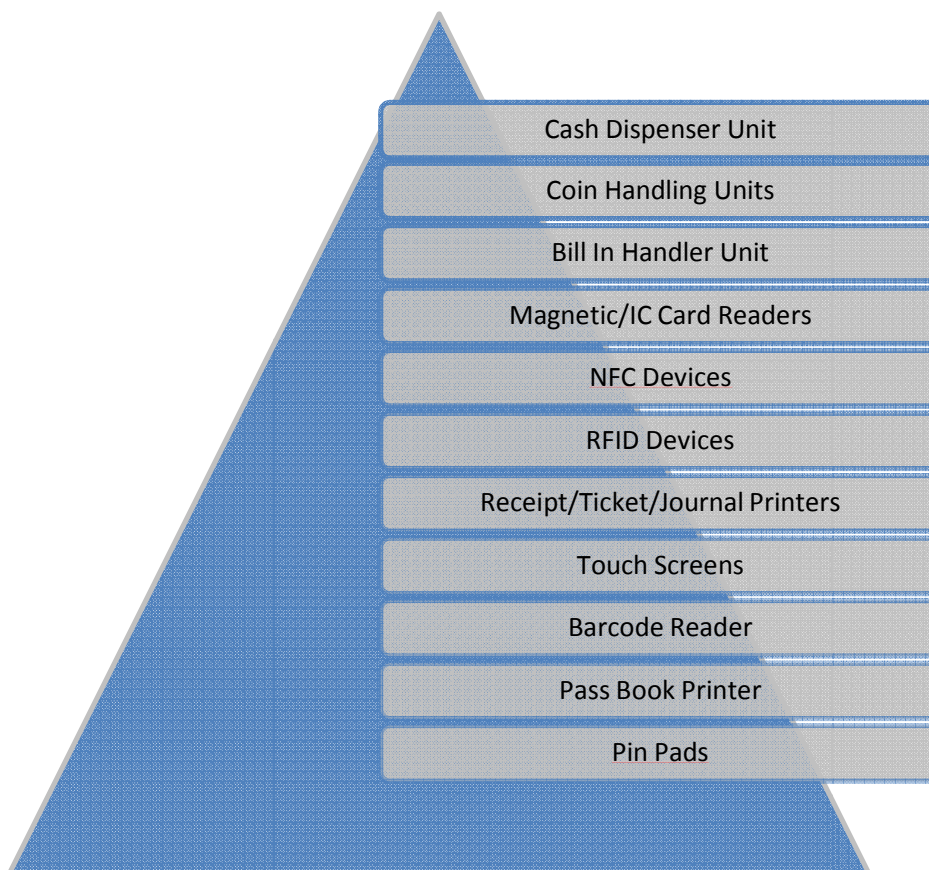


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3 Scope

The last decade witnessed the Point of Sale terminals coming of age and evolving into Point of Service machines providing sophisticated state of the art customer services and building customer relationships through enhanced user experience. NeST provides reliable services for maintenance support and research assistance for reducing time to market and increasing the cost effectiveness of POS products. The right blend of up-to-date technology and result driven team with an in-depth domain knowledge is what makes leading POS manufacturers and peripheral device manufacturers stick with NeST for developing software for futuristic POS terminals.

NeST offers testing services on various POS systems and components like Cash Dispenser Unit, Coin Handling Units, Bill in Handler Unit, Magnetic/IC Card Readers, NFC Devices, RFID Devices, Receipt/Ticket/Journal Printers, Touch Screens, Barcode Reader, Pass Book Printer, Pin Pads.





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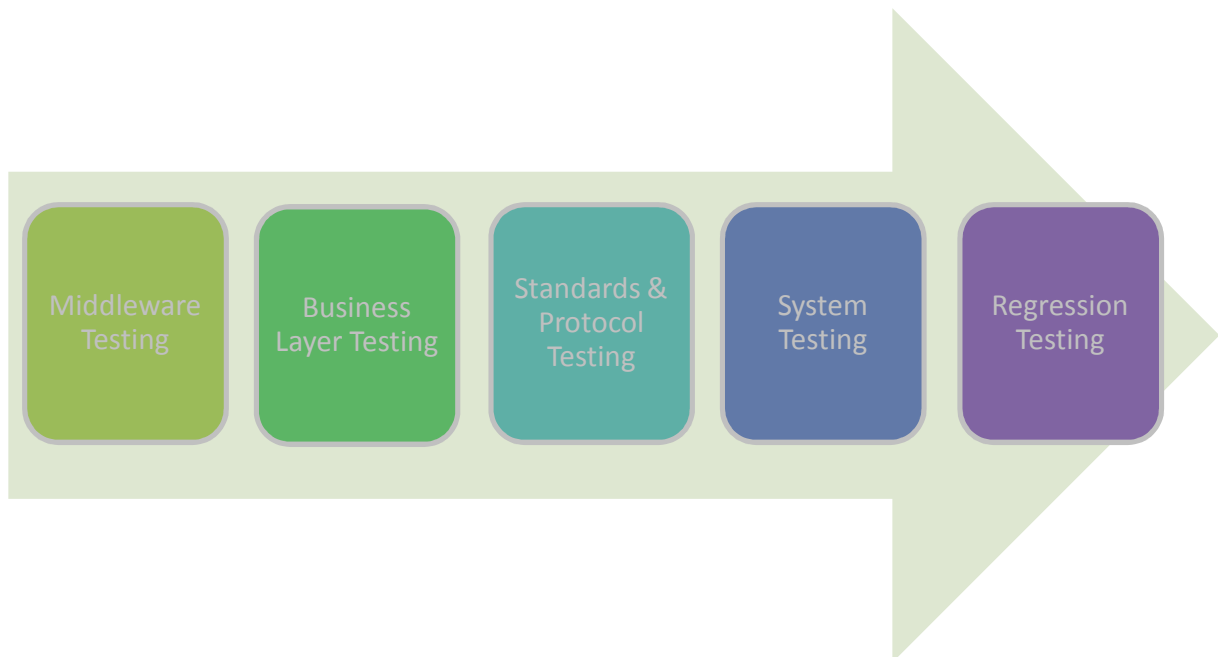
4 Challenges Faced and how we overcome

Following lists the significant constraints on testing of POS and the solutions implemented to overcome those

- Complex Interfaces – Systematic test designs are followed to reduce the complexity of interfaces in various POS systems.
- Multiple Configurations – Strong change management and version controlling practices are followed.
- Evolving Requirements - During testing phase, there were cases of requirement changes. This impact was covered by on time update of test cases and also with re-testing of impact areas. Transparent requirement traceability is prepared.
- Squeezed out Schedules – 100% test coverage for all critical business requirements are done.
- Japanese Screens and Menus – Testing team members are given training in Japanese language (JLPT Level 4), Screen shots of Japanese screens are translated and documented.
- Non availability of Hardware – Complex simulators are developed for unavailable hardware.
- Massive Deployment – Testing team members with experience in Integration and System testing on actual hardware systems are deployed.

5 Testing Techniques

The detailed Workflow of POS Testing is represented below:





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- ❖ **Middleware Testing** - Tested middleware for systems such as
 - ✓ ATMs
 - ✓ Coin Dispensing Machines
 - ✓ Counter Teller Machines
 - ✓ Town Access Points
- ❖ **Business Layer Testing** – It includes testing of
 - ✓ Customer Operations Panel
 - ✓ Hardware Settings & Hardware Units
 - ✓ Normal & Abnormal Scenarios
 - ✓ Localization
- ❖ **Standards & Protocol Testing** – NeST offers compliance testing on the following standards and protocols
 1. POS Standards
 - ✓ CEN/XFS
 - ✓ UPOS (OPOS & Java POS)
 - ✓ J/XFS
 2. Communication Protocols
 - ✓ IFX
 - ✓ Bio AP
 - ✓ NDC+
 - ✓ DDC
 - ✓ ISO 8583
- ❖ **System Testing** – Testing is conducted on actual hardware such as
 - ✓ System testing as per APTRA NDC standards
 - ✓ Hardware Specific Test
 - ✓ Product Testing
- ❖ **Regression Testing** - Selective retesting of system is carried out to verify that modifications have not caused unintended effects and that system still complies with its specified requirements.

6 Key Outcomes

- Detailed test plans and matured test execution workflows
- Stringent measures to ensure quality
- Workforce with high technical expertise in all financial hardware devices
- Firsthand experience in legacy as well as modern systems like Online Lottery System, High-end ATMs , Wrapped coin dispenser, etc
- Adopts cost effective and optimized practices such as simulators if necessary
- Expertise in developing both user mode and kernel mode simulators



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7 Conclusion

- ✚ Developed cost-effective high performance systems
- ✚ Component development and system integration were done efficiently

Experience enabled the Testing team to improvise on the NeST quality & testing strategy for better customer interactions, without compromising on delivering high quality product within limitations.