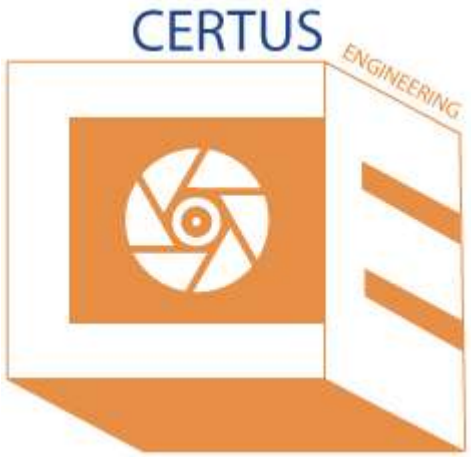
Certus Engineering



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1. Testing

We have split up testing in four main sections which are unit tests, integration testing, system testing, and user acceptance testing. Table 1 outlines the time spent on each test and Figure 1 shows an overview of the testing timeline in the form of a Gantt chart.

Table 1: Testing Timeline

Task Name	Start Date	End Date	Duration
Hardware Test	**10/18/15**	**10/20/15**	**3d**
RFID/Scanner HW Test	10/18/15	10/19/15	2d
Mechanical/Electrical Test	10/19/15	10/20/15	2d
SW Input Test	**10/20/15**	**10/27/15**	**6d**
Input Capture Unit Test	10/20/15	10/20/15	1d
Input OCR Integration Test	10/23/15	10/23/15	1d
Input Serial Host Module	10/26/15	10/27/15	2d
Data Manipulation Test	**10/30/15**	**11/03/15**	**3d**
OCR Validation Test	10/30/15	11/03/15	2d
RFID to Text Field Test	11/02/15	11/03/15	1d
Web Interface Test	**11/05/**	**11/16/15**	**8d**
Local Server Test	11/05/15	11/06/15	2d
Remote Server Test	11/09/15	11/10/15	2d
Interface/Stress Test	11/16/15	11/16/15	1d
System Testing	**12/02/15**	**12/07/15**	**4d**
User Acceptance Test	**12/02/15**	**12/07/15**	**4d**

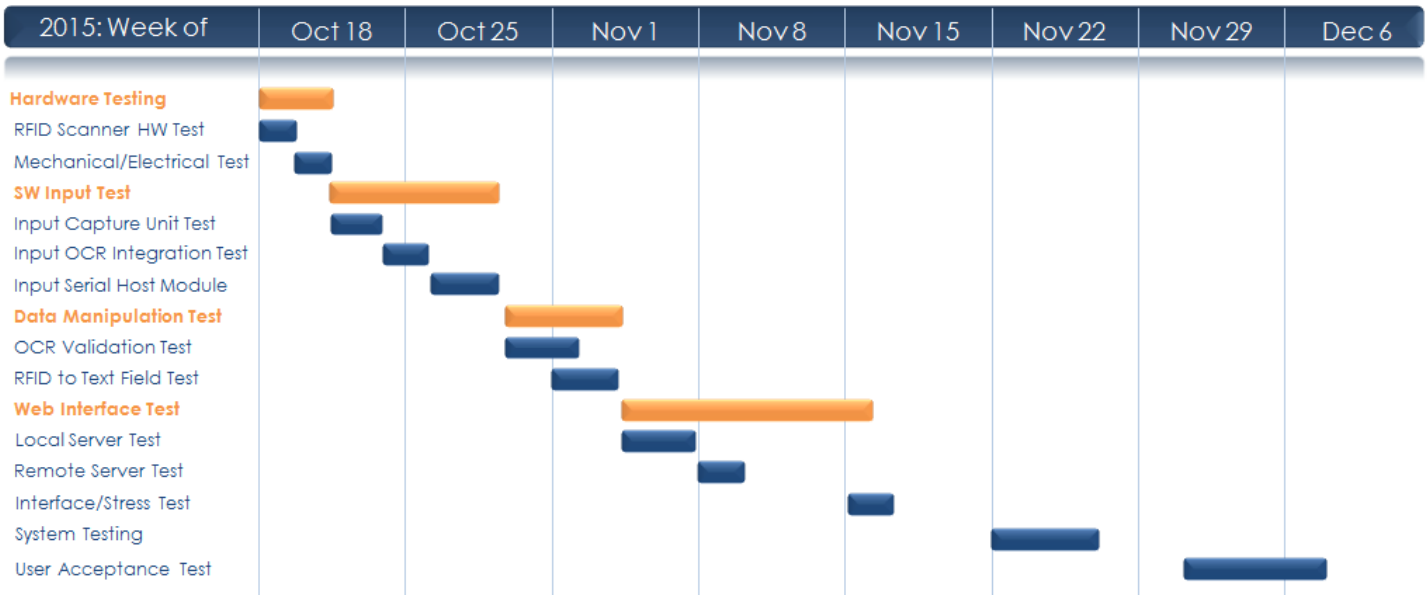


Figure 1: Gantt Chart showing testing milestones

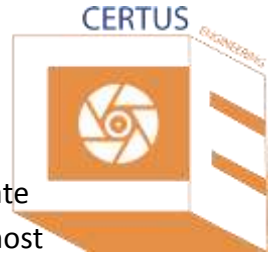
1.1 Unit Tests:

Software/hardware test cases are planned and performed to ensure correctness of each module in the system. Test cases will mostly check functionality of each module in boundary conditions and validation of our functional requirements.

These tests are performed earlier in the production phase or before adding any new and small software/hardware components to the project. Resistance of the box containing RFID/Scanner to drops, pressure and heat is tested. Each function or class created by our team is tested with variety of inputs to test critical situations such as stack overflow.

1.2 Integration Testing:

We will combine multiple unit tests to generate integration tests and observe how related components work together. As we add more components in later versions, these will be tested for proper integration. Integration tests are done after individual unit tests.



These tests are performed frequently in development stage to fix bugs or validate communication between components. For example, communication between host computer and microcontroller when scanning or tapping a RFID tag is tested to insure arrival of data in a short time and correct format. Electrostatic charge collected on the box is also measured when RFID and scanner both are used for a long period of time.

1.3 System Testing:

In this test phase, we focus on testing functionality of system as a whole. We will perform stress tests in this phase to ensure system can function properly under expected heavy use also to validate our functional and non-functional requirements.

These tests are performed later in production stage when individual units are completed and final product or prototype is available for testing. Data propagation through system is observed and total latency, efficiency and correctness of the whole system is analyzed in this stage.

1.4 User Acceptance Testing:

End user tests will be performed to validate some of non-functional features of the system such as learnability, power efficiency and speed. Also customer satisfaction will be evaluated during this process. Dates of the tests will be between Nov 20th 2015, and Nov 30th 2015.

These tests are mostly done towards the end of production of final product or prototype however user feedback is required after completion of any front end unit. Ease of use, user satisfaction and learnability of final product will be analyzed using these tests and user feedback.