

CSCE 606 – Software Engineering  
Project: Inventory System  
**Sprint # 2 – Retrospective**

**Customer: Dr. Robert Lightfoot**

**Links:**

- Deployed app: <https://robert-inventory-f91e26f91bb2.herokuapp.com/>
- Github Project: <https://github.com/orgs/tamu-edu-students/projects/101>
- Github Repo: <https://github.com/tamu-edu-students/CSCE-606-Inventory-System>
- Shared folder:  
<https://drive.google.com/drive/folders/1NsQfvHf9n272E8VKVghdkU4B7Elk4EYI>
- Discussion Channel: <https://app.slack.com/client/T08A4A8U89M/C08AJRT0UTC>

**Spring #2 Dates:**

- Started date: 02/11/2025
- Finished date: 02/24/2025

**Team and Members contribution:**

Name	Role	Contribution (%)	Points	Comments
Rafael Morales	SM/DEV	25	10	Contribute in QR Code, NFC Chip, Login Session and Merging Branches, fix TDDs and BDDs
Khush Patel	DEV	23	9	Contribute on updating models with the expected deleting behavior for Bins and Items
Saba Mostofi	DEV	18	6	Contribute on the logic for adding Pictures to Bin and Items, Help write the Documentation.
Arun Akash	DEV	18	7	Contribute in the User Authentication, Password reset and Simple UI for CRUD operations
Sid Rayapur	PO/DEV	16	6	Contribute in creating the Models for Location and Session.

### Sprint #2 Goal:

- NFC Chip and QR Code Integration for bin identification. ✓
- Adding Location and Picture Models to enhance item tracking. ✓
- Prevent item deletion. ✓
- Enhancing Frontend Compatibility by adding HTML and CSS to support backend ✓
- Allow item creation outside of bins ✓
- Login/Logout password reset ✓

### Sprint #2 Achievements:

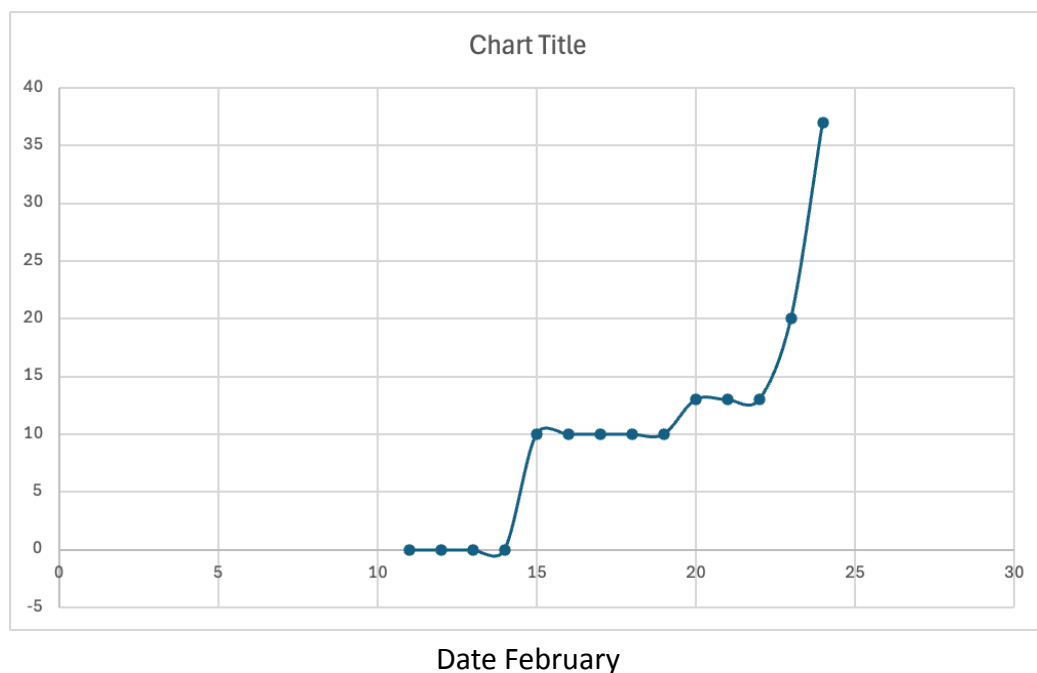
- Logic for NFC and QR Implementation were defined and implemented
- All user stories for **Password Reset** on **User** were completed.
- A basic HTML UI for CRUD operations was developed, allowing users to create, read, update, and delete records for the models mentioned above.
- The Logic for attaching picture to bins and Items was defined and implemented
- The Deletion process for Items was defined and implemented
- Location and session model were created

### Sprint #2 Backlog:

Backlog Item	Status	Notes
Create session Model	⚠ Partial	The implementation was completed but it hasn't been merged to Main.
Create Location Model	✓ Completed	Created some inconsistency on Bin models that has to be fixed on next sprint
Create Picture Model	✓ Completed	Can take and attach pictures to bins and locations
Add QR Code to Bin	✓ Completed	Tested using a mobile device and production link.
Scan QR Code for Bin Information	✓ Not Completed	Tested using a mobile device and production link.
Add NFC Chip to Bin	✓ Completed	Tested using a mobile device and

		production link.
Prevent Item Deletion after removal from Bin	✅ Completed	For Item it is working correctly. however, we have a Bug for Bin deletion that needs to be fixed
Allow items that don't belong to any Bin	✅ Completed	
Simple UI for CRUD Operations:	✅ Completed	Very basic UI. Next sprint we will be focus on the Front End
Password Recovery	✅ Completed	Working correctly in local, however, we have some issues for the Production App, we will carryover this bug for the next sprint
Improve Bin Form with Dropdowns	✅ Completed	
- Create log from session	❌ Not completed	Session was created, is on sid-session branch, however, it needs to be merged to main and tested

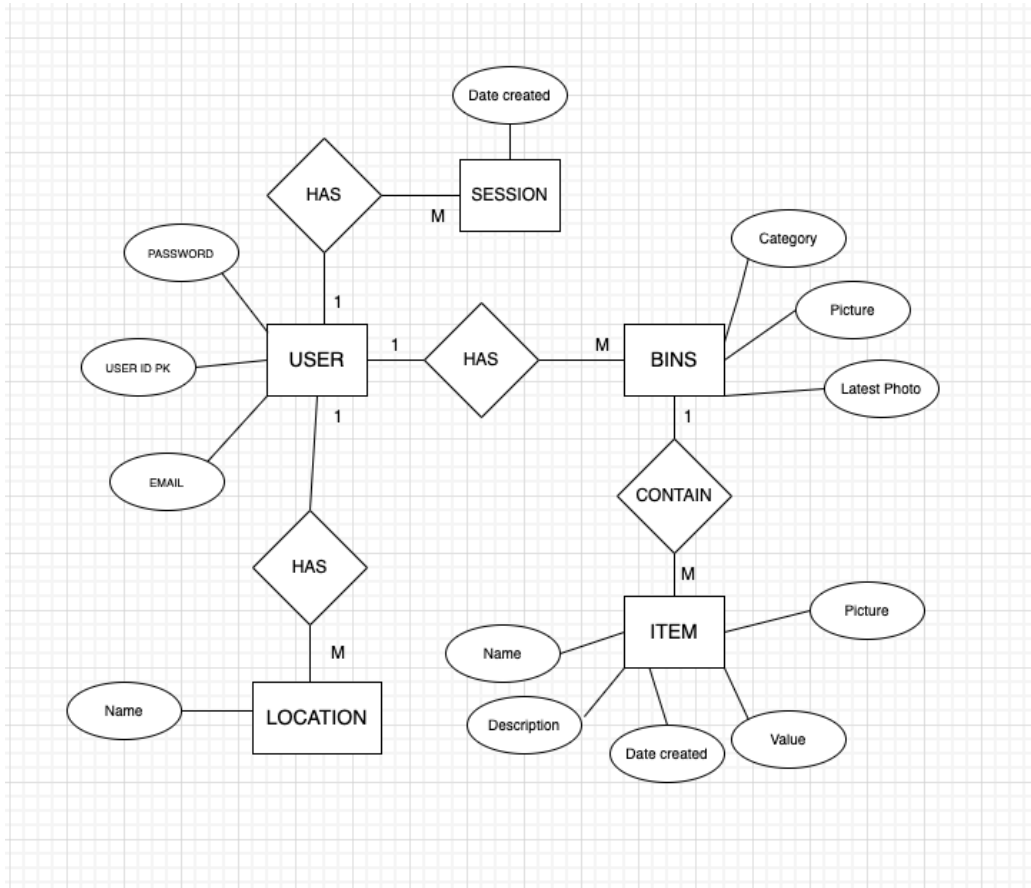
### Burn down Chart:



Total point 40. The chart above was created using an Excel file. For Sprint #2. Total points completed: 37

### Design Diagrams:

This is the current state of the Database:



## Documents of change:

Design Change	Comments
Multiple pictures for bins	It was planned to have multiple pictures for bins, however, after discussion with the customer, we decided to simplify the model, and now only 1 picture per bin is allowed.
The storyboard for location was changed.	For the previous sprint, LOCATION was a feature of the BIN table. Now, LOCATION has its own model and it is owned by USER. (Check Diagram Above)
UI Diagrams	UI Diagram were modified for a better control of the CRUD operation, Sprint #3 will change design to meet customer requests

The customer Was not available to meet towards the end of sprint 2.

## Evaluation of Code and Test Quality

All Files ( 95.39% )

Controllers ( 94.74% )

Channels ( 100.0% )

Models ( 100.0% )

Mailers ( 100.0% )

Helpers ( 100.0% )

Jobs ( 0.0% )

Libraries ( 100.0% )

All Files ( 95.39% covered at 7.42 hits/line )

24 files in total.

304 relevant lines, 290 lines covered and 14 lines missed. ( 95.39% )

Search:

File	% covered	Lines	Relevant Lines	Lines covered	Lines missed	Avg. Hits /
app/jobs/application_job.rb	0.00 %	7	2	0	2	
app/controllers/dashboard_controller.rb	83.33 %	12	6	5	1	
app/controllers/locations_controller.rb	90.91 %	68	33	30	3	
app/controllers/items_controller.rb	91.30 %	98	46	42	4	
app/controllers/users_controller.rb	91.67 %	21	12	11	1	
app/controllers/password_controller.rb	95.92 %	97	49	47	2	
app/controllers/bins_controller.rb	97.50 %	83	40	39	1	
app/controllers/application_controller.rb	100.00 %	38	15	15	0	

## Cucumber Scenarios and Results:

- Bin Picture upload

```
Using the default profile...
Feature: Add Picture to a Bin
  As a user
    I want to upload a picture when creating a bin
    So that I can associate an image with the bin

  Scenario: User successfully uploads a picture for a bin #
    in_picture_upload.feature:6
      Given I am logged in as "test@example.com" with password "Password1!" on the new bin page #
        nitions/bin_steps.rb:2
      When I visit the new bin page to add picture #
        nitions/bin_steps.rb:10
      When I fill in the bin field "Name" with "Storage Bin" #
        nitions/bin_steps.rb:16
      And I fill in the bin field "Location" with "Warehouse A" #
        nitions/bin_steps.rb:16
      And I fill in the bin field "Category name" with "Electronics" #
        nitions/bin_steps.rb:16
      And I attach a bin picture "spec/fixtures/files/bin_picture.jpg" to the bin picture field #
        nitions/bin_steps.rb:31
      And I press the bin button "Create Bin" #
        nitions/bin_steps.rb:36
      Then I should see the bin creation success message "Bin was successfully created." #
        nitions/bin_steps.rb:42
      And I should see the uploaded bin picture #
        nitions/bin_steps.rb:47

    1 scenario (1 passed)
    9 steps (9 passed)
    0m0.346s
```

- Item Picture Upload:

```
rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec cucumber features/spr
Using the default profile...
Feature: Add Picture to an Item
  As a user
    I want to upload a picture when creating an item
    So that I can associate an image with the item

  Scenario: User successfully uploads a picture for an item
    Given I am a logged-in user for item creation
    When I visit the new item page to add a picture
    And I fill in the item-specific field "Name" with "Laptop"
    And I fill in the item-specific field "Value" with "1200"
    And I select a bin
    And I attach a file "spec/fixtures/files/item_picture.jpg" to the item picture field
    And I click the item button "Create Item"
    Then I should see the item success message "Item was successfully created"
    And I should see the uploaded item picture

    1 scenario (1 passed)
    9 steps (9 passed)
    0m0.321s
```

- Allow item without bin (1 failure)

```

rafael@Rafael's-MacBook-Air CSCE-606-Inventory-System % bundle
Using the default profile...
Feature: Create Items Without Bin Assignment
  As a user
    I want to create items without assigning them to bins
    So that I can catalog items before organizing them

  Background:
    # features/sprint2/s2_allow_item_dont_belong_bin.feature
    Given I am a logged-in user # features/step_definitions/q

  Scenario: Creating an item without a bin
    # features/sprint2/s2_allow_item_dont_belong_bin.feature
    When I visit the new item page # features/step_definitions/q
    And I fill in the item field "name" with "New Camera" # features/step_definitions/q
    And I fill in the item field "value" with "499.99" # features/step_definitions/q
    And I click "Create Item" # features/step_definitions/q
    Then I should see "Item was successfully created" # features/step_definitions/q

  Scenario: Validation errors when creating unassigned item
    # features/sprint2/s2_allow_item_dont_belong_bin.feature
    When I visit the new item page # features/step_definitions/q
    And I fill in the item field "value" with "-10.00" # features/step_definitions/q
    And I click "Create Item" # features/step_definitions/q
    Then I should see "Name can't be blank" # features/step_definitions/q
    ERROR: Invalid expression: /*[contains(text(), 'Name can't be blank')]
    ./features/step_definitions/steps.rb:46:in `I should see'
    features/sprint2/s2_allow_item_dont_belong_bin.feature:24:in `Then I should see'

  Scenario: Creating an item and assigning it to a bin later
    # features/sprint2/s2_allow_item_dont_belong_bin.feature
    Given I have an unassigned item "Old Laptop" # features/step_definitions/q
    And I have a bin named "Electronics" # features/step_definitions/q
    When I visit the edit page for item "Old Laptop" # features/step_definitions/q
    And I click "Update Item" # features/step_definitions/q
    Then I should see "Item was successfully updated" # features/step_definitions/q

  Scenario: Viewing unassigned items
    # features/sprint2/s2_allow_item_dont_belong_bin.feature
    Given I have an unassigned item "Old Phone" # features/step_definitions/q
    When I visit the items page # features/step_definitions/q
    Then I should see "Old Phone" # features/step_definitions/q

Failing Scenarios:
Cucumber features/sprint2/s2_allow_item_dont_belong_bin.feature:1
4 scenarios (1 failed, 3 passed)

```

- NFC Chip

```

rafael@Rafael's-MacBook-Air CSCE-606-Inventory-System % bundle exec cucumber features/nfc
Using the default profile...
Feature: NFC Chip Scanning for Bin Access
  As a user
    I want to scan the NFC chip
    So that I am redirected to the correct bin page

  Scenario: A logged-in user scans an NFC tag
    # features/nfc.feature
    Given I am a logged-in user # features/step_definitions/q
    And I have a bin named "Storage Bin" with an NFC link # features/step_definitions/q
    When I scan the NFC chip for "Storage Bin" # features/step_definitions/q
    Redirected to the correct bin page - PASSED
    Then for NFC, I should be redirected to the bin page for "Storage Bin" # features/step_definitions/q

  Scenario: A logged-out user scans an NFC tag that belongs to him
    # features/nfc.feature
    Given I am not logged in # features/step_definitions/q
    And I have a bin named "Storage Bin" with an NFC link # features/step_definitions/q
    When I also scan the NFC chip for "Storage Bin" # features/step_definitions/q
    Then I should be redirected to the login page # features/step_definitions/q
    When I log in as "test@example.com" # features/step_definitions/q
    Then I should be redirected to the bin page for "Storage Bin" # features/step_definitions/q

  Scenario: A logged-out user scans an NFC tag that doesn't belong to him
    # features/nfc.feature
    Given I am not logged in # features/step_definitions/q
    And I found a bin named "Storage Bin" with an NFC link # features/step_definitions/q
    When I also scan the NFC chip for "Storage Bin" # features/step_definitions/q
    Then I should be redirected to the login page # features/step_definitions/q
    When I log in creating new user as "not_me@example.com" # features/step_definitions/q
    Then I should be redirected to the page "bins" # features/step_definitions/q

3 scenarios (3 passed)
16 steps (16 passed)
0m0.492s

```

- Password recovery

```
rafael@Rafael's-MacBook-Air CSCE-606-Inventory-System % bundle exec cucumber features/sprint2
Using the default profile...
Feature: Password Recovery
  As a user
    I want to recover my password
    So that I can log in if I forget it

  Background:
    Given I am a registered user with email "test@example.com" and password "Password123!" #

  Scenario: Requesting a password reset # features/sprint2/s2_password_
    Given I am on the forgot password page # features/step_definitions/pas
    When I enter my email "test@example.com" # features/step_definitions/pas
    And I press the "Send Reset Code" # features/step_definitions/pas
    Then I should see the "Reset code sent to your email" s2 # features/step_definitions/pas

  Scenario: Entering a valid reset code # features/sprint2/s2_password_re
    Given I have requested a password reset # features/step_definitions/passw
    And I received a reset code via email # features/step_definitions/passw
    When I enter the reset code # features/step_definitions/passw
    And I press "Verify" # features/step_definitions/steps
    Then I should be redirected to the password reset page # features/step_definitions/passw
    And I should see "New Password" # features/step_definitions/steps

  Scenario: Resetting the password successfully # features/sprint2/s2_password_rec
    Given I have entered a valid reset code # features/step_definitions/passwo
    When I enter "NewPassword1!" as my new password # features/step_definitions/passwo
    And I confirm "NewPassword1!" as my new password # features/step_definitions/passwo
    And I press "Reset Password" # features/step_definitions/steps
    Then I should see the "Password reset successful!" s2 # features/step_definitions/passwo
    And I should be redirected to the login page1 # features/step_definitions/passwo

  Scenario: Entering an invalid reset code # features/sprint2/s2_password_
    Given I have requested a password reset # features/step_definitions/pas
    When I enter an invalid reset code # features/step_definitions/pas
    And I press "Verify" # features/step_definitions/steps
    Then I should see the "Invalid or expired reset code" s2 # features/step_definitions/pas

  Scenario: Trying to use an expired reset code # features/sprint2/s2_password_
    Given I have requested a password reset # features/step_definitions/pas
    And my reset code has expired # features/step_definitions/pas
    When I enter the reset code # features/step_definitions/pas
    And I press "Verify" # features/step_definitions/steps
    Then I should see the "Invalid or expired reset code" s2 # features/step_definitions/pas
    And I should be redirected to the forgot password page # features/step_definitions/pas
```

```
Scenario: Trying to reset password with mismatched confirmation # features/sprint2/s2_pass
  Given I have entered a valid reset code # features/step_definition
  When I enter "NewPassword1!" as my new password # features/step_definition
  And I confirm "WrongPassword1!" as my new password # features/step_definition
  And I press "Reset Password" # features/step_definition
  Then I should see the "Passwords don't match" s2.1 # features/step_definition

Scenario: Trying to reset password with an invalid format # feature
  Given I have entered a valid reset code # feature
  When I enter "password" as my new password # feature
  And I confirm "password" as my new password # feature
  And I press "Reset Password" # feature
  Then I should see the "Password must include at least one uppercase letter" s2 # feature
  And I should see the "Password must include at least one number" # feature
  And I should see the "Password must include at least one special character" # feature

7 scenarios (7 passed)
45 steps (45 passed)
0m0.479s
```

- prevent item deletion



```

rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec cucumber
Using the default profile...
Feature: Prevent Item Deletion After Bin Removal
  As a user
    I want items to remain in the system after removing them from bins
    So that I don't lose item data when reorganizing my inventory

  Background:
    Given I am a logged-in user
    And I have a bin named "Kitchen Stuff"
    And I have an item "Coffee Maker" in bin "Kitchen Stuff"

  Scenario: Removing an item from a bin
    When I visit the edit page for item "Coffee Maker"
    And I remove the bin assignment
    Then I should see "Item was successfully updated"
    And the item "Coffee Maker" should be unassigned

  Scenario: Reassigning an unassigned item
    Given I have an unassigned item "Blender"
    And I have a bin named "New Kitchen Bin"
    When I assign item "Blender" to bin "New Kitchen Bin"
    Then I should see "Item was successfully updated"
    And the item "Blender" should be in bin "New Kitchen Bin"

2 scenarios (2 passed)
15 steps (15 passed)

```

- QR Code

```

rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec cucumber
Using the default profile...
Feature: QR Code Generation for Bins
  As a user
    I want to create a bin
    So that it generates a QR code automatically

  Scenario: User creates a bin and sees the QR code
    Given I am a logged-in user
    When I visit the new bin page
    And I fill in the bin "Name" with "Storage Bin"
    And I fill in the bin "Location" with "Garage"
    And I fill in the bin "bin_category_name" with "Misc"
    And I click "Create Bin"
    Then I should see the bin success message "Bin was successfully created"
    And I should see a QR code

1 scenario (1 passed)
8 steps (8 passed)

```

- Scan QR Code

```

rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec cucumber
Using the default profile...
Feature: QR Code Scanning for Bins
  As a user
    I want to scan a QR code
    So that I am redirected to the correct bin page

  Scenario: User scans a QR code and is redirected to the bin
    Given I am a logged-in user
    And I have a bin named "Storage Bin" with a QR code
    When I scan the QR code for "Storage Bin"
    Then I should be redirected to the bin page for "Storage Bin"

1 scenario (1 passed)
4 steps (4 passed)

```

## Some RSPEC Examples:

- Password Controller

```
rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % open coverage/index.html
rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec rspec spec/controllers
✓ Test Passed: GET /forgot renders forgot password page
✓ Test Passed: POST /send_reset_code generates reset code and redirects
✓ Test Passed: POST /send_reset_code handles invalid email
✓ Test Passed: POST /verify_reset_code with valid code
✓ Test Passed: POST /verify_reset_code with invalid code
✓ Test Passed: POST /resend_reset_code generates new reset code
✓ Test Passed: POST /resend_reset_code handles expired session
✓ Test Passed: GET /reset renders password reset page
✓ Test Passed: POST /update resets password successfully
✓ Test Passed: POST /update with invalid password
✓ Test Passed: POST create (valid login)
✓ Test Passed: DELETE destroy (logout)
✓ Test Passed: POST create (invalid login)
.
Finished in 0.47954 seconds (files took 1.96 seconds to load)
13 examples, 0 failures
```

- Request for bins and Items

```
Line Coverage: 69.91% (223 / 319)
rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec rspec spec/requests
✓ Test Passed: GET /index
✓ Test Passed: GET /new
✓ Test Passed: GET /show
✓ Test Passed: GET /edit
✓ Test Passed: POST /bins
✓ Test Passed: Update bin
✓ Test Passed: Delete bin
✓ Test Passed: GET /dashboard
✓ Test Passed: Redirect to Login
✓ Test Passed: GET /index
✓ Test Passed: GET /show
✓ Test Passed: GET /new
✓ Test Passed: POST /create
✓ Test Passed: PATCH /update
✓ Test Passed: GET /index
✓ Test Passed: POST /create
✓ Test Passed: updates the location with valid attributes
✓ Test Passed: GET login
✓ Test Passed: POST login
✓ Test Passed: DELETE logout
✓ Test Passed: after sign in redirection
```

- NFC and QR tests

```
rafael@Rafaels-MacBook-Air CSCE-606-Inventory-System % bundle exec rspec spec/models/sprint
✓ NFC URL in Development is correct - PASSED
✓ NFC URL in Production is correct - PASSED
✓ Test: Item created successfully without bin - PASSED
✓ Test: Item initial state is correct - PASSED
✓ Test: Item attributes set correctly - PASSED
✓ Test: Item correctly marked as unassigned - PASSED
✓ Test: Validates no_bin must be true when unassigned - PASSED
✓ Test: Still validates required fields - PASSED
✓ Test: Validates non-negative value - PASSED
✓ Test: Can be assigned to bin later - PASSED
✓ Test PASSED, bin removal behavior
✓ Test PASSED, maintains all other attributes after bin removal
✓ Test PASSED, allows reassignment to a different bin after removal
✓ Test PASSED, when attempting actual deletion
✓ Test PASSED, validation and state
✓ Test PASSED, requires no_bin to be false when bin_id is present
✓ Test PASSED, tracks the unassigned status correctly
✓ Test: Bin is valid with correct attributes - PASSED
✓ Test: Bin requires a name - PASSED
✓ Test: Bin requires a user - PASSED
✓ Test: QR code is generated upon creation - PASSED
✓ Test: QR code contains correct development URL - PASSED
✓ Test: QR code contains correct production URL - PASSED
```