Yacht Build/Refit Management Module Design

Overview

The Yacht Build/Refit Management module will be a new section in the Eastwind Management application that provides comprehensive tools for managing yacht construction and refit projects. This design document outlines the structure, components, and implementation approach for this new module.

Module Integration

The new module will be integrated into the existing Eastwind Management application as a top-level navigation item, similar to other main modules like Vessels, ISM, and Finances. It will maintain the application's existing design language and UI patterns while introducing specialized functionality for build/refit management.

User Interface Design

Navigation Structure

1. **Main Navigation**
2. Add "Build Projects" as a new top-level item in the main sidebar navigation
3. Position it under the "ADMINISTRATION" section, between "Vessels" and "Forms"
4. **Project Dashboard**
5. Upon selecting a build project, users will see a dashboard with key project metrics and navigation to sub-modules
6. **Sub-Module Navigation**
7. Drawing Management
8. Issue Tracking
9. Document Library
10. 3D Visualization
11. Progress Tracking

12. Equipment & Materials
13. Team & Contacts

Key Screens

1. Build Projects List

- Grid view of all active and past build/refit projects
- Quick filters for status (Active, Completed, On Hold)
- Project cards showing vessel name, type, yard, timeline, and completion percentage
- "Add New Project" button for creating new build/refit projects

2. Project Dashboard

- Project overview with key metrics:
- Timeline with milestone markers
- Budget overview (planned vs. actual)
- Issue statistics (open/closed/by priority)
- Recent activity feed
- Team members and roles
- Quick access cards to sub-modules

3. Drawing Management

- Drawing list with filtering and sorting capabilities
- Drawing details view with:
- Drawing metadata (number, title, revision, etc.)
- Review status and approval workflow
- Comment tracking with resolution status
- Version history and comparison
- Related issues and documents

4. Issue Tracking

- Map-based interface showing vessel GA with issue pins
- List view of all issues with filtering options
- Issue detail view with:
- Issue description and metadata
- Location reference (pin on GA or 3D model)
- Associated photos (up to 20 per issue)
- Comment thread
- Status tracking

- Assignment and due dates

5. 3D Visualization

- Integration with Matterport 3D or similar technology
- Ability to navigate 3D model of vessel
- Issue pins visible in 3D space
- Measurement tools
- Comparison between design and actual build

Data Model

New Database Tables

1. **BuildProjects**
2. id (PK)
3. name
4. vessel_id (FK to Vessels)
5. project_type (new build/refit)
6. start_date
7. target_completion_date
8. actual_completion_date
9. status
10. yard_id (FK to new Yards table)
11. description
12. created_at
13. updated_at
14. **BuildDrawings**
15. id (PK)
16. project_id (FK to BuildProjects)
17. drawing_number
18. title
19. build_group
20. current_revision
21. status
22. file_path
23. created_at
24. updated_at

25. **DrawingRevisions**

26. id (PK)
27. drawing_id (FK to BuildDrawings)
28. revision_number
29. submitted_date
30. start_date
31. due_date
32. commented_date
33. sy_commented_date
34. status
35. file_path
36. created_at

37. updated_at

38. **DrawingComments**

39. id (PK)
40. revision_id (FK to DrawingRevisions)
41. comment_text
42. author_id (FK to Users)
43. status (open/closed)
44. created_at

45. updated_at

46. **BuildIssues**

47. id (PK)
48. project_id (FK to BuildProjects)
49. title
50. description
51. location_x
52. location_y
53. location_z
54. status
55. priority
56. assigned_to (FK to Users)
57. due_date
58. created_at

59. updated_at

60. **IssuePhotos**

61. id (PK)
62. issue_id (FK to BuildIssues)
63. photo_number (1-20)
64. file_path
65. description
66. created_at

67. updated_at

68. **BuildModels**

69. id (PK)
70. project_id (FK to BuildProjects)
71. model_type (GA/3D scan)
72. file_path
73. version
74. upload_date
75. created_at

76. updated_at

77. **Yards**

78. id (PK)
79. name
80. location
81. contact_info
82. created_at
83. updated_at

Database Relationships

- A BuildProject belongs to a Vessel
- A BuildProject has many BuildDrawings
- A BuildDrawing has many DrawingRevisions
- A DrawingRevision has many DrawingComments
- A BuildProject has many BuildIssues
- A BuildIssue has many IssuePhotos
- A BuildProject has many BuildModels
- A BuildProject belongs to a Yard

Component Design

1. Project Management Component

Purpose: Manage build/refit projects and their basic information

Key Features:
- Create, edit, and delete projects
- Track project timeline and milestones
- Manage project team and roles
- Monitor overall project status and progress

2. Drawing Management Component

Purpose: Handle all aspects of drawing review and approval

Key Features:
- Upload and organize drawings by category
- Track drawing revisions and changes
- Manage drawing review workflow
- Comment and approval system
- Drawing status tracking

3. Issue Tracking Component

Purpose: Track and manage issues identified during the build/refit process

Key Features:
- Create and manage issues with spatial reference
- Link issues to specific locations on GA or 3D model
- Attach multiple photos to each issue
- Track issue status and resolution
- Filter and search issues by various criteria

4. 3D Visualization Component

Purpose: Provide spatial context for issues and project elements

Key Features:
- Display 3D model of vessel (integration with Matterport or similar)
- Show issues in 3D space
- Navigate and explore the vessel model
- Compare design intent with actual build

5. Document Library Component

Purpose: Centralized storage for all project documents

Key Features:
- Upload and organize documents by category
- Version control for documents
- Search and filter documents
- Preview documents without downloading

Technical Implementation

Frontend Implementation

1. **New React Components:**
2. BuildProjectsList
3. BuildProjectDashboard
4. DrawingManagement
5. DrawingDetail
6. IssueTracking
7. IssueDetail
8. ModelViewer

9. DocumentLibrary

10. **New Pages:**

11. BuildProjects.tsx (main entry point)
12. BuildProjectDetail.tsx (project dashboard)
13. DrawingManagement.tsx
14. IssueTracking.tsx
15. ModelViewer.tsx

16. DocumentLibrary.tsx

17. **Shared Components:**

18. DrawingCard
19. IssueCard
20. ProjectTimeline
21. StatusBadge
22. CommentThread
23. PhotoGallery

24. LocationPicker (for GA)

Backend Implementation

1. **New API Routes:**
2. `/api/build-projects` - CRUD operations for build projects
3. `/api/build-projects/:id/drawings` - Manage project drawings
4. `/api/drawings/:id/revisions` - Manage drawing revisions
5. `/api/revisions/:id/comments` - Manage revision comments
6. `/api/build-projects/:id/issues` - Manage project issues
7. `/api/issues/:id/photos` - Manage issue photos

8. `/api/build-projects/:id/models` - Manage 3D models

9. **New Services:**

10. BuildProjectService
11. DrawingService
12. IssueTrackingService
13. ModelService
14. DocumentService

Integration Points

1. **Vessel Management Integration:**
2. Link build projects to vessels in the existing vessel management module

3. Share vessel data between modules

4. **User Management Integration:**

5. Use existing user system for permissions and assignments

6. Extend user roles to include build-specific roles (e.g., Project Manager, Naval Architect)

7. **File Storage Integration:**

8. Leverage existing file storage system for drawings, photos, and documents

9. Extend metadata to support build-specific attributes

10. **Notification System:**

11. Integrate with existing notification system

12. Add build-specific notification types (drawing approvals, issue updates)

User Permissions

1. **Role-Based Access:**
2. Project Manager: Full access to all project data
3. Naval Architect: Access to drawings and technical documents
4. Owner's Representative: View access plus approval permissions
5. Yard Representative: Limited access to assigned issues and drawings
6. Observer: View-only access
7. **Permission Levels:**
8. View: Can see but not modify data
9. Comment: Can add comments but not change status
10. Edit: Can modify data but not approve
11. Approve: Can change approval status
12. Admin: Full control

Implementation Phases

Phase 1: Core Framework

- Build project management
- Basic drawing management
- Simple issue tracking

Phase 2: Advanced Features

- 3D model integration
- Advanced issue tracking with spatial reference
- Drawing review workflow

Phase 3: Integration & Refinement

- Full integration with other modules
- Performance optimization
- User experience refinements

Technical Considerations

1. **Performance:**
2. Optimize for handling large numbers of drawings and issues
3. Implement pagination and lazy loading for lists
4. Consider caching strategies for frequently accessed data
5. **Mobile Responsiveness:**
6. Ensure all interfaces work on tablets for on-site use
7. Optimize photo upload for mobile devices
8. **Offline Capability:**
9. Consider progressive web app features for limited offline functionality
10. Implement sync mechanisms for data collected offline
11. **Security:**
12. Ensure proper access controls for sensitive project data
13. Implement audit logging for critical actions

Conclusion

This design provides a comprehensive framework for implementing the Yacht Build/Refit Management module within the Eastwind Management application. The module addresses the key requirements identified in the user's presentation while maintaining consistency with the existing application architecture and user experience.