

# Xact System Upgrade Report

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Hello, everyone

I'm honored to present our team's work on the modernization of the Xact system. This project has successfully reconstructed the user interface using React framework while maintaining full compatibility with the original C++ backend modules.

## 2. System Architecture

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**2.1:** The new system employs a frontend-backend separation architecture, using WebView2 as a bridging layer between the React frontend and C++ backend. As shown in the first diagram, this architecture enables bidirectional communication between components while keeping them loosely coupled.

**2.2:** Our communication sequence diagram illustrates how data flows through the system - from React components calling service functions, through the WebView2 host objects, to the DeviceHandler and native modules, with results flowing back asynchronously.

**2.4:** Looking at our CNC control architecture diagram, you can see how we've created a clean communication chain from the React component through WebView2 Host Objects to the DeviceHandler, which then communicates with the native CCnc class.

**2.3:** Similarly, our X-ray control architecture follows the same pattern, with the XrayControl component sending commands like voltage and current settings through the bridge to the CXray module.

## 3. Core Functional Modules

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展示系统: xray,cnc,detect, Imageviewer+overlay+菜单

## 4. Core Improvements

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Comparing the legacy and modern systems, as shown in our comparison diagram, we've made significant improvements across all modules:

### 4.1 User Interface

- Implemented draggable floating control panels for better space utilization
- Designed collapsible sections for cleaner interface presentation

### 4.2 Technical Architecture

- Migrated from MFC/Qt to React for better development efficiency
- Centralized state management using React Hooks for predictable behavior

## 4.3 Performance

- Maintained responsive system behavior while adding more features
- Enhanced image rendering performance with GPU acceleration

## 5.Key Innovations

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**5.1:** The UI improvements diagram highlights how we've transformed the user experience - from fixed layouts and basic controls to responsive, customizable interfaces with intuitive feedback.

**5.2:** Our technical innovations diagram showcases how we've evolved from the old tightly-coupled architecture to a modern, layered design. Key innovations include:

- Frontend-backend separation through WebView2 bridge technology
- Component-based UI architecture for maximum flexibility
- Reactive state management for robust application behavior

## 6. Conclusion

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照着念差不多

Thank you for your attention. I'm happy to answer any questions.