Magenic®

Challenge — Code & hardware issues, suboptimal performance

An industry-leader in biomedical technology had developed a tablet application to configure the distribution speed of medication to neurological trauma patients through a surgically-implanted pump. The application, however, suffered from performance issues and long load times that hindered the user experience.

The company had spent over one year developing this application using a Microsoft technology stack. The PC tablet which was home to the application used an embedded form of Windows XP but lacked a graphics chip that could handle the application's WPF user interface design. This led to load times approaching 30 seconds upon startup and after pushing a button, as well as lag between dragging functionality and the on-screen cursor. The issues were particularly problematic due to the client's desire to further leverage this platform when developing additional applications to interact with other medical devices. These problems posed the threat of becoming recurring themes.
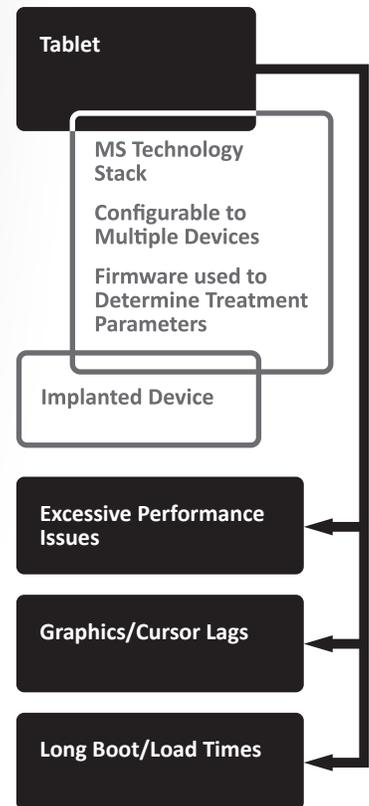
Solution — Performance analysis and code implementation

Magenic's principal consultant began by working with two of the client's development teams: the five-person platform development team and the six-person application development team. Magenic conducted performance analysis of the existing code and provided help documentation with recommendations on how to improve performance on the current and future applications. Specifically, the documentation featured Microsoft .NET optimization tips as well as some tactics to enhance the slow boot-up time for the platform and application.

The client was so pleased with Magenic that it kept our consultant on board for an additional nine months to implement the code changes on the application that wasn't yet feature-complete. This involved learning the business and industry language, as Magenic firmly believes that it is irresponsible to write code without knowing the industry for which the application is being written.

Tablet Performance Issues

Our client relied on a tablet application that used a Microsoft technology stack and ran on an embedded version of Windows XP. Its substandard graphics chip and some code inefficiencies had led to performance problems with the application. Users saw load times in excess of 25 seconds for application startup and after pressing buttons, as well as a lag between dragging functionality and the on-screen cursor display. This frustrating user experience would pose problems for future applications to be developed on the same platform.
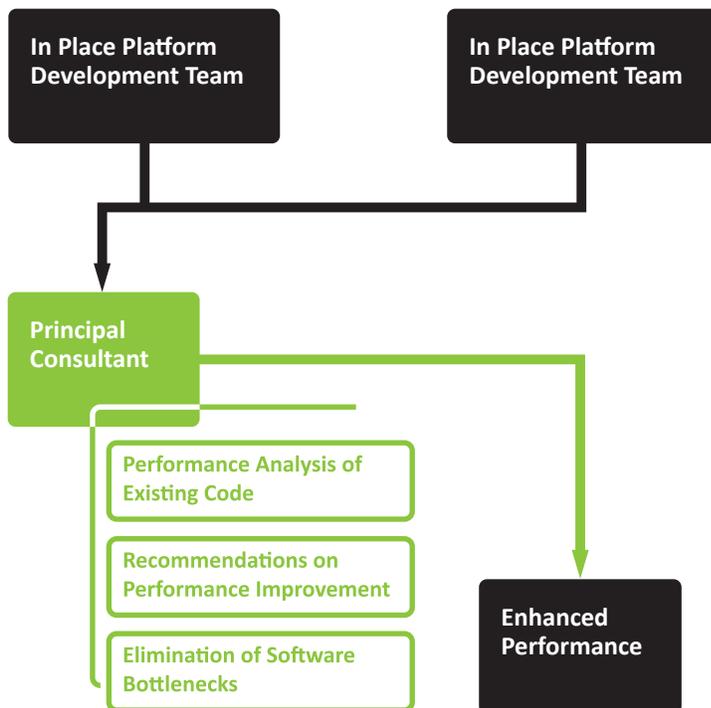
Tablet

- MS Technology Stack
- Configurable to Multiple Devices
- Firmware used to Determine Treatment Parameters

Implanted Device

- Excessive Performance Issues
- Graphics/Cursor Lags
- Long Boot/Load Times

Performance analysis consulting and code enhancements for an industry-leading biomedical device manufacturer

Result

Code optimization presentation to client's developers

Magenic's enhancements over the final nine months of the engagement resulted in noticeably faster performance for the application. Load times were reduced by over 60% – from 25 seconds down to eight seconds. Enhancements to the WPF code eliminated lag time when executing drag functionality as well. The improvements were well-received and noticed on an executive level within the organization.

When the performance phase of the project was complete, Magenic's principal consultant presented to over 40 of the client's developers on the inefficiencies which Magenic had fixed, how the changes were implemented, and how similar situations could be avoided when developing applications for this platform in the future. The client was provided with techniques to better utilize .NET as an application platform and more optimal uses of WPF code. Given the client's ultimate goal of creating a medical device suite of multiple tablet applications for multiple physical services, Magenic's consultation set up future success and helped ensure that optimal performance will be achieved the first time.

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In Place Platform              In Place Platform
Development Team                Development Team
        │                              │
        ▼                              │
Principal                             │
Consultant ───────────────────────────┤
    │                                  ▼
    ├─ Performance Analysis of      Enhanced
    │  Existing Code                Performance
    │
    ├─ Recommendations on
    │  Performance Improvement
    │
    └─ Elimination of Software
       Bottlenecks
```

Summary

An industry-leading biomedical device manufacturer came to Magenic needing to optimize load time and UI lag on a tablet application used to configure the speed of surgically-implanted medication pumps. Magenic's principal consultant provided help documentation to the client's platform and application development teams. The client asked Magenic's resource to stay on board and implement the code changes, which required quick learning of the client's business and industry language. In the end, Magenic's code enhancements reduced load time by over 60% and our consultant presented to over 40 of the client's developers on how it happened to set up future success within their organization.

Technology Used

Microsoft Visual Studios
Microsoft .NET
C#
WPF
MVVM
Red Gate Diagnostics

Contact Information

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Sixty percent load time decrease for tablet application that configures drug distribution to neuro-trauma patients

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