

Agile Development for Oil & Gas Extraction

Reduce computation time of 3D model rendering by up to 1,000 times over CPU-powered solutions

Client: Global provider of oil field service solutions

Industry: Oil & Gas

Project Type: Optimizing performance for software post-framework migration

Overview

1 Challenge:

The client encountered numerous technical issues that would necessitate extensive and time-costly regression testing, after migrating their existing application suite to the Eclipse RCP framework.

An ever-changing market dictated that the client needed to quickly develop and deliver products that offer full support at all stages of the extraction process. Updating existing products with better underlying frameworks and features was equally important.

2 Approach:

Luxoft provided:

Unique skill sets – teams addressed the specific needs of the highly specialized project.

Agile – Luxoft included certified Scrum masters in each of its seven Agile development teams, along with domain experts (geologists and geoscientists) to explain complex oil & gas workflows.

Luxoft also provided knowledge management and process improvements, better cost-effectiveness, and on-time delivery.

3 Solution:

Luxoft's teams worked with the client to deliver new functionality and optimization for their suite of new field development and resource-extraction applications, including:

End-to-end solutions for geoscience, well planning, and geo-steering.

Subsurface representation allowing for expert understanding of subsurface structure/properties.

Tools for real-time collaboration between geoscientists and reservoir engineers.

Geoscience workflow – uninterrupted.

3D rendering and modeling – digital processes that consume large amounts of the computing resource.

4 Result:

Offloading the computing resources required by geophysical algorithms to the GPU decreased computation duration by up to 1,000 times over CPU-based calculations.

Now, our client has effective software with an easy-to-use UI, and automated workflow that reduces mistakes, enhances teamwork, and improves area exploration and predictive qualities – guaranteeing better, faster decisions, due to improved performance and usability.

Challenge

The changing energy industry

Digital solutions for new field development and oil & gas extraction continue to rise in demand as fuel markets rapidly expand and change. Quickly developing and delivering products to market that offer comprehensive support at all stages of the extraction process is paramount to staying ahead of competitors. Updating existing products with better underlying frameworks and improved features is just as important.

One of Luxoft's clients, a major provider of oil field service solutions, made the switch to the Eclipse RCP framework for its application suite. However, testing post-migration revealed unexpected technical issues that would necessitate extensive and time-costly regression testing.

To accelerate their time to market our client contracted with us for the following services:

- Functionality extension
- Technical upgrades
- Application code refactoring
- Reliability enhancements
- Performance improvements
- Regression testing

Approach

Agile teams supported by domain knowledge experts

Geologists and geoscientists worked closely with each Agile team to share industry knowledge and provide an in-depth prospective on the oil & gas extraction workflow. It was invaluable in the testing of specific product features as related to real-world application and interpretation of 3D rendering and models of worksites. Luxoft provided our client with the following benefits through the full development cycle of the project:

1. **Unique skill sets** – Luxoft’s teams were proactively assembled to address the specific needs of the client’s highly specialized project. Luxoft provided teams of 3D visualization, OpenGL, CUDA, DevOps, and UI/UX developers, backed by domain experts such as geophysicists, geologists, and drilling engineers.
2. **Agile** – Luxoft included certified Scrum masters in each of its seven Agile development teams, along with domain experts to explain complex oil & gas workflows and effectively plan, develop, and test each product feature. Luxoft managed to set up an effective work environment for Agile collaboration between onsite and offshore team members. This provided the client with both an onsite presence and improved cost-effectiveness.
3. **Cost-effectiveness and on-time delivery** – Luxoft achieved the timely completion of project deliverables to the client’s satisfaction, accomplished through the rigorous selection of candidates by recruiters with a great understanding of the client’s domain.
4. **Knowledge management and process improvements** – Luxoft shared the expertise and knowledge we had developed in the client’s processes, platforms, and applications with the rest of the client’s business units.

Solution

Delivering a GPU computing framework for 3D rendering and modeling

Luxoft’s teams worked with internal staff to deliver new functionality and optimization to their suite of new field development and resource-extraction applications.

New functionality added to the client’s software included:

- End-to-end solutions for geoscience, well planning, and geo-steering
- Subsurface representation allowing for expert understanding of subsurface structure/properties
- Tools for secure, real-time collaboration between geoscientists and reservoir engineers
- Uninterrupted geoscience workflow at all steps of site assessment and well-planning process

A key component of the suite of applications is 3D rendering and modeling – digital processes that consume large amounts of the computing resource. As such, Luxoft and our client, optimized the performance of geophysical algorithms for the overall health of the applications.

Luxoft optimized performance by:

- Implementing a GPU computing framework to offload significant calculations to graphics cards
- Rendering 3D components before model visualization
- Integrating the GPU computing framework into the desktop application for further reuse in different UI components
- Utilizing CUDA and OpenCL to allow the GPU framework to perform on a wide range of hardware

Result

Timely project delivery achieved by cost-effective Agile practices

Luxoft domain experts were key to the project’s success, because it meant that our client avoided having to explain domain specifics. We delivered significant benefits to our client:

- **Productivity:** 3D modeling and rendering achieved by the client’s application through its GPU framework **reduces completion time up to 1,000 times** as compared to CPU computing frameworks of competitor products.
- **Increase: product revenue.**
- **Accuracy:** making a mistake in oil extraction is expensive, potentially costing millions of dollars. Now, our client has effective software with an easy-to-use UI, great performance, and an **automated workflow that reduces mistakes**, enhances teamwork, and improves area exploration and predictive qualities.
- **Fast decisions:** enhanced software helps users **make better, faster decisions**, due to improved performance and usability.

Ready to optimize your software performance?

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