PRODUCT BUILD

Automotive Aftermarket

Automotive

Our client is a multinational engineering company with a business that includes supplying vehicle diagnostic tools to the automotive sector. Vehicles supply diagnostic information in the language of their manufacturer, but vehicle mechanics may speak any number of languages around the world, meaning that often the vehicles they're working on do not speak "their" language.

The client's tools must cater to the language requirements of their customers, translating vehicle data so that it is usable. Teams of translators were needed to provide these translations manually, a lengthy and potentially error-prone process needed for every new make or model, as well as for any revisions made to existing vehicles. Seeking a more streamlined solution, the client engaged gravity9 and MongoDB as partners on a fast-paced Jumpstart project with the aim of completing work in time to show off the functionality of the tool at auto-shows taking place that year.

gravity9 used an iterative development approach with Java, Spring Boot, MongoDB and Google Translate API that allowed existing translations within the tool to be accessed via MongoDB database, and for any new translations to be provided by Google Translate API.

The project was completed within the tight timelines requested, providing the client's customers with a live translation tool that can function across 23 languages with new or existing makes and models of vehicle in the future. The client benefits from a better functioning product and no need for a slower, resource intensive, open-to-error manual translation process.

Utilized Technology Stack

- Cloud: N/A
- Database: MongoDB Atlas
- Backend: Java, Spring Boot
- Frontend: N/A

Review of Challenges

Our client, is a multinational engineering company that caters to numerous business sectors including engineering, automotive, and household products. The client caters to passenger and commercial vehicle maintenance and repair, offering parts diagnostic tools, and test equipment to a global market.

ECU (Engine Control Unit) diagnostic tools connect to customer vehicles to read vehicle data and error messages, displaying them to the user (typically mechanics at vehicle service centers) so that repairs and maintenance can be conducted. Vehicles provide diagnostic data in the language of their manufacturing company; however, mechanics may not speak that language, making it difficult to use the diagnostic information effectively.

Prior to this project, the client used internal authoring tools and a content management team to create translations for their diagnostic tool products so that customers could use them, however, the translations were not always accurate and could become outdated. In the event of a new vehicle make or model, mechanics had to wait for software updates (and then apply them manually) to effectively use the tool with that vehicle.

The client approached gravity9 through MongoDB, as our companies have an established history providing high quality, rapid-development Jumpstart projects and have worked with the client on other projects previously. gravity9 was asked to implement a new service that could translate data from vehicles to any language without a content management team or additional tools, offering customers up-to-date support and making the client diagnostic tools useful for any vehicle.

Our client now enjoys a stronger competitive position

Our Approach

Jumpstart projects place a special emphasis on fast progression from commencement to completion, making them ideal for clients who need delivery on a tight schedule.

gravity9 began requirement gathering, meeting with the client's key stakeholders to identify challenges and goals for the project. Our client trusted our teams to identify the most suitable technology stack and development process to meet their urgent needs. To provide the shortest possible time between additions, changes, and feedback, iterative development was leveraged. This allowed for regular demonstrations to stakeholders, who in turn could provide feedback as soon as possible.

For this project the highest priority was to provide a "first version" of the component, so that integration with the diagnostic tool on the client's side could begin as soon as possible. This allowed integration and further updates to continue concurrently, providing further functional requirements to the component.

The component was developed in Java and Spring Boot, with MongoDB used as a cache layer. Existing language translations could be taken from the database, while any missing or new ones are translated using Google Translate API. The client already had deployment pipelines and base libraries in place for these technologies, allowing a more efficient, streamlined development process, with Kubernetes being leveraged for deployment.

Functional development completed and performance testing took place using Gatling to check that the new component met non-functional requirements. Two scenarios were created (for when cached translation existed, and when it didn't) and then maximum payloads were tested to ensure the product was ready for a live environment.

Our Solution

gravity9 delivered a service component embedded within the client's own diagnostic tool infrastructure, operating in the background, serving other components both as a proxy and cache for live translation services. The component can cache, check versions, and fetch missing translations via Google Translate API as they are requested from other components.

The project was completed within narrow timelines, allowing the client to present their new diagnostic tools at automotive shows, translating documentation in 23 languages, handling different manufacturers documentation and different mixes of input or output query languages rapidly and accurately.

For cached translations, results could now be provided to the customer in near real-time, with un-cached results taking longer but still well within a useful timeframe to make the product useful in real world settings.

This allows the client to present their diagnostic tools on a global market, able to effortlessly work with documentation for new or changing vehicle brands and models as they emerge around the world, without delays and the need for manual input from translation teams.

Subsequent Outcomes

Demonstrating the best capabilities of a Jumpstart project, gravity9 were able to meet the client's crucial deadlines and deliver a fully functioning translation component, allowing them to show off the latest version of their tool to trade show customers, and win global business, within 2 months of project discovery.

The component provides rapid translation of diagnostic information from a range of languages into any number of required users languages and operates across existing and any new makes and models of vehicle worldwide.

For the client's customers, this makes it easy for them to understand data from a huge range of commercial vehicles, allowing them to focus on maintenance and repair work, rather than interpreting the data they receive.

Our client now enjoys a stronger competitive position, offering a tool with wide attractive functionality and applications around the world. Furthermore, the component removes the need for a resource-expensive translation team and minimizes the scope for error in translation services.

> The tool performs well across all use cases, demonstrating both reliability and speed.

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