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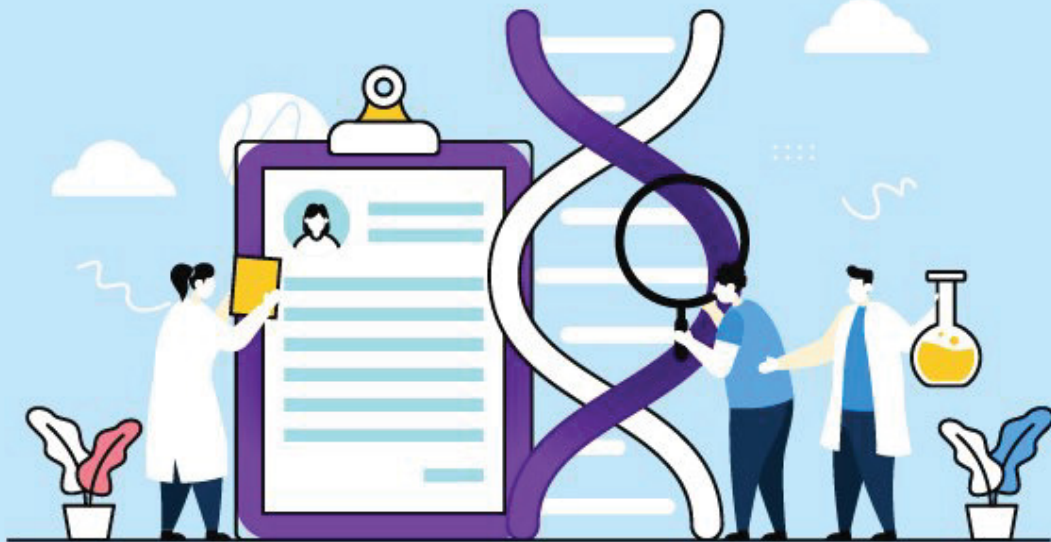
RNA SPLICING ERROR REPORT GENERATION USING ROR FOR A GENETIC ENGINEERING COMPANY

PROJECT OVERVIEW

Report generation was implemented within the existing Ruby on Rails (RoR) application by integrating an R engine. This integration allowed for the dynamic triggering of the R engine with customizable parameters. The Reports themselves were generated as HTML in R and seamlessly rendered within the RoR application. To enhance the overall application architecture and streamline file processing, improvements were made to reduce complexity. These enhancements resulted in improved efficiency and reduced the time required to generate and load the Reports. Additionally, the deployment of the application using Docker containers in the cloud significantly improved maintainability and availability.

SOLUTION DELIVERED

Application Development

CLIENT DOMAIN

Life Sciences

KEY HIGHLIGHTS

- Report generation time reduced by 75%
- The complexity of the code optimized for ease of use and efficiency
- Report load time lowered by nearly 30%

ABOUT CLIENT

The client is a growing genetic engineering firm that is a leader in RNA splicing error research and development. The client wanted to create a remedy for RNA splicing faults using analytics predictions in order to boost their developments in RNA research and therapies.

BUSINESS CHALLENGES

The client had a pre-existing application to assist in the identification, cataloguing, and interpretation of RNA patterns. However, they ran into performance problems when generating reports for experiment findings, which wasted a lot of time. They were motivated to deal with these difficulties and boost the effectiveness of their procedures.

BUSINESS REQUIREMENTS

The client identified the following business prerequisites to facilitate viewing the experiment results:

- Integrate R programming with the application for report generation.
- Generate experiment reports within a minimum timeframe.
- Deploy the application on the Microsoft Azure cloud platform.

SOLUTION HIGHLIGHTS

Phase 1

Indium deployed the following solution to generate report for the RNA sequence experiments:

- Updated the report generation application built on RoR to cater to the new requirements.
- Incorporated an R programing engine for report generation, which would be triggered by the RoR application with dynamic parameters.
- The R engine reads an input .txt file to create an HTML Report which would then be rendered using RoR in the application.
- Leverage Ruby on Rails capabilities to split multiple tabs into individual rails reducing the wait time and facilitating the user to view the results faster.

- A .txt file is dynamically generated and saved in the rails repository while running a report.
- The same file would be overwritten when the user adds new input that eventually saves disk space.
- The .Rdata file is generated on the first run, so on the next consecutive run, the reports will load faster rather than going through all files.
- Deployment of the rails application using Dockers on the Microsoft Azure cloud.

Phase 2

As a second phase of the engagement it is planned to enable users to add or alter the code (RMD) by logging into the application and navigating to the specific tab to update in the portal, rather than updating in the codebase.

BUSINESS IMPACT

- The implemented solutions had a significant impact on the client's business:
- The report generation time was reduced to just 15 seconds by splitting multiple tabs into individual rails, improving efficiency and allowing users to access results faster.
- The complexity of the Ruby on Rails code in the application was significantly reduced, resulting in enhanced ease of use and streamlined processes.
- The introduction of the .Rdata file generation reduced the loading time of the reports by nearly 30%, providing quicker access to valuable insights.
- Dockerized cloud deployment improved the availability and maintainability of the application, ensuring reliable access and simplified management.

TECH STACK

ABOUT INDIUM

Indium Software is a fast-growing Digital Engineering company, focused on building modern solutions across Applications, Data, and Gaming for its clients. With deep expertise in next-gen offerings combining data and applications, Indium offers a wide range of services including Product Engineering, Low-Code development, Data Engineering, Ai/ML, Digital Assurance, and end-to-end Gaming services.

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