

# Developing A Data-Intensive Application With Point Solutions vs. A Unified Data Platform: A Quantitative Comparison

## Executive Summary

*Neuralytix interviewed two different development firms to compare how they developed the same data-intensive application using different approaches. QPAIR ([www.qpair.io](http://www.qpair.io)) used various point solutions to build the platform and application, whereas Aluna Group ([www.alunagroup.com](http://www.alunagroup.com)) built the application using InterSystems IRIS Data Platform™, a unified data platform that provides comprehensive data management, interoperability, and analytics capabilities in a single product. The result of our investigation was that Aluna Group was able to develop the application for a lower total cost while using fewer employees and fewer total hours.*

## Contents

Executive Summary.....	1
Contents.....	1
Introduction .....	2
Comparison of Approaches .....	2
QPAIR .....	3
Application Development Costs.....	3
Application Development Time .....	4
Long-Term Maintenance .....	4
Aluna Group .....	4
Application Development Costs.....	4
Application Development Time .....	6
Long-Term Maintenance .....	6
Conclusion.....	6
Appendix 1 .....	7
Data Sources.....	7

## Introduction

Data is undisputedly the lifeblood of every organization. All organizations experience their own data challenges and their own data needs based on specific sets of business requirements. This has led to a diverse set of requirements for supporting data-driven applications, as well as a preponderance of data management technologies available in the marketplace to support these requirements. Many of these tools and technologies provide specialized capabilities such as relational data management, document data management, business intelligence, natural language processing, data integration, and more. Further, over the next few years, the amount of data and the number of tools are forecasted to continue to expand. This trend has given rise to the need for simplification, consolidation, and the introduction of integrated data platforms.

Currently, there are various approaches to developing data-intensive applications. One common approach is to use a variety of individual, specialized point solutions. Another approach is to use an integrated data platform such as InterSystems IRIS Data Platform. Neuralytix believes that using an integrated platform is the preferred approach in all but the most unique circumstances.

This paper compares the two approaches.

## Comparison of Approaches

Neuralytix believes that, in most cases, an integrated data platform provides the customer with three main advantages:

- Lower development cost
- Faster time to deployment
- Simpler ongoing support and maintenance

To validate this belief, Neuralytix worked with two different development firms that had been tasked with developing the identical data-driven analytic application for the Office of Sustainability at a large research university.

The university wanted a data-rich application to combine and aggregate 50 separate initiatives with different data types and analytical requirements for its end users, which are organizations looking to enhance their “green” efforts. For example, organization might want to understand the benefits of installing rooftop solar panels compared with a larger-scale solar farm in terms of cost, carbon reduction, and overall environmental impact. To accomplish this, both companies were tasked with building a data-rich application that could process and aggregate data from a variety of different data sources, analyze both structured and unstructured data, perform natural language processing of the data, and provide enough flexibility so the results of the analysis could be presented to a variety of audiences. This required that the application be able to highlight specific aspects of different projects, sort projects by a variety of criteria, and evaluate the effectiveness of projects using user-defined criteria. QPAIR was tasked with developing the application using point solutions, and Aluna Group was tasked with developing the same application using the InterSystems IRIS Data Platform.

## QPAIR

The QPAIR approach uses a technology stack comprised of a variety of point solutions. The stack is shown in Table 1.

Function	Tool
User Interface	Angular and JavaScript libraries
Backend	REST API app
Data Store/Knowledgebase	MongoDB, Amazon S3 (for structured and unstructured data)
Data Flow Automation	Apache NiFi, Kafka Client
Streaming Data Processing	Apache Kafka, Apache Spark on Amazon EMR
Text Analytics and Document Similarity	spaCy, NLPre, Gensim, TextBlob
Business Intelligence	Apache Spark MLlib/R

Table 1: QPAIR Application Development Tools

## Application Development Costs

To determine the costs associated with the development of the application, Neuralytix developed a cost model based on the personnel QPAIR used and the May 2016 Bureau of Labor Statistics (BLS) wage data (Table 2). To accomplish this, Neuralytix mapped the titles and responsibilities of the QPAIR personnel to the standard categories that the BLS tracks and then determined the number of hours each QPAIR employee spent on the project. For this project, QPAIR had two backend developers and one frontend developer dedicated to the project for eight weeks. Additionally, the company had a data engineer, DevOps engineer, architect, and a project coordinator assigned part-time. While each of the part-time employees was active at different times within the project, they all spent approximately 70% of their time on this project in total. Our model shows that the cost to QPAIR for the development effort was equal to \$88,800.15.

QPAIR Title	BLS Category	BLS Code	Man-Hours	Per-Hour Cost	Total Cost
Backend API Developer	Software Developers, Applications	15-1132	640	\$50.14	\$32,089.60
Frontend Developer	Web Developers	15-1134	320	\$34.69	\$11,100.80
Data Engineer	Database Administrators	15-1141	225	\$41.89	\$9,425.25
DevOps Engineer	Network and Computer Systems Administrators	15-1142	225	\$40.63	\$9,141.75
Architect	Computer Network Architects	15-1143	225	\$50.12	\$11,277.00
Project Coordinator	Computer and Information Systems Managers	11-3021	225	\$70.07	\$15,765.75
<b>TOTAL</b>			<b>1,860</b>		<b>\$88,800.15</b>

Table 2: QPAIR Development Cost Model

In addition to the development costs, we also include hardware and software costs. QPAIR deployed the application on Amazon Web Services (AWS). The three-year costs of the AWS server configuration required to run the application is \$21,029.76. Because the point solution approach uses free versions of the open-source tools, the QPAIR approach did not incur any software licensing costs. While QPAIR felt comfortable taking this approach, in most of the situations Neuralytix has investigated, the customer uses a commercially supported

version of the open-source software for a variety of reasons, including ongoing support and indemnification. So, the cost of  $\$88,800.15 + \$21,029.76 = \$109,829.91$  represents a total three-year cost. Clearly, adding in software licenses and/or maintenance costs would increase the total above this cost.

## Application Development Time

One of the critical components for customers is application development time. The longer a company is developing an application, the less time employees or customers are using it. When a customer begins a project using point solutions, a considerable amount of time is spent identifying the best tools for all aspects of the project.

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*“We spent a lot of time identifying the right tools for each aspect of the project.” Raghunath Anisingaraju, CEO of QPAIR*

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“We spent a lot of time identifying the right tools for each aspect of the project” said Raghunath Anisingaraju, CEO of QPAIR. This is interesting because QPAIR specializes in building

applications using open-source point solutions. The company is very familiar with the tools available to them, and yet they still had to spend a considerable amount of time deciding which tool to use for each aspect of the project. Neuralytix believes that spending the up-front time selecting the right tools is the correct approach when developing an application using point solutions because it generally results in a better application and less overall development time. However, by using an integrated data platform, much of this time can be eliminated.

## Long-Term Maintenance

When an application is developed using a suite of point solutions, the IT department must know and understand the update/upgrade/patch schedule for all the independent tools. Every update or patch can potentially have a negative impact on the application, which can lead to a very challenging application maintenance program and limit the upgradability of the overall application. Every application upgrade requires interacting with multiple tools, which can be challenging and time consuming.

Our model did not quantify or estimate the cost of long-term maintenance using a point solution approach.

## Aluna Group

Aluna Group used InterSystems IRIS Data Platform. This dramatically simplified the development of the application so that while QPAIR spent a considerable amount of time determining what tools to use for certain aspects of the project, Aluna Group found that the biggest challenges were nontechnical. For example, Aluna Group’s main challenges were in scoping the project and getting clear guidance on the project requirements. This is not an uncommon problem when developing an application. However, in many cases, when a project is re-scoped, and the requirements change, the IT tools often have to be reevaluated to see if they are still appropriate for the new requirements. This can add a considerable amount of time to the development process and, in the worst case, require IT to go back to the business unit and explain that they can’t support the new requirements with the current tools. The fact that Aluna Group never had to reevaluate the tools shows the strength of the integrated data platform from a flexibility perspective.

## Application Development Costs

Similar to QPAIR, Neuralytix built a cost model of the development costs for Aluna Group. The same title mapping and BLS data were used, and the results are shown in Table 3.

Aluna Group Title	BLS T Category	BLS Code	Man-Hours	Per-Hour Cost	Total Cost
Backend API Developer	Software Developers, Applications	15-1132	200	\$50.14	\$10,028.00
Frontend Developer	Web Developers	15-1134	280	\$34.69	\$9,713.20
Software QA	Software Developers, Applications	15-1142	40	\$50.14	\$2,005.60
Architect	Computer Network Architects	15-1143	40	\$50.12	\$2,004.80
Project Coordinator	Computer and Information Systems Managers	11-3021	40	\$70.07	\$2,802.80
<b>TOTAL</b>			<b>600</b>		<b>\$26,554.40</b>

Table 3: Aluna Group Deployment Cost Model

Aluna Group also deployed on AWS. The combined price for three years of software licensing and maintenance from InterSystems IRIS Data Platform and the required AWS costs resulted in an additional total cost of \$45,037.20. That brings the total to \$26,554.40 + 45,037.20 = \$71,591.60 for a three-year life cycle cost.

However, the total cost was not the only comparison. Looking beyond the developer costs reveals several other advantages to using an integrated data platform. Table 4 shows the total amount of time required for each of the two organizations. The open-source point solution approach took seven QPAIR employees a total of 1,860 hours to complete, whereas the InterSystems IRIS Data Platform approach took four Aluna Group employees 600 hours to compete. Being able to finish the task in dramatically fewer hours with fewer human resources assigned to the project is a significant advantage in today's flexible and fast-moving environment. With the stiff competition for highly skilled technical workers, having to employ almost twice as many people dramatically increases the complexity of the point solution approach. The added employees also increase the risk to the overall project given the current state of employee migration from company to company. Finally, the reduced total hours enables the customer to deploy the application faster and begin to realize the benefits sooner, either from increased employee efficiency and reduced costs or increased sales and market share. These are issues that Neuralytix believes every company has to consider, even if they can't be quantified exactly in a simple cost calculation.

Approach	Development Hours	Development Employees	Development Costs	Total Three-Year Cost
InterSystems IRIS Data Platform	600	2 full-time 2 part-time	\$26,544.40	\$71,591.60
Open-Source Point Solutions	1,860	7 total	\$88,800.15	\$109,829.21

Table 4: QPAIR and Aluna Group Development Comparison

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*The three-year life cycle cost for Aluna Group represented a 35% cost savings over the QPAIR approach.*

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## Application Development Time

Both projects took approximately the same number of weeks to develop, but as mentioned, Aluna Group used far fewer man-hours to complete the same task. The reduction in hours can provide management with additional flexibility. If a project is on a tight time line, personnel can be dedicated to the project, and it can be finished in fewer weeks. If the project has a more relaxed time line, it can be integrated

with other IT projects more easily.

## Long-Term Maintenance

Finally, when it comes to long-term maintenance, the time required to maintain an application built on a single integrated platform is generally lower. Because only one tool needs to be updated, the IT department only has to track one update schedule, which greatly simplifies the maintenance requirement.

## Conclusion

From our experience, and as described and quantified in this research, using an integrated data platform provides companies with several advantages over a self-built data platform using a variety of point solution tools. Generally, the total costs associated with using an integrated platform are lower than the costs associated with building the application using point solutions. The integrated approach can also be deployed in less time because there are fewer technical challenges and less vetting and learning required. Finally, it is Neuralytix's experience that the long-term maintenance associated with a single integrated platform is less challenging and costly than maintaining a collection of point solutions. Note, however, that the ease of long-term maintenance depends on the software vendor and the quality of its support organization. Based on these three points, we recommend that companies wanting to build a big data analytics application look first to using a commercial data platform such as InterSystems IRIS Data Platform rather than using a set of separate specialized tools.



## Appendix 1

### Data Sources

Labor Costs: Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates, United States, [https://www.bls.gov/oes/current/oes\\_nat.htm](https://www.bls.gov/oes/current/oes_nat.htm)

Aluna Group Software Costs: InterSystems list price

Aluna Group Hardware Costs: Amazon Web Services list price for the recommended configuration, <https://calculator.s3.amazonaws.com/index.html>

#### About Neuralytix

Neuralytix is a leading global IT industry analyst and marketing strategy firm. Our areas of expertise include IT infrastructure, the Cloud, go-to-market channels, support services and data/information platforms. Founded in 2012, and headquartered in San Francisco, California, Neuralytix is recognized for our candid and honest thought leadership, in-depth analyses, and our holistic view of the IT markets. Our analyses are aligned with the way IT customers acquire technology today and include both technical and business value analyses.

Our Clients include the who's who of the IT industry. Our publicly listed Clients alone, command a cumulative market capitalization of over US\$4 trillion. Our analyses help our Clients to elevate their disparate products and technologies into relevant technology domains, that correspond to the contemporary notions customers have of IT.