Build versus Buy
In-depth Guide

Contents

Introduction

Embedded business intelligence (BI) and reporting have become critical components for organizations looking to make data-driven decisions and gain a competitive edge. The ability for all segments of an organization to easily access, analyze, visualize data, and efficiently distribute data is a technological hurdle, but organizations willing to tackle this now stand to widely differentiate themselves and capture market share while others play catch-up.

Assessing whether to build an embedded BI and reporting tool in-house or investing in a dedicated solution from a vendor is a complicated decision. Organizations with this initiative should evaluate a number of relevant factors that span cost considerations, technical requirements, human capital allocation, solution capabilities, and other critical variables. In this paper, we cover these and more to enable your organization to come to an informed, appropriate decision.

Scenario

You are a CTO, product manager, IT project leader, developer, or business user who cares about your team and the success of your company. You have been faced with internal pressures from your team and leadership to deliver the best possible solutions for your customers and internal stakeholders.

The company's data has been growing rapidly across multiple sources. The team is struggling to keep up with the demand for insights and reporting with the limitations of the existing

The Value Equation

The best case scenario is the result with the largest ratio from numerator to denominator.

Variables

The variables in the equation focus on answering the following key questions:

1. Future State: What are the effects (i.e. business outcomes) you are trying to achieve as a result of this solution?
2. Likelihood of Achievement: What is the likelihood of achieving the desired outcome?
3. Time to Value: How quickly are you going to be able to achieve your desired outcome?
4. Effort & Sacrifice: As a result of your decision to build or buy, what will you have to start and stop doing?

tools. They have spent countless hours trying to create custom reports and visualizations from scratch, and the results were often inadequate and lacked the sophistication that the company needed to remain competitive. The ad-hoc requests continue to pile up, diverting attention away from longer-term technology initiatives.

At the same time, you are facing external market pressures such as customers demanding more reporting options, and competitors offering more advanced solutions, and internal pressures such as your team's inability to complete a project due to the inflexibility of your existing engine, resulting in loss of productivity, innovation, and competitive differentiation. The impact of the status quo means your company would fall behind.

Adding to the pressure is a tight budget and timeline. You're limited on resources to invest in the development of a new solution and worried about the risks and costs of building a tool in-house. You decide you need an intuitive, dynamic, and innovative embedded BI and reporting tool for your business needs, and you need it fast.

You are in charge of deciding whether to build a tool to embed reports and dashboards in-house or invest in dedicated software to meet your needs. Where do you start?

The Value Equation

As a starting point, viewing this problem as an equation helps to take into account key variables when deciding to build in-house or invest in a dedicated software to meet your needs.

$$\frac{Future\ State \quad x \quad Likelihood\ of\ Achievement}{Time\ to\ Value \quad x \quad Effort\ \&\ Sacrifice}$$

Figure 1. The larger the ratio from numerator to denominator will determine which option provides the best case scenario

Future State

Your future state frames the positive effects an embedded BI and reporting tool would offer to your business and acts as the north star as you embark this journey. The desired outcome addresses the key challenges and business drivers to help justify why you need this tool. Your future state should encompass some, if not all, of these variables: revenue, cost, risk, and strategy. Ask yourself the following questions when creating your future state:

1. What would you like to start, stop, and continue doing?
2. What does "right" look like?

"Customers tell me they have increased productivity, accuracy, and efficiency. They can identify employee trends and outliers faster, so they have better control of P-card spending, which facilitates budget forecasting and enables them to revisit policies more frequently."

—Marcel Syriani, VP & Chief Technology Officer at DATABASICS[1]

3. What are the benefit of getting it right?
4. How does your organization weigh the value of time to market?
5. How does this impact our revenue, ability to reduce costs, mitigate risk, and enhance our strategy?
6. How does this enable larger initiatives and other strategic priorities?

Example Challenge:

We now live in a world where answers are expected to be at our fingertips. The data consumerization trend has led to new expectations where users expect data to be intuitive, convenient, customizable, and actionable. What is more concerning is the persisting challenge of meeting the needs of how users want to consume the data.

Example Benefits:

1. Faster time to reporting
2. Reducing cost of report maintenance
3. Increase self-service capabilities to reduce dependence upon IT resources
4. Increase productivity amongst high-valued FTEs
5. Mitigate risk of customer churn
6. Enhance customer experience, improve customer satisfaction and loyalty

Your future state should encompass some, if not all, of these variables: revenue, cost, risk, and strategy.

Example Future State:

Our organization aims to support multiple initiatives to streamline our operations, increase our business agility to respond to market conditions, and provide world class customer service. Developing a robust, user-friendly, and customizable embedded BI and reporting tool will allow business users to find answers on their own with self-service reporting, increasing productivity throughout the organization, expedite development for creating reusable designs and components that can be used across multiple reports and visualizations, and meet internal and external demands regarding how they consume information.

Facts and Figures

IT Project Budget

On average, large IT projects run 45% over budget and 7% over time, while delivering 56% less value than predicted.

Software projects have the highest risk of cost and schedule overrun[2]

- 66% average cost overrun
- 33% average schedule overrun
- 17% average benefits shortfall

BUSINESS DRIVERS	SOLUTION ENABLERS	BUSINESS BENEFITS
OPERATIONAL EXCELLENCE	Self-service Reporting	• Increased productivity • Reduced cost of reporting
BUSINESS AGILITY	Precision Data Visualization	• Faster time to reporting • Uncover new opportunities
WORLD CLASS CUSTOMER SERVICE	Embedded Business Intelligence	• Enhanced customer experience • Increased competitive advantage

Table 1. Sample summary of future state

Likelihood of Achievement

Now that you've established your desired outcome, how likely are you to achieve the desired outcome? Assuming either option of building versus buying can generally offer you the same desired outcome, which option provides the better probability of success? A few key questions to consider when answering this question include:

1. Do you have the adequate number of resources to dedicate to this project? Do these resources have the appropriate skill level in developing this tool?
2. What is the organization's risk tolerance for exceeding the project budget?
3. Will your solution be able to provide the opportunity to add more features and functionalities as the business requires?
4. Will your solution be able to scale as the business needs grow?
5. What is the risk of failure and likelihood of missing requirements?

Choosing to build a solution in-house comes with a variety of inherent benefits and risks. One of the benefits is the ability to have complete authority (with limitations) to decide which features should be included and the priority of each. Nevertheless, this process and execution can be overwhelming, costly, and uncertain. This is just the tip of the iceberg.

CTI Solutions Group Advances their Product Lifecycle Management Suite with Jaspersoft

"After looking for about a year at all the different engines, watching several demos, talking to clients and users, we determined that Jaspersoft would have the quickest learning curve and the most user-friendly interface."

—CTI Solutions[3]

"A large portion of the IT organization is focused on support and administrative work that's often manual and inefficient..."

—McKinsey[4]

Resources

Organizations are often limited with the number of IT resources and the competitive demand of these resources required to propel a business initiative. Even with resources available, the variable costs are competing projects put on the back burner or delayed. This delays release of revenue generating projects, jeopardizes competitive edge, and affects other business improvement opportunities. Another consideration is the skill level of these resources and their ability to develop this tool. If these resources don't have experience building this tool (i.e. BI not a core competency for most developers), project budget, timelines, and risk of failure all increase.

As a result, additional resources may need to be hired, which, in itself, possesses layers of challenges and additional costs. We'll cover this in further detail in the "Effort & Sacrifice" section.

On the other hand, choosing a dedicated tool from a vendor provides the highest likelihood of achievement by leveraging their expertise, years of R&D, vast number of engineers dedicated to improving the features and functionalities, and success with working with numerous customers. Typically, vendors will also provide readily accessible support that puts your mind at ease by knowing your business is protected.

Time to Value

Time to value evaluates which option provides the fastest route to your desired results. For simplicity, assume either option (build or buy) is feasible in terms of obtaining an embedded BI and reporting tool. A few key questions to consider when answering this question include:

1. What is your desired time to market?
2. What are the repercussions of delaying time to market?
3. What investments are your competitors making in order to be ahead of the competition?
4. Are you creating additional technical debt?
5. What are the downstream effects by choosing to build?

Opportunity Cost

"The potential benefits that an individual, investor, or business misses out on when choosing one alternative over another."[5]

Adding to the challenges and demands from IT resources, an unintended consequence of many organizations, either due to rapid growth or M&A activity, is the adoption of redundant tools and disparate systems. As a result, IT bottlenecks are created, delaying project timelines, time to insights, and downstream effects throughout the organization. With organizations unanimously competing on time to market, the option that best supports this is critical preventing the downstream effects on users and departments as referred to in Figure 2.

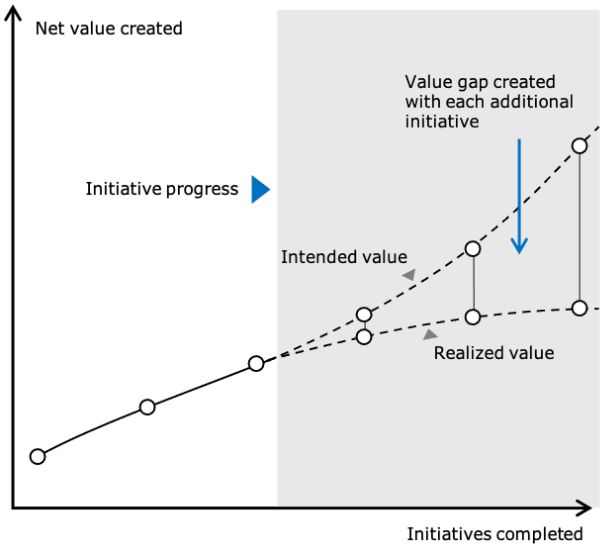

Figure 2. Unintended downstream impact to future initiatives

In today's fast-paced business environment, speed is a critical factor for success. By purchasing a tool from a vendor, companies can reduce the time it takes to bring their data insights and reports to market, without sacrificing quality, functionality, and delays to other initiatives dependent upon this tool. Additionally, leveraging the vendor's expertise and existing platform, companies can achieve faster time to value, confidence in the quality and reliability of the tool, and focus on delivering value to their customers.

Effort & Sacrifice

The last variable in this equation, effort & sacrifice, establishes what will you have to start and stop doing as a result of building versus buying? Some key questions to consider:

Understanding Requirements

The following includes components for understanding the requirements involved for the tool:

- User Experience: level of integration, type of analytics, and management of users
- Data Complexity: size of data, access to data plan, timeliness of data, and access to data from multiple systems
- Environmental Requirements: multi-tenant deployment, multiple concurrent users, performance, and availability / scalability

1. Do you have to hire more developers in order to build this tool?
2. Do you have the resources to be responsible for the training, support and on-going maintenance of the tool?
3. What is the cost of hiring additional resources? How long will it take to get a new hire(s) to reach full productivity?
4. What initiatives must be stalled or reprioritized if resources needed to be pulled?
5. What will you have to start and stop doing as a result of building vs buying?

Building Required Capabilities

Traditionally, the preferred approach to adding technology capability is to build internally. In-house coding ensure customized approach built for the enterprise. Although IT teams are capable of building customized solutions, it's often an expensive, demanding, and a distraction from other revenue-driving tasks. Variables include wide-ranging costs over substantial periods of time to design and build basic features, risks of feature and cost creep during development, as well as risk of project abandonment or lack of support due to limited resources.

As you identify your requirements, consider the following back of the napkin equation to estimate the costs to build each capability:

$$\textit{Total Build Cost per Capability} = (FTE_1 \; x \; Hrs_1 \; x \; Rate_1) + (FTE_2 \; x \; Hrs_2 \; x \; Rate_2) + \ \ldots + (FTE_n \; x \; Hrs_n \; x \; Rate_n)$$

Where:

- $FTE_1, FTE_2, \ldots, FTE_n$ *are the number of full-time equivalents (FTEs) required for each capability*
- $Hrs_1, Hrs_2, \ldots, Hrs_n$ *are the number of hours each FTE will spend on building the corresponding capability*
- $Rate_1, Rate_2, \ldots, Rate_n$ *are the hourly rates for each type of FTE*

Figure 3. Equation for calculating total build cost per capability

Similar to other software development projects, this takes a village. Factor in the number of developers, senior developers, QA/testing, analysts, architects, and project managers would be need to be involved for the various responsibilities and taken away from other competing initiatives to be successful.

Hiring New Resources

Hiring and retaining the right talent to build this custom tool can be an exorbitant cost, risk, and challenge across all industries. Variables include the cost of recruiting, training, compensation packages, direct and indirect turnover costs, and more. According to the Society for Human Resource Management (SHRM), the average cost of hiring new, non-executive, employee is $4,683.[6] Others have argued this cost could go up as high as "three to four times the position's salary."[7]

Training New Resources

With software projects being the most prone to cost and schedule overruns, a new hire reaching full productivity (shown in Figure 4) further exacerbates this challenge.[8] Assuming the average Software Developer's fully loaded compensation (core compensation plus benefits) is $110,822 and, conservatively, the average number of hours for training is 64 hours, the cost of training alone for that employee is ~$3,410.[8,9] This doesn't include the additional cost from the time of managers and key coworkers to train the new employee. If scaled out to three additional resources needed for this project, we're looking at over $10,000 in training costs alone.

Figure 4. Productivity rate for new hires

On going Support and Maintenance

Instinctively, the cost to build the critical capabilities takes center stage. However, the yearly post-implementation incurred costs is a key factor to take into consideration. Similar to the "Building Capabilities" section previously discussed, you can use the same equation as shown in Figure 3. Choosing to build puts the responsibility on your

Takeaways

Reasons to Build

1. Greater authority and control over the solution
2. Continuous use of tools already existing within organization
3. Not dependent on others or beholden to vendor for a specific feature

Reasons to Buy

1. Faster time to market
2. Lower and predictable TCO
3. Minimal risk due to proven track record, years of R&D, and dedicated resources
4. On going maintenance, support, enhancements don't require participation
5. Access to a wider range of features, capabilities, and experts (including engineers, dedicated customer success manager, support, and more)
6. Increased productivity as developers can focus on building core product
7. Proof of value evidenced by customer stories

teams for both support and on going updates. This can pose uncertainty of responsibility as well as variable costs for your organization in the future. Additional risks are introduced if the knowledge of the tool is possessed by a small team, should that team be redployed or leave your organization.

Choosing to invest in a vendor provides support, maintenance, avoiding cost of hiring new resources, and continued R&D efforts to enhance and extend capabilities that your organization could benefit from in the future.

Conclusion

In today's competitive business environment, it is more important than ever to bridge the insight to action gap. An embedded BI and reporting tool can provide businesses with the insights they need to stay ahead of its competitors, meet market demands, and make informed decisions. However, choosing to build in-house or invest in an existing dedicated solution from a vendor can be a difficult challenge for organizations given the dependence of a multitude of variables.

Using the value equation framework, we have outlined the benefits and drawbacks of both approaches. While building a solution in-house may provide greater control over the solution and customizations options, it is often a costly and time-consuming process that can lead to delays, compromises, and unexpected setbacks. Purchasing a solution, on the other hand, can provide a faster time to market, reduced costs, minimal risk, and access to a wider range of expertise, features, and capabilities to meet future business demands.

By carefully weighing the key variables covered throughout the whitepaper, you can make an informed decision that meets the needs of your company and helps you stay ahead of the competition.

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9 Salary.com, Software Developer (US)

Global Headquarters
851 W Cypress Creek Rd. Fort Lauderdale FL 33309
+1 650-846-1000 TEL
+1 800-420-8450
+1 650-846-1005 FAX
www.jaspersoft.com

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