# Data Management Solution: Build vs. Buy

*A Birdstep Technology, Inc. Business Whitepaper*

Published: August, 2008
Author: Duncan Bates
*Vice President of Product Management*


## Abstract

This article explores "Build vs. Buy", a key decision for determining the best strategy for meeting your product's embedded data management needs.

***This article is relative to the following versions of RDM:***

- ✓ RDM Embedded: All
- ✓ RDM Server: All

# Contents

## Introduction

A key decision when determining the best strategy for meeting your product's embedded data management needs is "Build versus Buy". To decide, your organization will need to perform careful analysis of many aspects, including: functional needs, expertise, quality, market timing, support and maintenance, product life, and cost.

## Functional Needs

For embedded database management software, there can be a long list of potential functional needs. For a single-tier solution, these would minimally include, but are not limited to:

- ✓ Flat-file Management—sequential reading and writing of data.
- ✓ Disk Input/Output—allows for persistent storage and retrieval, with opportunity for optimized lookups and safe writing.
- ✓ Indexing—allowing applications to efficiently access data based on defined characteristics.
- ✓ Record Management—record organization, addressing, allocation and deletion algorithms.
- ✓ OS/Target Platform support—functionality associated with using the targeted platform's resources through supported primitives.

For multi-tier solutions, the functional needs would include those of the single-tier, plus multi-user (management of controlled access to data by multiple users and prevention of deadlock) and client/server (supports distributed processing, scalability and fault tolerance) controls.

Beyond these basic features, your application may require advanced functionality, such as:

- ✓ Database mirroring/replication—allows storage of, and access to , more than one copy of the database.
- ✓ Transaction Management—functionality that assures ACID (atomicity, consistency, isolation, and durability).
- ✓ Data Field Management—management of the content and placement of fields within a record in support of high-level, controlled data access and memory/disk space usage.
- ✓ Dynamic DDL—an extension of Record Management providing the ability for run-time, dynamic, modification of the database structure and schema.
- ✓ Application to DBMS Interface(s)—processing layer addressing industry standard implementations like ODBC, JDBC, ADO, etc., or native/proprietary methods.

The basis for an educated decision on build vs. buy is achieved with a thorough understanding of your products needs, both for today and the future. Equipped with this information you can estimate your development effort to build.

To demonstrate, consider an example single-tier solution, with ACID and industry standard interface needs. The resulting estimates to build (requirements, design, develop, document, test, QA, management) would be:

| Functionality | Person-Weeks |
|---|---|
| Flat-file Management | 10 |
| Disk Input/Output | 15 |
| Indexing | 15 |
| Record Management | 25 |
| OS/Target Platform Support | 8 |
| Transaction Management | 80 |
| ODBC | 200 |
| **Total Development Time** | **353** |

For a multi-tier solution, with equivalent functionality, the estimates would be:

| Functionality | Person-Weeks |
|---|---|
| Flat-file Management | 10 |
| Disk Input/Output | 15 |
| Indexing | 15 |
| Record Management | 25 |
| OS/Target Platform Support | 8 |
| Transaction Management | 80 |
| ODBC | 200 |
| Multi-user Support | 100 |
| Client/Server | 120 |
| **Total Development Time** | **573** |

## Expertise

Now that you know what you need, can your organization build it, or is it best to buy? Even though "database management" is an academic topic for many computer scientists and software engineers, implementing these features correctly, and efficiently, takes expertise well beyond that taught in the universities. Often multiple product releases or subcontracting are required to "build" the complete and necessary solution.

## Quality

Quality results take focus, time and money. Focus on the; processes, methods, techniques, and requirements. Time is needed for; auditing, reviewing, measuring, and testing. And of course money: to pay for all the appropriate resources and tools. If you build your own solution, do you have the focus, time and money to achieve quality? Remember, several commercial solutions have been in the market place for 20 years: that equates to long-term focus, lots of time, and lots of money.

## Market Timing

"Time-to-market" is a big part of the consideration to build or buy. Competition is everywhere, like-products are quickly evolving, and you need to get your product out. What is the impact of developing your in-house solution as it relates to market timing? You know how long your in-house development will take. Is this acceptable or should you shorten your development time by making a buy decision? What is your competition doing while you are designing your own db?

## Support and Maintenance

Often in an analysis of build versus buy, the impact of the support and maintenance effort is not comprehended. Some amount of engineering and management time will be spent performing issue investigation, debug, reproduction of errors, interaction with users, and eventual correction of a defect or implementation of an enhancement. The more complex the solution, the greater the support costs.

In addition, the support effort will be highest in the early years of the general availability of your product. Without any enhancements to the original product, the support effort will lessen as the years go by. However, if enhancements are added, the support effort may not decrease.

A good estimate of person power needed to support and maintain (implement enhancements) for the data management portion of your product is 2 persons for the first year, followed by 1.5 the second, and 1 for the remaining product life.

## Product Life

The product life, or the number of years that your product will be a viable offer to the market, helps determine the long term effort and costs associated with either a "home grown" or commercially purchased solution. For example, if the product life is estimated at 5 years, a "build" solution will require at a minimum support and maintenance for that duration. A "buy" solution would require paying support and maintenance fees for the life of the product.

## Cost

The hard costs to "build" can now be calculated by using the estimates to develop the needed functionality plus the support/maintenance. The following assumptions are made to fulfill the cost calculation: a $50 burdened cost per person, and a five year product life with support effort averaging 1.3person years per year (2person years the first year, 1.5 the second and 1 for the remaining years). With these assumptions, the hard cost to "build" the single-tier example would be:

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | **Total Cost** |
|---|---|---|---|---|---|
| $841,200 | $135,200 | $135,200 | $135,200 | $135,200 | $1,382,000 |

Of course there could be additional soft costs, namely the effects of bad quality, lack of expertise, and poor market timing.

Using the same assumptions, the hard cost to "build" the multi-tier example would be:

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | **Total Cost** |
|---|---|---|---|---|---|
| $1,281,200 | $135,200 | $135,200 | $135,200 | $135,200 | $1,822,000 |

Having any advanced features in your data management solution would significantly increase the cost to build, and conversely if all you need is flat file management the cost is minimal.

## Conclusion

Assess a commercially available solution to determine if it provides the necessary functionality and that the vendor has expertise in the field with a long track record of quality. What is the cost to buy (clients, sessions, SDKs, support, maintenance, runtimes, training, other) compared to the cost to build?

Contact our team at dbsales@birdstep.com for a detailed analysis of your unique needs, and realize the tremendous savings of a "buy" decision.

## Contact Information

Website: http://www.raima.com

**NORTH AMERICA**

Birdstep Technology, Inc.
2101 Fourth Avenue, Suite 240
Seattle, WA 98121
Telephone: +1 206 748 5300
Fax: +1 206 748 5200
E-mail: americas@birdstep.com

**EUROPE**

Birdstep Technology ASA
C.J. Hambros Plass 3c
0164 Oslo, Norway
Telephone: +47 90628326
Fax: +47 24134701
E-mail: lpagni@birdstep.com