

# Supercharging Return on Investment with Rapid Application Development Tools

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Total Cost of Ownership White Paper

## Executive Summary

Today's businesses are facing many financial challenges, especially when it comes to developing IT applications. New technologies have arrived on the scene that reduce those financial burdens, while speeding the application development process. This white paper examines the FileMaker Platform, which employs the Rapid Application Development process, and how it offers certain advantages over tools such as Oracle, Microsoft SQL Server, MySQL, and Salesforce.com that use more traditional application development methodologies.

### *The problems with the traditional application development process:*

Businesses have identified application development projects as an area where significant cost savings can be realized, especially since cost overruns and delayed deliveries have become common problems. The cause of those problems can be attributed to miscalculating training needs, prototyping costs, and quality assurance costs, which are all related to the development of the application. Further impacting costs is the tendency of development projects to shift design goals or encounter new feature requests. Those problems are further exacerbated by the rigid specification and development cycle associated with traditional application development tools.

Problems encountered during application development negatively impact important business performance metrics, such as Return on Investment (ROI) and Total Cost of Ownership (TCO), both of which are used to gauge a project's success. The solution to those problems lies with the ability to expedite the development cycle, reduce overhead, and quickly accommodate project modifications, which will enable developers to more efficiently create, modify, and deliver new applications.

### *Solving problems with Rapid Application Development (RAD) technologies:*

Businesses today need agile IT solutions, which can react to market driven changes. Rapid Application Development (RAD) Tools, such as FileMaker Pro, have become the best way for businesses to incorporate agility into their application development projects. RAD tools deliver the ability to speed development, reducing training needs, accelerate prototyping, and enable rapid project changes. Those advantages combine to increase the ROI potential, while reducing overall TCO. What's more, RAD tools help to lower ongoing operational costs by easing developmental changes throughout the life of the project.

## The Hidden Costs of Traditional Development Tools

Over the years, the tools used for application development have become fragmented, meaning that developers usually have to purchase suites of products, such as Microsoft Visual Studio 2008 and Oracle Developer Suite 10g, which incorporate a multitude of tools, ranging from code editing tools to compilers to database connection brokers. In most cases, those suites are incomplete at best and require additional third party products, such as plug-ins, debuggers, database connectors, compilers, and a slew of other "added expense" items, which tends to be true with development products such as Salesforce.com Enterprise Edition. Even open source solutions, such as MySQL, do not escape the need for add-ons, in many cases, deploying MySQL requires the purchase of commercial tools with significant costs.

While increased product selection and multiple options may even result in new development opportunities, IT departments are usually saddled with additional training requirements, licensing costs, and integration chores. Those costs often increase exponentially and must be justified to prove the ROI of a project. But, those additional expenses and increasing costs are only a small part of the problem.

The development tools selected for a project also significantly impact the development process. The traditional application development method, often referred to as stagewise or waterfall models, is

based upon a structured step-by-step approach for developing applications. While sound in theory, the stagewise or waterfall approach leads to a rigid sequence of steps, which is anything but strategic. Each procedural step consumes time and resources by forcing application developers to “sign-off” after completion. That results in procedures that freeze development until each specification is coded, tested, and implemented, before proceeding to the next step. In most cases, there is a long delay before applications are completed and the development process can take so long that the fundamental needs of the business could change before the new application is implemented. While this is appropriate for certain transactional or financial systems there might be a more appropriate approach for departmental solutions.

Simply put, traditional tools and methodologies will significantly increase realized TCO and will reduce demonstrable ROI. It all comes down to the inefficiencies of the tools, the methods and the overall management of the process negatively impacting the bottom line.

## **Rapid Application Development Paves a Better Path to Enhancing TCO and Delivering ROI**

RAD brings new tools and processes that change the fundamentals of building applications. RAD tools, such as FileMaker Pro, replace the tedious hand-design and coding processes with automated design and coding. That automation delivers a multitude of benefits ranging from expediting application development to improving the agility of change management. Automation speeds both development and delivery by eliminating waterfall methodologies that isolate developers from subject matter experts. FileMaker Pro naturally embraces a spiral approach that emphasizes iteration and involves end users during development to ensure success at delivery. Spiral development allows a project to be broken up into smaller pieces, which can be developed concurrently and prototyped in manageable pieces. Each part of the solution can then be tested independently and then wrapped together to complete the project. The spiral development methodology goes hand in hand with RAD to reduce the time needed to develop applications, while increasing flexibility.

## **The FileMaker Platform**

The FileMaker Platform is a suite of tools used to easily build flexible database solutions for rapid deployment on Windows and Mac, and to extend them to the web. The product line consists of FileMaker Pro, FileMaker Pro Advanced, FileMaker Server, and FileMaker Server Advanced. FileMaker Pro is an encapsulated development and deployment platform – no additional tools are needed to build and deploy applications. However many developers opt to use FileMaker Pro Advanced in order to take advantage of the added customization and development tools included in the software. If a FileMaker application needs to be securely shared, FileMaker Server is added to manage the databases. Or FileMaker Server Advanced can be used to host even larger groups of databases, provide ODBC/JDBC connectivity and share databases over the web with more users than FileMaker Pro alone.

The FileMaker Platform is ideal for:

- Solutions that are currently based on spreadsheets or paper
- Retrieving and exchanging data with enterprise systems
- Data tracking, report generation, and analysis
- Workflow solutions for the department or workgroup

The FileMaker Platform is designed to help the non-programmer (subject matter expert) become more productive in collecting, processing, and analyzing information. The award-winning FileMaker Pro provides the tools to build a customized user interface with a relational database and business logic in a

single unified Windows and Mac application. Incorporating these three elements into one product has proven to be very effective and places a lighter cognitive load on the knowledge worker or other users.

Traditional vs. FileMaker Architecture	
Traditional Architecture	FileMaker Architecture
<b>User interface</b> — HTML, JSP, ASP, or VB	<b>Object oriented user interface</b> — FileMaker Pro
<b>Business/Application Logic</b> — C++, .NET, C##, OR J2EE/JAVA	<b>Point and click Business/ Application Logic</b> — FileMaker Pro
<b>Data</b> — Oracle, MySQL, or DB2	<b>Data</b> — FileMaker Pro or connect to Oracle, Microsoft SQL Server or MySQL
<b>FileMaker’s integrated architecture means developers can quickly modify the user interface, business logic, and schema.</b>	

**FileMaker Pro significantly improves ROI and reduces TCO by offering:**

- **Faster Development Cycles:** A Rapid Application Development environment speeds development by eliminating coding, compiling and other time consuming tasks. A quick start screen, built-in templates and other tools allow the creation of applications, even by novice users.
- **Codeless Application Creation:** An Integrated Design Environment eliminates manual coding tasks and automatically creates scripts and other code elements for programmers. Help screens, examples, and demonstrations are integrated into the product to show how to accomplish tasks.
- **Integrated Design Environment:** Simplifies design and maintenance by providing graphical tools, help, and utilities in a single interface. Developers do not need to launch (or purchase) additional tools to complete a project, while integrated help provides troubleshooting advice and tips to create applications or test prototypes.
- **Reduced Training Requirements:** Wizards coupled with graphical design elements makes getting started quick and easy, allowing new users to skip traditional training. A logical development process helps new developers quickly learn how to use FileMaker Pro and its associated tools, while built-in example applications highlight functionality and provide starting points for developing new applications.
- **Integrated Database:** A proprietary database can be used for prototyping or as a replacement for an expensive SQL-based system. FileMaker Pro supports up to a million records, fast indexes and includes tools that allow developers to examine data directly to build relationships and validate functionality.
- **Multiple External Database Connectors:** Access data from multiple sources and platforms, without needing expensive add-on tools or options. FileMaker Pro can connect to industry leading databases from Oracle, IBM, Microsoft, and many others. FileMaker Pro can develop applications that leverage those existing databases or work as an application that can link multiple disparate databases together to create unique cross-platform solutions.
- **Cross-Platform Support:** Develop for Windows or Mac OS systems with a single product.

- **Simplified Administration:** FileMaker Pro includes wizards and concise tools to simplify database maintenance chores, eliminating the manual tasks that are often associated with maintaining large databases, such as Oracle 10g. FileMaker Server provides remote database administration, the ability to schedule live backups, and scripts to automate administrative tasks.
- **Integrated Maintenance Tools:** Maintain, modify, and manage databases without having to purchase additional tools, products, or add-ons.
- **Integrated Support for Web-Based Applications:** Deploy applications to the web, quickly and simply with bundled tools and web server options. FileMaker Pro supports publishing databases to the web for as many as five concurrent users, while FileMaker Server Advanced increases concurrent web user counts to 100 users. PHP is supported in both FileMaker Server and FileMaker Server Advanced.

## Operational Benefits Offered By FileMaker Pro

Organizations adopting FileMaker Pro and spiral development methodologies will realize several benefits, some of which reach beyond traditional ROI and TCO calculations. As an application development tool, FileMaker Pro allows organizations to move to a class of developers that are focused on the business process and the dataset. Those developers are no longer saddled with the time consuming intricacies of hand coding applications and can focus instead on building applications that meet the needs of the business, instead of applications that are limited by the coding methodologies in use. What's more, elemental design changes are much easier with FileMaker Pro, thanks to a codeless development environment that leverages graphical design tools, allowing developers to quickly "paint" application screens and then populate those screens with the necessary elements to automatically build the business logic and code needed by the process. As a RAD tool, FileMaker Pro offers an Integrated Design Environment (IDE). In the case of FileMaker Pro, the IDE provides tools that enable developers to visually design the forms, menus, reports, tables, and so on, for applications using point-and-click and drag-and-drop techniques. Those tools allow developers to see design results as they progress.

Rapid development and ease of use are only two elements of the FileMaker Pro advantage. Adopters will also find that FileMaker Pro uses a data-driven approach to development – where database management and RAD are treated as a single element, instead of as two separate management tiers. This allows developers to easily incorporate granular security elements at the field level, automate indexes, create codeless sorts, or embed scripts. That unified approach also helps to simplify administration, while reducing the technical knowledge required to develop an application.

## Competitive Analysis: 3-Year TCO Study

There are several development tools on the market today – ranging from adhoc RAD solutions that combine third-party IDEs with coding tools to all-in-one database solutions that incorporate RAD like capabilities. While all have their benefits, most are encumbered with shortcomings that become apparent the further a development project progresses. Those shortcomings are a result of the limited integration between the various components used in the development environment. FileMaker Pro overcomes those limitations with a design that combines the three primary elements of a data-driven solution (database architecture, business logic, and user interface) into a single, inexpensive product.

Those features help most organizations to meet a variety of development needs and do not require additional add-on purchases. The fully integrated nature of those features directly improves TCO by speeding developmental changes or by allowing the incorporation of additional application capabilities, without requiring revisions to code or re-engineering the database and core application.

Comparing the FileMaker Platform with products from Microsoft, Oracle, Salesforce and the open source community reveals the long-term economic benefits of the FileMaker Platform.  
(Please see addendum for methodology)

First and foremost, the FileMaker Platform (referred to as the FileMaker Development Solution in the table below) proves to have a much lower initial licensing and tool set costs when compared to competing products – especially when a development solution is scaled to handle a larger number of clients. Salesforce.com and Force.com bundle the development environment costs into their licensing fees:

<b>Database License Acquisition Costs</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$7,574	\$13,049	\$44,799	\$157,995
MS SQL Server 2008 Enterprise Edition	\$13,969	\$18,019	\$42,319	\$211,595
Oracle Database Standard Edition 11g	\$17,500	\$17,500	\$35,000	\$175,000
MySQL	\$0	\$0	\$0	\$0
Salesforce.com Enterprise Edition	\$112,500	\$218,750	\$900,000	\$4,500,000
Force.com Enterprise Edition	\$15,000	\$30,000	\$120,000	\$600,000

  

<b>Development Environment (5 copies)</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Pro Advanced	\$2,195	\$2,195	\$2,195	\$2,195
Microsoft Visual Studio .NET 2008	\$3,995	\$3,995	\$3,995	\$3,995
Oracle Development Suite 10g	\$29,000	\$29,000	\$29,000	\$29,000
MySQL (using IBM WebSphere Studio)	\$12,000	\$12,000	\$12,000	\$12,000
Salesforce.com Enterprise Edition	\$0	\$0	\$0	\$0
Force.com Enterprise Edition	\$0	\$0	\$0	\$0

With the FileMaker Development Solution, the cost of application development drops significantly, thanks to the integrated tool set, codeless development capabilities, and rapid application development methodology. An enterprise can expect to reduce development costs by at least 60% when compared to Salesforce.com Enterprise Edition and as much as 80% when compared to Microsoft Visual Studio .NET 2008:

<b>Development Cost</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$78,750	\$78,750	\$78,750	\$78,750
Microsoft Visual Studio .NET 2008	\$405,000	\$405,000	\$405,000	\$405,000
Oracle Development Suite (Java)	\$296,100	\$296,100	\$296,100	\$296,100
MySQL (Java)	\$336,600	\$336,600	\$336,600	\$336,600
Salesforce.com Enterprise Edition	\$202,000	\$202,000	\$202,000	\$202,000
Force.com Enterprise Edition	\$202,000	\$202,000	\$202,000	\$202,000

The FileMaker Development Solution also offers significant savings when it comes to deployment of the application. The competitive advantage offered by FileMaker is fueled by wizard-driven deployment tools, as well as the availability of web-based application access. FileMaker Pro can concurrently develop both web accessible applications as well as multi-platform (Windows and Mac OS) applications, using a wizard-driven approach. This allows developers to create solutions based upon end user needs and not platform centric requirements, quickly and efficiently. The FileMaker Development Solution shows an incredible savings of 94% when compared to Oracle and significantly less expensive when compared to the hosted solutions offered by Salesforce.com and Force.com:

<b>Deployment Cost</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$1,575	\$1,575	\$1,575	\$1,575
MS SQL Server 2008 Enterprise Edition	\$20,250	\$20,250	\$20,250	\$20,250
Oracle Database Standard Edition 11g	\$23,688	\$23,688	\$23,688	\$23,688
MySQL	\$16,830	\$16,830	\$16,830	\$16,830
Salesforce.com Enterprise Edition	\$20,200	\$20,200	\$20,200	\$20,200
Force.com Enterprise Edition	\$20,200	\$20,200	\$20,200	\$20,200

When it comes to TCO, several other factors must be considered, ranging from personnel/staffing costs to training costs. The FileMaker Development Solution offers significant savings in all of those areas. Savings can be realized because the FileMaker Development Solution proves much easier to execute than competing products, saving personnel costs. The training requirements are also greatly reduced with FileMaker Pro thanks to wizards, integrated help and codeless application design. Those costs savings relate directly to departmental staffing budgets and prove to be a compelling economic argument for adopting FileMaker:

<b>DBA Cost</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$7,200	\$7,200	\$7,200	\$14,400
MS SQL Server 2008 Enterprise Edition	\$15,480	\$15,480	\$15,480	\$30,960
Oracle Database Standard Edition 11g	\$22,500	\$22,500	\$22,500	\$45,000
MySQL	\$16,560	\$16,560	\$16,560	\$33,120
Salesforce.com Enterprise Edition	\$9,000	\$9,000	\$9,000	\$18,000
Force.com Enterprise Edition	\$9,000	\$9,000	\$9,000	\$18,000

<b>Development Toolset Training (3 devs)</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$5,235	\$5,235	\$5,235	\$5,235
Microsoft Visual Studio .NET 2008	\$78,600	\$78,600	\$78,600	\$78,600
Oracle Development Suite 10g	\$39,500	\$39,500	\$39,500	\$39,500
MySQL (using IBM WebSphere Studio)	\$25,700	\$25,700	\$25,700	\$25,700
Salesforce.com Enterprise Edition	\$27,200	\$27,200	\$27,200	\$27,200
Force.com Enterprise Edition	\$27,200	\$27,200	\$27,200	\$27,200

With any large-scale application development and deployment project, ongoing maintenance, support, and upgrade costs are to be expected. Those costs, usually calculated over a 3-year period, prove to be an important element for calculating the TCO. The straightforward approach to upgrades, scalability, and automated maintenance in the FileMaker Development Solution proves to offer significant savings in those areas, helping to further reduce the TCO, while increasing the ROI. Both Salesforce.com and Force.com include some of those costs in their licensing fees, while MySQL, as an open source product, has no costs for the actual code used for a platform upgrade:

<b>Two Application Upgrades (dev time)</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$15,750	\$15,750	\$15,750	\$15,750
Microsoft VisualStudio .NET 2008	\$81,000	\$81,000	\$81,000	\$81,000
Oracle Development Suite (Java)	\$59,220	\$59,220	\$59,220	\$59,220
MySQL (Java)	\$67,320	\$67,320	\$67,320	\$67,320
Salesforce.com Enterprise Edition	\$40,400	\$40,400	\$40,400	\$40,400
Force.com Enterprise Edition	\$40,400	\$40,400	\$40,400	\$40,400

<b>Two platform upgrades over 3 years</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$4,482	\$5,857	\$17,707	\$59,175
MS SQL Server 2008 Enterprise Edition	\$6,304	\$7,754	\$27,828	\$139,140
Oracle Database Standard Edition 11g	\$11,550	\$11,550	\$23,100	\$115,500
MySQL	\$0	\$0	\$0	\$0
Salesforce.com Enterprise Edition	\$0	\$0	\$0	\$0
Force.com Enterprise Edition	\$0	\$0	\$0	\$0

<b>Support/Maintenance</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$2,157	\$2,157	\$2,157	\$2,157
MS SQL Server 2008 Enterprise Edition	\$5,156	\$5,156	\$5,156	\$5,156
Oracle Database Standard Edition 11g	\$0	\$0	\$0	\$0
MySQL	\$4,000	\$4,000	\$4,000	\$20,000
Salesforce.com Enterprise Edition	\$0	\$0	\$0	\$0
Force.com Enterprise Edition	\$0	\$0	\$0	\$0

By combining acquisition costs, development costs, maintenance costs, and support/maintenance costs with ancillary costs, it becomes evident where FileMaker Pro fits in the TCO picture. In a best case scenario, the FileMaker Development Solution deployed for 1,000 users can save an organization \$4.4 million over a 3-year period, when compared to a hosted solution such as Salesforce.com Enterprise Edition:

<b>Total cost of development platform ownership</b>	<b>25 clients</b>	<b>50 clients</b>	<b>200 clients</b>	<b>1000 clients</b>
FileMaker Development Solution	\$124,918	\$131,768	\$175,368	\$337,232
MS SQL Server 2008 Enterprise Edition	\$636,774	\$642,274	\$686,648	\$989,736
Oracle Database Standard Edition 11g	\$499,058	\$499,058	\$528,108	\$783,008
MySQL	\$479,010	\$479,010	\$479,010	\$511,570
Salesforce.com Enterprise Edition	\$411,300	\$517,550	\$1,198,800	\$4,807,800
Force.com Enterprise Edition	\$313,800	\$328,800	\$418,800	\$907,800

Although research indicates that significant savings can be realized on new deployments, there are situations where those savings do not represent real world TCO. For example, if an organization has a large investment in an Oracle Database solution, it may not make sense to migrate over to a new FileMaker-based solution. The cost of replacing the old system may exceed the benefits offered by the new solution. But, that may not preclude FileMaker from that organization. Since FileMaker Pro can connect with other database technologies, organizations that rely on other databases may still be able to use FileMaker to extend capabilities. Examples include using FileMaker for web deployments, report generation, simple database maintenance functions, and so on. In other words, FileMaker Pro becomes a supporting tool for the other technologies in use and still improves TCO, while increasing the ROI of future development projects.

## ROI Case Study with Best Practices

Oncology Services International (OSI) is a medical equipment vendor based in Montebello, NY that specializes in the sale and maintenance of refurbished medical linear accelerators and simulators used for cancer treatment. OSI is the largest independent provider of refurbished oncology equipment and maintenance services. The OSI business model is founded upon the tenants of maximizing ROI and lowering TCO for its customers by providing clinics with equipment to care for cancer patients at a significantly lower cost than purchasing new devices. OSI has applied the same concepts behind ROI and TCO internally to fuel growth of 10 percent per year. Achieving that growth rate meant paying careful attention to the technologies used to develop sales capabilities. That led OSI to deploy a comprehensive FileMaker Pro solution – created by FileMaker developer CAB inc.



### **Solution Specifics:**

- FileMaker software
- New Millennium Genesis Accounting system
- WorldSync SyncDek

### **Realized Benefits Impacting ROI:**

- Ability to handle double the sales volume with no addition to administrative staff expense
- Provided financial integrity and easy data access that facilitated the purchase of OSI by private equity group
- Reduced customer receivables in the over 90 aging category which resulted in a substantial reduction in short term interest expenses incurred to fund daily operations
- Improvement of cash flow by reducing the billing cycle from 30 days to 1 day for field service work and 1 week to 1 minute for contract billing.
- Provide support for real time management reporting and field service operations where none previously existed.

### **Business Challenge:**

To deploy an enterprise-level solution to replace SMB accounting product, enhance CRM and integrate existing FileMaker Pro database software used to generate service reports, control inventory, track contacts, and manage customer relationships. The new solution needed to offer specialized accounting functions and financial reporting that most standard accounting packages do not accommodate.

### **Due Diligence and Selection Process:**

An RFP was created to entertain bids from professional SQL and Oracle development firms. Several bids were received, with the lowest quote coming in at \$250,000, without customizations and hardware. That quote far exceeded the applicable budget and forced OSI to re-evaluate the SQL and Oracle requirements and identify alternatives.

OSI was able to find the New Millennium Genesis Accounting system, based on FileMaker Pro, and was able to locate a development firm to modify the software that was well versed in accounting solutions. CAB inc. was able to build a solution based on both FileMaker Pro and Genesis using spiral development techniques that leveraged the RAD enabled IDE in FileMaker Pro.

Using incremental development techniques, CAB was able to help OSI automate the right processes at the right time and eliminate “do over” program development costs. That kept costs low and maximized the ROI potential of the project. The development process focused on automating core business functions supporting the money-making components of the OSI business model first. CAB and OSI then implemented WorldSync’s SyncDek for service reports capture and parts file management.

### **Customer Benefits:**

For OSI, the solution based on FileMaker software has brought real meaning to the term return on investment. By taking advantage of the efficiencies of FileMaker Pro, the company has grown to 50 field service engineers without adding a single incremental administrative person.

TCO was lowered significantly, when compared with competing solutions. The FileMaker and Genesis solution, over five years, has cost 28 percent less. Further enhancing the ROI is the fact that the total sum included everything – software, hardware, and custom development. Moreover, OSI has achieved additional cost reductions. Savings were realized by cutting financing costs by reducing the billing cycle from 30 days to less than 1, and also by reducing external audit fees.

## Addendum: FileMaker Total Cost of Ownership Methodology

This study estimates the Total Cost of Ownership of a medium- to high-complexity database-backed application over a three-year period. Such an application would have in the range of 20-40 database tables. It would also have significant implementation of unique business rules.

For deployment scenarios, the 25, 50 and 200-client models assume a single database server. The 1,000-client scenario assumes five database servers supporting an average of 200 users apiece.

Hardware pricing was not factored into the model, as it is not a major differentiator among platforms. In all cases (with the exception of Salesforce) the systems were expected to be running on modern machines. For the 25- and 50-client scenarios a one-processor machine is used, one two-processor machine is used for the 200-client scenario, and five two-processor machines are used for the 1,000-client scenario. The number of processors is relevant to those cases where the pricing is assessed per processor.

**Database license acquisition costs:** Both Microsoft SQL Server and Oracle Database offer both per-seat and per-processor licensing. In both cases the per-processor licensing was more advantageous, so that pricing was used here. Pricing is based on one- or two-processor machines as outlined above. With specific respect to Salesforce.com/Force.com, the platform here is evaluated as a true custom application development tool. It was assumed that the custom application model would not need to take full advantage of the bundled CRM capabilities of Salesforce.com. Accordingly pricing for two editions of Salesforce.com: the CRM Enterprise Edition, was used in the study which includes fuller CRM functionality, and the Force.com Enterprise Edition, which is less expensive and includes much more modest CRM functionality. This allows comparison between scenarios needing the full CRM function, and those that concentrate on a purely custom application.

**Development environment:** Five licenses of each of the respective development environments were budgeted. Though the standard FileMaker Pro client can be used as a development environment for many development tasks, most developers prefer the richer development feature set of FileMaker Pro Advanced.

**Development costs:** A development staff of one senior developer or technical architect and two more junior developers was used for this scenario. For the FileMaker solution this team will spend about 1,250 hours on development in an initial 4-month period, followed by about 40 hrs./month for the remaining 32 months. Twice as many hours will be required for Salesforce development, and three times as many hours for Java or .NET development, based on third-party development experience of these other client technologies. Note that, although many business rules can be implemented in Salesforce.com using the platform's native workflows and approvals, the complex business rules often exceed what those features can deliver, necessitating database triggers and custom (Apex) coding.

**Two application upgrades:** This category estimates development costs for the regular delivery of new features into an application. Each upgrade is assumed to consist of 5% changes and 5% new code. Thus these codes represent a straight 20% of the original estimated development cost.

**Deployment costs:** Based on third-party developer experience of the relative complexity of deployment in each of these platforms, deployment costs were assessed as a percentage of original development costs. The following percentages were assumed in the scenario: FileMaker Pro 1%, Microsoft SQL Server and MySQL 5%, Oracle 8%, Salesforce.com 10%. For Salesforce.com, as stated above, the solution is assumed to be a complex application with significant use of Apex and VisualForce. Deploying such an application can be quite complex and time-consuming.

**DBA Cost:** A set number of hours per month for each platform, at market DBA rates, was used to calculate this section. For FileMaker and Salesforce.com 5 hrs./month were used, while for the remaining platforms had 10 hrs./month allocated for pure DBA time.

**Development Toolset Training:** The cost of both training and certification in these respective platforms is used for this section. For FileMaker the cost of taking the FileMaker Training Series for three developers (The FileMaker platform has a single certification level, FileMaker Certified Developer) was used. For the Microsoft training costs one Enterprise Application Developer and two ASP.NET developers were used for the scenario. For the Java-based toolsets the cost was based on one Certified Java Developer and two Certified Java Associates. For Force.com, it was assumed three people were taking the training required for Advanced Developer Certification.

In addition to the cost of the course themselves, the costs of the time, in hours, that must be spent to take the courses and achieve certification were added. The Microsoft certifications are particularly expensive due to the large number of courses that must be taken: nearly a dozen courses and nearly 400 hours of training in the case of the Enterprise Application Developer certification.

**Platform Upgrades:** Several vendors include platform upgrades in the base licensing cost, under various names such as “software assurance” or “software support.” Where such support was available as a bundled price, the support costs were split out and noted in this section. Readers should be aware that some licensing costs they may see in the marketplace, especially for Oracle and Microsoft, may include the software assurance fees.

**Support:** The platform upgrades category covers maintenance in the sense of ongoing software upgrades. This category refers specifically to incident-based technical support. The offerings here vary quite widely. For FileMaker, the cost of a single user contact for unlimited support was used. Microsoft’s licensing comes with some minimal phone support, so the price for 20 additional paid support incidents over three years was added. Oracle bundles technical support with its licensing fees, as does Salesforce.com. For MySQL, the price for the MySQL Network support on a per-server basis was used.

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## TCO Table and Methodology

TCO data collected and prepared by Soliant Consulting. Soliant creates data applications that support business process improvement in organizations around the country. Soliant focuses on rapid application development tools, specializing in Adobe Flex™, FileMaker Pro, Web/PHP and Salesforce.com.

## About the Author

Frank J. Ohlhorst is an award winning technology journalist, professional speaker and IT business consultant with over 25 years of experience in the technology arena. Ohlhorst has written for several leading technology publications, including ComputerWorld, TechTarget, PCWorld, ExtremeTech, eWeek, CRN and Toms Hardware. Ohlhorst has also contributed to business publications, including Entrepreneur and BNET, contributed to multiple technology books and has written several white papers, case studies, reviewers guides, and channel guides for leading technology vendors.

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