

Embedded Databases: Reducing ISV Risk

MySQL - The World's Most Popular Open Source Database

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1 Introduction

In this white paper, we explore the challenges and risks faced by technology providers (including Independent System Vendors (ISV), Original Equipment Manufacturers (OEM), and Value-Added Resellers (VAR)) when bringing a new product to market. On top of the customary market and competitive perils, these vendors face additional hazards brought about by the often necessary reliance on technology obtained from external sources.

In many cases, a Relational Database Management System (RDBMS) is at the heart of these new ISV offerings. Consequently, this crucial technology choice exerts great influence over the ultimate success or failure of any new solution. Embedding a proven, market-leading database such as MySQL can go a long way toward building a solid technology foundation while concurrently helping to mitigate risk.

2 Challenges Facing ISVs

Designing, developing, and deploying a successful new offering is difficult, especially when including external technology. In this section, we examine some of the most common obstacles encountered on the road to product success.

2.1 *Managing the Market Landscape*

Each year, thousands of new technology products hit the market. Unfortunately, despite the best efforts and intentions of their creators, most of these products will be considered failures and will not recoup their development costs, let alone turn a profit. New classes of solutions may struggle to find a viable market, while “me-too” offerings may arrive on the scene only to find that the window of opportunity has slammed shut. From the perspective of an ISV, there are two major types of roadblocks to surmount: delivering a product quickly, and being able to adapt to continually evolving market trends.

2.1.1 Time-to-Market

Markets are born and then reach maturity and saturation faster than ever before, placing ISVs under relentless pressure to deliver products quickly. Surprisingly, what often separates the winners from everyone else is that these astute players understand the importance of marshalling scarce resources on core product functionality. On the other hand, also-rans devote precious time and money to developing technology that could be acquired from elsewhere. The resulting product, while wholly developed by the ISV, frequently arrives too late to overcome the natural advantages afforded to those vendors who shipped product more rapidly.

2.1.2 Market Trends

As if the strain of designing and delivering a profitable product weren't enough, the ISV must also be adept at predicting market trends over the expected life of the new solution. Countless new products have reached the marketplace only to be considered technically obsolete in a matter of months. This places the vendor in reactive mode, forcing them to scramble and retrofit their solution to meet the new market realities, assuming that the product can in fact be altered quickly and successfully. Unfortunately, while the ISV is struggling to make these alterations, competitors are approaching the vendor's customers and prospects.

For example, in the past few years two significant and inter-related trends have disrupted the software industry. The open source movement has matured; it is no longer perceived as the domain of amateurs and hobbyists. In fact, many customer-driven RFPs and requirements documents now demand open source whenever possible. At the same time, the open source-based Linux, Apache, MySQL, and PHP/Perl (LAMP) technology stack has become the de-facto choice for infrastructure.

While these events have served as the catalyst for a new class of technology companies and associated products, they've caused panic among other vendors who built their solutions on closed, proprietary technologies. These ISVs are now racing to conform to these new realities. Unhappily, a significant percentage of these vendors will find that it's too late to successfully adapt: others will have taken their place.

2.2 Dealing with Competitors

A crowded competitive landscape has always been an inescapable fact of life for any ISV. We can divide competitors into two main classes, each of which presents its own challenges.

2.2.1 Traditional Competitors

In today's business environment, abundant venture capital and private equity funding sources, along with deep-pocketed public companies ensure that any viable market will be well-served. Naturally, some of these competitors will get to market more quickly, while others will struggle with technical and other issues, wasting valuable time in the process. The most ominous adversary is a focused, fast-moving vendor who offers an innovative, easily deployed solution and doesn't waste time or resources on anything outside their core competency. One way to get to market faster and edge out this competition is to embed key technologies, rather than develop them using scarce internal technical talent.

2.2.2 Embedded Technology Providers

One risk of selecting core technology from large, established vendors is the very real danger that a supplier may one day enter the same market as the ISV. In fact, these deep-pocketed vendors may already be present in the ISV's market. This places the ISV in an awkward position of competing with the maker of key internal technology. In some cases, things may get so unpleasant that the ISV decides to switch suppliers in the middle of the product's life, assuming that such an interchange is even possible. Aside from ending a dysfunctional relationship while consuming valuable time and resources, this effort generally does nothing to increase sales or improve the customers' experience.

For example, both Microsoft and Oracle offer embeddable relational database technology. However, given their size and relentless appetite for acquisitions, they are both major players in a host of additional markets. As we'll see throughout this white paper, it's dangerous for any ISV to rely on a current or future competitor for core technology.

2.3 Controlling Product Costs

Market and competitive concerns are just the start of the challenges facing an ISV when embarking on the journey to create a new product. The solution also needs to be delivered cost-effectively. There are many financial variables to consider when embedding core technology,

ranging from the staffing costs for building the solution, to development and QA access, to the inevitable runtime licensing discussion. Finally, the pricing structure for any solution needs to fit in with the ISV's preferred sales cycle.

2.3.1 Preventing Cost Overruns

What makes the financial aspect of developing a new product so challenging is that the ISV often has no way of accurately predicting either sales amounts or precise usage of their product. Variations between negotiated and actual utilization can haunt the ISV once their solution has been delivered to market. In certain situations, the ISV may be forced to undertake the unpleasant task of renegotiating the business relationship with one or more technology suppliers, or even requiring their customers and prospects to take on the burden of unexpected costs. This type of unplanned detour can play havoc with margins, and turn a profitable product into a money-loser.

2.3.2 Delivering a Low Total Cost of Ownership Solution

It's not enough for the ISV to control the development and licensing costs alone. Increasingly, their offerings must also feature a low Total Cost of Ownership (TCO) for the customer. Staffing and support costs can also have a dramatic impact on the overall price of a solution; prospective customers are quite aware of these realities. When deciding between two products of equal functionality and quality, TCO is often the tie-breaker. Consequently, to win these opportunities, it's vital that an ISV embed technology with a minimal impact on their customers.

2.3.3 Streamlining the Sales Cycle

When faced with the bewildering array and cost-of-goods-sold (COGS) impact of embedded technologies (such as databases), it's often tempting for the ISV to simply push the job of decision making, as well as incurring any related costs, onto the prospect. However, this may have the unwelcome and unintended effect of slowing down the sales cycle, as the prospect must now evaluate the same set of technologies as the vendor, without the benefit of the ISV's technical expertise. In addition, the prospect is now faced with the expense of purchasing additional software directly from the embedded technology vendor. Rather than undergo these daunting tasks, the prospect may either halt the purchase process entirely, or simply follow the path of least resistance and select a competitor that has already chosen their core components and delivered a complete solution.

2.4 Embedded Technology Decisions

Everything we've seen so far helps bolster the arguments in favor of embedding key technology. However, there are several additional factors at play, ranging from selecting the right data storage architecture to identifying the appropriate vendor to factoring licensing and other usage restrictions.

2.4.1 Deciding How to Store Information

Most ISV-developed solutions need some way of permanently storing information. When it comes to this important capability, some vendors simply elect to rely on the file system. However, this

approach is dangerous, since it exposes the user to security, performance, and data integrity hazards. It's far safer to employ a relational database for this specialized task. The next decision relates to selecting a commercial or open source database. Today's sophisticated customers are increasingly demanding open source solutions, both from the ISV as well as any infrastructure that the vendor incorporates. It is now possible to offer best-of-breed open source-based components as part of the product's underpinnings.

2.4.2 Choosing a Name-brand Embedded Technology

Given that interaction with data is at the heart of just about any technology-based solution, choosing the ideal information storage platform is a pivotal determination for the ISV. Customers and prospects also play a big role, since they want to be assured that the vendor has selected the right technology.

Faced with the potential impact of a bad data storage decision, the first thing that the vendor will do is to seek out embedded technology vendors with numerous reference cases. Of course, while positive customer citations are very important, the ISV will also want to ensure that the selected data storage technology will conform to the performance and scalability requirements for the new solution. It's also essential that the chosen product provide cross-platform capabilities, since the ISV will need maximum flexibility when offering the solution in the marketplace.

2.4.3 Working Around License and Usage Restrictions

No matter what embedded technologies are selected, many ISVs are forced to develop their solutions to work around license or other usage limitations imposed on them by the vendors of these ingrained components. The result is often a product that is unnecessarily hamstrung by these restrictions, which can impact its viability in the market. In other cases, the ISV may be forced to use a restricted or otherwise substandard version of vital embedded technology.

2.5 Providing a Good Installation and Support Experience

With cost and technical considerations out of the way, the next major concern for ISVs that are embedding externally-obtained technology relates to the overall installation and support picture for these components. To begin, it's essential that all included technology have as small a footprint as possible, since a heavier solution generally translates to higher cost and more installation complications for both the ISV and their customer. In fact, heavyweight embedded technologies' footprints can create significant headaches for the ISV as they plan for packaging and distributing their solution.

For valid business and technical reasons, many ISVs don't go out of their way to advertise that their solution is partially composed of embedded technologies. However, unless these components are chosen carefully, the customer will be forced to directly install these technologies. Unfortunately, these requirements often exceed the technical aptitude or resource availability of the customer, forcing the customer to consider alternate products.

Once the installation is complete, the next area of concern relates to providing ongoing sustenance for the ISV's solution. The support question is more complicated than it may initially appear, since there are at least three entities involved in this process:

1. **The customer.** Technical personnel working for the customer generally serve as the primary support resource for the actual users of a solution.

2. **The ISV.** Once problems arise, however, the customer quickly turns to the ISV to provide expertise and guidance towards resolving any issues.
3. **The embedded technology vendor.** Finally, the ISV may not be equipped to decipher the predicament, and will look to the vendor of the embedded technology for answers.

Unfortunately, this multi-entity process is riddled with potential failure points and other complications. While the support issue cannot be completely sidestepped, it's much safer and simpler to cut the problem down to size by embedding solid, low-maintenance technology.

3 Why MySQL for ISVs?

Now that we've itemized the worrisome topics for ISVs to consider as they bring a solution to market, it's time to see how embedding database technology from MySQL can help alleviate many of these apprehensions.

3.1 Managing the Market Landscape

In this section, we explore how choosing MySQL as the embedded database platform provides important advantages when it comes to how the marketplace perceives the ISV's offering.

3.1.1 Time to Market

Getting to market quickly can be a key differentiator for any vendor wanting to gain an edge. Since engineering staff is almost always overloaded and stretched attempting to deliver a new solution, one way to slow down a product's release is to waste key development talent on building ancillary technology that could be bought instead. By selecting MySQL as the embedded database platform, the ISV is able to focus on what it does best, rather than creating its own data storage infrastructure.

3.1.1.1 LeapFrog SchoolHouse – Using MySQL to Regain Focus on Core Competencies

LeapFrog SchoolHouse is a leader in the education technology market. Their simple-yet-sophisticated LeapTrack® Assessment and Instruction System is deployed in over 7,000 classrooms nationwide - helping budget-conscious school districts accurately test K-5 students and prescribe customized instruction in Reading, Math, and Language Arts. At the heart of the LeapTrack software is the MySQL database management system. LeapTrack was originally developed as a Windows-only product based on Microsoft Access. However, because the Apple Macintosh is such a popular computer in the educational market, LeapFrog SchoolHouse engineers later produced a Mac version built upon a proprietary database. Soon, it became apparent that even though the two applications shared much of the same code, it was too difficult and expensive to support two separate code-bases. By embedding MySQL, they were able to resume their engineering team's focus back to the core task of creating award winning educational software.

3.1.2 Brand Name Recognition

Through the years, MySQL has become a well-respected brand in the open source space, and the de-facto choice for databases. In fact, since the grassroots community has included it in the LAMP (Linux, Apache, MySQL, and PHP/Perl) acronym, it is considered in the same league as the other core open source infrastructure components. Every day, MySQL is downloaded more than 50,000 times. With over 10 million global installations, MySQL is the world's most popular open source database.

Enterprises in a wide range of industries and applications have selected MySQL to run the most mission-critical applications. A very small yet diverse sample of these references includes:

- **Google.** Employs MySQL as the database infrastructure for their vital Google Ad Words offering
- **Continental Airlines.** Relies on MySQL as the underlying database platform for ticket reissues.
- **DirecTV.** Utilizes MySQL to power its YES interactive TV application
- **U.S. Census Bureau.** A collection of strategic websites are built on MySQL.

For ISVs seeking to construct their solutions on a rock-solid, market-accepted platform, MySQL represents a safe choice. Solution vendors supporting an expansive and diverse stretch of industries have all entrusted MySQL as their data management selection. A small sampling of these markets includes technology (network management, security, storage, and so on), finance, medical, and education. Finally, the solutions themselves are delivered on manifold platforms, such as black-box hardware devices, hosted Software as a Service (SaaS), and traditional on-premise software.

Quickly turning prospects into customers, and then speeding new customers into production is the most effective way for ISVs to better control costs, maximize revenue, and thrive in today's hyper-competitive market. Given MySQL's ISV-friendly architecture, installation, and support capabilities, bundling MySQL as the embedded database permits the vendor to focus on core competencies, rather than being forced to work around database limitations. In addition, given MySQL's prominence and market acceptance, the ISV doesn't need to "hide" the fact that their product includes this embedded database. Analysts such as Forrester and Evans Data confirm MySQL's sizeable and growing market leadership, which means that the ISV's target customers are much more likely to bless this embedded technology. On the other hand, for ISVs that employ a less well-regarded technology, there is a significant risk that prospects will reject the embedded database, or at the very least require an expensive and time-consuming series of benchmarks and other tests to validate the technology.

3.1.3 Leveraging Market Trends

The pace at which open source solutions have penetrated even the largest, most conservative enterprises is truly astounding. These customers no longer view open source with suspicion and doubt; to the contrary, they now are dubious about technology that does not provide the opportunity to view its inner workings. For ISVs that have traditionally included closed, proprietary components, this new worldview represents a major peril. They run the very real risk of missing out on a major market trend. If this danger weren't enough, it's important to note that the movement towards open source is accelerating. Customers have evolved to a point where they now rely on the transparency offered by open source. Since ISVs must plan on a product having a multi-year lifecycle, this means that by the time the offering hits the middle of its lifespan, there may not be any customers left who will entertain the possibility of purchasing a proprietary solution, especially if newer competitors have adopted open source in the interim.

Including open source components such as MySQL in their solution helps ISVs proactively plan to meet these new market trends head-on, rather than reacting after the fact. Finally, since open source by definition is easier to evaluate than closed source, the ISV's technical staff can experiment to find the ideal blend of technologies to deliver the right solution.

3.1.3.1 SONY International - Standardizing on LAMP platform

Sony International (Europe) GmbH in Stuttgart, Germany runs one of the most modern electronic measuring facilities in the world. In this laboratory, Sony tests all electronic entertainment devices in accordance with existing emissions regulations (e.g. CE Norm - The European Committee for Standardization). Any electronic product or device sold in the European Union (EU) countries must pass these tests and comply with these regulations.

Originally, the testing records were all paper-based, making it a very time-intensive to submit testing requests and look up certificates. To solve this problem, Sony created an extensive workorder system (FIS) built on the LAMP (Linux, Apache, MySQL, PHP/Perl/Python) stack which allows Sony employees, partners, and resellers to submit testing requests for particular products. The system also stores all testing results and the test certificates.

3.1.4 Cross-platform support

Since MySQL natively supports a broad range of operating systems, development languages, and platforms, selecting this embedded database technology also gives the ISV maximum flexibility to port their solution to new environments. In many cases, a vendor will develop a product for one platform, only to belatedly learn that the market has moved in another direction. Even if the market hasn't moved, customers have their own requirements and agendas that may require support for a new environment. By selecting MySQL, the ISV can rapidly adapt to these new realities. Alternatively, by settling for a less flexible option, the vendor may not be able to easily accommodate customer requests or market demands.

3.2 Dealing with Competitors

ISVs face an arena filled with focused, direct competitors. As if this prospect wasn't intimidating enough, choosing an embedded database from a mega-vendor such as Microsoft or Oracle means that the ISV may be placed in the unenviable position of competing with an extremely deep-pocketed powerhouse, one that happens to supply core technology. Even if these behemoths haven't yet entered the ISV's marketplace, there's a good chance that they will at some point in the future, or at least acquire a direct competitor.

What makes the possibility of competing with a gargantuan technology supplier particularly unpleasant is that these firms have a history of entering markets after the trailblazers have shouldered all the burdens of evangelizing the new space. This means that all through the product development and initial customer acquisition phases, the ISV will not be aware of the impending entry of their technology supplier. Once the supplier does enter the market, the ISV will be forced to compete on price, features, and vendor viability with a competitor that will position itself as a safe, "one stop shop". Finally, due to typical royalty and other reporting requirements, there's a good chance that the embedded database vendor will be privy to the ISV's entire customer list.

3.2.1 Using MySQL to Deliver Competitive Advantage

Because of perceived solution simplicity or other factors, some ISVs will decide that an embedded database is not necessary. However, this places the vendor in a weakened position for a variety of reasons. To begin, if competitors currently or soon plan to include a relational database, this fact will be cited as proof of the incomplete solution offered by the ISV. Secondly, a relational database such as MySQL offers abundant features and enabling capabilities that can be leveraged by the ISV and their customers.

For example, in the past few years, enterprises have been increasingly employing Business Intelligence (BI) and reporting software to help make sense of the volumes of data captured as part of daily operational activities. When choosing between two solutions, one which offers a BI-ready database such as MySQL, and another that uses a closed, proprietary data storage mechanism (or none at all), the prospect will likely select the option that aligns more closely with their organization's information strategy. Finally, by either failing to include a database, or embedding a closed, proprietary solution, the ISV faces the significant hazard of being left behind by more prescient competitors that are riding the growing wave of customer adoption of open source and LAMP technologies.

3.2.1.1 S2 Security Corporation – Extending Product Reach with MySQL

S2 is an example of an ISV that was able to use an easily-embedded relational database such as MySQL to provide additional features and gain competitive advantage. S2 is an innovator in the development of network-based integrated physical security solutions. These systems provide key security functionality including access control, alarm monitoring, temperature monitoring, video and intercom. By employing network appliance architecture, S2's product line is cost-effective enough for use at a single location yet scalable enough to accommodate the largest wide-area security networks. The S2 solution is much more cost-effective than any competitive product because S2 has been able to embed full database functionality into its product at a significantly lower cost. In addition to S2's built-in reporting capabilities, MySQL's ODBC driver lets the customer employ other third-party tools to create even more customized reports.

Finally, since MySQL is designed to provide a small footprint, low overhead and high performance, there is a good chance that the ISV's solution will be able to run on the customer's existing hardware, or on new, low-cost commodity platforms. This gives the ISV a competitive advantage against other vendors that require expensive, heavyweight upgrades.

3.2.2 Streamlining the Sales Cycle

With all of the choices for data management available on the market, rather than selecting and embedded a given platform, some ISVs elect to provide their prospects and customers with a list of "approved" technologies, and then step out of the way and let them negotiate directly with these vendors. Other ISVs assume that their prospects will already have licenses in place with database vendors, and that these licenses can be used to support the ISVs new solution. Both of these assumptions are risky, and introduce unwanted dangers into the sales and delivery cycle.

To begin, by asking a prospect to select database technology from an approved list instead of serving as a “one stop shop”, the ISV gives up significant control over the sales cycle. The separate database selection and purchase process may go quite smoothly. However, it may also force the prospect into a long, drawn-out evaluation process for a previously-unplanned purchase. This typically requires involvement and sign-off from additional constituencies, some of whom may not understand or want to negotiate a separate arrangement with another vendor.

For prospects that already have already licensed database technology for other projects and purposes, it’s a risky bet for the ISV to assume that these licenses are site-wide and can be used to support the new solution. Even *carte blanche* site licenses come with restrictions, and these limitations may not be apparent until late in the sales cycle, or even after the customer has purchased the ISV’s solution. The customer is then placed in the unenviable position of having to obtain a valid database license after all, or even worse: beginning a new database evaluation process should the license terms be too unwieldy or costly.

For these, and many other reasons, embedding MySQL is much safer and cleaner, and helps the ISV stay more in control of the sales cycle.

3.3 Controlling Product Costs

It’s rare to find an ISV that isn’t under margin pressure. Customers have come to expect more functionality for less cost, and this translates to shrinking profit margins. One way for vendors to control expenses and maintain profitability is to carefully oversee the cost-of-goods-sold (COGS) for their product. Unfortunately, licensing an embedded database from most providers introduces a high degree of unpredictability into the ISV’s financial calculations. This is because the ISV must carefully and accurately predict transaction volumes and other usage patterns for their solution. These metrics are then “baked in” to the licensing agreement with the database provider, and may also drive the choice of a particular database edition.

However, if in reality the actual workload or usage patterns exceed vendor-specified limitations and restrictions, then the ISV will be faced with a series of unpleasant decisions. To begin, the ISV will be contractually bound to renegotiate the embedded licensing agreement, either globally or on a customer-by-customer basis, or even plug in a different version of the vendor’s database to support the transaction volume. These extra charges can evaporate the ISV’s profit margins and greatly complicate the already laborious process of bringing a new product to market. In fact, in some cases the new terms may be so onerous that the ISV may need to undertake a product re-architecture. Existing customers may also find themselves impacted by these new cost realities, having to pay additional licensing fees or purchase their own database software. Overshadowing all of these circumstances is the already-described possibility that the database vendor may be a competitor with the ISV.

3.3.1 Preventing Cost Overruns

Unlike the database products offered by other vendors, which come in a bewildering variety of configurations, price points, and license covenants, MySQL offers a single embedded license agreement. This agreement covers the entire MySQL product suite, with no restrictions on user count, transaction load, CPU class, or data volume. This means that the ISV can develop, ship, and support their product without having to worry about future usage patterns. In addition, MySQL offers qualified customers strong indemnification protection when embedding its technology.

3.3.1.1 PortaOne – MySQL Provides Affordability and Easy Installation

PortaOne is a leading solution provider for Voice over IP (VoIP) infrastructure: billing, management and customer care solutions. By providing an easy to use, turn-key solution, PortaOne allows small and medium sized Internet Telephony Service Providers (ITSPs) to deliver global carrier-grade services in a matter of days. PortaOne's target market required an affordable database with proven performance, scalability, reliability, and zero administration. Bundling MySQL has delivered on this promise: PortaOne customers now enjoy all the benefits of both commercial and open-source software without having to deal with drawbacks of either one. Support costs are under control as well, since MySQL's ease of use and Zero Administration capabilities help get customers installed and configured in less than 15 minutes.

3.3.2 Delivering a Low TCO Solution

MySQL's proven low total cost of ownership (TCO) translates into reduced ongoing expenses for the vendor and their customers. Its small footprint, easy installation, and Zero Administration capabilities help manage TCO throughout the all of the product development, deployment, and maintenance processes.

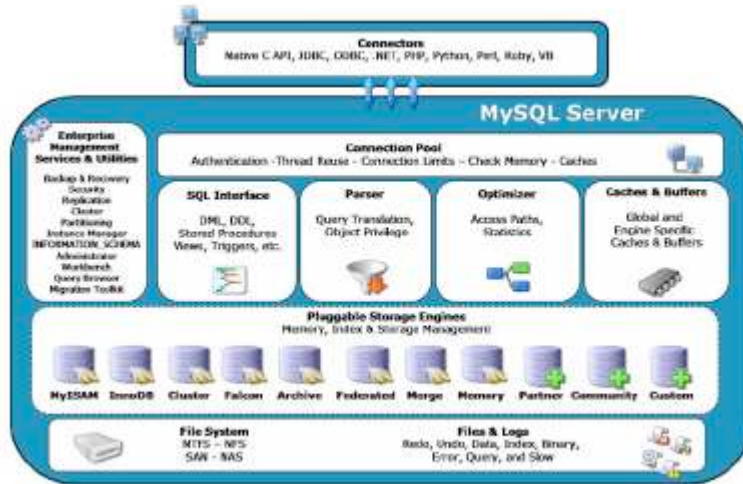
3.3.2.1 Suzuki – Embedding MySQL in Sales Kiosks

American Suzuki Motor Corporation (ASMC) teamed with Matrix Consultants to develop the Suzuki Sales P.R.O. (Professional Retail Outlet) kiosk, an award-winning sales tool for ASMC dealers nationwide. It puts all product information at the fingertips of the sales person and integrates it into the sales process. The system also allows the dealers to quickly offer new products and accessories to its customers faster than competitors. MySQL is at the core of this solution, driving the database requirements for the Suzuki Sales P.R.O. at over 600 dealerships nationwide. The kiosk application required an affordable database with proven scalability, reliability, and zero administration. After evaluating numerous databases, Matrix Consultants choose MySQL as the ideal database to meet these requirements.

3.4 Technology

In addition to all of the market, competitive, and product cost justifications for selecting MySQL, ISVs can feel confident about its technical architecture and feature set. To begin, MySQL's open source architecture means that there are no mysteries as to its inner workings. While most ISVs will never need to modify, or even examine MySQL's source code, it's comforting to know that it's always available for inspection and, if need be, customization.

Figure 1 shows MySQL's architecture.



From the perspective of an ISV, there are numerous compelling technical reasons for basing a product on this infrastructure. To begin, MySQL’s pluggable storage engine infrastructure gives the ISV’s product architects maximum flexibility and control when designing, developing, and configuring their solution. There’s a storage engine for just about every data processing profile, as summarized in the following table:

Processing Profile	Storage Engine
General purpose	MyISAM
Transaction-oriented	InnoDB
Data warehousing	MERGE
High availability	NDB
Extremely fast, transient persistence	MEMORY
Distributed processing	FEDERATED
High volume Web servers	Falcon

To make deploying the right engine as easy as possible, it only takes a single statement to install the storage engine. To help keep the deployed solution’s footprint as small as possible, the ISV can elect to include only the necessary engine(s).

3.4.1 Extending MySQL

As a core company philosophy, MySQL AB encourages third party engine development via the MySQL Storage Engine Partner Program. Examples of these products include:

- NitroEDB - Designed to support dramatic performance increases when processing multi-billion record sets.
- BrightHouse - Providing extreme compression for archiving multi-terabyte data warehouses.
- solidDB - Tailored for mission-critical applications that require strong transactional support.

Finally, for those ISVs with highly specialized processing needs that are not fully addressed by an existing storage engine, MySQL’s open architecture offers the ability to easily create and plug in new, customized storage engines.

3.4.2 Flexibility to Work with Multiple Languages and Platforms

MySQL supports numerous database connectors, giving the ISV the freedom and flexibility to develop their solution and interact with the database using a wide variety of programming languages and technologies, including:

- ODBC
- Java
- Java Beans
- .NET
- PHP
- Perl
- Python
- Ruby

MySQL also offers strong cross-platform capabilities. By selecting this infrastructure, the ISV can deliver their solution with confidence, knowing that it will be easy to support additional platforms should the market require this flexibility. For example, the ISV may initially offer their product on Windows, but may soon discover that it's necessary to port to Linux or other operating systems. Choosing MySQL means that at least the database component will not be a factor when porting to a new environment. MySQL is certified on the following environments:

- Windows
- All major Linux platforms
- All major UNIX platforms
- Mac OS X
- Novell Netware

For those ISVs that select a database infrastructure that is more limited in its portability, new market requirements will generate extensive re-architecture efforts. This type of work is time-consuming, costly, and risky, since customers are not known for infinite patience and competitors don't stand idly by, either.

3.4.3 Performance and Scalability

MySQL provides a unique blend of low TCO combined with high scalability and performance. This combination of traits is ideal from the ISV's perspective, as it provides maximum flexibility for the entire range of potential customer deployments.

For ISVs tempted to select a less capable, lighter-weight embedded database (or even choose a file system-based information repository), there are real risks if the actual usage patterns of their solution outstrip their embedded technology's capabilities. In this type of scenario, the ISV may need to ask their customers to upgrade their hardware, or replace the default data storage selection with a more industrial strength solution such as MySQL. As we've already seen, making these types of enhancements on the fly introduces unnecessary excitement, and can greatly inconvenience the customer.

3.4.3.1 Alcatel-Lucent – MySQL replaces proprietary solution, delivers high-performance

Alcatel-Lucent is an example of an ISV that carefully evaluated performance capabilities and then chose MySQL. Alcatel is a leader in fixed, mobile and converged broadband networking, IP technologies, applications and services, offering end-to-end solutions that enable service providers, enterprises and governments worldwide, to deliver voice, data and video communication services to end-users. The next generation subscriber database applications such as the HLR (Home Location Register) have become critically important for telecommunication services companies to achieve their goals. Up until 2005, Alcatel's legacy HLR system had been based on proprietary database technology. However given the enormous growth in the number of subscribers the system was to manage effectively, it became apparent to Alcatel that they needed a new solution. In addition to being a viable alternative in the long run, the subscriber database at the heart of the application needed to provide more flexibility and to deliver higher performance, scalability, and reliability at a lower cost. After an extensive evaluation period and numerous performance benchmark tests, Alcatel selected MySQL Cluster Carrier Grade Edition as their database of choice for their next generation HLR solution.

3.4.3.2 Zimbra – Using MySQL to handle large volumes of information

In addition to its high performance capability, MySQL can also gracefully handle large volumes of information. For example, Zimbra is the leader in open source, next-generation messaging and collaboration software, supporting over 8 million paid mailboxes across tens of thousands of organizations. Their customers include well-known service providers, Fortune 1000 enterprises and leading education institutions. The Zimbra Collaboration Suite solution unifies email, contacts, shared calendar, VoIP, and online document authoring in a rich browser-based interface and integrates with a full messaging and collaboration server. To ensure high levels of scalability, reliability, security and high-performance, Zimbra chose to build their solution on top of proven, high-quality open source components including Linux, Apache, MySQL and Ajax.

3.5 Providing a Good Installation and Support Experience

For ISVs, a winning customer support experience begins when their solution is first installed. Some vendors may elect to deploy their offering as a “black box”, thus concealing any embedded technologies such as a database platform, while other vendors take a more transparent approach, and let the customer see everything that's being deployed. Still others may follow a more flexible path.

3.5.1 Simplifying Installation

Regardless of the exact desired course, MySQL gives the ISV the freedom to completely control the installation experience. It also sports a small footprint and low overhead, which gets customers up-and-running more quickly, with less chance for complications. Other database offerings that are not as ISV-friendly will often require much more onsite installation, configuration, management, and performance tuning. These requirements can place a heavy burden on the staff of both the ISV and the customer, and can significantly influence whether an opportunity turns into a sale, and whether a sale turns into a satisfied account.

3.5.2 Somix Technologies - Using MySQL to get customers into production quickly with minimal support

Somix Technologies is a Network Management company that provides products and services to some of the world's leading companies such as Disney Stores, Fannie Mae and AutoZone. Somix found that existing Network Management products were expensive, difficult to implement, and did not capture the level of detail for Network Managers to effectively identify traffic bottlenecks and optimize the performance of their networks. To provide enterprise network managers with effective real-time decision making capabilities, Somix captures 20x more data than existing network management products. Somix relies on MySQL to manage these high-volumes of data. Furthermore, MySQL was cost-effective, enabling Somix to satisfy the requirements for price-sensitive small and medium businesses (SMBs). As a result, Somix has enabled their customers to save millions of dollars by optimizing their network resource utilization rates. Finally, bundling MySQL also fit Somix' philosophy of getting customers into production quickly; the US Department of Agriculture was able to set up Somix WebNM in just 3 days, and avoided weeks of high cost training and consulting.

3.5.3 Minimizing Maintenance

Once the installation is out of the way, the MySQL database is designed to run with minimal maintenance. Most ISVs elect to pre-configure and pre-tune their embedded MySQL installations, which means even less work for the customer. If need be, administrative tasks can be handled through a number of different channels, from easily-accessed utilities through the graphically-rich Enterprise Management Services and Utilities.

For situations that do require database vendor guidance, MySQL AB fields a highly qualified professional services and technical support organization. A fully customizable menu of support options is available, from electronic assistance all the way through 24x7 services.

4 Conclusion

Every ISV faces the challenge of getting a robust, full-featured product to market quickly and cost-effectively. MySQL provides a safe alternative to the stripped-down entry-level databases offered by the major players, and the lightweight offerings from obscure infrastructure providers. The following table itemizes some of the primary impediments to success, along with how MySQL helps overcome each obstacle.

Challenge	MySQL Advantage
Market	
Acceptance of selected database infrastructure technology.	Core of the most mission-critical applications at enterprises such as Google, NASA, Toyota, and the Chicago Mercantile Exchange.
Responding to market opportunities quickly.	Let engineers focus on delivering a world-class product rather than building their own storage architecture or working around a feature-limited database.
Movement away from closed solutions towards open source.	World's most popular open source database: 50,000 daily downloads, 10 million installations.
Supporting multiple platforms.	Available on Windows, Linux, UNIX, Macintosh.
Providing broad range of connectivity.	Connectors for ODBC, Java, Java Beans, .NET, PHP, Perl, Python, Ruby.
Competitive	
Competing with provider of embedded database technology.	MySQL AB only provides best-of-breed information storage technology, not enterprise applications.
Offering sophisticated data management features.	Feature-rich relational database platform easily integrated with business intelligence tools.
Forcing customers to buy new hardware.	Lightweight footprint and streamlined design extend life of older platforms.
Embedding a stripped-down database.	All features and capabilities are available on embedded database platform.
Cost of Goods Sold	
Delivering a low Total Cost of Ownership.	Designed for small footprint, easy installation, and zero to near-zero maintenance.
Avoiding surprise license cost overruns.	No license-based limits on database features, functionality, and transaction volume.
Managing indemnification risks.	Embedded database license provides indemnification protection.
Technology	
Struggling with "one-size-fits-all" database engine architecture.	Choice of highly specialized pluggable engines based on ISV processing requirements.
Working around a closed architecture.	Open source solution; pluggable engine architecture.
Scaling to meet high transaction volumes.	Supports some of the most transaction-intensive applications in finance, technology, and transportation.
Managing large amounts of data.	Numerous multi-terabyte data warehouses in production.
Support	
Providing a good out-of-the box installation	Designed for deep embedding and automated

experience.	installation/configuration.
Delivering compact product footprint.	Can run with as little as 40 MB of disk and 10 MB of memory.
Ongoing administration.	Automatically-managed memory settings, connection pool, and disk space; rich graphical tools provided as well.
Lack of vendor assistance resources.	Extensive training, consulting, and technical support options available from MySQL AB.

5 About the Author

Robert D. Schneider is a Principal at Think88 LLC. Based in Silicon Valley, and drawing from a deep pool of global talent and expertise in a wide variety of disciplines, Think88 delivers high-value solutions quickly and cost-effectively in the following practice areas:

- Integration and training based on modern Service Oriented Architecture (SOA), Open Source, and Software as a Service (SaaS) technologies.
- Technical sales and marketing methodologies, best practices, and content for growing enterprises.
- High performance database selection, design, development, and optimization.

Previous to Think88, Robert led all pre-sales, post-sales, training and support for Above All Software, a provider of composite application technology. Before Above All, he was the co-founder and Vice President of Professional Services for Optimize Solutions, Inc. Prior to Optimize, Robert led the Client Services organization as Director of Sales Engineering at Visigenic Software, as well as serving as a senior consultant at Informix Software.

He has provided database optimization, distributed computing, and other technical expertise to a wide variety of enterprises in the financial, technology, and government sectors. Clients have included Chase Manhattan Bank, VISA, HP, S.W.I.F.T., and the governments of the United States, Brazil, and Malaysia. Robert has written 4 books and numerous articles on database technology such as SQL Server and MySQL, and other complex topics such as information integration, SOA, and SaaS.