

ORACLE**TECHNOLOGY NETWORK****TECHNOLOGY: Information Matters**

The Luxury of Architecture

*By George Demarest***As industries mature, an associated, well-planned architecture becomes a necessity.**

On a windy night in July of 1545, the British war ship *Mary Rose* and her crew slipped beneath the waves off the southern coast of England in full view of her patron, King Henry VIII. Severe conditions, an outmoded design, and good old-fashioned panic had sealed her fate.

Welcome to the inaugural volume of *Information Matters*, a column dedicated to the examination of technology architectures and the best practices that make them work. In each issue of the magazine, I will highlight both established and emerging architectures that impact Oracle, our partners, our customers, and the industry as a whole. From grid computing to information quality to application design, this column will take a step back from the product features and the latest tools and examine the broader architectural issues and solutions facing information technology (IT) architects. Readers will be able to glimpse some of the inner workings of Oracle and the design decisions we make when developing and releasing a new product or service.

Beyond Research and Development there is Architecture

The *Mary Rose*, one of the king's favorites, had just led the British fleet out of Portsmouth Harbor to face an advancing enemy fleet from across the English Channel. Coming under fire, the *Mary Rose* turned to face her adversaries when a sudden gust of wind struck her broadside. With her lower gun ports open to the waves, she quickly took on water and sank. In his anxiety over the approaching enemy, her captain had rigged netting to repel boarders, ultimately trapping most of her crew of 411 below deck at the critical moment.

For the IT world, the story of the *Mary Rose* is illustrative on several points. Like a ship at sea, IT systems and their attendant architectures must be able to withstand sudden currents and unexpected conditions—from fluctuating workloads to loss of connectivity to failed disk drives. For the *Mary Rose*, battle conditions coupled with an obsolete design were her undoing.

So it is in the data center: Flaws in a system architecture and the confusion that can ensue aren't always apparent until conditions become dire or until a unique set of circumstances stresses the systems in new or untested ways.

Today's ships are architected to withstand the worst that the environment can throw at them. They have redundant electrical and mechanical systems and sophisticated procedures for dealing with the many eventualities of the sea. But in shipbuilding, as in many things in life, many critical technologies and practices are seen as luxuries until some illuminating disaster strikes. This has long been the case in IT as well. Who has time for architecture?

Yet, each year, the number of IT professionals listing their job function as "system architect" increases in our annual Oracle OpenWorld survey. Clearly, more and more companies have time—and, by inference, the budget—for architecture. Why is that?

Noted architect Frank Lloyd Wright once said, "We will never have a culture of our own until we have an architecture of our own." Most businesses today have a unique corporate culture, but the IT subculture is a much more recent phenomenon. And as the IT industry has matured, so has good IT architecture moved from being a luxury to being a necessity.

In every field, architecture is marked by pivotal design breakthroughs upon which many other breakthroughs depend. In naval architecture, we can point to advancements in locomotion, materials, and weaponry. In civic architecture, keystones led to arches, and arches led to bridges and aqueducts. Before long, these same design principles enabled architects to design magnificent structures such as the Parthenon and the Sistine Chapel. The pivotal designs in the IT world include microprocessors, disk storage, Ethernet, removable media, client/server program design, graphical desktop metaphors, HTML, XML, and so on.

Masterpieces of IT architecture, like their cousins dotting the world's physical landscapes, also abound. But unlike their steel and concrete counterparts, their genius is in their invisibility. Think about how your credit card works. You can wake up in the morning, show a piece of plastic at your favorite diner to get some corn flakes, pop it into a machine at the airport and pick up tickets to London, go on a fabulous shopping spree without exchanging currency, and fly back home and pick up

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some aspirin for when the bills arrive. All of these transactions take just seconds to complete, pretty much wherever you are in the world. Multiply this by hundreds of millions of people who do some variation of the same thing each day. Staggering!

Oracle has proudly contributed to the body of these "invisible" IT masterpieces upon which today's enterprises run; consider the company's development of the first commercially viable relational database, for example, and more recently the Cache Fusion technology that makes Oracle Real Application Clusters possible.

Learning from Success and Failure

Each of these technological masterpieces depends on myriad successes and failures, both mundane and spectacular, that have occurred through years of exploration and experiment. For a lot of us in the world of high technology, it is this real possibility of creating our own masterpieces, great or small, that keeps the industry vibrant and exciting.

IT architecture is an increasingly common topic among industry experts. In the recent *Harvard Business Review* article "Getting IT Right," the authors name three critical steps to creating a high-quality IT environment: creating a long-term plan in line with overall company goals, building a "unifying technology platform" that serves the overall needs of your business, and developing a "high-functioning culture" that can anticipate and achieve strictly defined business goals.

This emphasis on planning and culture points to the essential part of good architecture: the human element. System architects, and the IT staffs that execute and support these architectures, have an increasing role not just on the technology side but in the overall operation of the business. Thus, in this space in upcoming issues of *Oracle Magazine*, we will hear from a wide range of system and business architects on the human impact of their work. What does it mean, in human terms, to achieve 100-percent uptime, or to handle millions of transactions per minute, or to change business operations in weeks rather than months or years?

Good architecture transcends time-honored practices and notions. Developers ignore it at their peril, which is why architectural discussions now occupy the thoughts of a much wider audience of IT professionals. And in an industry where today's cutting edge is tomorrow's commodity, proven architectural principles quickly move from the elusive concept to conventional wisdom in an ever-decreasing amount of time.

For example, not so long ago, fault-tolerant computer systems were cost-effective only for truly mission-critical applications. Today, even small businesses can take advantage of enterprise-class technology in both inexpensive off-the-shelf products and professionally managed software services. One such service is Oracle On Demand, an IT-outsourcing business, powered by a state-of-the-art computing grid at our Austin Data Center. The Oracle On Demand grid brings phenomenal capacity and capability to companies of all sizes at a relatively modest price point.

Like the ship designers in Henry VIII's time, sometimes we must sit and watch as past notions of excellence and design slip beneath the waves. At the time of her loss, the *Mary Rose* was a magnificent sight—and an anachronism. Her type was too cumbersome and slow to match the speed, maneuverability, and firepower of newer ships. Her standard operating procedures for taking the ship into battle stumbled on her obsolescence, thus compounding her architectural weaknesses and hastening her demise. Within three decades, the British navy had phased out ships like the *Mary Rose* and developed designs that were nimble and powerful enough to defeat the Spanish Armada. This type of evolution is occurring all the time in IT.

In the issues to come, we'll look more closely at new architectures that are just now coming within reach. Topics such as grid computing, heightened data quality, and service-oriented architecture will be presented not as inaccessible ideals but as visions of the near future, with emphasis on the practical rather than the theoretical. We'll identify the design techniques, the best practices, and the tools needed to steer our information systems safely and successfully through changeable seas.

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Next Steps

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