

CHAPTER 9: EMERGING TRENDS

Trends in Database Management

Concepts in database management hardly fall in the category of come-and-go, as the cost of shifting between technical approaches overwhelms producers, managers, and designers. However, there are several trends in database management, and knowing how to take advantage of them will benefit your organization. Following are the some of the current trends:

1. Databases that bridge SQL/NoSQL

The latest trends in database products are those that don't simply embrace a single database structure. Instead, the databases bridge SQL and NoSQL, giving users the best capabilities offered by both. This includes products that allow users to access a NoSQL database in the same way as a relational database, for example.

2. Databases in the cloud/Platform as a Service

As developers continue pushing their enterprises to the cloud, organizations are carefully weighing the trade-offs associated with public versus private. Developers are also determining how to combine cloud services with existing applications and infrastructure. Providers of cloud service offer many options to database administrators. Making the move towards the cloud doesn't mean changing organizational priorities, but finding products and services that help your group meet its goals.

3. Automated management

Automating database management is another emerging trend. The set of such techniques and tools intend to simplify maintenance, patching, provisioning, updates and upgrades — even project workflow. However, the trend may have limited usefulness since database management frequently needs human intervention.

4. An increased focus on security

While not exactly a trend given the constant focus on data security, recent ongoing retail database breaches among US-based organizations show with ample clarity the importance for database administrators to work hand-in-hand with their IT security colleagues to ensure all enterprise data remains safe. Any organization that stores data is vulnerable.

Database administrators must also work with the security team to eliminate potential internal weaknesses that could make data vulnerable. These could include issues related to network privileges, even hardware or software misconfigurations that could be misused, resulting in data leaks.

5. In-memory databases

Within the data warehousing community there are similar questions about columnar versus row-based relational tables; the rise of in-memory databases, the use of flash or solid-state disks (which also applies within transaction processing), clustered versus no-clustered solutions and so on.

6. Big Data

To be clear, big data does not necessarily mean lots of data. What it really refers to is the ability to process any type of data: what is typically referred to as semi-structured and unstructured data as well as structured data. Current thinking is that these will typically live alongside conventional solutions as separate technologies, at least in large organisations, but this will not always be the case.

Integrating Trends

Projects involving databases should not be viewed and appreciated solely on how they adhere to these trends. Ideally, each tool or process available should merge in some meaningful way with existing operations. It is important to look of these trends as items that can coincide: enhancing security and moving to the cloud coexist?

The Top Challenges and Solutions of Database Management

No matter what field you work in, there will be changes over time. As technology becomes more and more advanced, everyone from doctors to politicians and athletes must learn to use these changes to their advantage. While other professions have encountered these changes, few have experienced them on the same level as database administrators.

Thirty years after the computerization of databases, the Internet has led to an exponential growth within the industry – whether indirectly or directly, everything that compiles data uses a database. Recent times have proven to be an exceptional period of the production and capturing of a nearly overwhelming amount of data. This has obviously created opportunities for businesses to gain visibility into their customers and industry, but it has also created many challenges in database management.

Database Management Problems

- **Data Integration from Various Sources** – With the advancement of smartphones, new mobile applications, and the Internet of Things, businesses must be able to have their data adapt accordingly. These varying types of data and sources cause a typical data center of today to contain patchwork for data management technologies. The management techniques have become more diverse than ever.
- **Public and Private Data Security** – In today's digital world, security is the most prevalent concern. Businesses must be able to ensure that every bit of their data remains safe and at limited risk of exposure from hackers or leaks. Database breaches of highly sensitive information have led to the destroyed reputation of businesses. It is up to the manager of the database to ensure that the data is fully secured at all times.
- **The Management of Cloud-Based Databases** – In recent years, the Cloud has become one of the biggest terms in the tech community. Both businesses and consumers want to be able to access their data from database from the cloud or from a cloud database provider's servers in addition to the standard on-premises mode of deployment. Cloud computing enables users to effectively allocate resources, optimize scaling, and allow for high availability. Handling database that run on the cloud and on-premises is yet another challenge for database managers.
- **The Growth of Structured and Unstructured Data** – The amount of data that has being both created and collected has been growing at an unprecedented rate for years. Those who deal with analytics may be excited by the promise of insight and business intelligence that comes