OLTP vs. OLAP: The Era of Specialization

While the introduction of Sabre opened up the floodgates of using computers for business data management and analytics, it also hinted at a split that will remain with the data industry to this day: every data management system designed since the days of Sabre will be optimized for one of the following two main use cases:

- **Transaction processing** (nowadays called **OLTP**, or OnLine Transaction Processing Systems)
- **Data analysis, processing** and **reporting capabilities** (nowadays called **OLAP**, or OnLine Analytical Processing Systems).

Both of these terms are somewhat ambiguous in how they are applied today. At the risk of oversimplification, think of the OLTP category as systems designed to handle vast amounts of end user requests as fast as possible, while also maintaining the overall integrity of the system. Then, you can think of the OLAP category as systems designed to handle much more complex queries over vast amounts of data for the purpose of business intelligence or reporting rather than to process end-user transactions. OLTP is like being a bike messenger quickly darting from customer to customer, while OLAP is like being a freighter carrying vast amounts of cargo over long distances. For example, a customer shopping at an online store typically interacts with an OLTP system handling the shopping cart

and a final checkout. A CEO of the same online store grilling her regional managers on the sales projections for the next quarter is using reports generated by the OLAP system.

With this split in mind, it is easy to see IBM's IMS (Information Management System) as one of the first clear examples of OLTP systems introduced to the market in 1966. Even though it was nothing like the relational databases we know today, it featured a few building blocks (such as a Transaction Manager) that modern-day database practitioners will have no trouble recognizing. Still, the IMS was a hierarchical database in its implementation and APIs. It took the pioneering work of E.F. Codd on the relational approach to database design to not only produce a superior implementation, but, more importantly, help introduce a declarative API that would become synonymous with the database industry for years to come: **SQL (Structured Query Language)**.

On the other side of the OLTP/OLAP split was Bill Inmon, who focused on reporting and data analysis, paving the way to the whole industry of **BI (Business Intelligence)**. His approach was to look at databases as gigantic integrated repositories of data points taken from a variety of different sources. In order to describe this particular way of using the database technology, he coined the term **EDW (Enterprise Data Warehouse)**. This happened around the same time as E.F. Codd and his IBM colleagues were working on SQL for System R.

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