

A Historical Perspective on Extensible and Composable Data Systems (Keynote Talk)

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ABSTRACT

Compared to the architecture of IBM San Jose Research Laboratory's System R, in the context of which the language SQL was developed first, the architecture of database management systems (DBMSs) has evolved a lot. As new requirements with respect to the external and internal functionality of DBMSs arose, the initial System R architecture was found to be quite rigid and requiring significant work to accommodate the new requirements. That led to the emergence of several DBMS research projects focused on extensible and composable system architectures. Once open-source software and software-as-a-service (SaaS) concepts became commonplace, they also provided additional impetus to the evolution of DBMS and other middleware architectures. In certain use-case scenarios, such architectures resulted in performance degradation and/or worse price-performance. In such cases, a more tightly integrated hardware-software co-design was found to be better. In this talk, I will trace these historical developments and discuss the features of a few state of the art systems.

Speaker Biography: Dr. C. Mohan is currently a Distinguished Professor of Science at Hong Kong Baptist University, a Distinguished Visiting Professor at Tsinghua University in China, and a member of the inaugural Board of Governors of Digital University Kerala. He retired in June 2020 from being an IBM Fellow at the IBM Almaden Research Center in Silicon Valley. He was an IBM researcher for 38.5 years in the database, blockchain, AI and related areas, impacting numerous IBM and non-IBM products, the research and academic communities, and standards, especially with his invention of the well-known ARIES family of database locking and recovery algorithms, and the Presumed Abort distributed commit protocol. This IBM (1997-2020), ACM (2002-) and IEEE (2003-) Fellow has also served as the IBM India Chief Scientist (2006-2009). In addition to receiving the ACM SIGMOD Edgar F. Codd Innovations Award (1996), the VLDB 10 Year Best Paper Award (1999) and numerous IBM awards, Mohan was elected to the United States and Indian National Academies of Engineering (2009), and named an IBM Master Inventor (1997). This Distinguished Alumnus of IIT Madras (1977) received his PhD at the University of Texas at Austin (1981). He is an inventor of 50 patents. During the last many years, he focused on Blockchain, AI, Big Data and Cloud technologies (<https://bit.ly/sigBcP>, <https://bit.ly/CMoTalks>). During 1H2021, Mohan was the Shaw Visiting Professor at the National University of Singapore. Since 2016, Mohan has been a Distinguished Visiting Professor of China's prestigious Tsinghua University. In 2023, he was named Distinguished Professor of Science of Hong Kong Baptist University. In 2021, he was inducted as a member of the inaugural Board of Governors of the new Indian university Digital University Kerala. Mohan has served on the advisory board of IEEE

Spectrum, and on numerous conference and journal boards. During most of 2022, he was a consultant at Google with the title of Visiting Researcher. He has also been a Consultant to the Microsoft Data Team in 2020. Mohan is a frequent speaker in North America, Europe and Asia. He has given talks in 43 countries. He is highly active on social media and has a huge network of followers. More information can be found in the Wikipedia page at <https://bit.ly/CMwIkP> and his homepage at <https://bit.ly/CMoDUK>.

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