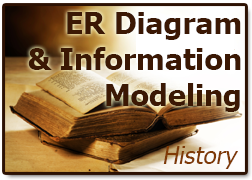
**A Short History of the ER Diagram and Information Modeling**

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[](http://www.dataversity.net/wp-content/uploads/2012/09/Modeling-History.png?x23053)by [Paul Williams](http://www.dataversity.net/contributors/paul-williams)

Data modeling came into vogue in the 1970s driven by the need to properly model databases or even real-world business processes. Peter Chen, an attendee at this year’s [Enterprise Data World](http://www.dataversity.net/enterprise-data-world-2012-conference-overview/) conference, popularized the Entity-Relationship model in a [paper published](http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.123.1085) in 1976.

The previous year, A. P. G. Brown, in a publication for the [International Federation for Information Processing](http://www.ifip.or.at/) (IFIP), published an article called *Modelling (sic) a Real-World System and Designing a Schema to Represent It.* While Brown’s seminal volume is surely relevant to this discussion, Chen’s paper, especially since it focused on the terms “entity” and “relationship,” is generally considered to be the beginning of the Data Modeling practice as it is known today.

Bachman Diagrams, a form of Data Modeling, also deserve some mention. Charles Bachman’s seminal late 60s article in DATA BASE put forth the concept of database “entities” and one of the first data structure diagrams, later to be known as a Bachman Diagram. Bachman was highly influential on Peter Chen.

Bachman wasn’t alone in contributing to the dawn of the Data Modeling practice. In the early 1970s, a UK-based systems engineer for IBM, J. Barrie Leigh, developed nascent ER diagrams for annuity system he worked on for the Royal Insurance.

Clive Finkelstein’s work as the progenitor for the practice of Information Engineering remains a relevant part of the history of data or process modeling. James Martin, for a time an associate of Finkelstein, is also a major player behind the history of Computer Aided Software Engineering (CASE) and Business Process Reengineering which plays an important role in Enterprise Information Architecture as a whole.

A closer look at these progenitors of the Information Modeling practice reveals how a few software and systems engineers were able to influence an entire history. Their work still echoes today whenever a DBA places an entity on a model or draws a line denoting a one-to-many relationship.

**Charles Bachman Diagramming Data Structures**

After serving in the Pacific Theatre for the US Army during World War II, Charles Bachman earned a Bachelors Degree in Mechanical Engineering from Michigan State University, followed by a Masters in the same discipline from the University of Pennsylvania.

Bachman honed his analytical skills working for Dow Chemical in the 1950s, rising to Data Processing Manager before leaving to join General Electric in 1960. At GE he developed the Integrated Data Store, known as one of the first widely-used networked databases. IDS-influenced systems are still in production today, namely [British Telecom’s massive CSS database](http://home.bt-webworld.com/ukiua/Articles/BTbyBobRatcliffe.htm).

For GE, Bachman also developed data Basic, a tool facilitating database access for an early form of the Basic language. It was in the summer of 1969, however, that he published the seminal article, *Data Structure Diagrams*, for DATA BASE, a publication by the Special Interest Group on Business Data Processing. The article put into print the concept of a data entity as well as what became known as the Bachman Diagram – an early form of the ER Diagram. Both were very influential on Peter Chen.

Bachman’s important work in database technology did not go unnoticed. He received the ACM Turing award in 1973 for “outstanding contributions to database technology,” and in 1977 was named a Distinguished Fellow of British Computer Society.

**Dissecting Peter Chen**

Born in Taiwan, Peter Pin-Shan Chen earned a Bachelors Degree in Electrical Engineering in 1968 from the National Taiwan University, followed in 1973 by a Ph.D. in Computer Science and Applied Mathematics from Harvard. As compared to Bachman’s corporate life, Chen spent most of his career in academia, with significant time spent in professorships at MIT, UCLA, and LSU. He is currently a distinguished faculty member at Carnegie Mellon University.

Inspired by Charles Bachman and others’ previous work, Chen formalized and popularized the Entity Relationship Model and Diagram in his famous paper, [*The Entity-Relationship Model — Toward a Unified View of Data*](http://www.csc.lsu.edu/news/erd.pdf). The paper, published in 1976 in the ACM’s *Transactions on Database Systems* while Chen was a professor at MIT, remains relevant today.

Given Chen’s position in the academic community, it makes sense that his ER modeling principles form the basis of many college courses and books. The ER model was also named an ANSI standard. In addition to database design, Chen’s ER model also serves well in systems and information modeling applications. The Unified Modeling Language (UML) is in many ways descended from the Entity Relationship model.

The maturing software development industry in the 1980s and 1990s saw the ER model being used as a framework for developments in the world of Computer Aided Software Engineering (CASE). Famous data modeling tools like ERwin, PowerDesigner, and even modelers embedded in IDEs like Microsoft’s Visual Studio, Apple’s Xcode, and Eclipse owe a large debt to Peter Chen’s vision.

**Clive Finkelstein, the Father of Information Engineering**

Australian computer engineer [Clive Finkelstein](http://www.ies.aust.com/cbfindex.htm) earned his Bachelors of Science degree in 1961 from Sydney’s University of New South Wales. He is considered by many to be the Father of Information Engineering, and was named a fellow of the Australian Computer Society in 1972.

In the mid 1970s, when faced with a need to translate strategic business requirements into something useful to the world of information systems, Finkelstein formulated the concepts and modeling notation that became the basis of information engineering. He wrote a series of articles entitled *Information Engineering* that saw publication in 1981 in Computerworld magazine. This was followed closely by a similarly titled report, co-authored with James Martin, which was published the same year for the UK’s Savant Institute.

Finkelstein’s approach to the practice of information engineering focuses on business-driven analysis, which contrasts with the technology-driven focus of his colleague, Martin. In recent times, Finkelstein’s Information Engineering principles have matured into something closer to Enterprise Information Architecture, incorporating service-oriented architecture technologies and business process management.

Finkelstein is also a champion of John Zachman and currently provides training and consulting in the Zachman Framework, focusing on rapid business reengineering. In fact, Zachman wrote the introduction to Finkelstein’s 2011 book, *Enterprise Architecture for Integration: Rapid Delivery Methods and Technologies*. The “Father of Information Engineering” remains a vibrant and active participant in the computer industry today.

**Reengineering the Business Process with James Martin**

British author and computer scientist [James Martin](http://www.jamesmartin.com/) earned a degree in physics from Oxford’s Keble College in the mid 1950s. He began his technology career in 1959 for IBM. In the 1970s, Martin became known as the rare sort of individual considered a guru in both the technology and business worlds. He is also a Fellow of the World Academy of Art and Science.

As mentioned earlier, in 1981 Martin teamed up with Clive Finkelstein on their seminal report for the Savant Institute, *Information Engineering*. Martin’s approach to information engineering served those focused on technology side of the practice compared to Finkelstein’s business-driven emphasis.

Martin’s work on IE notation led him to be a major developer of the prototypes for the Texas Instruments and Knowledge Ware computer-aided systems engineering tools. In fact, some in the IT press refer to Martin as the “Father of CASE.” Both TI and the Knowledge Ware CASE tools were considered leaders in the industry by the end of the 1980s.

For Martin, the CASE process needed to provide the ability to automate defining a data dictionary or Metadata encyclopedia directly from the description of a business process. This automation allowed the advent of the following cornerstones of modern business software engineering:  Rapid Application Development (RAD) and Business Process Reengineering (BPR).

Centered on the founding of the James Martin 21st Century School at Oxford in 2005, Martin’s recent work focuses on improving society to be able manage the challenges of today and the future. He currently lives on his own island off of Bermuda, an end-goal capable of inspiring anyone currently toiling in Information Technology.

From Charles Bachman’s original data structure diagrams all the way to James Martin’s prescient hopes for humanity in the 21st Century, the simple task of modeling business data and processes continues to be a vital part of the IT business and society as a whole. Hopefully, the histories of these four important men and their roles in the creation of the information modeling practice provided a measure of context and inspiration for any data professional today.