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**Architecture of the IBM System/360**

This paper discusses many of the design decisions made by IBM when considering the architecture of the IBM System/360. As a general overview, IBM designed the System/360 to be a general purpose computer for a variety of applications. They desired the System/360 to have “strict upward and downward compatibility” and the ability to expand into the future. What they eventually came up with was a line of machines consisting of six different models, each targeted with features toward different applications.

Another important aspect of any of the models of the System/360 was that even though they were all designed as somewhat general purpose machines, it was still very important to ensure that the cost of a given model be competitive with systems specialized in function. One design decision which I found especially interesting was the ability to choose whether a 32-bit word or a 64-bit word was used for floating point operations. The reason this choice was made was to allow flexibility to the user to select the mode appropriate for his/her application.

The next extremely important design decision of my interest was the debate between a pushdown stack or addressed registers. The paper goes through several of the disadvantages of using a stack based system, but what I found of most interest was that at the end of the day the performance of both systems is approximately equivalent. Having coded in both stack based (FORTH on co-op) and register based environments it is of my opinion that register based systems are much easier for the programmer to wrap their heads around, however each has its own place dependent on application. For this reason, I find it somewhat surprising that IBM chose not to offer another model (seeing as there are six already) with a stack based implementation.

One of the largest innovations in the System/360 was the flexibility developed for I/O peripherals. To a large degree, the design of a separate I/O interface for the System/360 made it possible to automate the communication between I/O devices and the CPU. Because of the abstraction of the I/O communication channel it became possible to multiplex I/O devices and allow for concurrent operation while maintaining acceptable data throughput rates for each individual device. Today, this is an absolutely essential feature which every system must support.

Overall, IBM succeeded in creating a robust system which was capable of handling many applications in scientific, business, and commercial, and real-time applications. To a large degree, many features developed on previous systems (Stretch) were reincarnated in a more sophisticated fashion, some of which are still in use on systems today.