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| IMSAI Pre-History: The Hypercube and Other Tales© 1999-2008 Thomas Fischer    All rights reserved worldwide**In The Beginning-** Advertising for the IMSAI 8080 began to appear in electronics and computer hobbyist journals as early as June of 1975. The first incarnation of **Bill Millard**'s IMSAI 8080 was built in a small but pleasant building and adjacent storage shed located at 1922 Republic Avenue in San Leandro, California. The business, IMS Associates, Inc., as it was then known, consisted of a handful of employees including a young engineering graduate and a software programmer, **Joe Killian** and **Bruce Van Natta** respectively. IMS Associates initially had provided engineering and software management to mainframe users including business and government. The services it offered were very advanced, and provided the firm a sporadic source of significant cash infusions, thus allowing it to participate and "jump" along with advancing computer technologies from one contract to the next.A major advance was announced in a press release dated October 25, 1975 in which the young specialty firm offered a relatively new and promising concept. ***The Hypercube*** was advertised as a four dimensional arrangement of dual 8080 processor "nodes" configured in 2x2x2x2, 3x3x3x3, and 4x4x4x4 arrays, with each node capable of communicating, via shared memory, with 8 adjacent nodes. This arrangement provided for the first processor in each node to handle system overhead and communications tasks while the second was left free to execute user code. The operating code was to be stored in ROM, and the total system promised unparalleled processing power at a fraction of the cost and overhead of mainframe machines from IBM, Honeywell, Boroughs, and other giants of the period. The advertised price of these three offerings was $80,000 for the Hypercube II, $400,000 for the Hypercube III (about 1/10th the cost of an IBM 370-168), and $1,280,000 for the Hypercube IV which was to be released in the second quarter of 1976. The concept was legitimized by publication in the December 11, 1975 issue of **ELECTRONICS** magazine. Ultimately, the U.S. Navy ordered a Hypercube II for installation in Huntsville, Alabama.An interesting offshoot of the project was the **IMSAI 108**; IMSAI's efforts to integrate a CDC (Control Data Corporation) "Trident" 50 Megabyte hard disk into the Hypercube architecture for mass data storage.  The project stalled when hardware glitches in the controller design diminished the importance of this project, just as the new FDC 2-2 Calcomp 8" floppy disk drive interface was being released, along with **Gary Kildall**'s CP/M (Control Program/Monitor... YES! "*MONITOR*") operating system version 1.2.  IMSAI's Chief Programmer [**Rob Barnaby**](http://www.imsai.net/images/people/barnaby-1.jpg) came on board at IMS Associates in late 1976 and worked closely with Gary for about 4 months, writing the I/O routines and embellishing some of Gary's original PL-1 source code.  Barnaby quickly absorbed the full extent of knowledge and performance of the development system and was soon clamoring for more computing and development power.Much of the earliest IMSAI implementation of CP/M was done on an Intel Intellec MDS-80 machine, basically because Kildall was so familiar with it's capabilities and the implementation of PL-1 development software that he had developed for it, presumably on an IBM 360 mainframe at his disposal at the Naval Postgraduate School in Monterey.   Rather than building the hardware from scratch, Killian and Van Natta suggested to Millard that they acquire some ALTAIR 8800's to use as the node processors. A number of factors scotched that idea, not the least of which was MITS' president **Ed Roberts**' insistence that IMS Associate's pay cash up front for any hardware. Ninety-day delivery times didn't help endear MITS to IMS Associates either. Although using someone else's hardware for the redundant portions of the project would have been an expedient, it was decided that if they were going to have to come up with cash in significant amounts, Millard, Killian, and company might as well build their own box. And so the unintended, but necessary "cloning" of the ALTAIR was about to happen.Between July and November of 1975, **Joe Killian**, as Chief Engineer led a small, informal band of associates to design, revise, establish purchasing contacts, document, kit and build the very first IMSAI 8080's. In order to achieve favorable prices and quantity breaks on the considerable amount of sheet metal and hardware required for the design, Killian and Van Natta persuaded Millard to sell the ALTAIR clones to hobbyists, who were now beginning a cohesive and forceful movement toward personal computing by embracing ALTAIR's (MITS') bus architecture, later to be known as the S-100 bus.Total production of the IMSAI 8080 between 1975 and 1979 is more than 17,000, but probably less than 20,000 units (according to a July 2002 e-mail from **Joe Killian**).  Fischer-Freitas Company produced approximately another 2200 systems between late 1979 and mid-1986.  |

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| *The following document has been scanned and converted to text from a copy of an IMSAI Manufacturing Corporation publicity document titled "THE HISTORY OF IMSAI: The Path to Excellence", produced in early 1978 and intended to boost moral and bind the dedication and "intentions" of employees into a more positive workforce.  It may have also been intended to serve as a foil against litigation that Bill Millard was involved in regarding default on a $250,000 note held by Mariner & Co., basis of the famous "Computerland trial" that ultimately destroyed the chain.  The whole story is documented in* **Jonathan Littman's**1987 *book "*[*Once Upon a Time in Computerland:*](http://www.imsai.net/history/imsai_history/imsai_history.htm) *The Amazing Billion DollarTtale of Bill Millard's Computerland Empire"***NOTE:** This article refers to the meaning of *"IMS"* as *"Information Management* ***Services****"* .   That is *NOT* supported by conversations with other early IMSAI employees and early documents I have read prior to this publicity piece that indicate the meaning to be *"Information Management* ***Sciences****"*-Thomas "Todd Fischer 8-13-99 |
| \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*THE HISTORY OF IMSAI- The Path to Excellence**Summary**IMSAI Manufacturing Corporation, a leading manufacturer of microcomputer systems and components, specializes in the small business and hobby market. Located in San Leandro, California, IMSAI developed and shipped its first product, the I-8080 Microcomputer, in 1975. The versatile l-8080 satisfied the limited needs of the hobbyist as well as the extended needs of commercial users. The sustained success of this initial product has enabled IMSAI to expand its product line. Today, after developing small business computers with a price tag low enough to be used by businesses with limited budgets, IMSAI has the broadest range of products offered in the microcomputer market, IMSAI was the first in the industry to design and manufacture a fully integrated system. The new VDP line - video data processor - applies the latest microprocessor and memory technology available to meet the demands of the rapidly evolving commercial market. IMSAI currently has over 300 dealers in the United States, Foreign sales are also beginning to represent a significant share of the IMSAI market.\* \* \* \* \* \* \* \*In the l973, William H. Millard founded IMS Associates, Inc. The initials stood for Information Management Services [***see NOTE above***], as its primary service was consulting in systems analysis and programming. Although no one knew it at the time, IMS Associates was the embryonic organization of IMSAI Manufacturing Corporation.Before he founded IMS Associates, Bill Millard had held management positions in finance and industry. As these industries began to make use of computer systems, his interest in computer applications grew. In the 1960's, he directed the design and implementation of major "on-line" information storage and retrieval systems in Alameda County and San Francisco; was employed by IBM, and in l969 founded System Dynamics, a computer software company. In l972, System Dynamics closed operations, having exhausted all of its invested capital. The one-time sale of the company's main product paid off creditors, but left nothing for Bill Millard and the other investors.In May 1972, Bill Millard began doing business as IMS Associates - as a one-man computer consulting and engineering firm - using his home as an office. Bill Millard's reputation for success in directing the design and implementation of large on-line information systems enabled IMS Associates to win several major contracts from industry and government.The failure of System Dynamics left Bill Millard with a deep conviction that the best way to sell software was to put it in "your own box" and sell the "box." It was a nice idea, but he had neither the capital nor the experience with which to pursue it.As a result of a succession of individual custom engineering and low volume assembly contracts between 1972 and 1975, IMS Associates and Bill Millard accumulated some capital and a great deal of experience. Initial contracts were for software only. Then came several that required overall project management of both electronic engineering tasks and software development.In 1974, a client for whom IMS had completed several hardware and software engineering contracts offered the company a contract to design and build a "prototype" product based on a microprocessor that could be used to "computerize" some electro-mechanical bookkeeping equipment, Under this contract, IMS Associates got its first opportunity to design an entire product, including the "packaging." This contract introduced IMS Associates and its engineers to the potential of microprocessors as a device that could be used for data processing functions, at a time when most people thought they were only good for automating things like washing machines.When the client began to receive orders for the product, he returned to IMS and offered the company a contract to manufacture ten more units. The carpeted "bank building" offices of IMS Associates became a low volume assembly facility, and the company gained its final production assembly experience. Yet still there was no product; no way for the company to get any residual or repetitive value from what it created, except to seek new opportunities to "do it again next month."Then in 1974, IMS Associates got its first opportunity to have its own product, Another client for whom the company had successfully completed general contracts, wanted a "work station system" that would do the complete job for any GM new-car dealership. IMS envisioned needing a CRT terminal, a small computer, and a printer, with special software. Five of these work stations were to have common access to a hard disk, which would be controlled by a small computer.Since the client wanted to market the product only to the auto industry, and IMS Associates wanted its own product, a product design contract was negotiated whereby the client would get what he wanted, with all rights to market the resulting products to the auto industry. IMS Associates would have the right to manufacture and sell the product in all the other markets in exchange for a low engineering price to the client and a royalty commitment.It was a contract of major size for both the client and IMS Associates.  A line of credit was arranged with a bank to fund the development. After over a third of this fund was spent, it became clear to Bill Millard that in his exuberance and determination to find a way to acquire a product of his own, he had severely "underbid" the contract, and there was simply no way to do the job for the agreed-upon amount using standard minicomputers and specially designed "IMS" interfaces, as originally planned.Product development was stopped, and in rapid succession, naked mini's and several one-board computers then being offered by the "traditional" minicomputer manufacturers were explored and discarded as costing too much.In desperation, Bill Millard and his chief engineer Joe Killian turned to the microprocessor. Intel had announced the 8080, and compared to the 4004 to which IMS Associates had been first introduced, the 8080 looked like a "real computer".It was clear that the only technology available at the time (l974) that could possibly allow IMS to meet the price constraints it was under was this new microprocessor technology. It was new and untried for true data processing functions. There was no road map, but the microprocessor seemed the only way that had any hope of success. Full scale development commenced forthwith, and the result was the now famous IMSAI I-8080 Microcomputer.Having designed, built, and installed a working 8080 Microprocessor, IMS was ready to produce its first product. In 1975, IMS placed a single ad in "Popular Electronics." The response to the ad was overwhelmingly positive. People sent in orders and money, and continued to do so while IMS geared up to produce and ship the first kits.  IMS, sustained by the faith of the public in its product, shipped the first 8080 Microprocessor kits on December l6, 1975.The first shipment was the result of a great deal of support and effort from IMS personnel. Somewhere between 20-30 people, their friends, and members of their families, worked long hours. The atmosphere was that of a family, The refrigerator was always stocked with food and juice and an endless supply of Cokes®. Many people who came to help out later joined the company as employees. With these people and their dedication, IMS entered the computer field shipping one product; and the product was a success.Initially IMS products were marketed by mail order. However, the success of the IMS product was further substantiated by requests for IMS dealerships. The network of IMS dealers had not been planned nor sought, but a dealer contract agreement was soon created and several dealerships were signed on all over the nation. Today, the company leads the industry in the number of dealers distributing its product (over 300 domestic and foreign dealers). Over 97 percent of sales are made through dealer stores and systems houses.After the milestone of its first shipment, IMS continued to expand its product, the number of employees, the amount of building space, and the number of dealers.  It had begun as two offices in a building in downtown San Leandro. While gearing up to ship its first kits, IMS moved to a building of its own, in the San Leandro warehouse district, to contain the kitting operations and the 20-30 people. Growth in an increasingly commercial market prompted IMS to expand its assembly department and offer more products assembled. IMS expanded its product tine to include component systems, printers, terminals, floppies, and software.In 1976, it became increasingly clear that IMS was a manufacturing company, not a consulting firm. In keeping with this transition, IMS Associates became IMSAI Manufacturing Corporation. IMSAI Manufacturing Corporation thus kept the name of the "parent" - IMS Associates Inc. - and the spirit of the "child" continued to grow.Today, IMSAI employs 170 people and is still expanding. IMSAI has moved again, contained now in two buildings and two warehouses. The primary address is 14860 Wicks Boulevard; the two buildings at this address house the administrative offices, technical services, engineering, and the manufacturing facility for assembled systems.In l977, IMSAI became the first in the industry to design a fully integrated system, This system has already expanded to include several models in the VDP (video data processor) line. The largest of these, the VDP-80, is a complete data processing center in a single compact package. It retails in single quantities for only $6995. This system includes a microcomputer, a 12" screen, one megabyte of floppy disk storage, 32K RAM, and a full keyboard with separate numeric and function keypads, Other products in this line offer double density and double track storage on 5-1/4" diskettes, with a storage capacity up to 780 kilobytes (VDP-44 model), making this the largest capacity mini diskette system on the market today. The VDP line allows the several hundred computer stores which carry IMSAI products to meet the demands of this new commercial market with a single, well-packaged product.Support from the IMSAI dealer has been instrumental in the growth and success of IMSAI Manufacturing Corporation. In addition to dealerships all across the U.S. and Canada, IMSAI created a European subsidiary to service their dealers in Europe. The dealer, OEM, and systems house network now encompasses Europe, Asia, Australia, South America, North America, and Africa. Foreign sales represent a significant portion of the IMSAI market.Common uses of the IMSAI Microcomputer Systems are:Small business data processing applicationsData communications and data entry systemsScientific applicationsComputer sciences education and developmentBanking and insurance applicationsMilitary and general government applicationsPersonal computer systemsThe "personal computer" industry is very competitive. IMSAI is now the largest factor in  that industry. Competition is both on a price basis and by product differentiation. New product introductions are frequent, and proper positioning of products by feature and price is important. IMSAI distributes through more stores than any company in the industry, and this has been an important competitive advantage, At any given computer show, a large proportion of displays there utilize an IMSAI. Further, with the new products recently introduced, IMSAI has the broadest range of products and the latest technology on the microcomputer market today. |