

MAPPER Systems History

- **The Genesis of Report Processing**
- **The 418 Report Processing System**



In 1968, once an adequate hardware input device was available in form of the UNISCOPE 300 CRT display It became possible to do transactional real time information processing.

In Feb. 1968, I prepared a document entitled “418 Report Processing System” which defined the concepts of general purpose Report Processing and the system methods for implementing such capabilities.

The software design was first implemented on the Univac 418 CRT-Report Processing system which was the beginning of Virtual Report Processing as provided by MAPPER Business Information Systems (BIS) systems.

MAPPER Systems History

- **418 RPS Development Group**
- **The Roseville Manufacturing Diagnostic Software Development Group.**
- **Bill Gray, Jack Olgren, Chuck Hanson**

Early in the development of the 418 CRT-RPS System, three individuals entered the picture who were of major importance to the evolution and promotion of Report Processing Services (RPS).

The first of these was William 'Bill' Gray. He became manager of the Diagnostic Software Development Group, which was also responsible for the 418 CRT-RPS project.

Jack Olgren, the top, senior programmer of the Diagnostic Program Development group initially declared that such a generalized, programmer-less method of using computers was not feasible. Based on prior experience, he believed that all applications had to be specifically coded. To his credit, upon further consideration, he conceded it might work. After reconsideration, he actually became the lead programmer for the Report Processing System project. His contributions to initial phases of system development were invaluable. Unfortunately, he died of a tragic motorcycle accident a year or so into the project.

Chuck Hanson also became a key programmer and system designer especially with later MAPPER 1100 and MAPPER C systems.

MAPPER Systems History

- **Report Processing Concepts**
- **In Feb. 1968, A document entitled “418 Report Processing System”**
- **The controllers for a Report Structured database**
 - Providing Form Generation, Report creation, storage and indexing, data backup and recovery and history processes
- **Report processor functions**
 - Function mask for process parameter and option specification
 - Report/s Search function
 - Search index table creation and maintenance
 - Totalizer and Arithmetic functions
 - Printing functions

The year was 1968. I was assigned to a small team of programmers who were to develop a Test Reporting application. The Test Reporting application was relatively simple. It consisted of lists of equipment type numbers, serial numbers, status codes and related plan/actual dates of test start, test phases and completion. Basically the files consisted of columns of the test status data.

I understood the nature of the desired reporting pretty well because of my previous experience as a test technician and engineer. Instead of coding for this specific Test Status Reporting application, I conceived a generalized approach to information reporting and Report Processing. I wanted a way to computerize any reporting task without the specific programming having to be done for each different type of reporting.

In Feb. 1968, I prepared a document entitled “418 Report Processing System” which defined the concepts of general purpose Report Processing and the system methods for implementing such capabilities. It described the system hardware requirements and basic report processing functions.

MAPPER Systems History

Report Processing Functions

The user's data forms provide the means for Report Processing function control.

EXAMPLE: Command parameters used in a Function Mask in an Automobile Inventory Database:

```

AUTOMOBILE INVENTORY
*Automobile.      .License.Wolsale. Retail . Schedl . Actual .
* Make           . Model . Number. price . Price .Delivery.Delivery.Customer
*-----,-----,-----,-----,-----,-----,-----,-----
*****          *****          *****          *****          *****          *****
BUICK            <Search for a single identity
BUICK            CENTURY      <AND condition search for 2 identities
                               MLS5933 <OR condition search 2 identities
                               MKL4371 <OR
                                     5,000 <Search in range, 1st value
R                                     15,000 <Search in range 2nd values
                                     + <Vertical summation/subtotals
                               Days difference between dates> + -
                                     Sort in alphabetic order> 1

```

A key to the “user friendly simplicity of the MAPPER language is the fact that intuitively obvious data and function parameters are submitted in the context of the user’s own data. When they design the data form they automatically create a function control language.

MAPPER Systems History

In the initial 418 CRT-RPS, control of access to the reports in the database used Mode control a feature of the Uniscope 300 display terminals for security control.



In the initial 418 CRT-Report Processing System, control of access to the reports in the database used Mode control a feature of the Uniscope 300 display terminals for security control. Besides a standard keyboard, these terminals also had a mode function keypad to the right of the keyboard. The meaning of the keys in this pad could be changed with a plastic overlay that had a series of tabs along its upper edge. As the pattern of these tabs was set on a given overlay, tab sensors would detect the pattern and thereby define a particular Mode of control and definition of key meaning.

For the 418 CRT-RPS, these mode keys were used to define a group of types of reporting.

MAPPER Systems History

- The 418 Report Processing System



At this time, I was working in the Univac Commercial Division. In this division, Univac had established two main lines of computers; the 1100 line of main-frame computers and a 418 mid-frame line of computers that were especially effective as communications processors.

Univac had recently obtained major contracts to provide United and Eastern Airlines with computer systems to manage their reservation processing. Besides providing the control processors and networks, these contracts also required the first large-scale use of display terminals. These were Uniscope 300 CRT terminals.

The Univac 418 Computer was chosen to run this RPS application because of its communication system orientation.

MAPPER Systems History

- **The 418 CRT-RPS Grows**
- **Evolution to Uniscope 100**
- **Roseville plant developed operational Report Processing applications:**

**Production Control
Scheduling and Dispatching,
Quality and Reliability Control,
Final Test,
Purchasing,
Material Support,
Cost Accounting,**

**Receiving,
Final Assembly,
Shipping,
Site Administration,
Transportation,
Development Center Engineering,
Drafting, etc.
IS&C Project Status**

The 418 CRT-RPS grew providing services to departments other than the original Test Department.

Also the system was adapted to use the newer Uniscope 100 terminals. It should be noted that the Uniscope 300 and 100 were dumb terminals providing only a display and keyboard.

MAPPER Systems History

- In addition to the Roseville plants, services were also provided to factory operations in:

**Eagan MN,
Jackson MN,
Montreal Canada,
Utica NY,
Salt Lake City UT,**

**Bristol TN,
Chicago IL,
Elk Grove IL,
Philadelphia PA,
Cupertino CA.
Blue Bell Headquarters**

- Over 375 different types of reporting 1,500,000 lines of report

Other Univac plants were connected by phone lines to the system so they could share the information and processing.

MAPPER Systems History

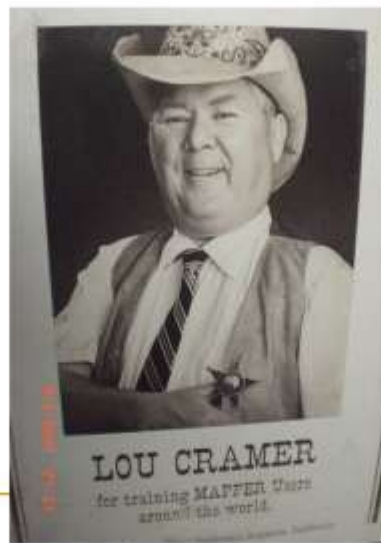
- The 418 CRT-RPS system at its full implementation.



It should be noted that this System had much less processing power, memory and data storage than one of the powerful PC's available today.

MAPPER Systems History

- **The Role of the System Coordinator**
- **Use Procedures and Guidelines contained in Report 1A**



It quickly became apparent that the concepts of report processing were popular with the users and demand for the services quickly accelerated. The need for a service Coordinator/Administrator/Teacher became apparent. I wrote the on-line Use Procedures and Guidelines contained in Report 1A and assumed the role of System Coordinator.

It was not long before a second Coordinator in the person of Lou Cramer was required. He became well known in the MAPPER world. He traveled much teaching the role of Coordination and promoting principles of User Driven report processing.

MAPPER Systems History

■ IS&C Take over



By 1974, the evolution of the 418 CRT-RPS service clearly represented a conflict of interest to the Information Systems and Control (IS&C) charter which was to provide all information processing for the corporation.

So, IS&C took the hardware, the software, the two coordinators and one of the 418 CRT-RPS programmers, Merlyn Zurn, and made them part of the Roseville IS&C Department.

Lou Cramer and I, as the 418 CRT-RPS system coordinators, felt clearly threatened by this take over by IS&C.

MAPPER Systems History

■ Use in Production Control – Lewis Rydeen



The Director of Production Control, Lewis Rydeen, was a very dynamic individual who demanded quick action and strict discipline from his staff in managing production.

This department ultimately became the largest user group in Univac Roseville operations and a prime example of User Designed Computing provided by the MAPPER system. They developed over 100 reporting applications in Production Control.

They were often called on to give Report Processing demonstrations to other users or visiting customers.

MAPPER Systems History

■ 418 CRT-RPS To 1100 Report Processing Systems

Sign-on and off,
Mode Switching,
Form Generation (New Type of Reporting)
Report Index, Add, Delete, Duplicate, Display,
Line Roll, Add, Delete and Duplicate,
Search Single or Multiple Reports for single ID's,
Sort Reports or Results,
Find and Display (positional search),
Match data between reports,
Arithmetic and Totalize data analysis,
System High Speed and Remote Printing
Punch Card output,
Report Build Generation, RBG
Report Generation, RPG

Use of Report Processing in the corporation suggested this kind of information processing had potential as a system software product.

A committee was formed to define the design specifications for a RPS 1100 software product. The design was to utilize the TPS and Data Base Management System (DBMS) 1100 system products.

The design committee for RPS 1100 proceeded to define a system that imposed the user interface of the 418 CRT-RPS and its Report Processing functionality over the standard 1100 TPS and DBMS product structures. This concerned me greatly because they refused to recognize our experience in meeting the demands of random access Report Processing as delivered by CRT-RPS. Of particular concern was the use of the conventional file record structures of the DBMS. The RPS 1100 designers would not recognize my concerns. They felt sure the powerful 1100 main frame and DBMS environments could easily deal with this Report Processing service.

I insisted on my concerns and ended my involvement with the project with a "White Paper" outlining my concerns and advice.

I left the 1100 RPS project and returned to my job as 418 CRT-RPS Coordinator and met with Bill Gray, the CRT-RPS Design Group Manager. I showed him my "RPS 1100 White Paper" and explained my concerns about the direction the RPS 1100 group was taking. I recommended that his group proceed to develop a version of Report Processing capabilities that would take advantage of our previous 418 CRT-RPS experience in the 1100 mainframe environment. He agreed and thus began the MAPPER project and a period of intense and politically dangerous competition between the two projects.

MAPPER Systems History

- **Development of MAPPER 1100**
- **The MAPPER acronym: Maintaining, Preparing and Producing Executive Reports**

Initial MAPPER 1100 Functionality

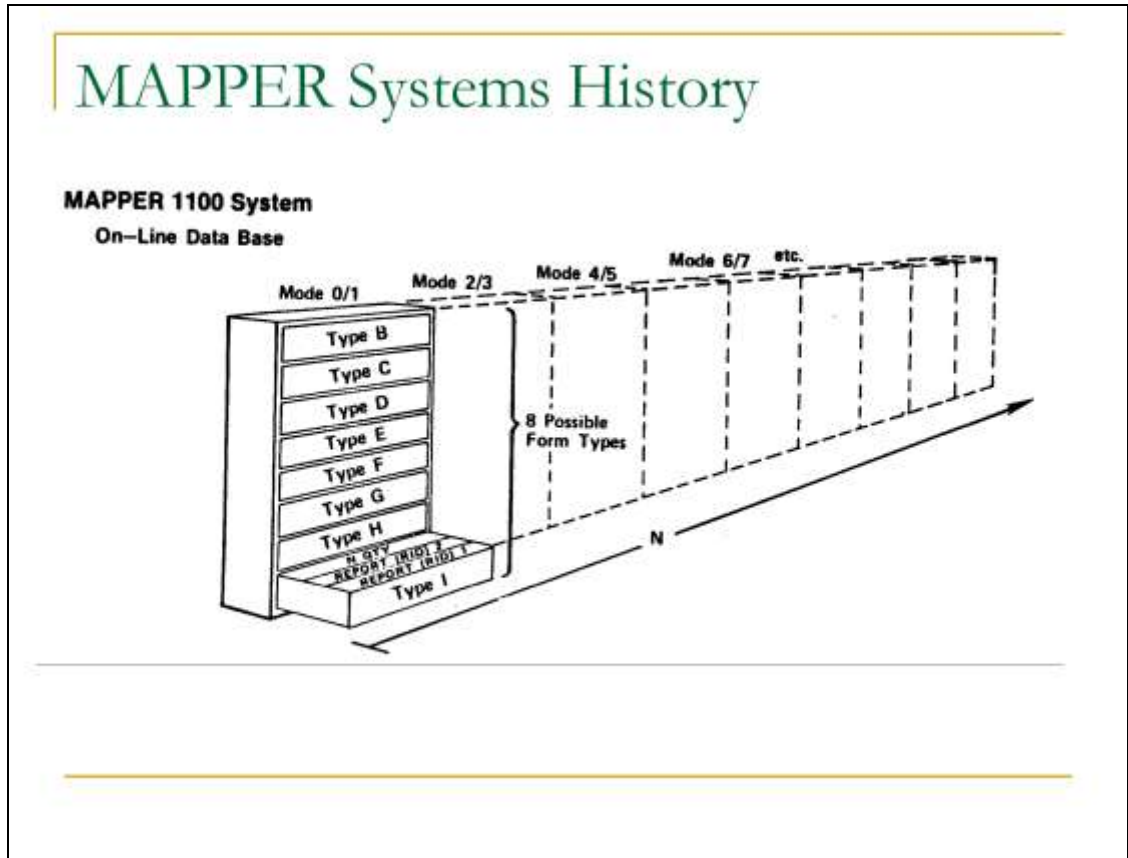
Sign-on and off,
Mode Switching,
Form Generation (New Type of Reporting)
Report Index, Add, Delete, Duplicate, Display,
Line Roll, Add, Delete and Duplicate,
Search Single or Multiple Reports for single ID's,
Sort Reports or Results,
Find and Display (positional search),
Match data between reports,
Arithmetic and Totalize data analysis,
System High Speed and Remote Printing
Punch Card output,
Report Build Generation, RBG
Report Generation, RPG

First MAPPER 1100 operations began in February of 1975 on an 1106 system in Final Test. By March, the service was stable and fully operational.

During the design of the initial MAPPER 1100 system software, the existing functionality of 418 CRT-RPS was duplicated. This consisted of these functionalities.

Chuck Hanson was responsible for creating the MAPPER acronym. He also was largely responsible for design of the internal architecture of 1100 MAPPER systems.

Note, the RBG and RPG capabilities provided the ability to create repeatable sequences of report processing functions.



The database was represented as electronic filing cabinets with reports stored in the drawers [types of reporting.] Users are familiar with this organization of data.

Users could switch between cabinets [Modes] if allowed and process the reports in the drawers [types of reporting.]

This also provide a very simple file naming system, 1b, 2b, etc.

MAPPER Systems History

- **MAPPER 1100 Transition to Marketing**
- **Obvious Marketing Potential**
- **Initial Resistance By Corporate Management**



As the MAPPER 1100 Report Processing service expanded and became available throughout the Univac Corporation, the possible appeal of the system as a marketable software product became obvious.

Corporate Headquarters supported RPS 1100 as the authorized Report Processing Software product.

MAPPER 1100 was not to be offered to Univac customers. It was only to be used internally in the corporation. These corporate directions to marketing were clear and direct.

However the growing reputation and appeal of Report Processing concepts and the example provided by the rapidly expanding MAPPER 1100 service in the Univac plants continued to attract the more daring marketing branch personnel.

MAPPER Systems History

- **Santa Fe Railway, The First MAPPER 1100 Customer**



The Chicago salesman who finally broke the ice was Joseph (Joe) Bradway with the first sale of MAPPER 1100 to Santa Fe Railway.

The first commercial use of Sperry Univac's MAPPER was on the Santa Fe Railway in **1976**.

By 1982, over 2,500 terminals were on-line tracking over 68,000 cars in over 175 rail yards. The system used two Sperry 1100/84 central multi-processors and had a total value of over \$25 Million.

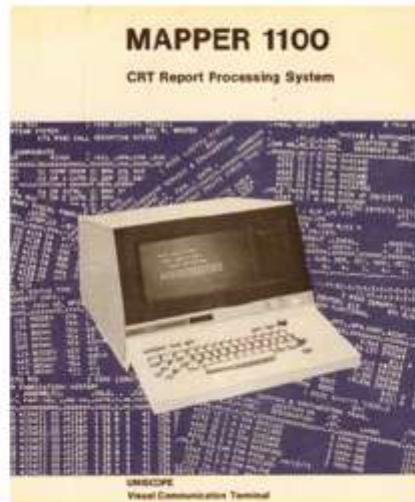
Initially the services used the RBG RPG capabilities to create the function sequences needed to create needed reporting. To improve efficiency, the RUN language was designed and used for application definition.

The Santa Fe sale was truly a breakthrough first sale. Joe Bradway, the Sperry Univac salesman for that account, was asked; how he could make such a sale when the head of Sperry Univac marketing had issued strict orders that the MAPPER 1100 system was not to be sold? He said he knew they would not turn down such a large order.

Shortly after the Santa Fe sale, another sale of MAPPER 1100 was made to GTE Automatic Electric. The Univac Chicago marketing branch also made this sale.

MAPPER Systems History

- **MAPPER 1100 Expands and Gains Power**



By 1978 other 1100 main frame computer system sales based on MAPPER 1100 were also made to FTD Florists and Sergeant Lundy Engineering corporations and the Chicago Board of Education.

Those sales were also made in the Chicago area. The Sperry Univac branch in Kansas City saw the example of MAPPER 1100 as used in the Santa Fe computer center in Topeka, KS. This prompted another sale of MAPPER 1100 to Kansas City Power and Light. All of the systems to that time had been sold as Category III products not supported by the corporation.

MAPPER Systems History

- A large set of manually executed update, selection and computational functions were provided:

A	Fortran-based equation calculator
ADON	Append a result or report to another report
AL	Alarm message on a specified date and time
AR	Add a report
AUX	Print reports on auxiliary printers
BATCHSTRT	Batch start function
BATCHPORT	Batch port input
BF	Binary find process
CHG	Locate and change a character string
COPY	Copy files from system to system
D	Display a report
DATE	Analyze dates within a report
DR	Delete a report
ELT	Copy report to program file
	<i>And more!</i>

These are a few of the manually executable 150 Report Processing Information Power Tools (functions) that were developed. These functions have more than + 750 Options that can be selected.

MAPPER Systems History

- **MAPPER 1100 Report Processing Transactional Daily Activity**

- Over 170,000 total transactions
- Over 40,000,000 lines of data processed
- Over 20,000 updates (equivalent to 100,000 punched cards)
- Over 10,000 searches of report/s
- Over 30,000 Totalizations, Sorts, RUNS
- Over 7,000 printouts and messages

The Roseville MAPPER 1100 system became a valuable information resource for Sperry Corporation. This is a typical day of report processing activity on that system.

MAPPER Systems History

- **MAPPER 1100 Report Processing Database**

Over 2,500,000 lines of report data on-line
Over 675 different kinds of reporting
Over 10,000 individual reports

The MAPPER system in Roseville became a major information service for the corporation with a sizable real-time database.

MAPPER Systems History

- **MAPPER 1100 Development Evolution to MAPPER C Unix**

X/Open Compliancy

- X/Open Registered Application
- Achieved certification on March 6, 1992
- Enrolled as the "first application" in the X/Open Application Registration directory



In the mid 1980's along with the industry concepts of 4th generation application development languages (4GLs) came the ideas of Open Systems and the common use of intelligent terminals and Personal Computers (PCs).

The idea of Open Systems meant that software could be written on one vendor's hardware that could be used on other vendor's equipment without modification.

One of the operating systems that had developed extensive use by different vendors was UNIX. This operating system was used on many different vendor's systems. It was a very efficient operating system that used applications written in C Language.

Sperry also offered a group of UNIX based computer systems. The success of MAPPER with 1100 systems made it an obvious choice to be offered for use with UNIX systems. This was called U Series MAPPER or MAPPER C software systems.

MAPPER Systems History

MAPPER Marketing Golden Age

At the peak of the success of MAPPER marketing shortly after the merger of Sperry with Burroughs to form Unisys, the MAPPER system market looked like this:

MAPPER 1100 Systems	1,500	USA
MAPPER 1100 Systems	1,000	International
MAPPER 1100 Systems	500	Japan
MAPPER 5 Systems	600	
Personal MAPPER Systems	6,500	
UNIX MAPPER Systems	4,300	

MAPPER Systems History

- Eventually over 500 main frame MAPPER systems were sold in Japan.



- In 1985, a Chinese micro-MAPPER system was also created. With Sperry's help

In 1984 a strategy of micro-MAPPER systems also evolved. A MAPPER 5 system using a Mitsubishi processor was developed and offered as the first micro-MAPPER system.

Then a PC MAPPER system was created which had an extra computer imbedded in a 386 PC to perform MAPPER Report Processing.

This MAPPER software was able to run on either Sperry or IBM PCs and thus became the first offering of MAPPER software on IBM hardware.

MAPPER Systems History

- **By the end of the Sperry era, a powerful array of Report Processing Information Power Tools were created that is unexcelled even in the industry today.**

MAPPER Report Processing Information Power Tools

Abort Process Acknowledge Message Add Line/s Add On Report/Result Add Report
Alpha to Octal Data Converter Append Data Line/s Arithmetic (Formula Solution)
Auxiliary Printers Background Run Batch Interface Binary Find Add new Report
Alpha to Octal Data Converter Append Data Lines Arithmetic Algebraic Formula
Solution Background RUN Batch Process Interface Binary Find Cabinet Switch
Calculate (Line By Line Logic) Calculate & Update Data Calendar Generation
Change Character String Display Colors Control Horizontal Character Count
Combine Report Data Communications Output Printer Compare Report Data Count
Statistical Analysis Create File In 1100 Create Help

And more!

150 Report Processing Information Power Tools + 750 Options

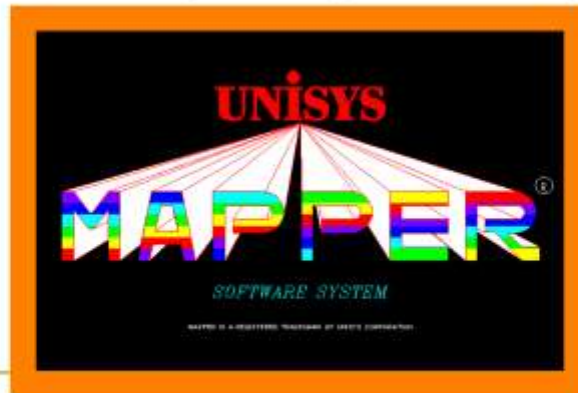
These Report Processing functions can be used by any user without programming. Each function can be turned on or off for each user if needed for security control. The users are limited only by their creative ability and security policies.

Users had an illusion of infinite capability but were coordinated and controlled with effective security and back up techniques.

MAPPER Systems History

■ MAPPER Graphics

- With the availability of graphic and color display terminals and PCs graphic chart functions were created. These could create:
 - Bar Charts Radar Charts Block Charts Scatter Charts Line Charts Target Charts Mixed Bar and Text Charts Line Charts Pareto Charts 3D Bar Charts Time Line Charts Multiple Chart Organization Chart Sign Maker Graphics Scaler



MAPPER Systems History

Additional RUN Logic

Break Collected Data Call Subroutine Change Variable Clear Abort Routine
Clear Error Routine Clear Label Table Clear Link To Other Run Clear
Subroutine Close Window Command Handler Create Result Copy Define
Button Define Constant Define Edit Box Define List Box Define Menu
Box Define Text Box Define Variable Define Window Exchange Variables
Execute Command Exit Subroutine Find and Read Line to Variable Function
Key Function Key Input

And more!

Additional RUN Logic, 175 Statements

Utilities were also provided to make RUN design very efficient. RUN statement code can be generated from manual function execution with the Iterative utilities.

Besides the user orientation of MAPPER System, the RUN language provided an efficient way to develop powerful, sophisticated applications. Typically, such applications could be developed in one tenth of the time as compared to conventional application development languages, even other 4GL's.

At the peak of the success of MAPPER marketing shortly after the merger of Sperry with Burroughs to form Unisys, the MAPPER system world looked like this.

MAPPER Systems History

- MAPPER 1100 Systems 1,500 USA
- MAPPER 1100 Systems 1,000 International
- MAPPER 1100 Systems 500 Japan
- MAPPER 5 Systems 600
- Personal MAPPER Systems 6,500
- UNIX MAPPER Systems 4,300

Other statistics of the MAPPER world.

MAPPER Systems History

The MAPPER World

Registered Terminals	935,000
Registered Users	1,031,000
RUN Designers	77,000
Active Applications	1,169,000
Reports On-Line	71,500,000
Stored Lines of Data	14 Billion
Lines Processed Per Day	61 Billion
Transactions Per Day	2.7 Billion

MAPPER Systems History

■ Representative MAPPER Customers At That Time

- Manufacturing
 - Unisys, General Telephone & Electronics, McDonnell Douglas, Nike
- Transportation
 - Santa Fe RR., Northwest Airlines, America West Airlines
- Distribution
 - Subaru of America, King Bearing, Kesko
- Retailing
 - Circle K, Floral Network
- Federal, State and City Governments
 - DOD, State of Minnesota, Westchester County NY, Hillsborough County FL, California and NYC welfare systems

Other representative groups of customers were:

- Banking - Union Bank of Switzerland, TS Bank

- Insurance - National Life, Kansas City Life, Employees Mutual

- Construction - Bechtel Corp., Sargent & Lundy

- Energy Production - Northern States Power, Kansas City Power & Light

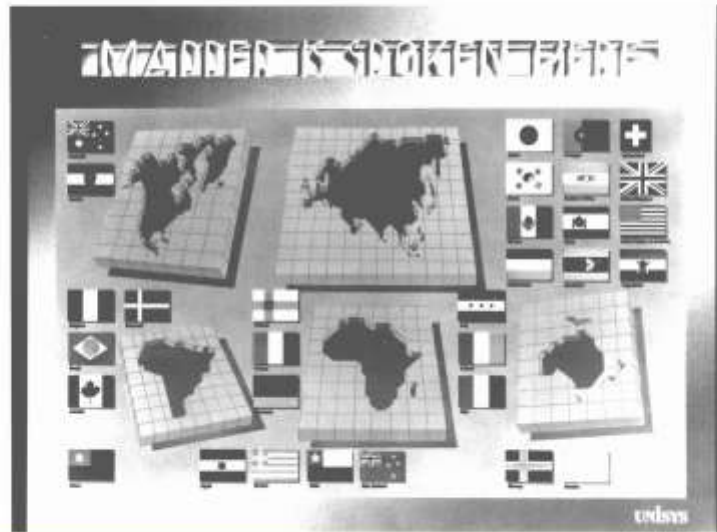
- Recreation - Walt Disney Enterprises, Carnival Cruise Lines

- Military Branches - US Army, Navy, Air Force

- + Many more

MAPPER Systems History

A Universal Appeal



The universal appeal of MAPPER Report Processing is reflected in the numerous translations to native languages that were made in the international market. It was translated for use into more than 15 foreign languages including Spanish, German, French even Chinese and Japanese.

The System has been renamed and offered under the name of Business Information System, Unisys BIS.

At its peak under Sperry Corporation, MAPPER systems were installed in a hardware base worth over \$3 Billion.

MAPPER Systems History

MAPPER Systems and Unisys

In 1986, W. Michael Blumenthal engineered the merger of Burroughs with Sperry in a hostile \$4.8 billion take-over to form Unisys Corporation. Unisys had 120,000 employees world-wide at the time of the merger and annual revenues of more than \$10 billion for a short time

One could speculate; could Sperry have been as successful without MAPPER systems? It is more likely that without MAPPER systems Sperry would have been more like the now insignificant Control Data Corporation with only proprietary hardware and unappealing applications to offer. Thanks to the added value of the over \$3 billion MAPPER systems market, Sperry was able to build a \$1 billion cash surplus which made it an attractive take over target.

MAPPER Systems History

MAPPER Reduction and Neglect

“There are two kinds of people, those who love MAPPER and those who don’t know enough about it”

Unisys has no aggressive programs for marketing into these dynamic markets. The Unisys management attitude regarding MAPPER products is truly baffling and very frustrating to the remaining MAPPER customers and worldwide fans who understand what it could be.

There is a saying among MAPPER fans, “There are two kinds of people, those who love MAPPER and those who don’t know enough about it”. Clearly Unisys management still does not have a clear understanding of what MAPPER Report Processing software potential could be.

MAPPER Systems History

No other products offer in one integrated, scalable software system:

Functionality available across a wide range of industry open systems

A Report Structured Database with interfaces to industry Relational DB's

A complete, Powerful 4GL Application Development Language

Extensive screen, edit and application code generation

Client-Server Networking across a range of system sizes and vendors

A full set of system, user and database security controls

Upward application compatibility from MS Windows PC's to

Client-server and mainframe systems.

Internet Integration and accessibility

MAPPER systems offer unique upward compatible power and capabilities .

MAPPER Systems History

MAPPER software has been constantly upgraded to run on all of these state-of-the-art systems:

Unisys main frame OS 2200 ClearPath series systems

Microsoft Windows Systems

Linux

SUN Solaris

Interfaces are available to create application that integrate the MAPPER system capabilities and database with industry database systems such as:

MAPPER Systems History

- **Industry Interfaces**

- ORACLE**
 - SYBASE**
 - INFORMIX**
 - Microsoft SQL Server**
 - DB2**
 - Object Database Connectivity (ODBC).**

Even today, after a history of 40 years, MAPPER Business Information Systems are still being upgraded and functionally improved.

MAPPER Systems History

- **MAPPER modernization concepts encompass:**
 - ✓ A Modern Graphic User Interface (GUI Point & Click) look and feel
 - ✓ for control of the interactive Information Power Tools
 - ✓ A Modern application development environment.
 - ✓ GUI, Unified system and database administration utilities.
 - ✓ Tools to aid in modernization of existing applications.
 - ✓ Expanding interoperability with other industry software environments.
 - ✓ Internet operability and integration.

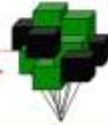
MAPPER Systems History

Virtual Report Processing The MAPPER Story

A book By Louis Schlueter
See: [www.xlibris.com/Virtual
Report Processing.html](http://www.xlibris.com/VirtualReportProcessing.html)

Lou's Email aluco@msn.com
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Business Information Server
Celebrating 40 years of excellence



This book details the complete history of this remarkable product and discusses its current marketing potential.

An E Book version is also available. You can Email me for information.