From / IBM

Special Issue

IBM Pavilion,
New York World's Fair

Fairgoers at the IBM pavilion at the New York World's Fair are about to take a ride. They are seated on the People Wall, a line of 12 rows of seats that holds ten audience of about 500. The wall will be lifted 50 feet high into the Information Machine above where a 15-screen presentation is about to begin. The host, dressed in white tie and tails, descends from the steel trees on a crow's nest platform. Great doors from the dome open and the wall rises on a 45 degree angle, In the darkened theater, 15 screens of various shapes and sizes line a curved wall. Some of the pictures move, some are still and flash for brief moments. The presentation shows how computers solve complez problems using simple principles of logic we all use every day. The show was created and produced by Charles and Ray Eames, with story by Glen Fleck and music by Elmer Bernstein. A limited number of reserved seats are available daily.

Information Machine Theater Has People Wall, 15 Screens

A ride, a show, new sights, new sounds and new ideas are all part of the experience of a visit to IBM's pavilion at the New York World's Fair.

The setting of the pavilion is that of a cool garden shaded by man-made steel trees. In the garden, puppet theatres, a probability machine resembling a giant vertical pinball game, a scholar's walk and demonstrations of computer accomplishments serve as supporting acts to the main show, the Information Machine.

Visitors follow a maze of suspended paths that lead to the People Wall, an elevated bleacher that seats about 500 persons at a time. Bomb bay-like doors on the ovoid-shaped theater above open and the entire People Wall with 500 aboard is lifted 50 feet high, into the theater.

Here, from 15 screens, a new kind of motion picture entertainment leaps out at the viewer. One minute he experiences hairpin turns with a racing car driver. Next, he is running a freight train, then working out plays with a football coach.

After a number of seemingly unrelated scenes unfold, the viewer discovers for himself that computers are not mysterious. They help solve the most complex problems with simple principles of logic, similar to those we all use in making decisions every day.

This is one of a number of dramatic and exciting new approaches in architecture and visual arts that is used by IBM to tell the story of modern information handling.

The aim of Charles Eames and Eero Saarinen Associates, co-designers of the pavilion, was to create an entire environment, rather than a building to house exhibits. Last year, more than five million fairgoers visited the IBM pavilion. A visitor can make same-day reservations for People Wall seats.

A visitor can begin a tour at any one of the series of supporting exhibits. In three puppet theaters, mechanical actors entertain and inform. The probability machine shows how science uses "chance" to detect laws of order from seeming chaos.

Displays in the Scholar's Walk provide insight into man's attempts to build mathematical machines. Ancient calculating devices also are on view.

In the center of the Scholar's Walk, a Bubble Machine demonstrates some of the laws of calculus. Cubes, triangles and other complex wire frames are dipped into a soap solution and raised into the light. Fragile, transparent soap films stretch across the wire frames and form surprising, shiny shapes. The bubbles always assume a shape with the least possible area, a central concern in the development of differential equations.

In the center of the Pentagon theaters, a machine illustrates celestial mechanics. Inside a glass enclosed case, tiny balls revolve around on a surface. The surface is shaped so that when a ball is launched, it acts like a planet moving around the sun, or a satellite circling in orbit around the earth.

In addition to the theatrical devices and displays, the visitor can see a data processing system at work in the computer applications area. An experimental IBM computer system reads a handwritten date and prints out the headline news of that day. Another experimental system translates technical Russian into simple but intelligible English.

Sherlock Holmes, Dr. Watson Solve Train Mystery in Puppet Theater Presentation

Holmes: *Elementary, my dear Watson. Did it not strike you that each of the three was a man with a moustache of a singular green hue?*
Watson: *And the leader of the Paddington mob is a man with a green moustache!*

The dialogue of the haughty Sherlock Holmes and the intrepid Doctor Watson are part of a performance in one of three little theaters in the IBM pavilion.

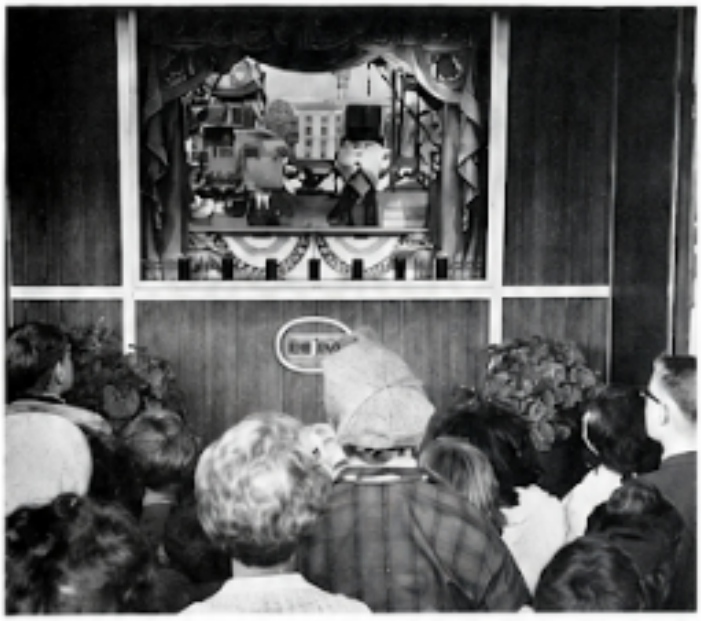
The actors are electro-mechanical puppets synchronized with lights, music, narration and sound effects to present a show complete with moving trains, bandits, police, Baker Street idioms and a surprise ending.

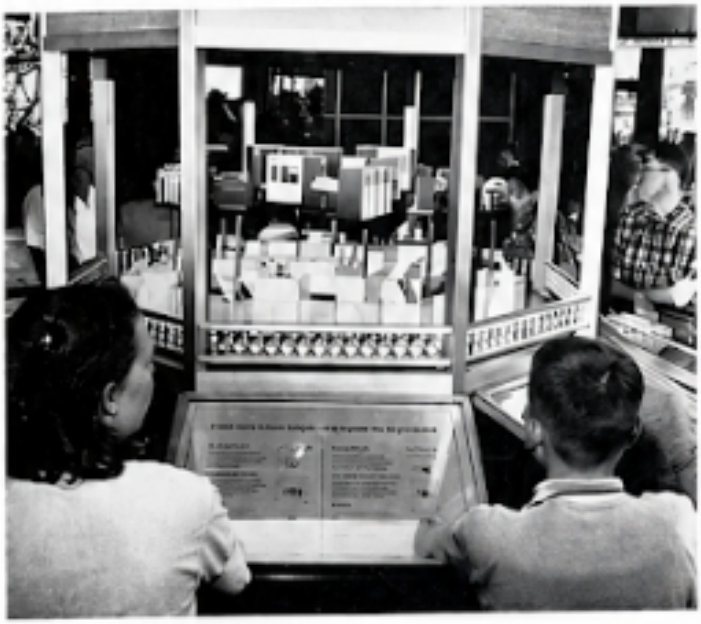
For hundreds of years, puppets have been used to entertain and instruct young and old alike. Here at the IBM garden in cameo theaters decked with banners and bunting in the spirit of carnivals of old, they are once again used to make fair visitors laugh and learn.

In one theater, Sherlock Holmes unravels the mysterious disappearance of the Glasgow Express by asking questions that are answered by "true" or "false" choices. In the show, detective Holmes points out that he used the same simple logic that is used in programming a computer.

Across the way another puppet theater presents "Computer Day at Midvale." The townspeople have gathered to hear the mayor dedicate Midvale's new computer. The mayor tries to explain the computer's importance to the community. His explanations are oversimplified and they are corrected by a oomputer expert who shares the platform. The mayor states that now he knows the computer is "awesomely simple, marvelously complex, slowly programmed, incredibly speedy, shockingly naive and highly sophisticated."

In a third theater still another play is underway—"Cast of Characters." The characters are the machines and the many people of different skills that must be teamed together to make an effective information-handling system. People, the narrator emphasizes, are the key to problem-solving—"people who can with intelligence and understanding interpret the output of the machine in a way that is meaningful . . ."





At the IBM pavilion at the New York World's Fair visitors participate in a demonstration of two computer accomplishments—recognition of handwritten characters and information retrieval. An optical scanning device reads a date written on a card by a visitor and retrieves a headline published by The New York Times on that date. The recognized number is transmitted to an IBM 1460 data processing system where 40,000 headlines are stored. The computer is also programmed to do mathematical feats, as above, on problems suggested by the audience.

Computers Instantly Recall Headlines, Translate Russian Text Into English

Pick any date that comes to mind: your birthday, your graduation, your marriage, and write down the date on a card. Then watch as an experimental computer reads your handwriting displayed on a radar-like screen. In seconds, a headline that appeared in The New York Times on that day is flashed in bright lights across an overhead display.

Nearby, you can see how a computer translates Russian science articles into simple but understandable English. It works from a 200,000 word dictionary—the size of a phonograph record.

These computer advances, optical scanning, information retrieval and automatic language translation are displayed at the IBM pavilion at the New York World's Fair.

After a visitor writes a date on a card, an operator feeds it into the experimental optical scanner linked to an IBM 1460 data processing system. In a fraction of a second a tiny electronic scanning beam has outlined the contours of each number and identified the specific numeral. Information about the number is transmitted as a series of electronic pulses to a computer at the pavilion.

The entire number—the date—is compared with 40,000 numbers in the computer's "memory" or data storage system. Stored with each date is a news item from The New York Times, one for every day since The Times started publishing in 1851.

This item is transmitted to the computer's output unit, which prints it on a card—and also flashes it in lights over the exhibit. A visitor to the pavilion might, at random, select the date 3(March)-6, 1861. This headline would then be flashed across the display: MARCH 6, 1861: PRESIDENT LINCOLN'S INAUGURAL WORDS TO THE SOUTH: 'WE MUST NOT BE ENEMIES.'

The demonstration of automatic translation is designed to show the effectiveness of machine translations today—and also to show how a computer can be used by people many miles away from the machine itself.

The matter to be translated is transmitted over telephone lines by two IBM 1050 data communications terminals, one at the Fair and another in a company plant at Kingston, N. Y. The translation is sent back by the same method. A viewer at the demonstration watches a typist copy sentences from a Russian scientific article. A television screen shows the words in the Russian alphabet as they are typed. Seconds later, another screen shows understandable English sentences being typed automatically on a printer.

A demonstrator explains that the English is a direct translation of the Russian text—with a computer in Kingston doing the translating.

To make the translation, a light beam searches a plastic "dictionary" disk that has been imprinted with the microscopic code for 200,000 Russian words and their English meanings. It takes 1/40th of a second for the beam to find a word and report its meaning to the computer.

However, languages are so rich and complex that experts are a long way from the precise definition of all grammatical rules for any language. There is a way to go before exact translations can be achieved.

Tomorrow's Headline Today?

The day the Fair opened, a visitor tried to stump the computer that recalls newspaper headlines from the past by giving a date in the future. Here's how the computer answered:

"THE DATE YOU HAVE REQUESTED WAS FEBRUARY 3, 1970. SINCE THIS DATE IS STILL IN THE FUTURE, WE WILL NOT HAVE ACCESS TO THE EVENTS OF THIS DAY FOR 2,113 DAYS."

WHAT'S NEW . . .

Visitors to the IBM pavilion at the New York World's Fair will find a variety of new attractions this year, designed to make their second visit as interesting as the first.

The principal change in the pavilion is a new version of the Information Machine presentation, a fifteen-screen movie feature high up in the ovoid theatre. Although the theme of the film remains the same, many new scenes are presented giving the film new dramatic emphasis. In one new scene, city planners create a "model" of a city in the computer in their attempts at urban redevelopment. Manipulated in a computer, the model helps planners compare relative merits of different approaches.

Another new exhibit is Random Walk, a device which helps display probability theory. The display consists of a grid of lights about three feet square. In the center of the grid is a lamppost. At two ends are devices which tumble two dice each imprinted with directions such as "one step east." The imaginary figure begins at the lamppost and moves according to the instructions on the dice and the path is followed by a beam of light.

Viewers around the display follow the movement of the light questioning whether it will move off the grid or return to the lamppost.

But, the innovation which may interest most visitors is the new reservations system which permits visitors to see the main attraction without waiting in line. Tickets are distributed on a first-come basis for shows that day only. Visitors who secure tickets for a show later in the day, return to the pavilion at that time and are seated without waiting in line.

A Different Type Job

A group of young men and women at the IBM World's Fair pavilion have an interesting and challenging assignment. As part of the language translation demonstration, they copy from complex Russian scientific texts and type this information on a specially modified typewriter with a Russian keyboard and the Russian alphabet.

However, none of them speaks, writes or understands Russian.

Follow the Bouncing Ball It Shows Laws of Chance

What is the potential number of accidents in a large group of automobile owners? How can a scientist forecast the results of cross-breeding animals or plants?

In the 300 years since the early work of Blaise Pascal the science of probability has developed. It has enabled scientists to predict the molecular behavior of gasses; mathematical laws of probability have helped establish the insurance business; "chance" has helped science detect the laws of order in a world of random events.

At IBM's World's Fair pavilion, a Probability Machine—a huge glass-enclosed device resembling a vertical pinball machine—demonstrates how a probability curve can be found by experiment.

A stream of 15,000 polyethylene balls pours down from the center top of the machine through a maze of hundreds of aluminum pins into 21 chutes at the bottom of the machine, forming a bell-shaped "curve of probability." The effect of the completely random action of the bouncing balls is to form almost exactly the same curve each time the balls are dropped. This curve is known as the normal distribution curve of science. The curve charts what is normal or average in a large number of test cases.

In the Probability Machine, the balls are carried to the top in 48 buckets attached to 32 feet of chain. When all the balls have been dropped, the chain stops. A gong sounds for a minute when the curve is fully formed. The balls then fall through a hopper, where a conveyer belt feeds them back to the buckets on the chain to repeat the cycle.

The atmosphere of the IBM World's Fair pavilion is that of a garden. Tall steel trees form a translucent cover for a series of colorful exhibits that offer simple and entertaining explanations of computers and other modern information handling devices. In creating the pavilion, the designers—Charles Eames and Eero Saarinen Associates—set forth to create an environment in which to show that the methods used by computers in the solution of even the most complicated problems are merely elaborations of simple, human-scale techniques, which everyone uses daily. They attempted to create an environment rather than provide a building to house exhibits.

Reservation System Cuts Long Lines at People Wall

One sure way to spot popular attractions at the New York World's Fair is to look for long waiting lines. There will be one exception to the rule this year—a first-come-first-served reservation system, eliminating waiting in line at the IBM pavilion.

The reservation system was tested successfully toward the close of last year's season which brought more than five million visitors to the IBM pavilion. Tried on a limited basis, the system eliminated waiting in line for those visitors who made advanced reservations and permitted waiting in line for those who preferred not to return later in the day.

Here is how the IBM reservation system works:

Fairgoers who wish to ride the People Wall, the principal attraction at the pavilion, may go to a reservation booth to secure tickets. Tickets are distributed for that day only on a "first come" basis. Half of the nearly 500 seats on the People Wall are reserved every show for ticket holders. The visitor may secure tickets for the next available show or may choose tickets for a show later in the day. The starting time for each show during the day and the availability of tickets for that show are posted on a board behind the booth. Upon returning to the pavilion at the time specified on the ticket, the visitor enters through a separate gate and is given immediate seating on the People Wall.

The system also allows those who find it inconvenient to come back a second time to wait in line.

For those persons waiting in line, the People Wall is reached through the entrance side of a maze of walkways which is elevated over a large reflecting pool. No matter which path the visitor takes, left or right, up or down, all paths lead to the destination—a seat on the People Wall that will carry the visitor into a great theater that rests on top of the grove of steel trees.

On the walkways strolling entertainers amuse visitors who wait for the next show. The People Wall descends from the raised theater. Those who have seen the show file off. Now, it's show time again.

Hunt and Peck At Typewriter Bar

A visit to the World's Fair is not complete until friends and relatives back home have heard about it with a postcard. At IBM's pavilion, visitors are invited to type a free postcard on one of ten colorful IBM "Selectric" electric typewriters at the contemporary typewriter bar located near the entrance.

The IBM Selectric is a radically different kind of typewriter, having no type bars or moveable carriage. Instead of type bars found in conventional typewriters, the machine employs a single sphere-shaped typing element bearing all the alphabetic characters, numerals and symbols.

It types by means of the element moving across the paper, tilting and rotating at high speed, selecting and imprinting the desired character as the typist uses the machine's ordinary keyboard. The left-to-right motion of the element eliminates the need for a moveable carriage.