

# MULTI-VISITOR, NETWORK ENABLED GAME MODEL

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## ABSTRACT

This vignette illustrates one way that a game-based educational activity oriented around the curriculum could be integrated into museum visits, thus enriching both the in-school activities and the experience of the museum visit.

## THE STORY

Grace logged into the 7<sup>th</sup>-grade “history of technology” MUVE and checked to see who was in world. Bama was in and so was Frisco Dog. The other members of the Blue-Group were not in yet. Grace paged them over the channel, “Yo team-mates, it’s Nonova, how’s things?” Her teammates responded quickly with “good, good.” They chatted briefly, doing small talk at first, then settled into class work, checking out their assignment. Ms. Duncan had prepared topics for students in her class to research prior to next week’s visit to the Museum of Computer History downtown.

The Blue-Group’s task was to research items from the museum’s exhibit on information technology in science technology. The exhibit was well known for having objects used in science-fiction television shows and movies and had a good collection of historical “futuristic” computers—renditions of what writers and computer scientists in the past had thought computers would evolve into. Later the team would prepare a presentation for students in other groups (who were researching other aspects of computer history) and work in mixed-member groups to summarize the previous 50 years of computer history and predict future directions for development. In addition, they would have to predict how long it would take before the computational capabilities portrayed in the science fiction displays would actually be available. Ms. Duncan liked the exercise because both the historical and technology aspects dovetailed nicely with the 7<sup>th</sup> grade curriculum and had not been a drain on classroom time—at least not since the kids got past the initial learning curve.

The Blue-Group met in the same virtual space as the other groups, the “Infospace.” Infospace was a sort of futuristic, three dimensional world populated by historical characters and their futuristic counterparts. Students could navigate their avatars within the space and communicate with one another through text and graphical gestures, including facial expressions that students could base either on generic characters or digitized photos of their real faces. Throughout the experience they would encounter not

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only other students, but also automated characters--non-player characters (NPCs) that followed set paths and offered hints or tours. Students quickly learned to take advantage of these NPCs who were usually based on important historical figures and even discovered that sometimes college students or subject matter experts were operating them in real-time. It was hard to know what to expect in Infospace, but it was wise to gather as much information as possible when you encountered it.

Once within Infospace, Frisco Dog suggested they start exploring, and they each manipulated their avatars through the infospace in search of places or things that might help them in their quest. Grace, aka Nonova, entered a building and found a doorway labeled ENIAC. She clicked on the door, expecting to be teleported to the inside of a computer, but instead found herself inside a large room filled with strange looking boxes that resembled tape reels. After poking around a bit, clicking on things, and reading their descriptions, she found out that she was indeed inside the ENIAC computer, even though entering it had not required rescaling her avatar to a tiny size in the way required to enter other computers. She paged her teammates. "Hey guys, I'm inside a huge computer, I didn't even have to smallify myself to get in." It turned out that Bama had found herself inside a maze-like space consisting of larger than life ones and zeros and was trying to find her way out. The only way was to rearrange the ones and zeros to represent the number 85, a process that required her to research binary systems. Fortunately, Frisco Dog knew of a link that described this and he projected it to her screen, something Bama could not yet do. Projecting links was a privilege reserved for students who had learned the first four basic skills and Bama had only passed the quizzes for the first three. The fourth one, based on presentation, could not be earned automatically but was based on Ms. Duncan's assessment of a write-up, which she then input to the system using a teacher management interface.

As she wandered about, Nonova was suddenly greeted by a tall, slender woman dressed in what looked like an old-fashioned military uniform. The avatar resembled her own in the way it walked, but she suspected it was a bot and not another player. It addressed her, "Hello, do you know about COBOL?"

"No" she responded, quickly running a search for COBOL by pulling up the search function from her toolbox. Upon finding out that COBOL was an early programming language, meaning Common Business Oriented Language, she broadcast the news out to her teammates at the same time that Frisco Dog announced he had tripped over some information on BASIC and was learning about how many derivatives of it had been created over the years.

The tall, slender woman addressed Nonova again, "I'm Grace Hopper, what's your name?"

Cool, thought Nonova, and gave her real name, Grace, in response, stepping out-of-character momentarily. She wasn't sure if Grace Hopper was another student or an NPC.

"Nice to meet you, Nonova, please follow me if you'd like to learn more about COBOL."

The tall, slender avatar walked away between two rows of tall, slender machines that looked kind of like large audiocassettes. “These are tape drives, we use them to store data.” Nonova continued following Grace, pausing momentarily to click on one of the tape drives. Doing so displayed a larger picture of it in the display panel on the right of her screen as well as a pick list with items like “Other early storage devices,” “How Magnetic Media work,” and so on. She saved the location of the display page, resolving to come back to it later but preferring to follow Grace Hopper for now. She wished she had earned the privilege of projecting her view to other players because that would have come in handy with the Magnetic Storage information.

A week later: Ms. Duncan shepherded the class off the bus and instructed them to stay together, “We’re going to meet to the right of the main entrance to pick up our VIAs (Visitor Interactive Apparatus) and then you’re free to go where you wish inside the museum until 12:30 when we meet in the basement cafeteria. Remember to check for your assignments and your to-do lists.

The VIA’s turned out to be small, hand-held devices that had a 640x480 screen, and some control buttons, a lot like a GameBoy or a PlayStation console. Grace chose a red one and fastened the Velcro strap around her wrist so she couldn’t drop it. She then set off to explore the museum, preferring to walk by herself rather than with one of the little groups that quickly emerged from the class. There it was! She saw one of the early tape drives and read the little display card posted on the wall next to it. At the end was a an invitation to obtain more information through the infrared port on her VIA. She aimed it at the IR transmitter and pressed the green button to indicate acceptance. After looking on the VIA screen at examples of other tape drives from the period, by different manufacturers, she chose to add one to her inventory, filling one of the 20 squares that formed a frame around the center display portion of the screen.

Not sure what she was supposed to do next, she turned to a boy standing near her and asked, “What am I supposed to do now that I have a tape drive in my inventory?” “Do you need it for your assignment,” he asked? Grace remembered that Ms. Duncan had told them to check out their assignments so she glanced at the display screen and pressed on the assignment icon. It quickly displayed this brief message:

Welcome to the Museum of the History of Technology. Your assignment today is to assemble a representative collection of objects that demonstrate four key advances in the history of computers. You will find different categories as you progress through the museum, and you may choose any four of them. No more than half can be objects that are physically displayed in the museum, so the others will have to come from the virtual-displays that you can access via the infrared port on your VIA, or by trading with other visitors.

Grace wasn’t quite sure what to make of the idea that she could trade objects, but since the word “trading” was highlighted she realized it was a link and read about the trading game underlying the museum visit. It explained that the trading was a give and takeso that you lost anything you traded. It all worked out in the end because you needed to collect a group of objects that together told a story. You could collect other objects and

then trade them to other visitors who needed those and might have something you needed delete spacingthat was of no use to them. Delete spacing

Remember, your task is to develop a virtual exhibit of your own. That exhibit must contain objects from the history of computers that you find important and interesting, arranged in a sequence that recounts the development of this technology.

Grace noticed that the boy was looking at her as she read the assignment. He asked, "So, what school do you go to?"

"Bayside" she responded, "You?"

"Mountain View."

"How many objects have you gotten so far? "

"Six. You?"

"Just one, from here," she responded.

"Did you check out the prizes," He asked?

Grace had heard about the prizes, but didn't know what they were. The idea was that if you made a good exhibit you could win something at the museum gift shop at the end of the visit. The museum would select from all the assembled electronic exhibits to help them design their future exhibits within the physical museum space or for their web site. Some collections might also be used in future Infospaces.

Seeing that she was kind of confused, the boy offered, "You can get the gift list from any of the IR beamers just scrolling down to it. It's the last option."

An hour later Grace stood in front of a display case labeled "The First Computer Bug". Inside it she could see part of a moth taped into an old notebook. The description, written in neat handwriting, said that this bug has shorted out the ENIAC computer in 19xx. From the data port, Grace learned that the word "bug, "when applied to the concept of a system problem, predated its use in computers, having been used much earlier in electrical engineering. Thinking this interesting, she saved this fact linked to a line drawing of the moth nested beneath the edge of a vacuum tube. Then she saw the boy she had seen earlier and said, "Hey, isn't this stuff about the first computer bug cool?" He looked at the exhibit, nodding, and pointed his VIA at the IR port under the exhibit. "Hey, it says that . . . . ."

Grace browsed around a bit, but couldn't find what he was talking about and asked him where this information was. It turned out that only visitors with red VIAs got that what delete spacing she saw, while only those with blue VIAs got the information the boy had given her.

The only way for them to get some objects was to trade with other visitors. She introduced herself as Grace to the boy, whose name turned out to be Adam, and beamed him the drawing of the moth in exchange for his information about vacuum tubes. Since they had different colored VIAs, they decided to walk onward together.

### **EPILOGUE**

. . . . . the story could continue in any number of ways, but one possibility is that Grace and Adam develop a strong collaboration and share many objects. It turns out they can't get all they need unless they interact with visitors who have different colored VIAs. Throughout their discussion they make plans to interact online in the Infospace later. At the close of the museum visit they turn in their VIAs at the gift shop and receive Infobucks which are as good as cash at the gift shop.