Steth E. and Howie C. in the Hasbro Children's Hospital
User's Guide and Documentation

Technical Specifications

The application will run well on a Pentium-class system with at least 16Mb RAM and a 2X-speed CD-ROM drive. The application will run optimally on a Pentium II-class system with more than 32Mb RAM and 12X-speed or faster CD-ROM drive.

The system display should be set to 640 x 480 pixels and High Color (16-bit). To confirm or change the system display settings from the Start menu, select "Settings" then "Control Panel" then "Display," and finally the Settings tab. Any resolution greater than 640 x 480 will still allow the application to function properly, but the application will appear in a small window in the center of the screen instead of filling the display. The system display colors should be set to High Color (16-bit) or True Color (32 bit). The application will not function properly if the display is set to only 16 or 256 colors.

The application makes extensive use of audio, both for the voices of the main characters and sound effects. Users should listen to the application's audio with PC speakers or headphones. Using the application with no sound at all might prove confusing for the user. If no sound can be heard from the PC's speakers or headphones, double-click on the loud speaker icon in the tray on the far right of the task bar to check the system Volume Controls. Make sure that the Volume Control slider is up and the channel is not muted, and that the Wave slider is up and the channel is not muted.

Startup and Installation

The application resides on a CD-ROM. It can be run off of the CD-ROM by simply double-clicking the application icon or by finding the executable using the "Run" command from the Start menu. Because the CD-ROM drives at the hospital are not very fast, better performance can be achieved by installing the application onto the hard-disk of any PC. However, the size of the application might make this option impossible: if the hard-disk of the destination PC does not have ample room, the application might not copy fully or simply run at performance worse than that on the CD-ROM itself.

Inpatient vs. Outpatient Explorations

Pre-operative inpatients do not go through the same preparatory procedure as outpatients. For this reason, users are asked as soon as the exploration begins whether they want to explore as an inpatient or an outpatient. The inpatient exploration is considerably shorter than the outpatient version, as the inpatient exploration is merely a subset of the outpatient exploration. The outpatient exploration visits two entire rooms that are excluded in the inpatient exploration.

Exploration vs. Dictionary mode

The application is designed primarily to be used as an exploration. This is primarily because only the complete exploration introduces the hospital environment and all of the

preparatory procedures. However, for the convenience of all users there is a dictionary mode. From the main dictionary screen the user can quickly and directly access the definitions of all of the people, equipment, and procedures that can be seen using the exploration. There is no difference between the definition screens seen in the dictionary mode and those corresponding to the same people, equipment, and procedures in the exploration.

The Navigation Bar

The navigation bar is at the bottom of the screen and its buttons maintain consistent functionality throughout the exploration. The two yellow arrow buttons control the left-to-right and right-to-left panning of the user's first-person view. The reload button returns the user to the start of the current room. The back button returns the user to the start of the previous room. The sound button toggles the application's audio on and off. The exit button returns the user to the Main Menu from anywhere in the exploration. And the Magic Tile button, when activated, advances the user to the next room. The navigation bar also displays the name of the current room of the exploration.

Summary of Design Decisions

Although the hospital liaisons were fairly clear about the content they wanted to include in the program, most of the application and user interface design decisions were left up to us. More detailed explanations about the following items are included below.

Graphical interface (overall)

We had two options for the overall design of the graphical interface: we could have drawn all the rooms or photographed them. We decided early on to photograph each room in Surgical Services at Hasbro to use as a backdrop for our "story" because we thought that it would be less time-consuming and a more accurate representation of what a patient would see in the hospital. Photographing the hospital took many more attempts than we had originally planned for, due to new ideas that we introduced, technical difficulties, time required for precision and on-the-spot scripting, and minor miscommunications with the hospital. The photographed rooms have been filtered to contrast the environment with the sharper aesthetic of the people. In order to encourage the user to click on certain items to learn more about them, the highlighted items become larger upon mouse-over.

Panning

With the decision to photograph each room came our idea to include a joystick-type button for a navigation bar controlled by the user. Since the rooms did not fit on a 640 x 480 pixel screen, we knew that the user would need to pan from side-to-side. The end result was a set of Left and Right Arrow buttons in the navigation bar that, when clicked, would slide the photo in either direction and stop at a predetermined point. The user has no control over where the screen stops, and this is to ensure that the user does not miss an object on the end of a screen.

Which buttons were included in the navigation bar

We wanted to minimize the number of buttons on the navigation bar without leaving the user lacking in their control of the flow of the exploration. We decided to include "Back" and "Reload" buttons to allow the user to return to the room they just left or re-start the

room they are in. The "Exit/Main Menu" button ends the exploration and returns the user to the Main Menu. From the Main Menu, the user can re-start the exploration, enter dictionary mode, read the project credits, or exit the application. The projector's sound can be toggled on or off from the navigation bar as well. Lastly, when the user discovers a Magic Tile, the Magic Tile button appears in the navigation bar allowing the user to click on it to advance to the next room.

Characters: design, personalities, movements, language

We have included both real and cartoon characters in our program. The user meets at least one new character in each room so that s/he does not get bored with a repeated format throughout the program. The exploration is narrated by two main cartoon characters. Steth E. Scope is a female tour guide in a stethoscope shape who moves and jumps around the screen, introducing new items and talking about important issues. Howie C. Hasbro is a Band-Aid man who lives in a dictionary and defines various items, people, and procedures for the user. The real characters do not have speaking roles because we would have had to record the Hasbro Surgical Services staff reading all of their own voices. After careful consideration, we decided that having the human characters speaking to the user in their real voices was not worth the logistical difficulties inherent in recording the O.R. staff.

Language and Script for the relationship between the user and the program

The language used in the program was important to our clients. They gave us the homework of writing preliminary definitions of the items, equipment, and personnel, which translated into research for us to do. After presenting our first attempt to the clients, we went through numerous revisions and came to a consensus after people in different positions (doctors, child life specialists, nurses) gave us their feedback. "Advanced" definitions describe in more detail certain procedures and items; these definitions might not be appropriate for younger users, and for this reason these definitions are not read aloud by Howie C. as the others are. In terms of the speaking language, we aimed for a sixth-grade average colloquial narrative from Steth E. Scope, and our script was approved by a child life specialist before we made a final decision about it.

Guided tour model vs. exploration model

Although we knew from the start that our program would be modeled after a guided tour or an exploration of the Surgical Services environment, we did not determine the level of guidance that our narrator would give to the user until we spoke with students from last year's Educational Software Seminar course. Our initial instinct was to give the user as much freedom as s/he wanted, because tours can become authoritative and boring, but we later realized that too much freedom without incentives along the way would lead to boredom and indecision. As it stands, our narrators dictate to the user crucial pieces of information, suggest items and people that the user should be familiar with, and allow a certain degree of freedom in navigating through the environment.

How the flow of rooms would work: Magic Tiles

The flow of rooms was given to us by the clients, once they determined the exact path that a patient would follow in Surgical Services and the reasons for entering or not entering certain rooms. Our main concern was trying to find an incentive for the user to take advantage of the exploration that is built into our program and proceed to the next room. Our program uses Magic Tiles to encourage and guide the user throughout the program. Tiles were chosen because Hasbro has ceramic tiles made by children displayed on its walls, and we believed that a familiar icon would make sense. The user is introduced to the

Magic Tile concept at the beginning of the program. Once the user clicks on a certain number of items in each room (that number is specific to each room), Steth E. Scope finds a Magic Tile behind that item, and the user has the option of going to the next room. By simply counting the number of unique items the user has clicked on in a given room instead of always hiding the tile behind the same item, we do not allow a user who has played the game before to skip quickly through the rooms by quickly finding the Magic Tiles. Steth E. Scope guides the user towards certain items if they are important for the user to learn about and then gives the user time to explore.

Design of the body screen

Our clients wanted to include simple descriptions of the most common procedures done at Hasbro in the program, and they also noted that many people (patients and the parents) do not know the technical names for their operations. Together with our Hasbro liaisons we decided on a screen with a human body that, upon mouse-click, displays a list of the procedures associated with the clicked-on area of the body. Although everyone agreed that this would be the best way to communicate information about procedures to the patients, some Child Life Specialists were concerned that a realistic human body would frighten children. Our end result was a simple, "humanesque" body which has the basic shape of a human but lacks graphical detail and any discernible sex.

How to make the program work for both inpatients and outpatients

Another specification from our clients was to consider the different paths that children might take to get to the operating room. From the three major paths (inpatient, outpatient, and emergency), they decided that we should focus on inpatients and outpatients. Our program asks the user at the beginning whether s/he is an inpatient or outpatient, and then either starts the user in the outpatient waiting room or the school-age holding room. This "branching" requirement was not difficult to implement because the set of rooms that inpatients visit is simply a subset of the rooms that outpatients visit. As far as our exploration is concerned, the only difference between inpatients and outpatients is that inpatients start in the school-age holding room (skipping the waiting room and check-in desk) and they cannot choose from all the same vehicles that outpatients are offered.

Sound

We recognized early on in our design process that a strong audio component accompanying our visual exploration could greatly enhance the user experience. The audio narration is the most prominent. Everything that our narrators "say" is actually heard, and all of the text that is written in our definition pages is read aloud. The audio narration is synched to text bubbles that display the words the narrators are saying. In this fashion, the exploration's users can choose to just listen to the narrator, or to listen and read along at the same time. The sound effects component of the audio was an easy way for us to add a degree of fun, unpredictability, and humor to the user experience. For example, item mouse-overs are accompanied by one sound, the appearance of a definition page by another sound, and the panning motion of our first-person view by still another. To underscore the completion of each room and the advancement of the user to the next room, we have short musical clips that play from the moment the user clicks on the Magic Tile button, through the fade-out of the old room and the fade-in of the new room.

Press Release (June, 1999)

A new method of pre-operative patient orientation has been installed in the Hasbro Children's Hospital: an interactive CD-ROM. This computer program teaches kids, both inpatients and outpatients, what to expect in their visit to Hasbro Surgical Services. Patients and their parents using the program will "virtually" visit Surgical Services' rooms, learn about the typical equipment used, meet the Surgical Services staff, and become familiarized with the pre- and post-operative patient experience at Hasbro.

The CD-ROM was designed and produced by four undergraduate students at Brown University: Oliver Hurst-Hiller '99 (Computer Science), Rupali Kotwal '00 (History and pre-medicine), Yusuke Naito '00 (Computer Science), and Naomi Ture '00 (Visual Arts and Education). The four students were enrolled in a Brown University course entitled the "Educational Software Seminar." The Educational Software Seminar is offered jointly by the Brown University Computer Science and Education departments and taught by Prof. Roger Blumberg. Blumberg is a Visiting Lecturer in the Department of Computer Science as well as a Research Fellow in the Institute for Elementary and Secondary Education, Senior Technology Specialist at the Education Alliance, and a Visiting Scholar at Brown's Institute for Brain and Neural Systems.

The goals of the Educational Software Seminar are two-fold. Students first develop an understanding of basic educational philosophy and the principal goals of education. They then learn to analyze existing educational software and apply those analytic techniques to the development of their own projects. Each student was part of a team project that worked with a teacher or professor in the Providence community to build a software application envisioned by the sponsor prior to the start of the semester. In addition to the Hasbro project, other teams in the class worked with faculty members at the Vartan Gregorian Elementary School in Fox Point, the Brown University School of Medicine, and the Brown University Department of Geological Sciences.

Sandy Daigneau (Child Life Specialist), Dr. Richard Gillerman (anesthesiologist), Kristen Pardini (Child Life Specialist), Linda Goodale (Child Life Specialist), and Susan Cicchini (Elementary Teacher, Hospital School) were the primary liaisons between Hasbro and the Brown students. The Hasbro contacts worked closely with the software group to identify both the strengths and weaknesses of the method for delivering pre-operative orientation that was in place as of February, 1999. The pre-existing mechanisms, collectively known as the POP program, included a video, a book with photos and text, and an hour-long orientation with a Child Life Specialist. The Hasbro "clients" conveyed the consensus opinion that the pre-existing mechanisms were inadequate or outdated and the design of the CD-ROM began in earnest in late February 1999.

Hasbro Surgical Services, the Hasbro in-patient classrooms, and Professor Blumberg's students hope that the CD-ROM resulting from this collaboration represents an interactive and fun method by which the hospital staff can better prepare patients for their hospital experience.