

# mark steiner, inc. Simulation Engine Approach

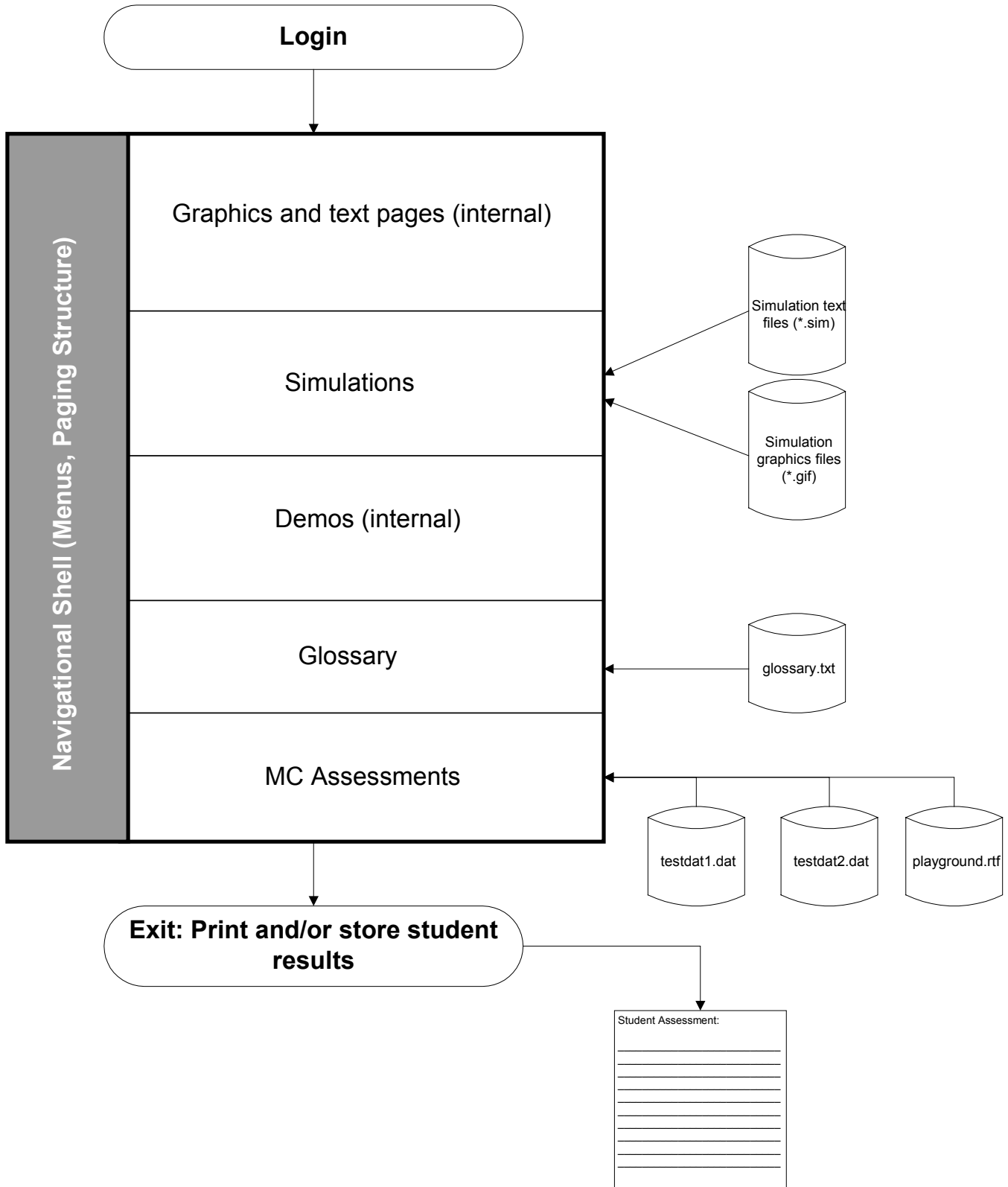
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Simulations allow learners to practice and test a variety of controlled situations without consuming data or harming the actual system. mark steiner, inc. has extensive experience constructing engines within CBT courseware that have simulated a variety of software products and electronic devices. Many of the elements, techniques, and concerns of any type of simulation engine are quite analogous. Most engines are based on the premise of repeating a series of tasks, calculations, and inputs, which in turn derive a set of outputted values and conditions. This document describes and depicts the approach and components that mark steiner, inc. uses for simulation-based CBT.

By definition, a simulation engine uses core coding and functionality to accomplish given tasks. Often, external data files are used to supply the engine with the data that is required to execute tasks and simulations. One approach is to construct a second application, or Simulation Wizard, to create and maintain the external simulation files. Once the engine is constructed and fully tested, changes to the Simulation Engine are not required. For example, for software training, a Simulation Wizard might be created to allow Authorware programmers or instructional designers to specify the data required for the simulation. This could include hotspot and button locations, text field locations, correct answer(s), correct and incorrect feedback, links to graphic files or screen grabs, links to audio files, etc. The Simulation Wizard then generates a data file in a format compatible with the Simulation Engine. The actual Authorware training application points the Simulation Engine to a specific data file when that simulation is required. If the need to modify simulations occurs (as it often does) after the initial scope, the Simulation Wizard is used to modify existing ones, leaving the source code intact.

Compare this approach to one that embeds all graphics and sound files within the courseware and requires "hard coding" of each individual interaction. Defining required interactivity upfront and constructing a Simulation Wizard and Engine enables courseware to be developed much faster with fewer errors. Also, the required level of programming competency for team members constructing simulations is reduced considerably.

The following is a sample Application Diagram depicting the structure of CBT courseware using simulations.



# “Green Screen” or Main Frame Simulation

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In simulating green screen applications within a CBT program, a few finite inputs exist that define a particular interaction or sequence. These include:

- Simulation file name
- Graphic file name (screen grab)
- On-screen instructions
- Number of fields
- Location of fields (X,Y)
- Whether a field is judged
- Maximum number of characters in the field
- Default (or Preset) value
- Right or left justification
- Correct answer
- Judge Key (Tab, Return, F11, etc.)
- Data type (character, date, number, etc.)
- Incorrect feedback

While the list may seem somewhat daunting, whether or not one uses a simulation engine or builds each interaction individually, each of these elements must be addressed. The Simulation Wizard is a graphical interface that facilitates the gathering of this information, ensures that all information is gathered for each sequence, and provides a WYSIWYG (What You See Is What You Get) interface to the individual assembling the simulation.

It should be noted that simulations do not negate the upfront instructional design work of selecting, identifying, and writing the simulations. For the purposes of this paper, it is assumed that the simulations have been identified and written, and that screen grab graphics have been captured and processed to the correct file format and size.

The following section displays screen grabs depicting the steps in the process.

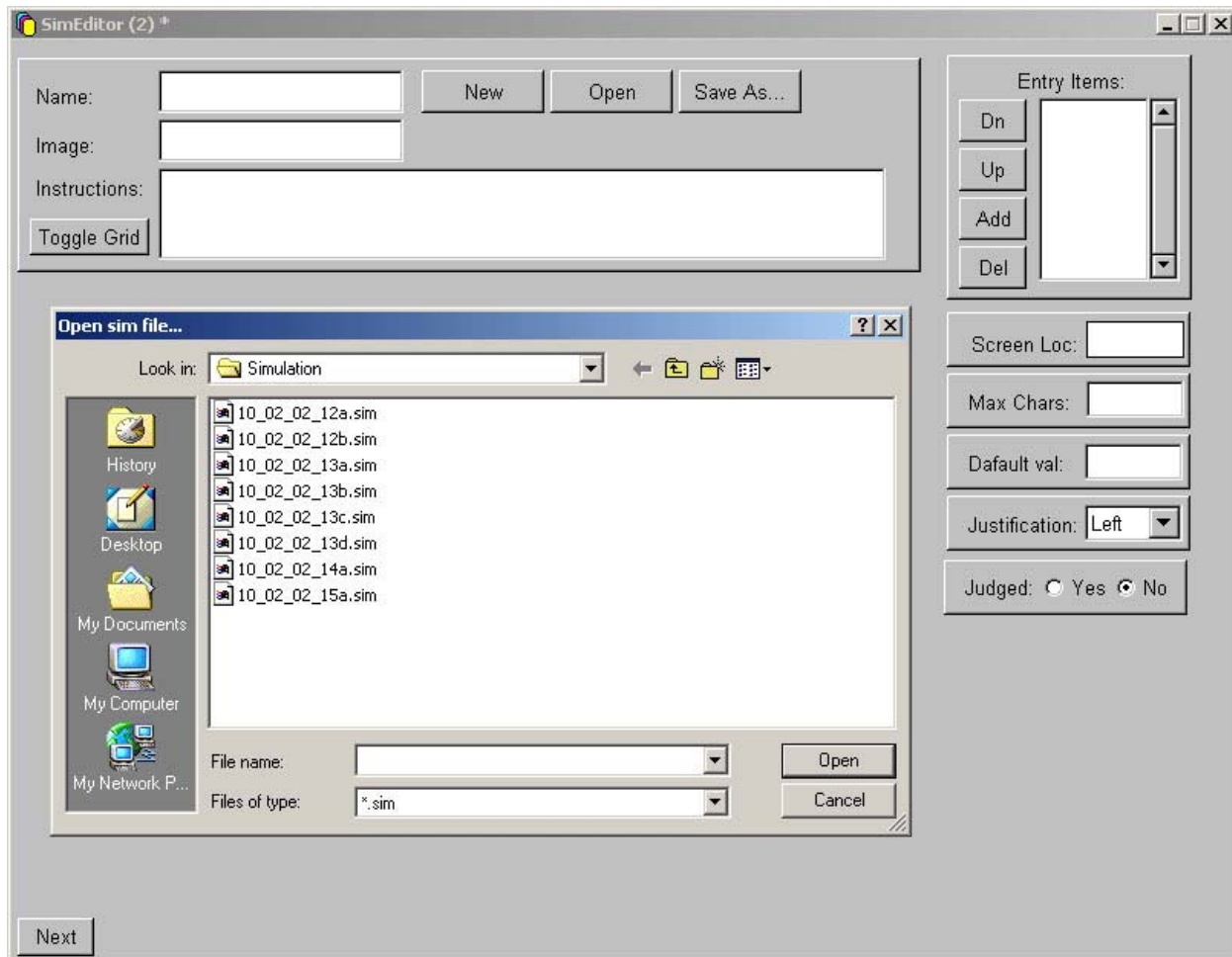
## Step 1: Launch Simulation Wizard.

This Simulation Wizard facilitates creating and modifying green screen simulation sequences. The interface supports all of the tasks and inputs required for the simulation.

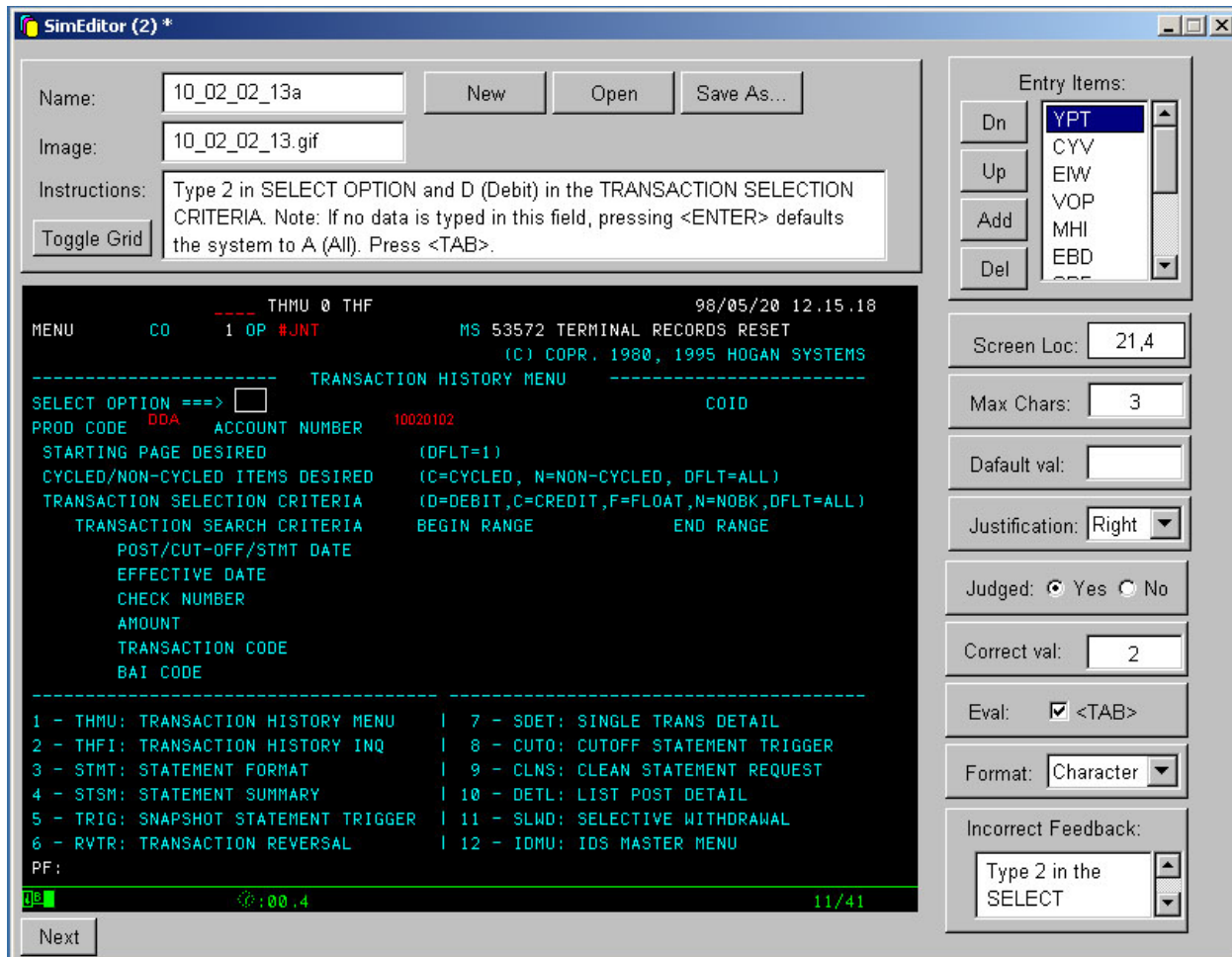
The screenshot shows the SimEditor (2) \* window with the following elements:

- Name:** [Text Input Field] **New** **Open** **Save As...**
- Image:** [Text Input Field]
- Instructions:** [Text Input Field] **Toggle Grid**
- Entry Items:** [List Box] **Dn** **Up** **Add** **Del**
- Screen Loc:** [Text Input Field]
- Max Chars:** [Text Input Field]
- Dafault val:** [Text Input Field]
- Justification:** [Dropdown Menu] (Left)
- Judged:**  Yes  No
- Next**

## Step 2: Create New Simulation file or Open Existing Simulation file.



### Step 3: Gather simulation data.



The top third of the screen contains global information for a particular sequence such as: simulation file name, graphic file name, on-screen instructions, and a list of the field identifiers (Labeled "Entry Items:"). The Entry Items area contains unique 3-letter identifiers for each field. By clicking the Down, Up, Add, and Delete buttons, fields can be added or deleted, and their tabbed order can be manipulated.

The lower two-thirds of the screen contains the screen grab, and field specific information. Notice the white rectangle on the screen grab, which marks the location and size of the current field displayed, in this case field "YPT". The field is located in the 21<sup>st</sup> character from the left, and in the 4<sup>th</sup> row down. The field can contain a maximum of 3 characters. There is no default value, meaning that the field begins empty. Once data is entered into the field, it is right justified. The field is marked as judged, meaning that it is a critical field that the user must enter data into. The correct answer is "2", and will be evaluated by pressing the Tab key. The data format is character (or text), and the incorrect feedback is (although somewhat obscured) "Type 2 in the SELECT OPTION field."

Input for other fields can be gathered by clicking on another Entry Item from the scrolling box in the top right-hand corner. Once all fields have been added, ordered, sized, and all data has been inputted, the simulation file can be saved.

Once simulation files have been created, they can be incorporated into an Authorware shell. The Authorware shell can support any screen design and layout to suit the specific project. Any other types of interactivity can be added, such as log in, menu structures, other practice and rehearsal interactions, presenting of content, multiple-choice assessments, etc.

#### INCORPORATION OF SIMULATIONS WITHIN AUTHORWARE

If using the mark steiner, inc. Authorware simulation engine, the only step required within Authorware to play a specific simulation is to drag a specially defined calculation icon onto the flow line when and where the simulation should take place. The title of the calculation icon must exactly reflect the title of the simulation file (.sim).

If the screen grab changes, or there are changes to the number and size of fields, or a change to the on-screen verbiage, a change to . . . , one only needs to use the Simulation Wizard to change the external .sim file. Changes to the Authorware file are not required.

## “GREEN SCREEN” SIMULATION RUNNING IN AUTHORWARE

The following depicts a simulation running within an actual Authorware CBT. This particular course was for the US Federal Reserve Bank. By design, the Forward button is not displayed or active until the learner successfully (or unsuccessfully, in 3 tries) completes the simulation.

Console Created by mark steiner, inc.

```
IDST          IDMU 0 IDS          98/05/20 12.05.30
MENU         CO      1 OP #JNT      MS 53572 TERMINAL RECORDS RESET
                                     (C) COPR. 1980, 1995 HOGAN SYSTEMS
----- INTEGRATED DEPOSITS MAIN MENU -----
SELECT OPTION ==> _                COID
PROD CODE          ACCOUNT NUMBER
-----
1 - APMU: ACCOUNT PROCESSING MENU | 11 - LKMU: REA/TDA LINKED ACCT MENU
2 - AIMU: CLIENT ACCOUNT INQUIRY MENU | 12 - IYMU: INTEREST RATE/YIELD MENU
3 - AIM2: ACCOUNT INQUIRY MENU | 13 - RP00: RELATIONSHIP PRICING MENU
4 - THMU: TRANSACTION HISTORY MENU | 14 - PORT: TDA PORTFOLIO INQUIRY
5 - IPOM: IDS PROCESSING OPTIONS MENU | 15 - CMST: COMBINED STATEMENT
6 - NAMU: NAME / ADDRESS INFORMATION | 16 -
7 - | 17 - FSMU: FSS SYSTEM MENU
8 - | 18 - RSMU: RESTRAINTS MENU
9 - | 19 - OTPR: OTP STD MENU
10 - | 20 - NSFR: OTP NSF MENU

PF: .,-IBAR
08/43
```

Type 4 in SELECT OPTION, DDA in PROD CODE, and 10020102 in ACCOUNT NUMBER. Press <ENTER> to display the THMU.

Initiating Account Total Extractions

Exit Help 0% 25% 50% 75% 100% Back



# GUI (Graphical User Interface) Simulation

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While the need for “Green Screen” simulations still exists in many industries, most software created these days is of a GUI nature, incorporating the use of a mouse.

In simulating GUI applications within a CBT program, again, a few finite inputs exist that define a particular interaction or sequence. These include:

- Simulation file name
- Graphic file name (screen grab)
- Audio file name (if required)
- Interaction type (clickable or text entry)
- On-screen instructions
- Number of fields
- Location of fields (X,Y)
- Whether a field is judged
- Maximum number of characters in the field
- Default (or Preset) value
- Right or left justification
- Correct answer
- Judge Key (Tab, Return, F11, etc.)
- Data type (character, date, number, etc.)
- Incorrect feedback

The GUI Simulation Wizard is a graphical interface that facilitates the gathering of this information, ensures that all information is gathered for each sequence, and provides a WYSIWYG (What You See Is What You Get) interface to the individual assembling the simulation.

The following section displays screen grabs depicting the steps in the process.

**Step 1: Launch Simulation Wizard and start a New file or Open an existing simulation.**

		<b>HOT SPOT DATA</b> <u>Hot Spot Graphic</u>  <u>Hot Spot Audio</u>  <u>On-Screen Text</u>  <u>Incorrect Feedback 1</u>  <u>Incorrect Feedback 2</u>	
		<b>TEXT ENTRY DATA</b> <u>Text Entry Graphic</u>  <u>Current Text Field #</u>  <u>Total # of Text Fields</u>  <u>Field Judged?</u>  <u>Field Preset Entry</u>  <u>Incorrect Feedback</u>  <u>Field Correct Answer</u>	
<b>Feedback Box Interaction # 1 of 1</b> Please input the title for the external SIM file OR click OPEN to edit an existing file. <input type="text"/>		<b>Interaction Type:</b>	<input type="button" value="Import Media"/>
		<b>SIM File Title:</b>	<input type="button" value="Place Hotspot"/>
		<input type="button" value="Exit"/> <input type="button" value="Open"/> <input type="button" value="New"/>	<input type="button" value="Feedback"/>

**Step 2: Select the Interaction Type. In this example, HotSpot is selected.**

**Feedback Box Interaction # 1 of 1**

Please select an interaction type:  
HotSpot or TextEntry

**Interaction Type:**  
SIM File Title: MSI

HotSpot TextEntry

Exit Open New

Import Media  
Place Hotspot  
Feedback

**HOT SPOT DATA**  
Hot Spot Graphic  
Hot Spot Audio  
On-Screen Text  
Incorrect Feedback 1  
Incorrect Feedback 2

**TEXT ENTRY DATA**  
Text Entry Graphic  
Current Text Field #  
Total # of Text Fields  
Field Judged?  
Field Preset Entry  
Incorrect Feedback  
Field Correct Answer

Created by  
mark steiner, inc.

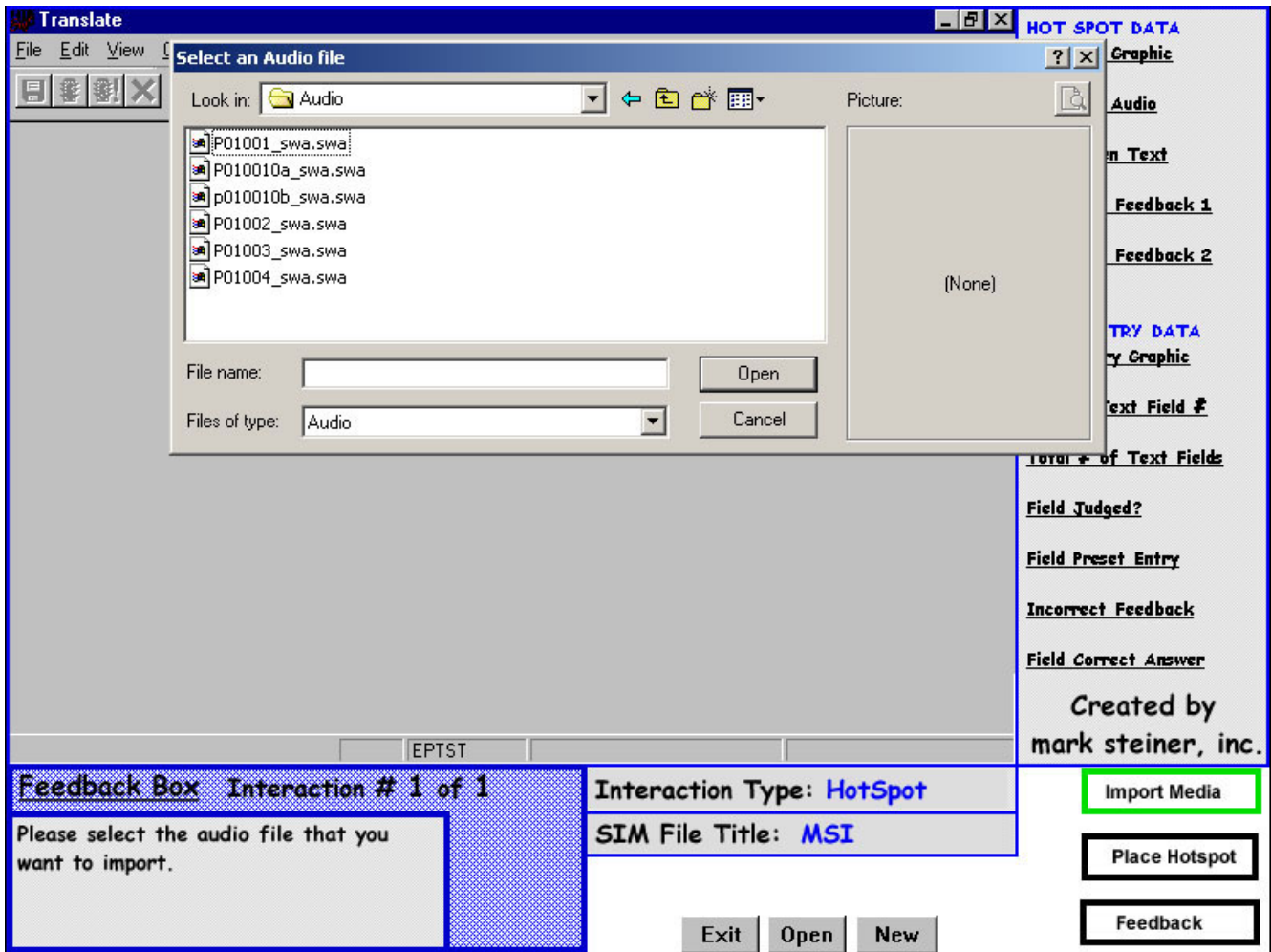
If the interaction includes any pointing and clicking with a mouse, whether it be on a pull down menu, a button, a hot area, etc., select a HotSpot Interaction Type.

If the interaction includes any text entry to fields, select a TextEntry Interaction Type.

**Step 3: Select the screen grab for this step in the simulation.**

The screenshot displays a software interface with a file selection dialog and a control panel. The dialog, titled "Select a Screen Grab Graphic", shows a list of files in the "ScreenGrabs" folder, including files like po0000, PO00005, po0001, PO00010, PO00015, po0002, PO00020, Po00021, PO00025, Po00026, PO00027, Po00028, po0003, Po00030, Po00035, Po00040, Po00045, Po00050 PLAS, Po00050, Po00055, Po00060, Po00065, Po00070, and Po00075. The "File name" field is empty, and the "Files of type" is set to "Graphics". The "Open" and "Cancel" buttons are visible. To the right, a "HOT SPOT DATA" panel lists various options: Graphic, Audio, on Text, Feedback 1, Feedback 2, TRY DATA, y Graphic, and Text Field #. Below this, a "Created by mark steiner, inc." notice is present. At the bottom, a "Feedback Box" for "Interaction # 1 of 1" contains the text "Please select the graphic that you want to import." The "Interaction Type" is "HotSpot" and the "SIM File Title" is "MSI". Buttons for "Exit", "Open", "New", "Import Media", "Place Hotspot", and "Feedback" are also shown.

**Step 4: Select an audio file.**



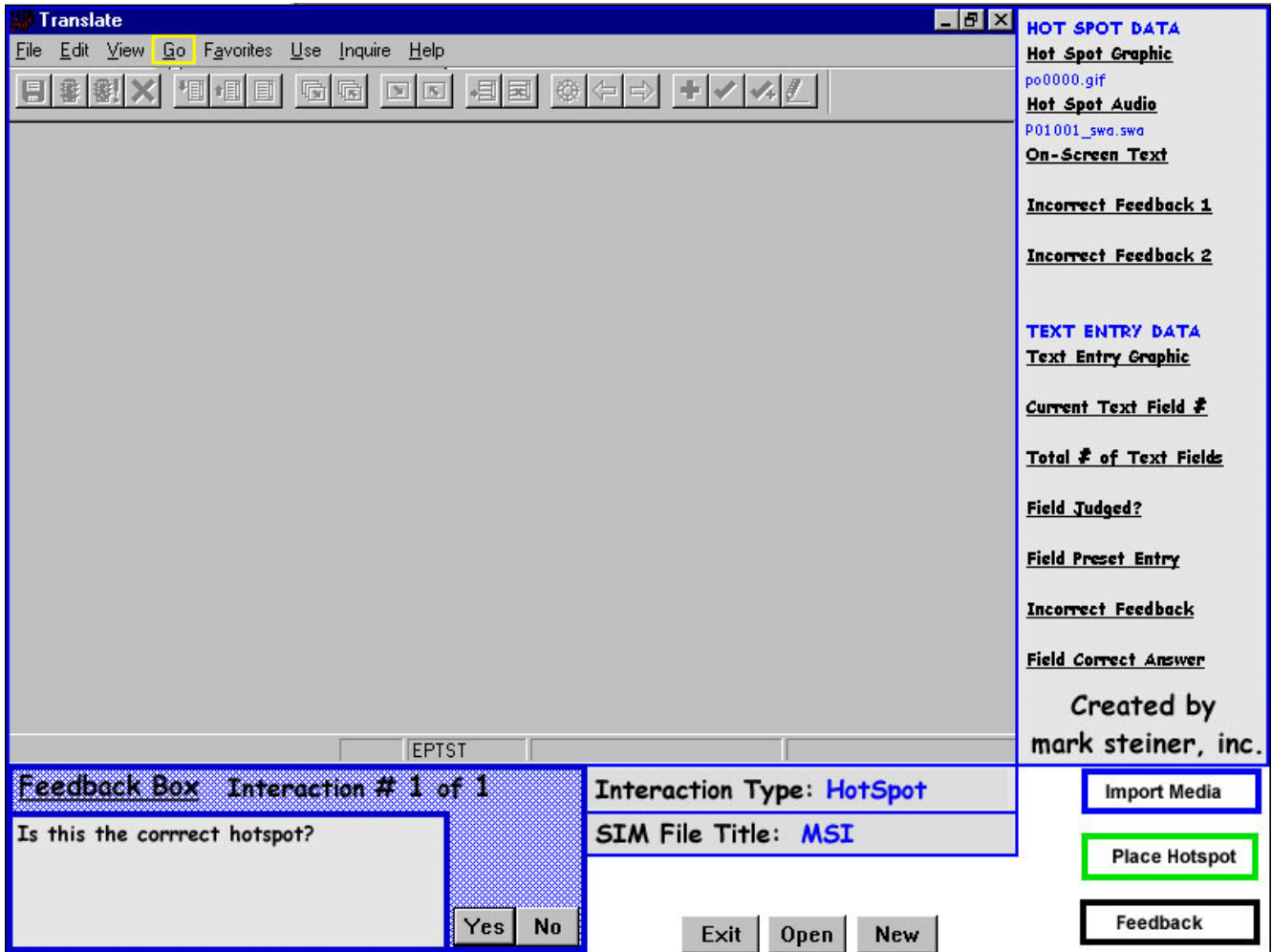
**Note: Audio functionality can be bypassed or removed if unneeded.**

**Step 5: Click on the area of the screen that contains the upper left-hand corner of the desired hotspot. Then press any key to lock in your selection.**

The screenshot shows the 'Translate' application window with a menu bar (File, Edit, View, Go, Favorites, Use, Inquire, Help) and a toolbar. A pink hand icon is drawn over the top-left corner of the main workspace. A dialog box is open, titled 'Feedback Box Interaction # 1 of 1'. The dialog contains the following text: 'Click to define the bottom left-hand corner of the hotspot. Then press any key to lock in your selection.' To the right of this text, it says 'Interaction Type: HotSpot' and 'SIM File Title: MSI'. At the bottom of the dialog are buttons for 'Exit', 'Open', and 'New'. On the right side of the application, there is a 'HOT SPOT DATA' panel with various fields like 'Hot Spot Graphic', 'Hot Spot Audio', 'On-Screen Text', 'Incorrect Feedback 1', 'Incorrect Feedback 2', 'TEXT ENTRY DATA', 'Text Entry Graphic', 'Current Text Field #', 'Total # of Text Fields', 'Field Judged?', 'Field Preset Entry', 'Incorrect Feedback', and 'Field Correct Answer'. At the bottom of this panel are buttons for 'Import Media', 'Place Hotspot', and 'Feedback'. The text 'Created by mark steiner, inc.' is visible at the bottom of the right panel.



**Step 6: Click on the area of the screen that contains the bottom right-hand corner of the desired hotspot. Then press any key to lock in your selection.**

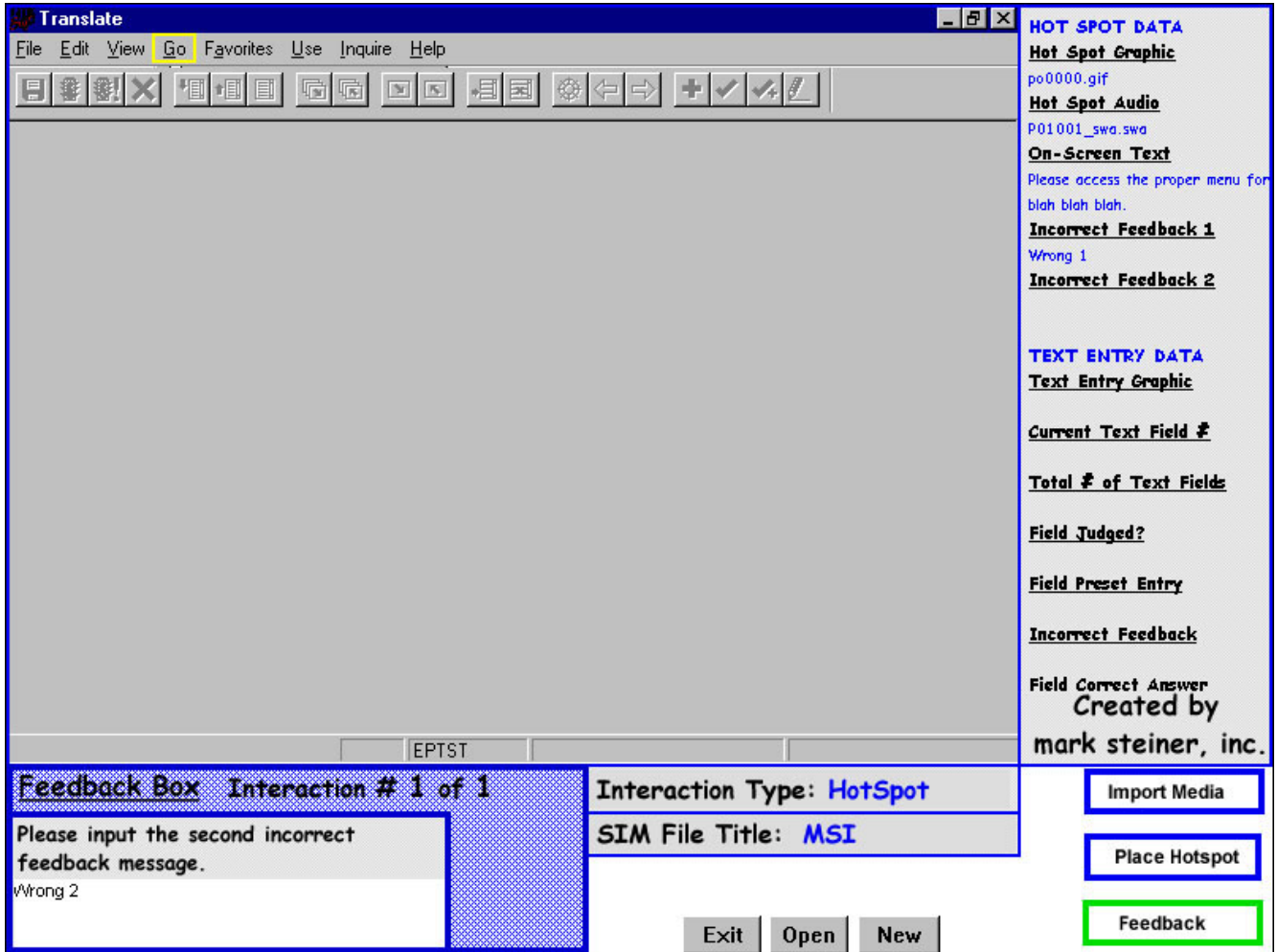


**Step 7: Input the on-screen text or instructions.**

The screenshot shows the Translate software interface. The main window has a menu bar (File, Edit, View, Go, Favorites, Use, Inquire, Help) and a toolbar with various icons. The central area is a large grey rectangle. At the bottom, there is a status bar with 'EPTST' and a 'Feedback Box' for 'Interaction # 1 of 1'. The feedback box contains the text: 'Please input the on-screen text (instructions). Please access the proper menu for blah blah blah.' To the right of the feedback box, there are fields for 'Interaction Type: HotSpot' and 'SIM File Title: MSI'. At the bottom right, there are buttons for 'Exit', 'Open', 'New', 'Import Media', 'Place Hotspot', and 'Feedback' (which is highlighted with a green border). On the far right, there is a vertical panel with sections for 'HOT SPOT DATA' and 'TEXT ENTRY DATA', each containing several sub-sections with labels like 'Hot Spot Graphic', 'Hot Spot Audio', 'On-Screen Text', 'Incorrect Feedback 1', 'Incorrect Feedback 2', 'Text Entry Graphic', 'Current Text Field #', 'Total # of Text Fields', 'Field Judged?', 'Field Preset Entry', 'Incorrect Feedback', and 'Field Correct Answer'. At the bottom of this panel, it says 'Created by mark steiner, inc.'



**Step 8: Input the on-screen text or instructions that occur upon a second wrong response.**



**Note: This functionality can be altered or removed, based on CBT design.**

**Step 9:** If the sequence is completed, click Yes, otherwise, click No and additional HotSpot or TextEntry interactions can be added to this simulation sequence.

The screenshot shows the 'Translate' application window. At the top is a menu bar (File, Edit, View, Go, Favorites, Use, Inquire, Help) and a toolbar with various icons. The main workspace is a large grey area. On the right side, there is a 'HOT SPOT DATA' panel with the following sections:

- Hot Spot Graphic:** po0000.gif
- Hot Spot Audio:** P01001\_swa.swa
- On-Screen Text:** Please access the proper menu for blah blah blah.
- Incorrect Feedback 1:** Wrong 1
- Incorrect Feedback 2:** Wrong 2
- TEXT ENTRY DATA:**
- Text Entry Graphic:**
- Current Text Field #:**
- Total # of Text Fields:**
- Field Judged?:**
- Field Preset Entry:**
- Incorrect Feedback:**
- Field Correct Answer:**

At the bottom of the window, there is a status bar with 'EPTST' in the center. A 'Feedback Box' dialog is open, titled 'Interaction # 1 of 1'. It contains the question 'Is the sequence completed?' and two buttons: 'Yes' and 'No'. To the right of the dialog, there are two text fields: 'Interaction Type: HotSpot' and 'SIM File Title: MSI'. Below these are three buttons: 'Exit', 'Open', and 'New'. On the far right, there are three buttons: 'Import Media', 'Place Hotspot', and 'Feedback'.

GUI SOFTWARE SIMULATION RUNNING IN AUTHORWARE

The following depicts a simulation running within an actual Authorware CBT. This particular course was for Pepsi.

**Purchasing**

**Adding Vendor, UOM, and Quantity**

Unit: 10101 PO: NEXT

Vendor: PLASTI PAK-001 ID: 153818

PO Date: 07/06/1999 Buyer: Coyne, Barry

Line	Item	Item Description	UOM	PO Qty	Amount
1					

Fetch Lines From: 1 To:

quit menu back next glossary

Now it's your turn to practice. Type a description for 20 oz plastic bottles in the **Item Description** field.

Page 12 of 22

# Summary

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Utilizing the mark steiner, inc. simulation wizard and external data file approach greatly reduces the development time required for software simulations. By maintaining the data external from the CBT application, updates can be made directly to simulation files, rather than the Authorware course files.

More information regarding these simulation tools or CBT design approaches, please contact:

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# Additional Information on mark steiner, inc.

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mark steiner, inc. is a learning consulting company specializing in technology-based learning. With over a decade of experience in all phases and aspects of the learning process, we offer intelligent, honest, practical expertise. msi helps organizations solve their human capital challenges by using innovative learning strategies and systems and by leveraging its broad industry expertise. msi applies cost-effective and integrated learning programs to each company's unique business, resulting in increased productivity and improved operational efficiencies.

## About the President

Mark Steiner has been a training professional for over a decade and holds a BS in Industrial Technology and an MS in Industrial Training. The majority of the past decade has been spent designing and developing eLearning programs for a variety of clients and industries. Over the years, he has developed a myriad of CBT (computer-based training) and WBT (web-based training) programs and is intimately familiar with proven design and development methodologies. His project roles have varied from director to group leader to project manager to instructional designer to programmer to media specialist. He is an Authorware guru with over 8 years of Authorware development experience. He has also have instructed graduate level courses in CBT and has spoken at variety of training and online learning conferences in the US and Europe.

## Services

### ELEARNING STRATEGY AND DESIGN

msi provides eLearning strategy advisement services to corporations to help mitigate the associated risks with implementing an e-Learning solution. The e-Learning strategy process is described in the steps below:

- Assess company goals and needs: Analyze corporate business goals and processes, organizational structure, staffing, skills, and curriculum and instructional needs.
- Identify current status of the company: Assess technology/infrastructure, existing content/library, training functions, stakeholders and customers, learning models, delivery formats, legacy systems and training budget.
- Design "future state": Recommend business processes, technologies, organizational structure, and learning models to be used.
- Identify gaps: Determine the gaps between existing content, technology, organizational structure and learning processes and the future model. Skill gaps and potential growth areas are recognized.
- Develop an e-Learning plan: Plan for organizational changes, business processes, technology implementation and content design and development.

## INSTRUCTIONAL DESIGN/CONTENT DEVELOPMENT

The content development process consists of four main stages: Planning and Analysis, Design, Development, and Deployment.

- During Planning and Analysis, msi will analyze the company's goals, the target audience, and the existing work and training environment. Once the goals and objectives are determined, instructional designers will research the subject matter and scope, create the curriculum map and define technical and functional requirements, so that the courses can be developed.
- Next, instructional designers will create the design document, the prototype, the storyboards, the scripts, and the guides as required.
- During development, the designers will first develop construction standards and templates. Then they will produce the media elements in order to construct the courseware. Once the courseware is created, they will construct the student and learning experience evaluations. Last, in order to assure quality, they will facilitate a walkthrough and complete the pilot.
- Finally, developers will create a deployment plan. Once the plan is developed, they will receive final approval and signoff from the client. Last, they will complete knowledge transfer to the appropriate client representatives, help to communicate the training rollout internally and complete the evaluation revisions.

## AUTHORWARE EXPERTISE

With over 9 years of profound Authorware development experience, msi is one of the top Authorware development companies in the US. From data-driven dynamic performance support systems to modular reusable learning objects to discovery learning business simulations, msi has the expertise to build the eLearning applications your company needs and your employees deserve.

## PROJECT MANAGEMENT

msi has extensive project manage experience and skills. Whether it's expertly managing a project as part of the end-to-end solution or fulfilling just the project management role on an interactive media or web-based project, msi has the experience and rigor to ensure the success of your project.

## ELEARNING PROCESS DEVELOPMENT CONSULTATION

Over the past decade msi has continued to dissect and perfect the eLearning process. Developing eLearning is a complicated process. There are a variety of roles, tasks, and processes that all need to be orchestrated for the successful completion of an eLearning project. This consultation is appropriate whether it's your first project and you'd like assistance within your organization or you've completed several projects but would like to "fine tune" your roles and processes.