SimuSys® 400

Super fast design & prototyping for the iSeries 400 – a White Paper

Original software

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1. Introduction

Few development projects deliver as promised. Some 80% are late and/or exceed budget; 40% miss their objectives or are abandoned; less than 40% satisfy training and skills requirements.

A consistent feature of development projects is that users frequently do not understand the system being developed for them. Too often, the result is unsatisfied expectations and costly rework.

Applications prototyping offers the best chance of avoiding such scenarios. Prototyping gives all concerned parties the chance to air their views on both look and functionality before any code is written. Using a prototyping method ensures that users get most of they want, and that expectations and deliverables do not become "fuzzy". This results in less re-work and ensures a shorter move to production lead time.

SimuSys is a unique design, specification and prototyping solution, created specifically for the iSeries 400 applications development. As part of the design process, you can use SimuSys to create a simulated system to obtain feedback from users, or to carry out demonstrations, story-board presentations and application training at the same time as building the underlying Specification document. Whole systems or parts of systems can be modelled without any coding, and the simulations linked into existing applications.

Using SimuSys makes the design process more rewarding and helps stimulate ideas in Systems Designers and Users alike, producing a more easily accepted design faster. Because the same design is automatically turned into a printed Specification, the System Designer is saved considerable effort. Once the design, already familiar to the users, is signed off, SimuSys provides a fast start to the development process by producing display file DDS code and a Field Reference File of new fields. Fields can also be referenced to an existing Field Reference File.

2. How SimuSys saves time and effort

Pictures of existing Screens can be captured from a display and immediately built into a SimuSys Prototype simply by running the application and pressing the Attention key. This gives an immediate simulated copy of an existing application that can be amended without touching any code, and without needing any of the application databases.

SimuSys's Design_IT module makes it very easy to alter existing screens, or to build new ones from scratch. You simply key on the screen what you want the design to look like. You can move and copy blocks of text or fields with or without a mouse to get exactly the image you want. To check how the screen will appear when it is executed, simply press a function key and you can key into the input fields, see all the correct colours and use the screen that you have designed. When creating a screen from scratch, the Wizard turns creating a basic form or subfile style screen into a simple set of questions and answers so it can take just a few seconds to build a new screen.

SimuSys is structured into Projects, Scripts (Prototypes), Screens and Fields. Text Notes can be held at each level. It uses these, combined with the database field information, screen styles and logic instructions in the Scripts, to produce a Specification document.

SimuSys also has time saving features for developers to generate display file DDS (Data Description Specifications) code and Field Reference Files automatically from the Screen designs.

SimuSys enables iSeries 400 Projects to be modelled and the design shown to users as a simulated system before any code is written or technical documents produced. Hence, it provides a way of achieving many of the benefits of Joint Application Development (JAD).

With SimuSys a system designer can illustrate quickly to users how an application will look and feel, enabling the two parties to work together at an early stage - saving time and reducing misunderstandings. It means that, once the design stage has finished and the coding has begun, Users still have a simulation of the system to work with and can start initial training, revising procedures and preparing for the implementation. Thus implementation is brought forward through concurrent activity.

SimuSys has been designed to be as easy to use as possible, with prompted entry fields, powerful copy and move instructions for text and Screen design elements, and a standard iSeries 400 style interface. SimuSys also has predefined output styles that avoid repetitive instructions to obtain the correct look for different types of fields and which make it possible for non-programming staff to alter or create new Screen layouts at the design stage.

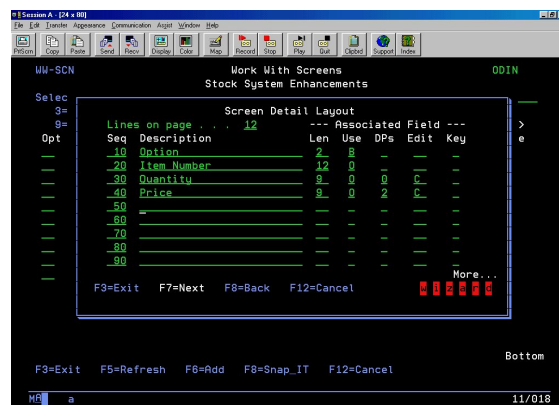## 3.   Building Prototypes

One of the most powerful features of SimuSys is its ability to create Prototypes quickly from existing Screen images or from brand new designs.

SimuSys uses low-level iSeries 400 technology - for better performance and to by-pass the traditional source code to compiled object processing. This means that Screen layouts can be captured, amended or built without programming skills. In addition, a Prototype of linked Screens can be amended interactively and re-run immediately with the new changes in place. This enables the design to progress with immediate feed-back, making it especially suitable for working jointly with users. Prototypes can also be created as modules for ease of maintenance and then joined together or called from one another.

Screen images (Screens) can be created in SimuSys by one of three methods:-

1.   *Creating a new screen with the Wizard*
2.   *Designing them interactively on the Screen (Design_IT)*
3.   *Capturing an image displayed by an existing program (Snap_IT)*

Screen images can be amended with Design_IT (including those initiated by the Wizard), which displays the Screen with its fields and constants and provides a simple way to add, move, copy, or alter fields and constants.

When moving or copying text on the screen, the area is easily highlighted to select a text block so, for example, columns and related fields can be repositioned in one simple process. In addition, the terminal (PC or terminal) can be used like a typewriter to create or alter a design. At the press of a button, the Screen goes into Display mode - showing exactly how the Screen will appear when executed, complete with colours, fields with example data, and input fields that can be keyed into.

Screens are linked together into Scripts with easy-to-use logic instructions (Actions) that enable a user to progress through a series of Screen images in the same way as in the finished application. The progress from one Screen to the next can be defined by function key, field values or a combination of both. For example, keying a '1' into a field and pressing enter may take the user to a Screen to create a new customer record, whereas a '5' in the same field will access a display of persons at the customer location. Alternatively pressing F4 might call up a Screen that shows available customer codes.

Links can be made from one Script to another and back again. Selecting data from, for example, a prompt window can also be simulated with the chosen value being returned into the equivalent field in the previous screen. Example data can be entered to appear in the output (and 'both' type) fields. Validation rules may be specified for fields with associated error message text, which is automatically overlaid if the validation is broken. At the same time, the field in error is highlighted and error reset processing is implemented. Hence, a real looking application can be created in a few minutes, without any traditional coding or compiling and without any application files. Prototype Scripts are held within a Project in SimuSys so that multiple Projects can be set up to reflect the different tasks or Projects in the IT department.

The following diagram (Figure 1) illustrates how Screens are linked to Scripts (executable Prototypes) and how many Scripts can be set up for a Project:
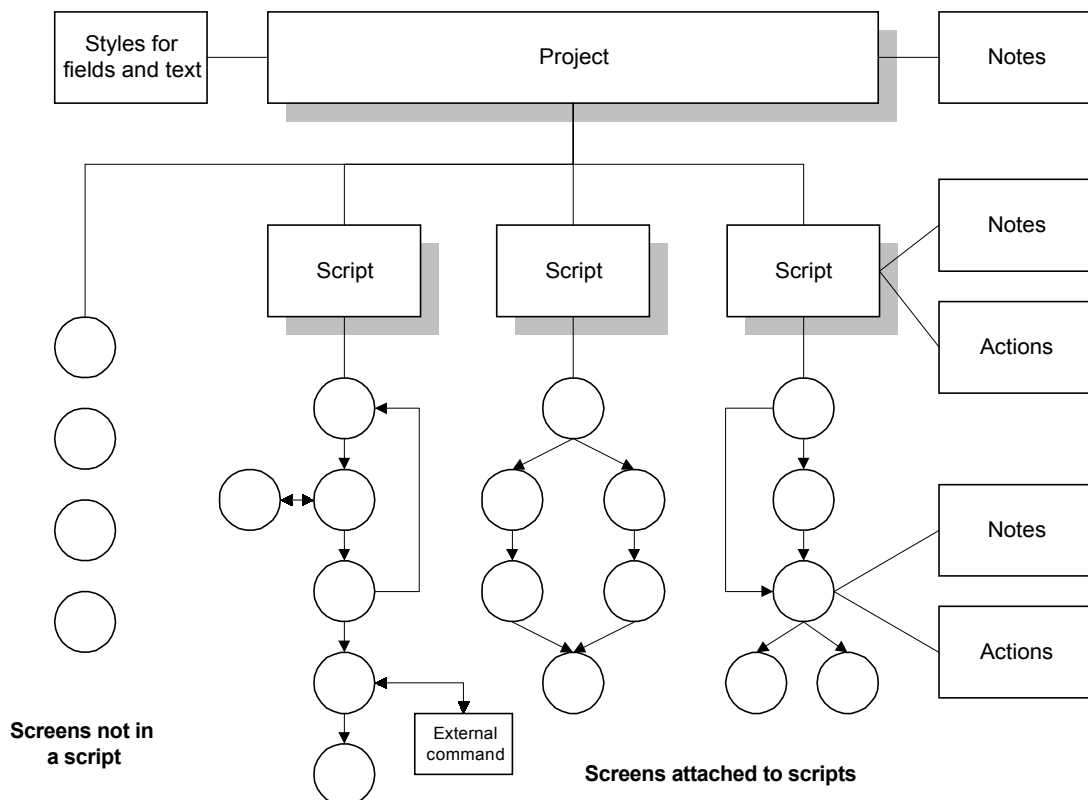

Figure 1 – Relationship of Projects, Scripts, Screen and Notes

4. Documenting the design

Text notes are stored against Projects, Scripts, Screens and database fields so that a design or a demonstration can be documented as it is created. This text can also be retrieved as help text while running the Script, as well as being included in the automatically generated Specification document.

A design Specification document is created by SimuSys (Spec_IT), providing a ready to work from document for confirmation with users and coding by developers.

The specification document automatically includes:-

- a picture of each Screen together with the fields the Screen uses
- validation rules for fields and error messages
- the screen styles (field attributes)
- the actions of any function keys, i.e. the progression
- the text (design notes) for the Project, Script and Screen
- the database fields used in the Prototype

The document can be printed directly by SimuSys on the iSeries 400, exported to the IBM iSeries 400 Office Vision Word Processor or any PC-based word processor. A special macro will automatically format a Microsoft Word for Windows document so that minimal intervention is required to produce a top quality printed document.

This means that, as well as delivering the Prototype to the users, the designer can simultaneously produce a professionally formatted Specification document for sign-off with the minimum of effort. Furthermore, if the users have been involved in the Prototyping process they will already have a level of confidence in the System Design, making the review of the Specification document much less daunting, much smoother, and more productive. Apart from saving time in production of the design and the specification, the increase in confidence that is gained on both sides through using SimuSys ensures better progress during development and implementation.

5. Creation of display file DDS and Field Reference Files

Once the design is complete, the DDS for each Screen is created automatically by Code_IT. DDS can be created for all Screens in a Project, Screens for a Script or selected individual Screens in a few moments with the Developer specifying the display file and format naming conventions. In many cases, the Developer will wish to add additional information to the automatically created DDS, but there is still a substantial saving in the Developers time for this task. SimuSys handles both subfiles and windows as well as enabling your own standard program heading blocks to be included automatically at the start of the generate DDS.

The DDS is created in a few seconds and SimuSys offers a selection of editors for the developer to check and alter the new code with. If the Developer uses a PC, the SimuSys menu will enable PC editors to be launched from the iSeries 400 session.

The Meta_IT option builds a Field Reference File for all the fields defined in the Screens which have been named and identified as database fields. This takes into account DDS keywords, such as column headings, that have been defined for the field. This saves additional Developer time helping to further reduce the Project timescales.

6. How do SimuSys Prototypes work
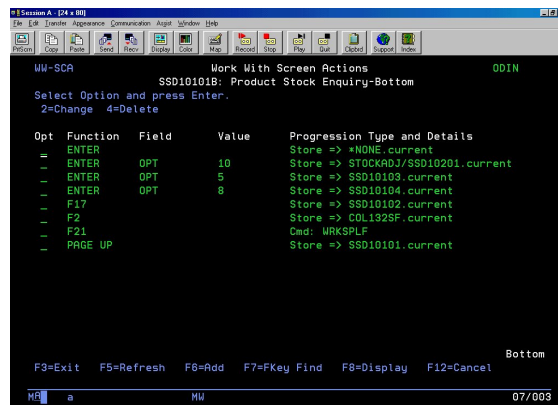
Real looking Screen images

Each Screen image in SimuSys is held within a Project, and may also be linked to a Script, or a number of Scripts. The Scripts are used to execute a Prototype containing the Screens and hence execute a simulated application.

The Screen image is stored in database form with details of each field, each constant, their display attributes and the permitted function keys. SimuSys uses this information to reconstruct an image of the Screen exactly as it would appear if it were output from a program. It does this without compiling the Screen, interfacing directly with the IBM 5250 data stream and converting the data describing the Screen into a Screen image. This means that changes can be made quickly to a Screen or Script and the effects immediately reviewed without any coding or compile overhead. Additionally, SimuSys includes the ability to have example data on the display without the use of the actual database files.

SimuSys applies all the attributes that would be used in the compiled version of a Screen to the Prototype and hence the simulation is visually perfect and can be used in the same way as the final compiled version will operate. Colours and attributes such as reverse image, high intensity and underline are shown and fields which are designated for input can have data typed in, while other areas are protected. This means that a Screen can be tested and amended to ensure it satisfies the requirement while it is being designed, and before any coding is done.

Scripts are used to link a series of Screens that are to be executed together. Action codes are set up for each Screen, or overall for the Script, to determine which Screen should be shown next depending on the function keys pressed and data typed in to Fields on the Screen. A Script can be called from within another Script so that the content of each can be kept small and modular and then used in many larger controlling Scripts. With this a complete simulation of a series of Screens can be built up and executed.

Because the Screens in a Prototype are not compiled in order to run them it means that they can be amended and redisplayed immediately. The process can be completely interactive as SimuSys has a very low system overhead.

Simulated data

With each progression from one Screen to the next, it is possible either to retain or discard the current data, as well as determine whether the next screen should use the latest data or its original default. Let's say you are using the option for current data in the next Screen: when data is typed into a named Field on the first Screen, and that Field is used on another Screen in the sequence, the keyed data is repeated in the second occurrence. The effect of this is that when data is keyed in on one screen, it appears in equivalent screens later in the simulation - just like the real application. Example data can also be set up which will always appear in the appropriate Fields so that the Prototype looks totally real. It can be used to create a pre-planned progression for the Script, allowing a user to step through the Script just by pressing Enter.

Design notes and help text

Notes that have been set up for a Screen can be displayed as Help text to reinforce the demonstration or Prototype. See also the later section in this Chapter on Story boards.

When running a Story Board or Script, SimuSys can display the Screen Notes as Help text.

Prototype progression logic

SimuSys Actions are a simple way of defining what each input or operator action will do, and hence determine which Screen will appear next. By default, if no other actions are defined, pressing the Enter key will move on to the next Screen in the Script.

Action instructions are used to control the logic in the Prototype Script and can be defined at a Script level (such as F12 BACK - previous Screen, or F3 EXIT) to simplify setting up the progression in a Prototype. These Actions can be made up of function keys (Enter, Print, Help F1, F2…F24) and values entered in fields. For example:-
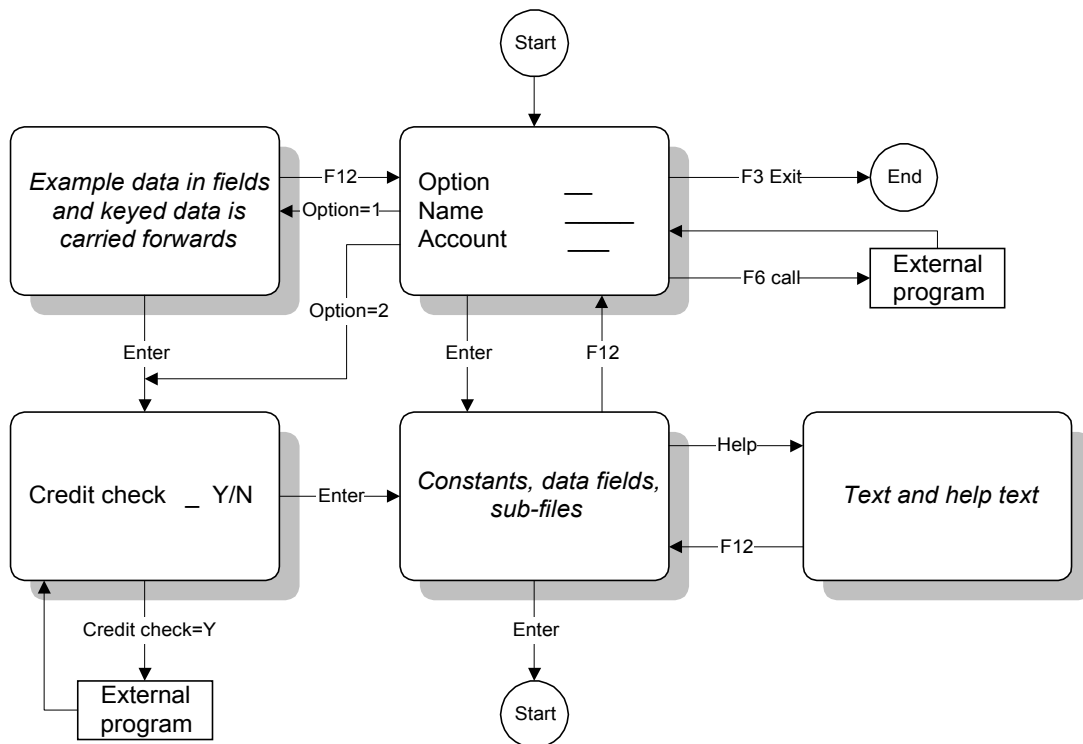

Figure 2 – Example of Actions controlling progression

With this combination of features it is possible to create Prototypes which are virtually indistinguishable from the real thing and which can be easily amended. In addition, there is no program (RPG, COBOL etc.) logic to be written at this stage and no data files to be updated. This makes SimuSys ideal for design Prototypes because the design can be easily altered as well as being completely safe to leave with users or potential customers to demonstrate how the system will work when delivered.

Story board demonstrations

The SimuSys Prototyping process can be used to create demonstration Story Boards and to simulate whole systems. These stand-alone virtual applications can be safely despatched to potential customers, giving them the ability to view and try out the application directly on their own iSeries 400. Because example data can be set up in the Prototype, the examples and the progression can be set up to suit the message to be conveyed, although the user can still interact with the Prototype using whichever functions are permitted to determine their own path through the Story Board. The Help or F1 keys can be programmed in the Prototype to access the Screen Notes, giving immediate on-line Help text which can be used to reinforce the sales message or explain the features shown in the Story board.

A standalone Story Board takes up very little storage space and uses minimal system overheads, hence it is easily shipped and installed. It can be set up to step the user through the functions you want to illustrate, or let them interact controlling the progression.

7.0   To Find Out More

If SimuSys has fired your imagination, you can download a free evaluation copy from our web site, www.origsoft.com, to try it for yourself. Or, just call us, ask to speak with a consultant, explain your requirements and we will do our best to help you!

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