

Transaction Page User Guide

Building Dynamic Voice Applications with Angel.com

Introduction.

This guide provides an overview of Transaction Voice Pages. It is intended for people who want to build dynamic voice applications using the Angel.com Site Builder tool. More detailed help and specific instructions on each feature can be found in:

- Context-sensitive online help
- Self-explanatory descriptions through the Site Builder interface
- The Angel.com Learning Guide.
- The Transaction Page Reference Guide.

If you have any questions that are not answered by these resources, please send an email to support@angel.com

The Angel System.

Angel.com enables subscribers to create Voice Sites. Voice sites are made up of Voice Pages, which are linked together by keywords and accessed by phone through an Angel Phone Number. Like a Web site, every Voice Site has a unique numeric address or URL and a home page, which is the first page that callers hear. For more information on the Angel system please refer to the "Angel.com Learning Guide".

Building Dynamic Voice Sites.

If you have a dynamic application in mind and would like to build it with Angel there are a few elements that will help you in your task:

Question Pages

Question Pages allow you to formulate audio 'questions' to callers. You can play some audio messages and then instruct the system to collect input from a caller. You might want to ask for their age, their ZIP or their favorite fruit. In general, Question Pages capture numbers, keywords, credit card numbers and expiration dates, yes/no answers, currencies, dates and times. Angel remembers answers to questions for the duration of the call. Angel can submit these answers at any time during the call.

Transaction Pages

Transaction Pages allow you to submit answers as parameters in an HTTP request to a remote web server and interpret the results back as actions for Angel to perform for the caller. It's easier to think of Transaction Pages as Voice Pages that you construct 'on-the-fly' with the information you've collected from callers. This 'on the fly' page can play audio, text, transfer to a phone, take a voice message, follow a link, ask a question or a combination of these.

A common pattern in dynamic Voice Sites will have the caller go through one or more question pages, then use a Transaction page to submit data and confirm something in the response. By combining pages you can achieve more sophisticated behaviors.

System Requirements, Needed Skills

In order to build a dynamic Voice Site you will need

- space on a web server that can receive requests from the public Internet. You can choose your favorite web server, such as Apache or Internet Information Server.
- The ability to execute web scripts on the web server. These scripts will take parameters submitted by Angel and process them to produce a response. Examples of scripting languages: ASP, JSP, Perl, PHP. Alternatively, you can use CGI to execute a program in your language of choice.

In order to create the application you need no speech expertise. If you know how to write a dynamic web page, using standard web programming techniques, you can write a dynamic Voice Site. A basic understanding of HTTP POST/GET (HTML Forms use POST/GET) will also help.

As you work towards rolling out your Voice Site to a larger audience you may want to consider using professional voice talent for optimum results. Contact us at sales@angel.com to get a quote on prompt recordings.

Planning the Call Flow.

Before you start developing your application in Site Builder it might help you to think of the Voice Site in terms of dialog samples. Try to jot down how a caller would typically interact with Angel. For example:

1. **Angel:** Thank you for calling the Starbucks Store locator. Please state your ZIP code
2. **Caller:** 22102
3. **A:** These are the closest locations. When you hear the one you want, just say it. Your choices are: Tysons Corner, McLean or Reston Town Center.
4. **C:** Tysons Corner
5. **A:** To hear more details, you can say opening hours, driving directions or specials
6. **C:** Opening hours
7. **A:** Starbucks at Tyson's corner is open from 5 AM till 11 PM from Monday to Friday....

Once you have a few samples of these dialogs it's time to identify at which points of the conversation Angel will have to present information to the caller that it could only know by making a remote server query. In the above example, lines 3 and 7 are such points. We will call these *dynamic conversation points*.

With the dialog and the dynamic conversation points, we are ready to decide on a structure for the voice site. In this case, we would want the following pages:

#	Page Name	Page Type	Purpose
1	Greeting	Message	Greet the caller, provide instructions
2	Ask ZIP	Question	Ask for ZIP code
3	Read Store List	Transaction	Read list of closest Starbucks and ask for one of choice.
4	Select Store Details	Question	Give the caller a choice of store details to select from
5	Read Store Details	Transaction	Read specific store details.

During a normal call:

- The Greeting page would just play a message with some introduction and instructions for the caller. When finished, it would forward to Ask ZIP.
- Ask ZIP collects a 5 digit fixed length number from the caller. It then forwards to Read Store List
- Read Store List represents the first dynamic conversation point. It sends a ZIP to the remote server and retrieves back a list of locations. Then it forwards to Select Store details.
- Select store details records the second caller choice. When finished, it would forward to Read Store details.
- Read Store details represents the second dynamic conversation point. It sends the store name and detail selection. The remote server should return the opening hour details and Angel would play them.

Now that we've explored the workings of each page we are ready to name the functionality of our scripts.

Script #1, *read_store_list*, takes in a ZIP code and returns a formatted AngelXML string that plays a list of Starbucks in that ZIP code.

Script #2, *read_store_details*, takes in a store name, a detail selection and returns a string of text with the opening hours for that store.

Collecting Input from the Caller

Let's take a closer look at Question Pages.

Number Response Type

Response Type

The system will listen for a numeric response from your callers. [More...](#)

- Natural Number Example: Two hundred thirty two
- Variable Length Digit Sequence Example: One two five five
- Digit Sequence Within a Range Minimum Maximum (< 30)

Then go to Site# Page# [What's this](#) ?

This screenshot of a question page illustrates how you could specify a ZIP code. Because most people would enter their zip code one digit at a time, the best choice for this type of data is a **Digit Sequence Within a Range**. When Angel asks a Digit Sequence Question, it waits until the last digit is entered and then it tries to validate the input. The “Minimum” and “Maximum” digit values instruct Angel to accept only 5 digit strings, starting at 10000 and ending at 99999.

If you'd like to ask callers information such as street number or an employee number, where digits could vary, you should use **Variable Length Digit Sequence**.

Angel also recognizes numbers that are naturally spoken, when you chose the **Natural Number** response type. It's useful for information such as day of month, age or quantity. Natural numbers will be recognized up to 6 digits. Negative numbers and numbers with decimals (up to 6 decimal digits) are also recognized.

Callers can always say or type the number they're entering. There's no need to enter a terminating character (#) after the number is entered as Angel will recognize the end of the string.

Keyword Response Type

Play Audio Message(s) Order

You can say opening hours, driving directions or specials

Response Type

<input type="checkbox"/> If caller says	or Press	Save Value	Then go to	Site#	Page#
<input type="checkbox"/> hours, hours of operation, opening hours	<input type="text" value="1"/>	<input type="text" value="hours"/>		<input type="text" value="82"/>	<input type="text" value="4"/>
<input type="checkbox"/> directions, driving directions	<input type="text" value="2"/>	<input type="text" value="directions"/>		<input type="text" value="82"/>	<input type="text" value="4"/>
<input type="checkbox"/> specials, what are the specials	<input type="text" value="3"/>	<input type="text" value="specials"/>		<input type="text" value="82"/>	<input type="text" value="4"/>

[What's this](#)

This screenshot illustrates how you would represent a choice where the caller can say one of three possible things. In general it's good practice to enumerate the available choices in the audio message, so that the caller will give a guided response. This trick can increase recognition rates.

The first column, labeled **"If caller says"** specifies all the possible things the caller would say. Each row represents a logical grouping. You can provide alternative choices with the same meaning by separating them with commas.

The second column, labeled **"Presses"** specifies a touch pad equivalent to the choices on the first column. It's useful to enunciate keypad choices after the caller has been unable to make a clear keyword selection in repeated occasions. Keypad choices are limited to 9 selections.


The third column, labeled **"Save Value"** specifies the text string representing the response that will be saved for the duration of the call. This string will be made available by means of a Transaction Page (see below).

Finally, the columns **"Go to Site # & Page #"** allow you to decide where to go next. If this information doesn't depend on the answer (most common case) all values can remain the same. In many occasions it's useful to direct Angel to go to the Transaction Page that will submit the answer.



On some occasions, though, it's useful to be able to 'branch' on a question. This is a common technique used in surveys, for example. Let's say you're designing a restaurant guest satisfaction survey and there are two sets of questions, one for those who had lunch and one for those who had dinner. You could then go to different destinations when guests answered "I had lunch" or "I had dinner" respectively. In cases like this you would enter different destinations in the column.

Yes / No Response Type

Play Audio Message(s) Order

 Did you try an item from our pastry selection? Say yes or no. 1


Response Type

If caller says	Go to	Site#	Page#
Yes		82	5
No		82	5

This screenshot illustrates the creation of a Yes / No question page. Use this page when you're asking a close-ended question. Angel uses special logic to make sure that most common synonyms of 'Yes' and 'No' (such as 'Sure', 'Yeah', 'Nope') are also recognized.

Credit Card Response Type

Play Audio Message(s) Order

 We accept Mastercard and American Express. Please enter your credit card number. 1

Response Type

Select the credit card types you wish to accept. To learn more see [Capturing Credit Card Information](#).

Visa MasterCard American Express Discover Diners Club

If number is	Go to	Site#	Page#
Valid		61	3
Invalid		61	4

[When is a credit card number valid?](#)

With Credit Card Question pages, you can capture credit card numbers. Angel ensures that the credit card number is well-formed and plausible. This is done by checking the length (15 or 16 digits depending on the credit card type) and the checksum. Angel does not perform credit card authorization (AVS checks). The Valid / Invalid fields allow you to specify which pages to follow in order to deal with credit cards that don't pass the checksum rule.

Credit Card Expiration Date pages capture expiration dates in credit card format. Callers can say "October 2004", "Ten oh four", etc. and Angel will capture "10/2004".

Submitting Answers to your Server

Once you've collected input from the caller it's easy to send it off to your server, where you can process the responses and execute your business logic. Transaction Voice Pages take collected input, and submit it to a server. DVPs expect a formatted response back.

In the Starbucks locator example we would like to submit ZIP code information:

Play Audio Message — This message will be played in a loop until remote server responds.

None

Parameters to Submit

Submit to URL Post Get

<input type="checkbox"/>	Type	Parameter Name	Parameter Value	Test Value
<input type="checkbox"/>	?	zipCode	Ask ZIP	22102
<input type="checkbox"/>	C	requestSource	fromAngel	fromAngel

Interpret Response As

then go to Site# Page#

Specifying Submission Parameters

This is what you can specify in a Transaction Page:

- **Play Audio Message:** Allows you to play some 'on hold' music or message while the response is being retrieved. The sound file you specify will be played in a loop. If you don't specify a sound file, the default Angel 'on hold' sound will be played.
- **Submit to URL:** Specify here the server and path to the script that will handle the request. In our example, we're calling read_store_list.pl on the aparicio.org web server
- **Post / Get:** If you have a preference to handle the request as an HTTP GET, you can change this setting. The default is POST
- **Type:** You can include 4 parameter types.
 - "?" is for **Question Page**. It means, "get me the response(s) for this Question". In the example we're interested in the response to the "Ask ZIP" question.
 - "C" is for **Constant**. You can specify any string you want. In the example, we're adding a constant named "requestSource" so that the script can know the request is coming from Angel.
 - "ID" is for **Caller ID**. If you specify this parameter, Angel will send you the Caller ID (technically called ANI – Access Network Identifier). A common use for ANI is to identify recurring callers. ANI is a 10 digit number
 - "D" is for **Angel Number**. If you want Angel to send you the number that callers called, your Angel phone line, use this parameter. The technical name for Angel Number is DNIS – Dialed Number Identification Service. DNIS is a 10 digit number. Angel Number is a useful parameter to have when you want your Voice Site to behave differently depending of where the call was coming from. For example, you may want to greet your callers differently if they're coming through an office forwarded phone or a personal forwarded one.

- **Parameter Name:** The 'key' in the set of key/value pairs that Angel will be submitting. If you use the same Parameter Name multiple times, Angel will aggregate the values being submitted into an array. For example, if you were to ask for two ZIP codes, you could send them under one name.
- **Parameter Value:** The 'value' in the set of key/value pairs that Angel will be submitting. In the case of parameters of type 'question' this will be the answer to the question. In the case of constants, Angel will send whatever you type in the field. In the case of Caller ID and Angel Number, the value will be determined by the system.

Testing Your Server

Transaction Voice Pages include a handy test feature. When you click the "Test" button, Angel will try to reach your server with simulated values (the "Test Values" column) and then print the results of the test in a separate test window.

Reading a Response Back

Once the parameters have been submitted to your server and any processing is done there, Angel expects a response with instructions on what to do next in the call. Angel interprets the response in different ways, depending on the settings you have selected in the Transaction Page.

Interpret Response As

XML then go to  Site# Page#

The "Interpret Response As" drop-down box allows you to instruct Angel what to do with the response:

- **"Angel Audio File"** will be interpreted as the path to an audio file existing in your Angel.com account. Angel will play the audio file and then follow the link specified to the right in the "Site #" and "Page #" fields.
 - If the sound file is not found, the caller will hear silence.
 - Use "/" to separate folders in the path to the sound file
 - A single "/" represents the root audio file folder in your account, but is optional in the path
 - Some examples:
 - /hello.wav
 - /misc/thanks.wav
 - /other/locator/zip.wav
 - hello.wav
 - misc/thanks.wav
 - other/locator/zip.wav
- **"External Audio File"** will be interpreted as the path to an audio file residing on a remote server. Angel will retrieve the audio file through HTTP, play the file, and then follow the link specified on the Page Editor to in the "Site #" and "Page #" fields.
 - If the audio file is not found on the remote server, the caller will hear silence.
 - Example:
 - <http://www.angel.com/sounds/sound.wav>
- If you choose **"Digitized Voice"** Angel will interpret the response as text to be read back to callers. After playing the text, Angel will follow the link specified to the right in the "Site #" and "Page #" fields. The text being played should follow the following rules:
- When **"Link"** is selected, Angel will interpret the response as a site number and page number and will follow this link. This type of response is useful when you have many possible inputs but only a few responses. For example, if there only were three possible

opening hours for Starbucks it might be easier to create a Message page with each schedule and then link to them depending on which particular one the selected store used.

- Links take the form “123/456” where the digits before the slash represent the site number and the digits after the slash represent the page number.
- Some examples:
 - **55/78**
 - **55/**
 - **55**
- **“Phone Number”** allows you to instruct Angel to transfer the caller to a specific phone number.
 - The phone number returned should be a 10 digit string with no formatting. It should represent a valid phone number, including toll-free numbers. No international numbers are allowed.
- When **“XML”** is chosen, Angel interprets the response as a full-fledged AngelXML document and parses it as such. It then follows the instructions in the AngelXML. To learn more about AngelXML, please refer to the **Transaction Page Reference Guide** section.

Advanced Issues and Special Situations

This section covers techniques that harness all the power of the Angel platform. If you have sophisticated application needs these suggestions could help.

How to ask the same question several times

Sometimes you would like to put callers in a loop where they're entering a list of items for a while, until they're done and they move on. Let's assume that you'd like to find Starbucks in several ZIP codes:

1. **Angel:** *Thank you for calling the Starbucks Store locator. Please select the ZIP codes you would like to search. Let's get started.*
2. **A:** *Please state a ZIP code (3 sec pause). When you're done say 'continue'.*
3. **Caller:** *22102*
4. **A:** *Please state a ZIP code...*
5. **C:** *20171*
6. **A:** *Please state a ZIP code...*
7. **C:** *Continue*
8. **A:** *These are the closest locations. When you hear the one you want, just say it. Your choices are: Tysons Corner, McLean or Reston Town Center.*

If you know in advance how many items in the list will be entered, you could create one question page for each item, and chain them together. But for a list like the ZIP codes in the example, where the number of items are unknown, we need a separate approach.

A simple way to achieve the behavior above is to create a question page that links to itself:


Question Page

Use this page to ask questions of your callers. Select the type of response callers should provide and create a link to the page they will hear after responding. [More...](#)

Page Properties

Page# Name Make this a Main Page [Why?](#)

Site Keywords — Callers can say these keywords anywhere in your voice site and get to this page.

Play Audio Message(s)		Order
<input type="checkbox"/> 	<input type="text" value="Please enter your ZIP code"/>	<input type="text" value="1"/>
<input type="button" value="DELETE"/>	<input type="button" value="ADD SOUND FILE"/> <input type="button" value="ADD DIGITIZED VOICE"/>	<input type="button" value="ADVANCED DIALOG OPTIONS"/>

Response Type

- Natural Number Example: Two hundred thirty two
- Variable Length Digit Sequence Example: One two five five
- Fixed Length Digit Sequence Length

Then go to  Site# Page# [What's this](#) 

This question page will ask for a ZIP, confirm that the input was correct, ask for another ZIP, confirm that it was correct, etc. As you can see Angel will be playing this page in a loop until the caller instructs it to move on by saying “continue”. This can be activated by taking the next page in the flow, “Read Store List”, and assign it a “continue” site keyword:

Dynamic Page

Use this Dynamic Page to...

Page Properties

Page# Name Make this a Main Page [Why?](#)

Site Keywords — Callers can say these keywords anywhere in your voice site and get to this page.

When the same question is answered several times, multiple values are sent to the remote server as an “array”. For more information please refer to the Transaction Page Reference Guide.

How to Ask questions that depend on data that’s not available while creating your site

Sometimes your application calls for a very information rich user experience. In this context, a lot of the information that you will be playing to your callers depends on their answers and Angel will need a lot of help from your server to determine what actions to take next.

In this section we explain how to play messages that depend on answers to questions that can only be defined during the course of a phone call. Let's take our original Starbucks locator application:

1. **Angel:** Thank you for calling the Starbucks Store locator. Please state your ZIP code
2. **Caller:** 22102
3. **A:** These are the closest locations. When you hear the one you want, just say it. Your choices are: Tysons Corner, McLean or Reston Town Center.
4. **C:** Tysons Corner
5. **A:** To hear more details, you can say opening hours, driving directions or specials
6. **C:** Opening hours
7. **A:** Starbucks at Tyson's corner is open from 5 am till 11 Pm from Monday to Friday....

When step 7 is reached, the second dynamic conversation point, we will need two pieces of information: the chosen store ("Tysons Corner" in the example) and the selected detail ("Opening hours").

If you remember from the example in the Designing the Call Flow section, page #3, Read Store List was a Transaction Page. This page submitted the ZIP code and got back a list of stores in that area. It went a step further and **asked** the caller for one of those stores. This was achieved by returning some AngelXML representing a Question Page:

```
<ANGELXML>
  <QUESTION>
    <PLAY>
      <PROMPT type="text">
        These are the closest locations, when you hear the one
        you want, just say it. Your options are
      </PROMPT>

      <PROMPT type="text">
        Tysons Corner, McLean, Reston Town Center
      </PROMPT>
    </PLAY>

    <RESPONSE>
      <KEYWORD>
        <LINK keyword="Tysons Corner" dtmf="1"
          returnValue="tysons_corner" destination="6"/>
        <LINK keyword="McLean, Mac lane" dtmf="2"
          returnValue="mc_lean" destination="6"/>
        <LINK keyword="Reston Town Center, Reston" dtmf="3"
          returnValue="reston" destination="6"/>
      </KEYWORD>
    </RESPONSE>
  </QUESTION>
</ANGELXML>
```

This AngelXML document represents a Question Page that saves values just like a normal keyword Question Page would. To submit the selection made by the caller, all that is needed is to add a parameter of type "Question Page" to the Transaction Page handling the submission.

In our example, page #5, Read Store Details, has the Transaction Page selection as the first parameter:

Parameters to Submit

Submit to URL Post Get

<input type="checkbox"/>	Type	Parameter Name	Parameter Value	Test Value
<input type="checkbox"/>	?	storeID	Read Store List	tysons_corner
<input type="checkbox"/>	?	SelectStoreDetails	Select Store Details	directions

DELETE ADD PARAMETER: VOICE PAGE CONSTANT CALLER ID ANGEL NUMBER RUN TEST

The second parameter represents the answer to the question “Which details about the store you would like to know?”.

How to send a voicemail response as a parameter in a Transaction page

Sometimes you may want to ask a question to your caller that has a free-form response and does not fit into the response types featured on the Question Page. To do this, and then submit their response through the Transaction page follow the following steps:

1. Create a voicemail page that asks your question and collects the response through a voicemail recording.
2. On your Transaction page, add a parameter of type “Voice Page.” In the “Parameter Value” drop-down list, select the Voicemail Page you created. When the Transaction page gets submitted to your remote server, the value of the parameter you created will be a text string with a link to the voicemail audio file on our server, for example <http://www.angel.com/sounds/voicemail.wav>

Other Resources

If you would like to find out more about how to build Transaction applications with Angel.com, please refer to the following documentation:

- **Angel.com Learning Guide.** Provides a thorough introduction to the Angel Platform, different techniques to design successful voice user interfaces and explains in detail each Voice Page type.
- **Transaction Page Reference Guide.** Provides further information on AngelXML, response types for Transaction Pages and HTTP protocol error codes.