Contact Center Knowledge Management

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Abstract

The Health Care industry is ever changing and becoming more complex by the minute. The demands on Health Care Providers are increasing and solutions to common problems are being tested and proven. Sutter Physician Services has made a bold move in having many of their clinic's phone calls for appointment scheduling and other patient requests directed to a centralized location rather than to individual clinics. Managing the information that the person who answers that phone call knows is both challenging and exciting. This project combines aspects of challenges related to both technology and health care. Utilizing the correct technology in the correct way will improve the patient experience by having their questions answered consistently every time that they contact their doctor's office. When the Patient Service Representative who answers the phone has the correct information, they will make few mistakes and complete the call quickly.

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Chapter 1: Introduction

Patients often need to call in to their health care provider to discuss personal issues or inquire about test results. Managing the policies and procedures surrounding how those question are to be answered can be a very challenging experience that can be either aided or hindered by the technology used. The purpose of this project paper is to present challenges faced with ensuring that every patient service representative responds to those questions in the same way for each patient that is trying to reach their provider, and the implementation of technological tools to better facilitate decision support.

Background

Sutter Physician Services (SPS) is a Strategic Business Unit (SBU) operating with Sutter Health. Sutter Health is a network of hospitals, doctor's offices and other medical facilities in Northern California. A portion of Sutter Physician Services is two contact center. These contact centers employ Patient Service Representatives (PSRs) that take inbound phone calls for patient requests. The PSRs that focus on handling appointment-scheduling requests are a part of the Clinic Access Division of the Patient Service Center (PSC). One of the clients that receives services from the PSC is called Sutter Medical Foundation (SMF). This client has approximately 55 locations and about 350 clinicians that they do appointment scheduling. Each location and each clinician has their own preferences as how to handle appointment scheduling requests. Since all of these types of calls are being funneled to a contact center instead of to the office location directly, there are a lot of things that cannot be communicated as they would be face-to-face with an in-house PSR. On the other hand now that phone calls are coming in to a central contact center, the front desk personnel can be more focused on the patients once they come in and managing the waiting room.

Since the one-to-one relationship and face-to-face contact between a PSR and Clinician that the PSR is scheduling appointments for is missing, technology and knowledge management are a must. The documentation that a PSR uses to make decisions about a clinician's schedule must be as accurate and usable as possible. This documentation must be digestible both at a training level; but also at a real-time decision support level while the PSR is actively talking to a patient.

The current delivery system of this information is broken up in to two parts that are referred to as: "Workflows" and "Preference Pages". Workflows are PDF printouts of Visio Diagrams that explain the process that the author says is how calls should be handled in general. It has scripting pieces, and serves as a general guideline for how to complete a call from start to end. The Preference Pages list out more specific details for how things are handled when dealing specifically with that Clinician or the Clinician's location. The preference pages state things such as the type of appointment are selected in the Electronic Health Record (EHR) system when scheduling an appointment for specific symptoms or appointment request reasons. These pages also indicate the insurances that the Clinician accepts, the procedures that they perform in the office, and other information such as if they share their practice with other clinicians. Sometimes these preferences are specific enough to indicate how to treat calls that come from specific patients.

Statement of the Problem

The PDF Printouts of the Visio diagrams are good training resources. They are also great resources when a client wants to explain to SPS what they expect the PSR to do, in general when getting a certain type of call. The problem with these documents though is that they are difficult to follow while on a call. The workflows reference other pages within the document and

depending on the author; the pages have been inconsistent in linking to the other referenced page making it difficult for the PSR to navigate to the correct next page to follow the next correct set of instructions. There is also a key part of the process that lists specific symptoms and how things should be handled for specific symptoms. The list is so large that it cannot fit on to each page where that list is necessary to be referenced. Therefore, the list has to exist on the most pertinent page and the agent must be trained that when they come across a question in the workflow that asks them if the patient is calling in about any of the symptoms on this list that they need to navigate to this specific page in the workflow. Then they read that list to determine if those symptoms are there and then return to the page that they were reading earlier. Then they find their place that they left off from and continue down the process. Then, even if they get to other specific parts of the process (document), they may also need to use the preference page to make a judgement call as well between what the general workflow says and what the clinician's preference is as stated on their preference page. This navigation through the workflows is cumbersome and not very conducive to call flow.

In addition, there are still people in the care center location such as Registered Nurses (RNs) and Medical Assistants (MAs). These people do have face-to-face conversations with the clinicians every day so they hear things about how their clinician's wants things done well before the PSRs hear about it. That information may not make it to a workflow or preference page before a phone call happens from a PSR to a MA. During that call, the MA will tell the PSR something that is different from the workflow or preference page and now tribal knowledge is born. Only certain people in the Care Center know, and now that specific PSR knows, and then people talk. Yet nothing gets documented and there is just a crazy mess. This then leads to the

documentation becoming unreliable for the PSR and now the PSR is going off of memory for that specific event, then forgetting other parts of their call.

The problem to be addressed by the project is the number of errors done by PSRs by providing an easy to follow web/browser-based script that must be followed on each call, which will give them the correct steps to be done, based upon the caller's request and caller's provider's preference for how that request should be fulfilled.

Purpose of the Project

The purpose of this project is to implement a new knowledge management system that will enable the PSC and PSR to effectively manage incoming calls and access information relating to specific appointment scheduling requests or other clinical concerns that may come their way. This new system will replace the existing process and will involve AnswerPath, SharePoint, and Interactive Intelligence.

Objectives of the Project

The project is worth doing because we want to improve the overall patient experience when contacting the PSC for an appointment with their doctor. From listening to calls and shadowing other agents actively taking calls it appears that most of the patients that call in believe that they are calling their actual doctor's office when they are scheduling an appointment. We want to keep that perception. We want to schedule appointments for patients at the times that are available for the correct duration every time. When certain things need to be sent to other people besides the caller's PCP we want to be able to explain to them why and what the process is. We want to do this consistently such that every PSR handles every call the same way; yet not in a robotic fashion. Doing this project will allow for information to change quickly and to be followed consistently every time as well. When things change the documentation will be

changed and the PSR will always be expected to follow the documentation and not tribal knowledge. When tribal knowledge arises it should be recorded, debated, and either made a part of the formal documentation or declared debunked.

Assumptions

Assumptions made about this project include that the existing Visio diagrams can easily be converted in to AnswerPath scripts. The process will be manual as there is no direct import feature of the software. Some changes may need to be made to the existing documentation to reach the maximum effectiveness available from AnswerPath. For example, a lot of the Visio diagrams ask “Yes or No” questions at almost every juncture. AnswerPath has the possibility of having more than just simply those binary selections; therefore, since that availability is there it should be taken advantage of. A good example of this is with regard to a person calling to Cancel, Reschedule, or report that they are late to an appointment. The Visio version of this goes such as “Cancel?” -> “Yes or No”, if “No” then “Reschedule?” -> “Yes or No”, if “No” then “Late?” and on. Whereas with AnswerPath the question can simply be “What did the caller report” with options of “Cancel”, “Reschedule”, or “Late”. The script may then move on from there.

Limitations

At this time, it is assumed that only one person will be able to have the AnswerPath MapIT designer application on their computer to edit AnswerPath scripts. Therefore, the build and future changes will need to go through one single point of contact. The results of the AnswerPath script will be published to HTML and saved anywhere that an HTTP service is available. At this time, a SharePoint document library has been chosen to store the HTML output and thus be accessible to the necessary users. The person operating the AnswerPath software has

not used it before in any other line of work. There will not be any consultants from people that have experience with the software; nor from the vendor of the software.

Definition of terms

- SPS – Sutter Physician Services. The Strategic Business Unit within Sutter Health providing services to Clinicians such that they can focus on being a clinician and allow other manage some of the non-clinical aspects of the job.
- PSC – Patient Service Center. The contact center where telephone calls are routed to for appointment requests for doctors that are subscribed to the clinic access product that SPS provides.
- PSR – Patient Service Representative. The person that answers the phone when a patient calls a Sutter Health doctor that are subscribed to the Clinic Access product provided by SPS and is requesting an appointment.
- RN – Registered Nurse. A person either at a Care Center or even the PSC that is clinically trained to make diagnosis for certain medical condition and gives advice as to whether a person should see a Primary Care Provider doctor or an Emergency Room doctor or even not need to worry about anything at all and give confirmation that they patient is doing fine.
- MA – Medical Assistant. A person, who under the direction of a qualified physician, performs a variety of routing administration and clinical tasks in a physician's office.
- AnswerPath – A software that provides a graphical user interface to the author who generates workflow steps in the document and then exports the steps to

HTML files and publishes them on an Intranet or Internet such that they can be accessed by the desired readers.

- jQuery – a JavaScript code library that makes selecting and modifying HTML elements on a web page easier to code.
- UI – User Interface, the buttons and objects visible on a screen which allow a user to interact with content objects
- Breadcrumb – A special hyperlink that allows a user to go back to specific places within an HTML document such that if they wish to return to a specific point in a document they can click on that link. This provides an enhanced experience from just allowing a user to click on the “Forward” or “Back” buttons in their browser.

Chapter 2: Literature Review

Having a contact center speak with one, consistent voice is a big challenge. Many different people from many different demographics enter in to specific job markets for their own reasons. Some come in to escape another industry. Others come with this being their first professional job after high school. Some plan to stay forever. Others plan to stay until they can get another opportunity. Each person also has their own learning style. Therefore, they also have their own teaching style. Aside from taking action based on a patient's request another job of the PSR is to explain to the patient the process for fulfilling a request, the status of a request or perhaps why a request cannot be fulfilled.

PSRs are faced with many decisions to make with regard to how to fulfill the patient requests that they receive. Currently they make decisions based on process flow diagrams that provide general steps for how any request of that nature can be fulfilled with supplemental documentation in another system that documents specifics on the preference that particular location or clinician would like things to be done. The goal of this project is to find a decision support system which will allow the PSR to receive specific documentation for how to fulfill a patient's request at the moment that they need it. Instead of having the PSRs being "hunter-gather's" (Beringer, M., personal communication, March 5, 2015) of information, they will have the information on screen when they need it.

There are many companies that offer a variety of software solutions for real-time decision support. There are also many solutions available for software that allows the user to make visual models of a process and how variation affects that model. A number of software solutions were reviewed and considered before a decision to move forward with AnswerPath was made.

Why Other Software Solutions Were Not Selected

The term “real-time decision support” is very broad topic. In researching software solutions through Google a number of varying results appear. Many companies offer decision support for different scenarios. Many are for executives that have connections in to an Enterprise Resource Planning software. Others are for sales or manufacturing. Others offer decision support for health care; however, those systems are for clinical decision support. The decisions that the PSR has to make are not truly clinical in nature with the exception that they need to identify that a patient is calling with an emergent clinical concern that needs to be addressed more readily than an appointment with their primary care physician; therefore, software solutions such as those were not chosen for the scope of this project.

There are also other process or workflow diagram software that were considered as well. The reason why those other solutions were not selected were because the goal was to guide the PSR through the process instead of showing and explaining the process. Furthermore, there is a desire to have more content per box without being overwhelming. There is also a desire to link to external resources while keeping the user on the same content window without breaking navigation.

List of Software Solutions That Were Not Selected and Why

1. Oracle Real-Time Decisions (Oracle, n.d.)
    a. There were not any demonstrations on their site that showed how the application worked.
    b. There were no pricing models available
    c. The description seemed to be heavy on the sales and marketing side of decision support than support request side.

2. The DecisionsTools Suite 6 (Palaisade, n.d.)
    a. The decision support offered in this product appears to help project portfolio managers determine what projects in their portfolio have the best risk and reward situations. It also helps executives determine which projects are worth spending money on.
    b. The decision support offered by this product is clearly not the type of decisions that the PSRs need to make.
3. Decision Explorer (Banxia, n.d.)
    a. This software seems to be more specific to help users in a meeting situation where there are so many ideas out there and helps facilitate the discussion to ensure that all ideas are fully explored.
    b. This software does not appear to have any support that will help facilitate a discussion between a caller and the PSR on the phone.
4. LogicNets Clinical Decision Support System (LogicNets, n.d.)
    a. This software appears to help doctors and nurses make clinical support decisions when it comes to patient care; however, for the scope of this project we are focused mostly on appointment scheduling and other patient concerns that are not necessarily clinical in nature.
5. Lucidchart (Lucidchart, n.d.)
    a. This program functions much like Visio and allows process charts to be made quickly and easily as well as display them in a web based format. It also allows multiple concurrent users to edit the document at the same time. On the surface, it would appear to be a good alternative to doing

PDF cutouts of Visio diagrams; however, since the desired solution is to have a user move through a process on a click-by-click basis, this product was not selected

6. Gliffy (Gliffy, n.d.)
    a. This product again functions much like Visio and allows the user to make graphic models of a process; however, again it does not take the user through a guided script to read content and make further decisions depending on other questions that were answered earlier; therefore, this product was not selected

How the New Zealand Transport Agency Addressed the Problem

There is a case study published on the Hindin Solutions Incorporated website (Hindin Solutions Incorporated, n.d.). Hindin Solutions Incorporated is the manufacturer of the AnswerPath software. Their client, the New Zealand Transport Agency serves as the source for information regarding the Motor Vehicle and Drive License Registers. They receive many inquiries via phone and email and was difficult to have everyone give the same, consistent answer, every time. The other bullets about the problem matches the problem that is trying to be tackled in this project including the ability to provide consistent, timely information to staff, enhance staff awareness and knowledge to reduce errors and retain corporate knowledge. By using AnswerPath they were able to overcome these challenges and reduced escalations.

Literature Review Conclusion

After researching the options available in the industry as well as the options used for similar circumstances it was determined that AnswerPath would be best suited to address the business need at an economical price. The AnswerPath MapIT Designer has a user interface

similar to Visio from an authorship perspective and then published to HTML files to other users. So only one license is needed for the Knowledge Manager. The cost was only $600. Considering that no new servers or other infrastructure are required for this project makes it a very economical option to investigate and peruse.

Chapter 3: Methodology

Managing a healthcare center's help desk system and the knowledge maintained by the professional working with the company can be a major challenge. As shown in the literature, there are many knowledge management systems available that can help in this process. The purpose of this chapter is to present the implementation methodology and provide the full details for the installation and use of a new knowledge management system for Sutter Health.

Introduction

The purpose of this project is to utilize technology in such a way that Patient Service Representatives (PSRs) may have real-time decision support for each of their phone calls, which will reduce their errors and increase their efficiency. The system must be able to help the PSR drive the conversation as well as utilize the Electronic Health Record system correctly when handling appointment scheduling or other requests from patients.

Participants

The end users that will benefit from this project are the PSRs. The people involved in developing the content for AnswerPath will be those who have already been involved in developing the content for the current Visio diagrams, which is currently an operations manager for the target client group that we are focusing on. In addition to the operations manager, we have one supervisor, an experienced agent, and an agent that is relatively new to taking phone calls. All the while a technical operator, known as a Knowledge Manager, will translate the written documentation, and the narrative of the known deficiency with the existing documentation and utilize that information and make it available within the AnswerPath script. The Knowledge Manager (KM) will then be tasked with exporting the AnswerPath script to HTML and uploading it to a SharePoint document library.

In addition to this content development side of things there are other things going on from a telecom perspective. The current process is that a PSR will receive a screen pop that directs them to a web page that gives details about the location that the caller was trying to reach. The new process will be that the person will get an AnswerPath web page instead of a location Preference Page. There are certain situations where the phone number is used for multiple locations and departments so in some cases customized web pages have been made asking the agent to click the correct link depending on the department that the caller called in about. With the new process the telecom system will be able to skip that and get them to an AnswerPath script for the department and location that the patient called in for. Fortunately, at this time an IVR menu is installed, but passing information collected from the IVR to a web page is not yet enabled and a solution must be found that will allow information collected from the IVR populate information to the AnswerPath web page that pops up. Participants from the vendor of the telecom solution are involved in this as well as other project managers leading other parts to this initiative. Technically, AnswerPath is just one piece of a larger puzzle, and there are many moving pieces.

The AnswerPath scripts will be used by approximately 600 PSRs and will be regarding the steps to be followed for 55 locations and 300 clinicians. There are other people the manage the affairs of the contact center and they will have an interest in how the documentation is laid out such that they can know what it is the PSC knows and debate on deficiencies or enhancements from there.

Materials

There are many different materials involved in making this happen. They include the AnswerPath MapIT Designer Software, SharePoint, and the Interactive Intelligence client.

AnswerPath MapIT Designer Software

The AnswerPath MapIT Designer software is the software that is used by an AnswerPath script author, in this case a Knowledge Manager, to produce a document similar to how one would produce a document in any workflow design application, like Visio, to make boxes, instructions, questions, and logic to move from one step to another. This application makes it so that all of this information doesn't have to be coded by hand in JavaScript or HTML; instead, it allows the user to make the process in this program and export it to JavaScript and HTML to be used by other users. This tool is very unique in its ability to display instructions and ask questions that the reader will then either answer for themselves if the information is available in the EHR, or other referenced documentation. In other cases, the question will need to be asked of the caller to get the PSR to the next question. Some features of this program that are very useful are that questions may be asked at any given time and then used later in the process. This means that the reader will not have to re-answer a question that they have answered before. Furthermore, at any given juncture where there is variation in the process due to questions answered earlier an alternative step may be presented to the user because of their selection. This now allows locations to be as different as they like; meanwhile, the reader can have the correct information delivered to them based on their responses to prompts within the script.

Once the author feels like the script is in a sufficient state, the author may export the script to JavaScript and HTML. The results of the files that are exported may be uploaded to any shared document location. In this case it has been chosen that a SharePoint document library will be the desired storage location for these exported files. Additional JavaScript and CSS files may also be used to include any customizable user interface that is desired that may not have been

available from the files that come out of the box from this export. Meaning that the script can look like it is part of any given website.

While these exported files are extremely user friendly and are exactly what the PSR should have for a phone call, there is still some drawbacks within the MapIT designer program itself from an authorship perspective. This feedback has also been provided to the manufacturer of the software. Some of these limitations include that there is not a way to easily go to a specific box by name or any sort of a find feature. Take Word for example, you can usually do a CTRL+F to find a word on a page. With the Designer Software one is not able to find a page by the name of the page, nor by the content of the page. This will make future updates to certain pages difficult. For example if a phone number or email address was placed in multiple places within a script it may be difficult to find all the different places where that email address or phone number was placed. Instead one will have to preview the script. Find the page in question, and then try and look around the entire document to find it in an editable fashion and update the content there.

An additional limitation is that there is no reporting on the total number of objects in the document. There are many objects that can be placed in any document including pages, questions, answer groups, responses within answer groups, and conditions. There are no automatic totaling of that information and thus there is no way to quantify the level of effort that was required to produce the document in question.

When reviewing a page object within the document the page will only show outbound connections and not inbound connections to that page. This means that when you are looking at a page you only know where a page will take the user to next, but it does not tell the author what pages link in to that given page. Having a list of inbound as well as outbound conditions would greatly enhance the authorship experience.

Despite some of these limitations, the AnswerPath MapIT designer is an excellent program and works really well for what it does. Other comparable products on the market were mostly for sales and marketing, but not for decision support for customer service, which is why this product was chosen. The bottom line is that it produced a better experience for the PSR. The fact that the documentation will be slightly more difficult to manage is an acceptable risk due to the benefit of this enhanced experience.

The MapIT Designer software addresses the need of reducing errors by having a centralized place to put all decisions and outcomes into a central location and changed on an as-needs basis. When PSRs are expected to make different decisions than what they were trained to do before will have those new decisions and outcomes placed in this tool. Once that decision has been added to the script the script will be exported again and uploaded to SharePoint again. This way as long as the PSR follows the prompts they will be lead down to the correct decision.

SharePoint

SharePoint is serving multiple purposes in this project. It is storing the JavaScript and HTML files produced by the MapIT AnswerPath designer. Furthermore, it is also has a small JavaScript file that acts as a middle tier between the telecom system and the screen that actually populates when the user gets a call. As stated earlier the telecom team is working on providing URL parameters to web pages. We have decided to have those URL parameters go to this JavaScript file that will look up the DNIS, and department in a SharePoint list that holds the actual URL that the user should be forwarded to. This allows the correct AnswerPath script to open for the phone number dialed and the department selected. In addition to this a review of the AnswerPath session is collected and posted to a SharePoint list related to the call key provided in the URL parameters from telecom. This will allow us to review a call key, and see what

AnswerPath told the agent to do. We can then analyze the path that was taken to improve it for either better accuracy or better efficiency. This way, enhancements to the script can be assessed on those findings. There are other ways that storing this session data may be useful as well, although those requirements have not yet been realized.

SharePoint addresses the need at hand by being the storage location of the results of the AnswerPath scripts. It is not enough for the information to be changed in the MapIT Designer. The information must be exported and uploaded such that it can be retrieved. Without SharePoint the users would not be able to access the information that is intend to deliver to them.

Interactive Intelligence

The PSRs have Interactive Intelligence Interaction Manager installed on their computer such that they have information about the call that was delivered to their desk. This program also delivers a screen pop that opens a web page that gives some details about the location for that the caller was intending to reach. Patients calling in assume that they are calling their doctors office and we want them to feel that way and so the more information a PSR knows about that location the better they are able to provide that experience to their caller. Changes will be made to Interactive Intelligence such that URL parameters will be able to be given to a web page that will then forward them to the correct AnswerPath script.

The error rate will continue to decrease with this tool because the AnswerPath script will already know the region, location, department, and operating hours of the call. With that information pre-loaded in to the AnswerPath script, all that is left to be entered in is what the caller's request is. Knowing that region, location, department, operating hours, and caller's request will direct the agent to get additional parameters about the condition of the caller or patient and lead them to the correct decision and action to take.

Design

The variables that will measure this projects success are the average handle time of a call and the errors per thousand rate of calls. AnswerPath does truly have a way to have an impact on both of these metrics. The interesting thing to this though is that at times these two metrics are at odds with each other. A person can do their job quickly and do it wrong; while on the other hand one can do their job correctly and do it slow. Finding the correct balance is very difficult. People going off of memory and doing things as quickly as they can results in errors. People taking too much time produces irritated patients, and if not, then irritated supervisors and managers.

The initial goal of this project is to build a complete AnswerPath for all 7 Pediatric medicine clinics for one of our largest clients to see how well that works out from a PSR perspective, as well as a client and care center perspective. Because if we can reduce errors then the care center will be happy. If the document is consistent, then the PSR and the patient will be happy and there will be wins all around.

Procedure

First and fore most the existing documentation will be converted in to AnswerPath. The AnswerPath documentation will then be presented to the Operations Manager, Supervisor, Experienced, and Less Experienced agent to be debated on and perfected from known limitations of existing documentation and confirmed tribal knowledge that should be made in to the standard work knowledge. We will then work on the AnswerPath script until it is worthy to be used by the rest of the contact center agents. We will make it such that the correct AnswerPath script opens for these specific locations and departments.

Converting the Visio diagrams in to AnswerPath documents will be a manual process. There is no import from Visio or any other sort of import either. Therefore, the boxes and shapes

that are on the existing documents must be made manually in the AnswerPath MapIT Designer. This may seem disappointing; however, it also allows the content to be enhanced due to the features that are available in the software as described earlier the existing documents had binary, yes-no, decisions boxes on them that could easily be condensed to a multiple choice question box for AnswerPath. Because of this manual process it allowed the collaborative process to happen at the same time. So instead of doing just a direct copy and paste of the existing documents, we have an Operations Manager, Supervisor, Experienced PSR, and Less Experienced PSR collaborating to ensure that the content is correct and understandable.

Surveys will be made available for PSRs to fill out to provide feedback about how effective their experience with the new knowledge management tool was and suggest ways that it can be improved. In addition, comparisons of monthly calls per thousand errors and average handle time to compare what type of an impact it had. For example, it may be found that the average handle time increased slightly, yet the errors reduced greatly.

Work Plan with Timetable

Task	Due	Notes
Request MapIT Designer Full Version purchase	04/01/15	Complete
Install MapIT Designer to the Knowledge Manager's computer	04/20/15	Complete
Confirm that AnswerPath documents can be published to existing SharePoint environment	04/25/15	Complete – Confirmed that the export made from MapIT Designer can be published to SharePoint
Convert Existing Workflows to AnswerPath format	04/30/15	Complete
Develop enhancements to the telecom screen pops to	05/01/15	Complete – Telecom has developed a Screen Pop

provide AnswerPath DNIS and department selection information		action that provides AnswerPath DNIS and location information
Develop handling scripts for AnswerPath to recognize the DNIS and department information provided from telecom	05/01/15	Complete – AnswerPath script now recognizes the telephone number that the patient dialed and what department (Family Medicine, Internal Medicine, Pediatrics, etc.) that the patient needs to talk with.
Develop JavaScript logic such that links to existing Preference Page contents can be linked within a dialog box in the AnswerPath script.	05/06/15	Complete – AnswerPath now has an "Open this location's preference page" button in the top right corner. This makes it appear as though the Preference Page, AnswerPath script and Telecom system is all integrated.
Validate AnswerPath script content and fill any gaps in knowledge	05/11/15	In progress – Multiple day long events with both experienced and inexperienced PSRs have been done to get the information complete and to real-world standards instead of just simply how things have been explained currently.
Get approval for content with the Client	05/30/15	Not Started - Once we believe that we have all of the content complete we will present it to the client's leadership to verify consistency.
Amend content based upon Client feedback	06/12/15	Not Started – After the client has provided feedback we will amend the content as requested
User acceptance testing	06/15/15	Not Started – Once the consent is approved a small team of PSRs will test it out and provide subjective

		feedback about how they feel it affects their job performance. Objective analysis of their performance will be done as well.
Training	6/26/15	Not Started – Once the script is acceptable both on a client and user level training will be provided for the remaining agents that have not experienced it yet.
Telecom routing table changes	06/29/15	Not Started – Once the training is complete the screen pop URL field on the telecom routing table will be updated with the new URLs for the AnswerPath scripts.
Subjective survey offerings	07/31/15	Not Started – After the system has been in use for a month subjective surveys will be sent out to determine user acceptance level.
Objective analysis	07/31/15	Objective analysis of error rate and handle time will be performed to see if having this new knowledge management system in place helped increase the performance of either of those statistics.

With the exception of the AnswerPath MapIT Designer software to be installed on to the Knowledge Manager's computer (which cost $600) this project uses infrastructure that already exists. No new servers are required for this project because the "Document Library" feature of SharePoint fulfilled the need of having a storage location for the HTML and JavaScript files produced by the AnswerPath application. The telecom and IVR systems are already in place. A few minor changes to the Screen Pop Action behavior was changed to provide DNIS and location information to the web page listed in the "Screen Pop URL" field of the routing table.

The personnel involved in this project will be a Project Manager, two Telecom Analysts, an Operations Manager, a Knowledge Manager, a Supervisor, as well as an experienced and inexperienced PSR. The IT Help Desk and Procurement teams were involved as well. The project manager kept track of all of the activities of the various teams involved. The telecom analysts take the necessary action to program the screen pop actions to provide the DNIS and location information as URL parameters to the URLs listed in the telecom routing table. The Operations Manager, Knowledge Manager, Supervisor, and PSRs worked on developing the content of the AnswerPath scripts. The Operations Manager will be responsible for communicating with the clients and PSRs of the changes that are coming and the supervisor is available to answer or filter questions from PSRs to ensure their readiness to use and accept the new tool. The Knowledge Manager will also develop JavaScript code for features that are not needed but not available out of the box from the HTML or JavaScript files that are published by AnswerPath.

Chapter 4: Results

The amount of content that is necessary to make the final phase of this project had proved to be more massive than earlier anticipated. Therefor a dry run of an AnswerPath with less content was attempted. Between this dry run and trying to build the content to work for the subject matter of appointment scheduling and other patient request, the project was full of learning opportunities for everyone that was involved in the project. If there is something that AnswerPath was able to be integrated in to the telecom system such that the AnswerPath script can be made aware of the phone number that the patient dialed and the department that they are trying to reach. The second thing is that links to supplemental information can be linked and displayed in dialog boxes within the same window of the AnswerPath script such that user's don't have to browse away from the AnswerPath script when information available in another system needs to be referenced. The third thing is that the content of the existing Visio diagrams was lacking and in order for AnswerPath to be a success that the content of the Visio diagrams had to be addressed and corrected before successful implementation; during which, it was also discovered that it is best to make one AnswerPath script for each client rather than making a new one for each location and department within that client.

Findings of the Study

The AnswerPath script can be made aware of the Phone Number and department that the Patient is trying to reach

Getting a PSR to the correct information at the correct time is crucial. It was determined that the critical things which must be known in order to give the PSR the correct information for how to handle the call were: "The call's region", "The call's location", "The call's department", and "The operating hours of the call". With that information loaded in to AnswerScript and pre-

populated for the agent when they got a call would make it such that AnswerPath could lead them to the correct content inside of it. The way that a PSR responds to certain requests depends on all of the factors described earlier. With AnswerPath being provided a DNIS, which means the phone number which the patient dialed, and the department that they are trying to reach. From that, AnswerPath was able to infer the region, and from the current date and time on the computer of the user that is running the script, determine the operating hours of the call.

This was not done by default functionality out of the box of AnswerPath. What needed to be done was to build a middle-tier client that would receive that DNIS and department information, which was dubbed: “AnswerPath Router”. This AnswerPath Router application was a simple HTML file that listened to the provided DNIS and department as URL parameters. It would then lookup some information on a SharePoint list that told the AnswerPath router the URL to the AnswerPath script and the additional URL parameters to pass along to that AnswerPath script. Doing this made it such that AnswerPath “jumped” passed portions of the script that would have beforehand asked the PSR to tell AnswerPath what the call’s region, location, department, and operating hours thus saving those 4 clicks and even at which the PSR may not have been able to identify on their own without additional questioning of the caller.

Supplemental information can be linked and displayed in dialog boxes within the same window of the AnswerPath script

The existing Visio diagrams constantly told the PSR to referrer to another document known as the “Preference Page” for the clinician or location for specifics on how to handle those situations for that location or clinician. A common example is with regard to Nurse Advice requests. Some locations have their own Registered Nurses onsite at their locations that are likely to have availability to answer the transferred call and answer the patient’s question. On the other

hand some of them don't in which case local Registered Nurses are available in the call center which can be talked to. So depending on if that care center would prefer advice nurse requests to go to them directly or to the call center nurses is different. The agent would normally have two tabs or windows open depending on their own preference to review that workflow information and that preference page information.

It was discovered that AnswerPath, with a little bit of JavaScript programming, could have the location preference page appear inside the same window / tab as a dialog box. That way when an agent was told to look at another source for a piece of information they would not completely be taken out of the script. So again because AnswerPath is aware of the call's location it is able to pass the parameter of the call's location to what was called a "Screen Pop Router" application. That "Screen Pop Router" then took the information passed to it and redirected to the preference page as a dialog box. This way now the agent has an "Open this location's preference page" button at the top of their screen. They can refer to it when they feel it necessary. Otherwise there are also times which the AnswerPath script tells them to click the button to get a piece of information and then to click on the "Next" button to get additional information about what steps to take with the information that they leaned from that resource.

In addition to doing that for preference pages, we also discovered that it was useful to do that in cases where special handling notes on a step were too lengthy to read at once. An example of this was a table that told the PSR where to look in the EHR system to find out if the caller was an authorized person to discuss patient concerns with. The table was lengthy and distracted from the rest of the content of the page so it was determined that building links that would pop up as a dialog box instead would be more beneficial than displaying that information ahead of time.

In order to get this functionality to work the appropriate way that was desired, code was used from the basic functionality of the JQuery UI library's dialog box as well as an extended code library that had the extra functionality that was desired. The jQuery UI (jQuery Foundation, n.d.) was included in to the AnswerPath script via CDN reference. In addition, the code library that was used to extend the functionality of the dialog box was uploaded to a sub-folder of the AnswerPath script and included as a reference. The name of the code library was called jquery dialog extend (crab.c...@gmail.com, n.d.).

The content of the existing Visio diagrams needed additional work

It was determined that there were some inherent problems with trying to describe certain situation handling by these Visio Diagrams. One concern was that the existing Visio diagrams were binary, meaning having only "Yes" or "No" decision boxes. AnswerPath on the other hand can have a myriad of options available at any given question point. For example the exiting Vision diagrams when describing the "Cancel, Reschedule, or Late" process for patients calling in to let us know that they are unable to make their previously scheduled appointments were described on the diagram as "Cancel" -> "Yes or No", if "No" then "Reschedule" -> "Yes or No", if "No" then "Late?" and on. Having this directly translated in to AnswerPath would cause at least 3 clicks or more to get to the "Late" process. Whereas with AnswerPath the question can be: "What did the patient need to tell us about their existing appointment?" -> "Cancel", "Late", or "Reschedule" and now we have taken them down to just one click and thus we still give them an experience similar to the workflow because people reading the document form a high-level overview could assume that experience.

In addition, it was discovered that some tribal knowledge was not captured within the workflow diagrams. Because AnswerPath uses an entire web page of content to describe any step

of the process instead of just a few words within a small Visio shape it was determined that we should capitalize on that opportunity to be more specific. There were many collaboration meetings with the Client Services Coordinator, a Supervisor, and two PSRs to determine what those gaps are and who they can be included in to the new AnswerPath script.

Because of this, there was a lot of content that was determined to be missing from the existing process. It was assumed that the existing workflows could just be translated in to AnswerPath and while that did happen, it was not sufficient. The content that we were able to gather by extracting information from these people that are dealing with these problems day in, and day out ended up not really looking like the existing process at all. That is of course an exaggeration. However, the effort that was involved in getting AnswerPath to the correct content was certain much more involved that earlier anticipated.

It's better to make more conditions than files

Earlier it was assumed by the Knowledge Management coordinator that since there is so much deviation between locations and departments that it would be a good idea to make a separate AnswerPath script for each new combination of a location and a department. It was determined that assumption was wrong. An additional factor to this decision was made because it was uncertain if the telecom implementation of providing a DNIS and department to the AnswerPath script may not be a possibility. Once it was determined that the possibility was a certainty it completely changed the scope of the project. Instead of making one AnswerPath script for one specific location and department it was now one AnswerPath script for all locations and departments. Because the "Open this location's preference page" button is now a reality, it makes certain parts of this approach easier, but other parts more difficult. For example, how to handle calls from patients that present with certain symptoms need to either be told that they

have to talk to a nurse before being allowed to make an appointment, or an appointment can attempt to be made and only will they need to talk to a nurse if an acceptable appointment can't be found. That means that for some locations a warm transfer to the advice nurse, and at other locations that means a message to their queue to call them back. Not only that but all of that changes depending on the operating hours of the call as well. By having the content for different locations and departments in separate files makes things easier to manage the conditions which can be explained to AnswerPath as to which content to display to the PSR next and is easier from an authorship perspective. Now that all of the locations and departments are in the one file, additional conditions must be specified to direct the PSR to the next content box. Earlier it was assumed that it would be best to have many files with fewer conditions specified in them; however, in the end it was determined that having one file with many conditions was the superior option.

Summary

AnswerPath's output is HTML and JavaScript and thus that piece of it is considered OpenSource. They also allow additional JavaScript files to be included in their exported files. For the most part, the intent for that was for styling purposes being that many companies need to use a combination of CSS and JavaScript files to get their company image correct on the web; however, with this availability it was discovered that additional functionality could be added to the software even though it didn't come with these capabilities out of the box. The capabilities that we programmed in with additional JavaScript programming were the ability to push a user through portions of the AnswerPath script such that they don't have to answer those questions manually. This is effective because it makes AnswerPath seem to be integrated with the telecom system. In addition, since the script is aware of the location of the call it can more easily move

the PSR to the correct content for that situation for that location more quickly and easily. The less questions the PSR has to answer manually the better. In addition to being able to program extensibility in to AnswerPath it was also discovered that it is easier to manage all of the content for a specific Clinic Access client in one file rather than multiples. Knowing this will help in future implementation of AnswerPath for other SPS clients.

Chapter 5: Conclusion and Recommendations

Several lessons were learned during this process regarding the impact to the patient and PSR experience, as well as how assumptions and limitations may impact the potential success of the project.

Impact to the patient and PSR Experience

While the content of the end result was being developed a decision was made to do a dry run for a specific subject matter for a specific region of calls. The subject matter that was chosen was the "Provider to Provider" call process and the region selected was the "North" region because that region was concerned about how we were handling requests when other doctors and other types of care givers call in requesting to speak with a doctor at the location that they called. Again, since the phone calls arrive physically at a different location than the doctor that is being requested to speak to it's not possible for the person that received the phone call to get out of their desk and see if the doctor is actively seeing a patient and if they can be pulled away to speak to the provider. Furthermore, each doctor may only want to be contacted under certain conditions and other conditions have a message sent to their Medical Assistant (MA). The challenge with this region is that each Medical Doctor has their own pool of Medical Assistants that they have help them out. In other regions there is only one pool of MA's for each location. So, even if the PSR were to identify whether the issue merits a phone call or a message being sent that they may select the wrong number to dial or MA pool to send the message to.

The content covering this subject matter was developed utilizing the same people that had been used to develop the content for the end result including the Operations Manager, Supervisor, Knowledge Manager, and two PSRs. In this case, the content was developed to specify that if the person calling in was a provider to follow the next steps. If the caller was a

patient then the PSR would then be directed to the locations preference page as they had been used to seeing before. Once the content was deemed ready the script was exported to HTML and uploaded to SharePoint. During the next huddle meeting, a demonstration of it was presented to the agents before it would happen such that they would know what to expect. The URL for this AnswerPath script was given to the telecom group to use as the new screen pop URL for the locations that we wanted this content to pop up for and they updated it in the routing table.

The first day that it was in use, a PSR made a mistake on a call. The PSR did a warm transfer to the backline, as we would like; however, they did it for a patient scheduling request instead of for a provider to provider call. The PSR stated that "as per this new thing it tells me to call for this request." We were able to find the call and watch the screen recording and we saw that the agent actually did get redirected to preference page like they should have been for patient requests however, the preference page was where it told them to make that call. The intent of the information on that page was to state that in the event that a patient wanted a same day appointment and the PSR was unable to fulfill that request is when they are to make that call. Because the PSR did not have much experience on the phones yet they believed that they were directed to a new page of information; where in reality they were directed to the same information that they would have seen before and because they stated that it was "new" to the person who answered the call it was automatically blamed on AnswerPath even though the blame really relied on the existing system and the interpretation of the information in the existing system from which AnswerPath forwarded them to.

In addition, this script had the PSR select a location to be forwarded to in the event of a patient call. The PSRs struggled to identify the location that was dialed because the screen pops that they received earlier already directed them to information about the location. We also have a

provider search page that was heavily used to determine the location of the call, which was not available via AnswerPath. There is a section within the soft phone to help the PSR identify that location; however, the characters were limited which made it difficult for the agent to select the correct location when the AnswerPath script asked them to select it.

From that it became apparent that the AnswerPath script must be aware of the region, location, department and operating hours of the call and not rely on the PSR to select it. As a result the source code of the exported JavaScript files were analyzed and it was determined that there was a "Session Manager" object that was utilized to build breadcrumbs to sections of the script. From that it was derived that if we could determine the breadcrumb URL we could have the agent "pushed" to a certain page in the script with certain selections already made for them. The way it worked is the breadcrumb URL indicated the radio button selection made in earlier pages.

A SharePoint list was built that mapped the DNIS and department information that would come from telecom to what those matching selections would be in the AnswerPath script. A HTML page was set up that had JavaScript code that would read the URL parameters from Telecom, and look those up in the SharePoint table to determine the breadcrumb URL and forward the user to the AnswerPath script with that location and department information selected for them. The script also used the current date and time of the call to derive what the operating hours of the call were (before or after hours) which selection would be made for them as well.

How assumptions and limitations may impact the potential success of the project

The assumption that the existing workflows were ready to be dropped in to AnswerPath, combined with only one person able to make changes to the AnswerPath script certainly made it difficult to produce content that was ready and viable to make a positive impact to the error rate

and call handling times. Had it been known how long it would take to combine synchronize schedules and make availability for content development the initial end date would have been delayed earlier. Also, a plan for who those individuals would be and when and how often they would make would help with that decision as well.

Recommendations

When considering to use AnswerPath as a knowledge management system for contact centers it is recommended that a decision should be made early to have as much content in to one script as possible rather than making many scripts. AnswerPath is capable of handling variation in processes with different inputs provided by the user. Due to the volume of content or volume of decisions points that could be possible may seem unmanageable; however, it was determined that managing more conditions in a single file is easier than managing the same content with variation across multiple files.

An additional recommendation is that having as much information about what causes variance in the process is best to be loaded at the beginning rather than at the point in which the decision would change. In terms of this project we determined that it was better to determine these elements at the beginning of the script rather than asking them about these elements at a later junction about the call: the region, location, department, and operating hours. Getting that information ahead of time to be used later will prevent the user from re-answering that question down the line. For example if the caller has multiple requests it is more effective for the script to already know that the call is during a certain operating hour than to have to ask the user to select the operating hours during any point of the request thus preventing them from answering that question twice.

An addition recommendation is that if the AnswerPath output does not directly do what is necessary to not just accept it because JavaScript programming can be added to it, which should allow the desired effect to be possible, so long as it is something that is possible by JavaScript programming. In terms of this project, it was used to keep the user within the same browser window when links to external content were necessary to grab some quick information out of and return to the script. Without this JavaScript programming, the most that would have been able provided the user would be a link which would open in a new window or tab with instructions to the user that they should return to the AnswerPath window to continue on after that information had been gathered. It was assumed that if the user were took to a different page in a different window that they may not follow through the script the rest of the way. By adding this JavaScript programming the user is able to reference that information while still in the AnswerPath script. The external resource will now open in a dialog box that can be closed and re-opened at will by the user.

How others may replicate this project

In order to replicate this project, all one must do is get a copy of the AnswerPath MapIT designer, once they have the product, they can at least produce AnswerPath scripts that they can use on their own computer. When they purchase a full version then their AnswerPath software will export the script to HTML of which can be uploaded to any place that has an HTTP Service. This project used a SharePoint Document Library; however, one may choose to do an Apache or Windows Internet Information Server to publish their scripts to. If they have existing business processes that are documented in Visio, or step-by-step, if-then type of information then they can easily convert that content to an AnswerPath script by dragging content or question pages to the appropriate places and connect them together with either an else condition which means that it

will go to the next page no matter what or specify conditions provided by the user earlier in the script.

Researchers wishing to look in to the capabilities further will want to set up an HTTP server that receives POST inputs. This project had to rely purely on client level scripting (JavaScript); however, they also have the capability for the session that the user went through be posted to a server for additional processing. The example that they include in their documentation is an ASP.NET Server application that will receive the posted xml session and store it to a database local to the server. The script is a demographics survey about what industry a person is in and how much money they make. While the scope of this project didn't set-up such a service it is nice to know that it is there for future releases.

Summary

Appointment scheduling is more difficult than one who has not been involved in the process before may believe. At its very basic form it would seem that if a patient is sick and they want to be seen by their primary care provider at the provider's next appointment slot. The reality is that it is much more complicated than that. To add to the complexity for this project there is no face-to-face interactions with providers and those trusted to make informed decisions about that provider's schedule. The PSR must also be able to know when a patient must talk to a nurse before attempting to make an appointment for the patient that called in. The PSR must also know how to respond to other requests, which may not be appointment related.

In order to ensure that each PSR responds to each situation the same way the state was to explain the processes for these situations by way of Visio diagrams and Web Pages called Preference Pages. The purpose of the project is to implement a new knowledge management system that will enable the PSR to effectively managing incoming calls and access information

related to that situation in a way that would be able to be followed in an enhanced way. The project involved utilizing the company's existing SharePoint and Interactive Intelligence (Telecom) systems. The new element was AnswerPath, which was used to produce HTML and JavaScript files that were upload to SharePoint and brought up as a result of a "screen pop" from the Interactive Intelligence client when the call comes in.

The assumptions of the project included that we believe that the existing Visio diagrams could easily be converted in to AnswerPath scripts. The reality was that the content of the Visio diagrams needed additional content to be accurate. Since some of the information in the existing documents were either out of date or in transitional phases that made it difficult to translate the documents. Furthermore, there were gaps between this information and what was actually being done in practice and what was expected. Ironing out those details was the greatest challenge of the project and pushed the completion time frame beyond the expected measures. It was determined by the project team that it was better to allow the time to be extended than to have incorrect information in the new knowledge management system.

Limitations of the project were mostly around licenses for the MapIT Designer software and Human Resources. It was difficult to have all of the authorship on one individual considering the amount of content that needed to be converted as well as customizations to the HTML and JavaScript output of the system. As a results it was determined that two additional Knowledge Management coordinators are needed in the company on a full time basis.

The process that was performed to get this system up and running were to make a few changes to the telecom system such that the telecom system provided a DNIS and department information to web pages as URL parameters. The web page would then take that information to find out the correct AnswerPath script to deliver to the PSR that received that phone call. We

then collaborated with Operations Managers, Supervisors, and PSRs to develop the content of the AnswerPath scripts. Additional modifications were made to the JavaScript and HTML files to make the pages look like other Sutter Health websites. In addition to the look and feel the customizations also allowed links to other web pages be displayed in dialog boxes within the same window as the AnswerPath script.

This project had a wealth of learning opportunities available from it. The complexity of the Health Care system did bear its ugly head throughout this process. The scary part of that is that the only subject matter of the Health Care system in scope for this project was the appointment scheduling process for one medical foundation and primary care providers (Family Medicine, Internal Medicine, and Pediatric Medicine Doctors). Not only were things about Health Care learned throughout this project but things about technology were learned as well. It was discovered how it is to make the telecom system integrate with a browser to deliver meaningful content to the person who is on the receiving end of the phone call. The process for developing content and managing content in AnswerPath such that it can walk the user through a script and make informed decisions was learned. Finally it was discovered that just because AnswerPath does not meet a business need out of the box that the business need can be reached by including customized JavaScript and HTML coding to the final script.

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