

CS283-01: EPICS

Final Report

Client: WFYI

Semester: Spring 2015

Team Members: Ashley Zegiestowsky, Chris Bowman

Date: April 27, 2015

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Abstract:

This report details the work conducted during the spring semester of 2015 for the EPICS project working with WFYI on the development of a new software or application that replies with automated responses to WFYI's user's interaction with their social media presentation. This report details all of the research and processes involved in narrowing the scope of the project and producing a few deliverable tangibles in regards to research conducted in the social media field and also within the Twitter API documentation. The team structure and project management are outlined as well as recommendations for future work that could be implemented by the next EPICS team to take on this ambitious project.

CHAPTER 1: INTRODUCTION

Problem Statement & Objectives:

WFYI would like to create a system to automatically respond to user inquiries about program air dates and times. The system will poll Twitter and Facebook for user posts matching a predefined pattern*. The system will get its program information from an internal WFYI program database. A Web based interface to access program schedule data will be implemented by WFYI to fit a specification designed in collaboration with the EPICS team(s).

Client Description:



Client Contact: Chris Bowman, Internet Projects Manager

WFYI Public Media is Indiana's largest PBS and NPR member station. Through our informative on-air, online, and community-based resources, WFYI provides a forum for open dialogue about issues that are important to our community. We encourage conversations that promote diverse perspectives. Our award-winning and locally produced documentaries and public affairs programs address a variety of relevant topics; including the high school dropout crisis, opportunities for lifelong enrichment, early childhood education, healthcare, workforce development, the arts, and environmental affairs. Additionally, WFYI proudly bolsters community development by hosting and supporting community events throughout the year, including our signature events; PBS KIDS in the Park and the Ice Miller Indy Wine Fest.

Overall Approach & Process Model:

This EPICS WFYI Spring Semester project was a unique experience for our EPICS team and myself given that I was the only undergraduate student member of my team (an occurrence an EPICS class has never dealt with before). Also, due to the ambitious and broad nature of the proposed project, the overall approach entailed a heavy emphasis on research and discovery and less of a focus on technical implementation (until the end of the semester). The general process model involved a detailed dive into many different areas of research ranging from social media interactions to API integration and development. Throughout this process there was a constant cycle of trial and error and narrowing down of the topic at hand in order to produce a tangible and significant result.

Organization of the Report:

The following report consists of six chapters, a bibliography, and an appendices section. The first chapter serves as an introduction to purpose and content of the following report. The second chapter details the original requirements and project objectives that have evolved throughout the semester and development of the project focus. The third chapter delves into the Social Media Research that was conducted by the team in order to gain more perspective and better understanding of this area in order to proceed with the project in the most effective and useful manner. The fourth chapter deals with the exploration of the Twitter API documentation and related technologies related to a refocusing of the projects original scope. The fifth chapter elaborates on the project organization and management utilized by the team to further the progress and success of the project. The sixth chapter proposes several recommendations for future work relating to the current status of the project and how to improve and add on to the current project. Finally, the bibliography contains all of the sources utilized for this project throughout the semester, and the appendices section contains all other important documents, weekly status reports, and presentation slides that were not mentioned earlier in the report.

CHAPTER 2: REQUIREMENTS SPECIFICATIONS

- 1) User Query Parser – parse a user’s question pulling out likely program name token(s) and interrogate the Program Lookup Interface for results. WFYI would like to investigate the feasibility of trying to parse natural human language.
 - a. *Natural language parser:
 - i. Given a sample of question phrases parse out the program name(s) for sending to schedule interface to make a query.
 1. e.g. “When does Downton Abbey air next”, “What time is No Limits on?”
 - ii. WFYI can provide many examples of questions.
 - b. *Script based/fixed format:
 - i. As an alternate: We may teach our users to use a specific format for phrasing questions.
 1. e.g. for twitter “#AskWFYIProgramBot <Program Name>”
 2. Not sure what to do on Facebook yet
- 2) Query Engine – interface between the different user interface platforms (currently Twitter and Facebook) and send queries to the program look up back end.
 - a. Receive a raw user query from one of the platform ‘hooks’.
 - b. Send the raw query to the User Query Parser to format the query into something the Program Lookup Backend understands.
 - c. Send the query to the Program Lookup Backend.
 - d. Respond to the hooks with the response from the lookup backend.
- 3) Program Lookup Backend – something WFYI will build to suite specifications defined by the design of the Query engine
 - a. Potentially a SOAP interface, or basic RESTFUL service.
- 4) Twitter Hook – listen for and respond to queries that come in on WFYI’s twitter channel.
 - a. Read twitter posts with a given #hashtag (#AskWFYIProgramBot?)
 - b. Write a reply tweet with the query results
- 5) Facebook Hook – listen for and respond to Facebook posts that come into WFYI’s Facebook page asking about program air dates/times
 - a. Maybe the questions will follow a specific pattern, or contain a key phrase, e.g. AskWFYIProgramBot

The technologies used to implement the components will need to run on Windows Server 2008 or Windows Server 2003. This design is also considered only a draft and WFYI encourages architectural input from the EPICS team.

**NOTE: The two highlighted requirements (4. Twitter Hook & 5. Facebook Hook) were the two sections focused on for this semester.*

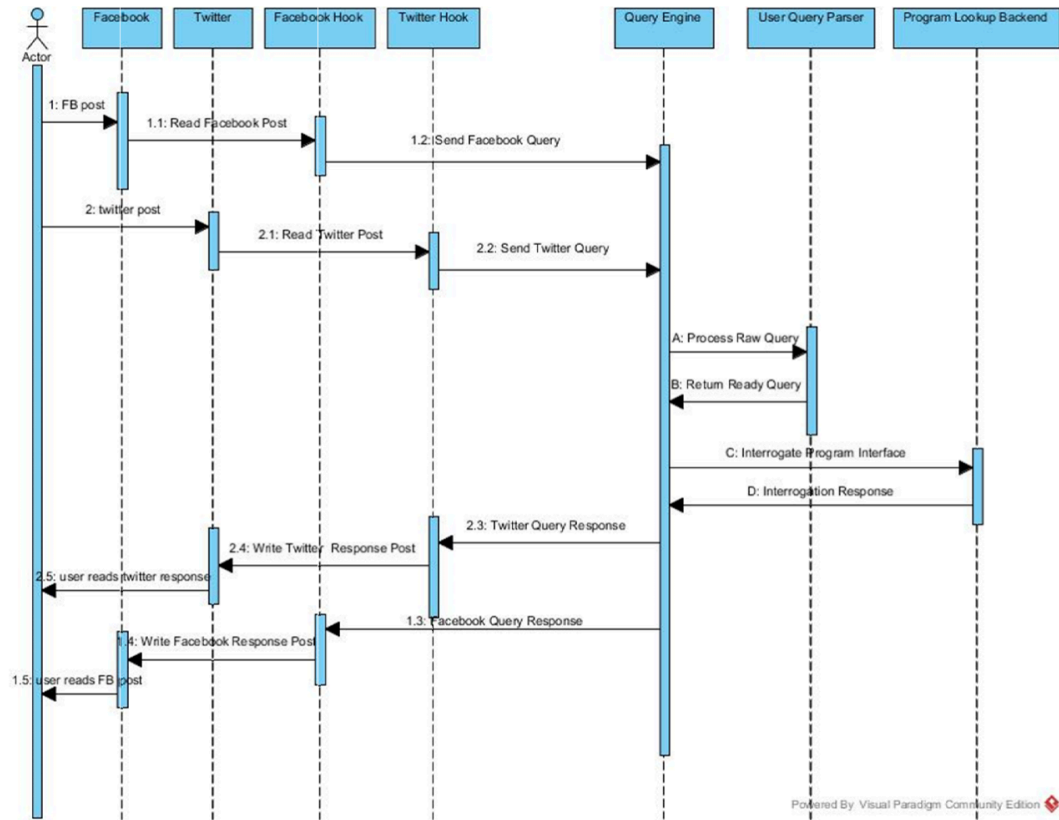


Figure 2.1 Automated Social Media Interaction Diagram

The above diagram details the general workflow of the desired goal for the proposed automated social media interaction application.

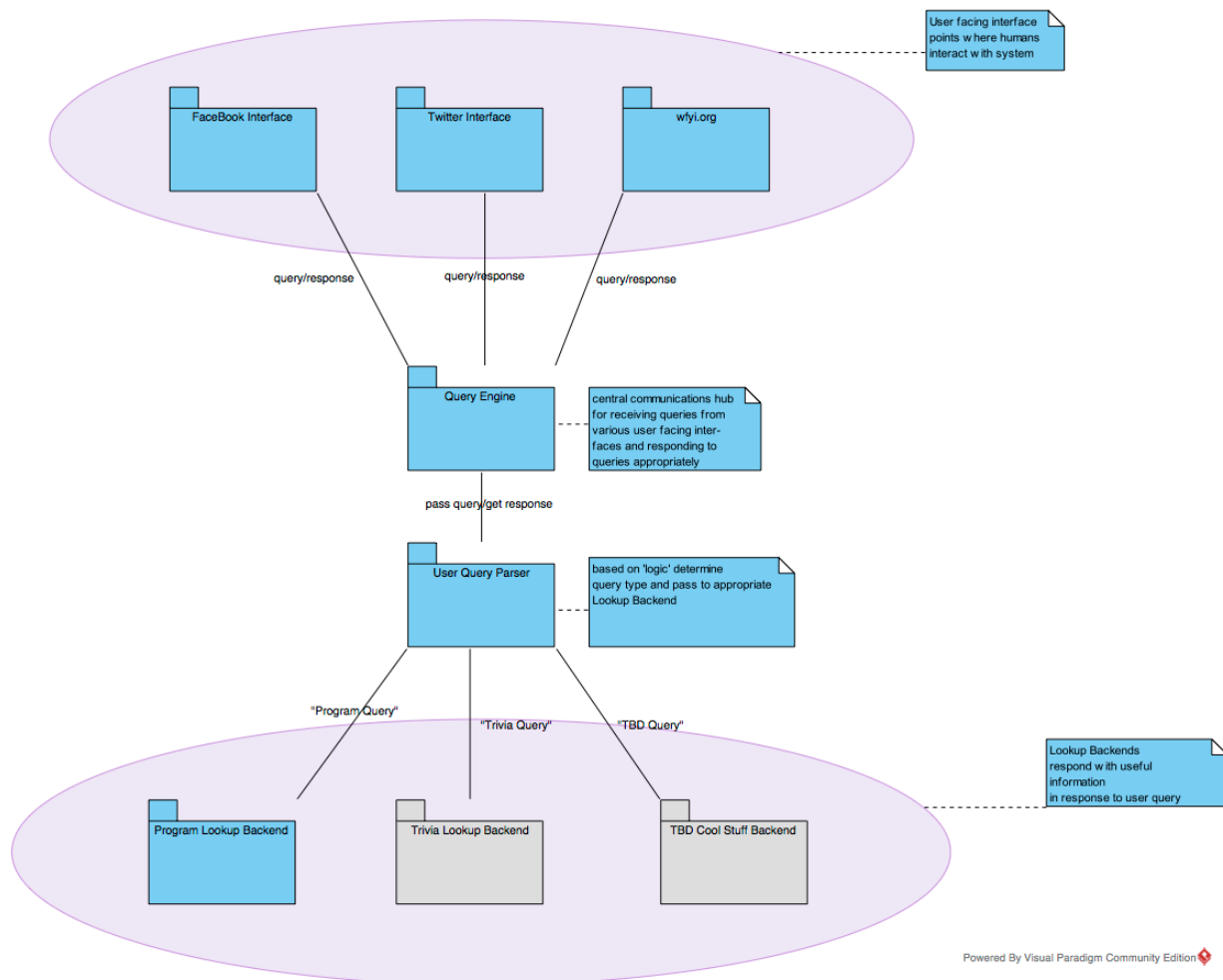


Figure 2.2 Automated Social Media Block Diagram

The above diagram outlines the basic architectural structure of the desired application. The structure roughly follows a three-tiered approach with the first tier containing mostly the components with which the user interacts. The second tier contains the business logic, query parser, and query engine, and the third tier contains storage and look up backend to complete the functionality of the application.

CHAPTER 3: SOCIAL MEDIA RESEARCH & CONCLUSIONS

Overview:

This section details the Social Media Landscape Survey that was conducted within a four-week timeframe after defining a clearer and narrower scope of the project discussed in the preliminary meetings.

Purpose:

- **Project Goal** = automate select responses to user interactions with WFYI's social media presence (Facebook, Twitter, Website)
- **Survey's Purpose** = observe and analyze other station's usage and user interactions of their own social media presence

Survey Guidelines:

Social Media Platforms:

- Facebook
- Twitter

Organizations (TV & Radio Stations Surveyed):

- WFYI – Facebook & Twitter Presence
- Local Indianapolis Stations
 - Station 13:
 - Website: <http://www.wthr.com>
 - Facebook: <https://www.facebook.com/WTHR13>
 - Twitter: <https://twitter.com/WTHRcom>
 - ??
- Local Nashville Stations
- National Stations

Frequency of Data Collection: Weekly? Daily?

Broadcaster Statistics/Data Collected:

- Number of posts
- Types of posts
 - Replies
 - Comments
 - Messages
 - Information about: program, contest, etc.
 - ??
- Content types
- Do these organizations have a social media presence?

Generalized Description (for each station):

- How was the station using their social media?
- What is their central goal?
- Did there appear to be a theme to their content?

Data Collected from Social Media Survey:

**Survey of WTHR13 News Station*

FACEBOOK:

Methods of User Interaction:

- Post directly to the Page
- Comment on a Post or Picture
- Send a private message
- Tag WFYI in a post

Content Categories:

- Direct Questions or Requests
- Opinions
- Informational
- Other

Content Types: Text, Image, Video, Link, Shared Page


Response to Users:

- Direct Questions/Requests – Answered by Station 13
- Direct Questions – Answered by other Users
- Direct Questions – Unanswered
- Information Posts – Followed-up by Station 13

**Promptness of Response: between 10 minutes – 1 hour*

Examples of Facebook User Posts:


Category: Direct Questions - Answered by WTHR-TV


**Dave Melton** ▶ **WTHR-TV**
13 hrs · 🌐

Any news on the fire by IU West Hospital in Avon ?


Like · Comment · Share · 👍 1 💬 1

👍 Marilyn Triplett likes this.



**WTHR-TV** ✓ That was a garage fire around 6 pm on Kreutzinger Lane. We understand there were no injuries, although the garage was damaged by the fire.
Like · Reply · 👍 1 · 13 hrs

**Mathias Timberman** ▶ **WTHR-TV**
1 hr · 🌐**WTHR-TV** ✓ It was our lead story at noon. It's also on our website. We'll post a pic and link to our page once people start gathering.
<http://now.wthr.com/1DytMjp>**Statehouse rally Monday to support Superintendent Ritz**
WTHR.COM | BY WTHR CHANNEL 13



Kelsey Taulbee
▶
WTHR-TV

2 hrs ·

I find this disturbing. And the ad itself is riddled with grammatical errors. This is the forum we are finding the "professionals" used to grade our children's standardized tests? Has anyone reported on this yet?

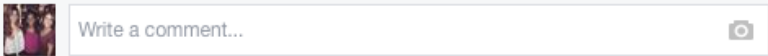
Test Evaluators Needed (to score K-12 standardized tests)


If you have a Bachelor's degree or higher, we need your help to evaluate student assessment tests. Come apply! For more information and to schedule an appointment visit our website...

INDIANAPOLIS.CRAIGSLIST.ORG

Like · Comment · Share ·
2
1

2 people like this.




WTHR-TV
✓
Hi Kelsey, this has been in place for a long time, but thanks for your tip...we'll check into it!

Like · Reply · 2 hrs



Cane Jordan
▶
WTHR-TV

9 hrs ·

The audio keeps cutting in and out, while watching the live news on the 13 app for iPad. It just started doing this today, has worked fine the rest of the time. Is it the app or something on my end?

Like · Comment · Share ·
1




WTHR-TV
✓
I think we've got it fixed. Sounds a lot better on our end.

Like · Reply · 8 hrs



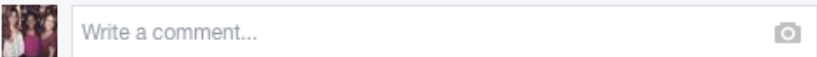
Dave Melton
▶
WTHR-TV


13 hrs ·

Any news on the fire by IU West Hospital in Avon ?

Like · Comment · Share ·
1
1

Marilyn Triplett likes this.





WTHR-TV
✓
That was a

Write a comment...

 on Kreuzinger Lane. We understand there were no injuries, although the garage was damaged by the fire.

Like · Reply ·
1
13 hrs

Category: Direct Questions - Answered by other Users


**Joan Lacy Tungate** ▶ **WTHR-TV**
Yesterday at 10:54am · 🌐

Any news on the investigation of "deflate gate" ... or has the "broom and dust pan " been put away !!!

Like · Comment · [Share](#) · 👍 4 💬 1

👍 4 people like this.

Send this to friends or post it on your timeline.

**Ralph Laakmann** The NFL got the east coast/west coast match up they wanted....highest ratings ever....what deflate gate!?!?
Like · Reply · 21 hrs

👉 1 Reply

Category: Direct Questions – Unanswered

**Rod Reed** ▶ **WTHR-TV**
Yesterday at 7:10am · Cicero, IN · 🌐

Two separate terrorist attacks yesterday in Denmark and I can't find one mention on any of your online platforms. Why is that?

Like · Comment · Share

**Wendi Merrill** ▶ **WTHR-TV**
19 hrs · 🌐


What is going on near 10th street ??? Smoke, lots of emergency vehicles...




Like · Comment · Share


Category: Requests & Informational Posts

Posts To Page


currently lives in Springfield, OH but is from Indianapolis, IN...if ANY ONE has seen her or has any information PLEASE call Rhonda Stone (317) 717-7436 just the littlest thing can be a BIG key to finding her...Shelby if you see this you have the eyes of SO many hunting for you PLEASE just call and let us know your fine, we love you!!! — with **Shelby Stone** and **Shelby Stone**.




Like · Comment · Share ·  1  2  3


 Diana Asberry-Whitt likes this.



Top Comments ▾


 3 shares







Write a comment...




**WTHR-TV**  Has a police report been filed, and if so, which police agency?
Like · Reply · 3 hrs · Edited


**Tiffany Kiefer** there has been one filed in Springfield Ohio where she lives right now but she is from indy so she could be either place
Like · Reply · 3 hrs


 2 Replies · 2 hrs

**Raechele Ewing**  **WTHR-TV**
4 hrs · Indianapolis, IN · 


Accident on east bound I-70 merging onto 465N. 4 vehicles involved







Like · Comment · Share ·  4




Write a comment...



**WTHR-TV**  Thanks for the photo...stay safe out there!
Like · Reply ·  1 · 4 hrs

**Tawnya Curran** There's not one salt truck to be seen.
Like · Reply · 3 hrs

 View 2 more comments

15

TWITTER:

Methods of User Interaction:

- Tweet to/at Station 13
- Retweet
- Reply to a Tweet

*More difficult to decipher interactions between the users and the station on Twitter versus facebook (without having admin access to twitter account)

Comparison of Facebook vs. Twitter:

After observing and collecting data from both WTHR13's twitter and Facebook presence and comparing it to that of WFYI's, it appears that Facebook functions and is laid out more like a website whereas Twitter appears to be more of a continuous feed or stream of information. Other interesting topics or areas of discussion that arose while conducting this research include: the existence and influence of user demographics, difference in content available on Facebook & Twitter versus the website, and difference in platforms accessed by the user (desktop, tablet, smartphone).

Additional Research Resources:

Due to the nature of this research in regards to Social Media, we decided to reach out the Butler Communications department to see if they could shed any light on the topic or point our team towards any other research that existed similar to the social media survey we had been conducting.

Communication Department Contacts:

Rose Campbell ~ Chair, Strategic Communication
Professor, Strategic Communication
317-940-9357

rcampbel@butler.edu

Jessica Moore ~ Chair, Organizational Communication & Leadership
Assistant Professor
317-940-8081

moore@butler.edu

Best Commercial Practices:

After speaking with two chairs of the communication department, they brought to light a few types of software that helped manage social media, called Social Media Management Software, and had a similar functionality to what the original project hoped to accomplish.

Social Media Management Software (SMMS)

- A scientific approach to tracking, measuring, and engaging with actionable social marketing data
- Provides analytics & reports
- Dependent upon the needs of the company

5 Categories of SMMS

1. Listening
2. *Conversation/Engagement* *most closely fits WFYI's social media needs
3. Marketing
4. Analytics
5. Influencer

Software	Need	Key Players	Small Business Alternative
Social Listening	What is being said about my ... <ul style="list-style-type: none">• Company?• Competitors?• Category in SM? What words are used in association with our brand? Where is this chatter occurring?	<ul style="list-style-type: none">• Crimson Hexagon• Lithium• Meltwater Buzz• Radian6• Sysomos• Trackur• Visible Technologies	<ul style="list-style-type: none">• ViralHeat• SocialMention
Social Conversation	Efficiently respond to questions posed to our company in SM. Find real-time opportunities to provide assistance.	<ul style="list-style-type: none">• Argyle Social• Attensity• Awareness• CoTweet• Spreadfast• Sprinklr	<ul style="list-style-type: none">• Hootsuite• Jugnoo• Postling• Sprout Social

	Assign conversation opportunities to various people in the company.		
Social Marketing	<p>Create custom Facebook apps</p> <p>Launch & administer promotions</p> <p>Manage creative assets on YouTube & beyond</p> <p>Multiple people can create with workflow & approvals</p>	<ul style="list-style-type: none"> • Buddy Media • Engage Sciences • Hearsay Social • Involver • Shoutlet • Spredfast • Virtue • Wildfire 	<ul style="list-style-type: none"> • Agorapulse • ShortStack
Social Analytics	<p>Know how effective my social media efforts are.</p> <ul style="list-style-type: none"> • On specific platforms • Overall <p>Know whether all of this is worth the effort</p>	<ul style="list-style-type: none"> • Adobe/Omniture • PageLever • People Browser • SAS • Simply Measured • Social Bakers • Syncapse 	<ul style="list-style-type: none"> • Crowd Booster • Google Analytics • Swix
Social Influencer	<p>Find social media participants that are...</p> <ul style="list-style-type: none"> • Disproportionately interested in • Or influential about ... a particular topic <p>Understand their ...</p> <ul style="list-style-type: none"> • Passions • Spheres of influence 	<ul style="list-style-type: none"> • Appinions • GroupHigh • Klout • Kred • Peek Analytics • Plexus Engine • Vocus 	NA

Figure 2.3: Five Types of Social Media Management Software

The above table provides a brief summary of each type of social media management software and needs each software address as well as a list of both commercial and open source versions of the specific software.

Commercial Software Example (Viralheat):

What Viralheat Does:

Listen

- Monitor conversations across social media presence
- Create smart streams
- Identify trends

Analyze

- Convert data into action
- Identify and grow your audience
- Provide thorough measurements and metrics of data & content

Content

- Source relevant content
- Manage workflow
- Extends reach for optimal promotion

Pricing (Lite Version): \$9.99/month to \$89.99/month

*For exact prices, most companies ask to be contacted directly

Open Source Software Example (Hootsuite):

*Similar functionality to the commercial software options but differs in the following aspects:

- Limited functionality
- Platform Specific (some, but not all)
- Less extensive reporting features
- “The Basics”

Figure 2.4: Hootsuite Plans & Pricing

The table below displays the different features and functionality between the free version of the product and the paid versions of the product.

	Free	Pro	Enterprise
	Great for: Personal Use	— 30 day free trial — Great for: Businesses (from \$9.99/month)	Great for: Corporations, Organizations, Governments
Plans & Pricing	Current Plan	Upgrade to Pro	Learn More
Social Profiles	Up to 3	50 included, up to 100	Unlimited
Enhanced Analytics Reports	Basic	1 included, up to 10	Unlimited
Message Scheduling	Basic	Advanced	Advanced
Team Members	None	1 included, up to 9	Up to 500,000
App Integrations	Basic	Basic	Unlimited
RSS	Up to 2	Unlimited	Unlimited
Hootsuite University	Optional	Optional	✓

Recommendations for WFYI:

1. Buy a commercial software

Pros & Cons: The commercial software available is very powerful and comprehensive and could be a great asset to WFYI's social media presence. However, the software may be outside of WFYI's price range, and the business may not be large enough or have enough substantial need for all of the features that are included in the paid versions of this type of social media management software.

2. Use an open source software

Pros & Cons: The open source software available for social media management contains similar functionality to that of the commercial software available. However, these software options are limited and may provide WFYI with all of the desired functionality, but this is a free alternative that could aid in WFYI's social media management.

3. Build your own interface (using Facebook & Twitter's API's)

Pros & Cons: This option would allow for almost complete customization of social media management software. However, this alternative deals with the complex topic of Facebook and Twitter's API, which contains an immense amount of documentation. Also, building a customized version of software of this type would require a lot of time and resources and may not be worth the effort or outside of the abilities of an undergraduate college student.

CHAPTER 4: TWITTER API & ASSOCIATED RESEARCH

Re-evaluated Project Scope/Direction:

**Re-evaluation of the project scope and direction was necessary after the findings and results of the Social Media Landscape Survey highlighted a new technical need and purpose*

Components/Goals of the New Project Scope:

- Target specific type of user posts with content regarding technical problems (ex: audio not working on a television program)
- Automate process to parse and search for these technical related posts and immediately send them to Master Control (eliminating the need for an actual person to be monitoring the Facebook & Twitter feeds for technical issues)
- Build a prototype that interacts with the Twitter API

Technologies & Documentation Explored:

- Twitter API Documentation <https://dev.twitter.com/overview/api>
 - Overview of the API
 - Libraries that interact with the Twitter API using the .NET platform (both have a package that can be used in visual studio)
 - Linq2Twitter <https://linqtotwitter.codeplex.com/>
 - Tweetinvi <https://tweetinvi.codeplex.com/>
 - OAuth – third party protocol that is necessary to access the Twitter API <https://dev.twitter.com/oauth>
 - Creation of a Twitter Dev account to create apps in order to generate the needed keys and tokens that serve as the credentials to connect with OAuth to the Twitter API <https://apps.twitter.com/>
- Microsoft Visual Studio 2013 – visual basic, c#
- AppHarbor (.NET Platform as a web service)*
- RavenDB (No SQL Database)*

*Outside of project scope, may not be beneficial for the desired functionality

*Links to the article and video tutorials for code examples with these libraries can be found in the bibliography section

CHAPTER 5: PROJECT ORGANIZATION & MANAGEMENT

Team's Organizational Structure:

The organizational structure of our team was very unique for this semester of EPICS. To be more specific, our team consisted of Chris Bowman, Dr. Linos, and myself, the only student member of the team. Chris was the client contact who provided the project idea and helped narrow down the scope and general project direction. Dr. Linos served as a team advisor/member when needed. Given that I had no other student teammates, Dr. Linos acted as my teammate in a way so that I could bounce ideas off him and discuss any obstacles I ran into. However, I conducted the bulk of the project work and research in regards to tangible deliverables.

Project Management Process:

The project management process functioned around a weekly time base. Weekly meetings were held every Monday to discuss the Weekly Status Report and action items for the following weeks. In addition to the initial meeting with the client, Chris met with Dr. Linos and I at least once a month to discuss the progress of the project and re-evaluate the project direction if needed. There were very few scheduling conflicts throughout the semester, and it was very easy to get in contact with the client via email if any questions or obstacles arose.

List of Weekly Status Reports (WSR):

WEEKLY STATUS REPORT (WSR)

[January 26, 2015]

TO: [Panos Linos and Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [January 19, 2015 – January 26, 2015]

I. RED FLAGS: NA

II. ISSUES: NA

III. ACCOMPLISHMENTS (dates):

January 21, 2015

- Set up initial contact meeting with client to discuss project

IV. ACTION ITEMS FOR FOLLOWING WEEK (dates):

- Conduct initial Meeting (Whole Team) [01-26-2015]
- Define the scope of the project for semester (Chris & Ashley) [01-26-2015]
- Begin preliminary work for project (Ashley) [TBA]

WEEKLY STATUS REPORT (WSR)

[February 2, 2015]

TO: [Chris Bowman, Panos Linos]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [January 26, 2015 – February 2, 2015]

I. RED FLAGS: NA

II. ISSUES: Difficulty understanding the Twitter and Facebook API documentation

III. ACCOMPLISHMENTS (dates):

January 29, 2015

- Completed Block Diagram of AskWFYIPProgramBot

January 31, 2015

- Beginning of a working outline for the authentication process for the Twitter API

IV. ACTION ITEMS FOR FOLLOWING WEEK (dates):

- Complete outline for authentication for Twitter API Documentation (Ashley Zegiestowsky)
- Begin outline for authentication for Facebook API Documentation (Ashley Zegiestowsky)

WEEKLY STATUS REPORT (WSR)

[Monday, February 9, 2015]

TO: [Panos Lions, Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [February 2, 2015 – February 9, 2015]

I. RED FLAGS: NA

II. ISSUES:

- Determine the best way to survey the technological landscape of other local and national TV & News Stations social media presence
- Determine with what frequency is appropriate to conduct this survey in order to obtain the most comprehensive results and feedback

III. ACCOMPLISHMENTS (02/02/2015 – 02/09/2015):

Monday, February 2, 2015

- Defined a more reasonable and tangible scope and direction
- Created a timeline for milestones and tangible deliverables:
 - Wednesday, March 4th: Station Visit & Presentation of Landscape Survey
 - Wednesday, March 18th: Submit detailed Requirements
 - Wednesday, April 1st: Submit Use-Case Scenarios
 - Wednesday, April 15th: Submit Final Document
 - Bonus: Research Facebook & Twitter API documentation

Thursday, February 5, 2015

- Initial Survey of WFYI website and other local new stations

IV. ACTION ITEMS FOR FOLLOWING WEEK (02/09/2015 – 02/16/2015):

- Gather a list of local & national news stations to be surveyed (Ashley)
- Determine the criteria and frequency of the stations to be surveyed and how best to organize and collect data (Ashley)
- Contact Ken Creech via email and set up meeting

WEEKLY STATUS REPORT (WSR)

[Monday, February 16, 2015]

TO: [Panos Linos, Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [February 9, 2015 – February 16, 2015]

I. RED FLAGS: NA

II. ISSUES: Still waiting to get in contact with communication department to find previous research or resources in regards to the use of social media

III. ACCOMPLISHMENTS (February 9, 2015 – February 16, 2015):

Wednesday, February 11, 2015

- Continued researching WFYI and Station 13's website, Facebook, and Twitter presence

Friday, February 13, 2015

- Met with Professor Ken Creech to discuss Social Media related questions
- Set up meetings with Rose Campbell & Jessica Moore (from the Strategic Communications department)

IV. ACTION ITEMS FOR FOLLOWING WEEK (February 9, 2015 – February 16, 2015):

- Meet with Rose Campbell & Jessica Moore to discuss Social Media related research or resources (Ashley)
- Establish a structured way to research and document the use of each station's website, Facebook and Twitter presence (Ashley)
- Continue survey WFYI and Station 13's social media presence and possibly look into other station's social media presence (Ashley)

WEEKLY STATUS REPORT (WSR)

[Monday, February 23, 2015]

TO: [Panos Linos, Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [February 16, 2015 – February 23, 2015]

I. RED FLAGS: NA

II. ISSUES:

- Trouble organizing observations and data gathered into categories
- Difficulty navigating the Journal of Computer-Mediated Communication

III. ACCOMPLISHMENTS (February 16, 2015 – February 23, 2015):

Wednesday, February 18, 2015

- Email correspondence with Communication professors (Rose Campbell & Jessica Moore)
- Obtained new sources of research and information regarding the use of Social Media
 - SMMS: Social Media Management Software
 - Cision
 - Journal of Computer-Mediated Communication

Monday, February 23, 2015

- Met with Professor Rose Campbell to discuss Social Media related questions
- Continued email correspondence with Rose Campbell

IV. ACTION ITEMS FOR FOLLOWING WEEK (February 23, 2015 – March 2, 2015):

- Begin preparing for Social Media Presentation at WFYI (Ashley)
- Establish a structured way to research and document the use of each station's website, Facebook and Twitter presence (Ashley)
- Continue survey WFYI and Station 13's social media presence and possibly look into other station's social media presence (Ashley)

WEEKLY STATUS REPORT (WSR)

[Monday, March 2, 2015]

TO: [Panos Linos, Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [February 23, 2015 – March 2, 2015]

I. RED FLAGS: NA

II. ISSUES: Looking for possible open source Social Media Management Software

III. ACCOMPLISHMENTS (February 23, 2015 – March 2, 2015):

Thursday, February 26, 2015

- Met with Jessica Moore to discuss Social Media Management Software

Friday, February 27, 2015

- Researched different types of Social Media Communication/Engagement Software & if an open source free version exists

IV. ACTION ITEMS FOR FOLLOWING WEEK (March 2, 2015 – March 16, 2015):

- Create power point presentation for Social Media Landscape Survey (Ashley)
- Establish a structured way to research and document the use of each station's website, Facebook and Twitter presence (Ashley)
- Continue survey WFYI and Station 13's social media presence and possibly look into other station's social media presence (Ashley)

WEEKLY STATUS REPORT (WSR)

[Monday, March 16, 2015]

TO: [Panos Linos, Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [March 2, 2015 – March 16, 2015]

I. RED FLAGS: NA

II. ISSUES: Redirection of project goals and scope

III. ACCOMPLISHMENTS (February 9, 2015 – February 16, 2015):

Wednesday, March 4, 2015

- WFYI Station Visit & Tour
- Social Media Landscape Survey Presentation

IV. ACTION ITEMS FOR FOLLOWING WEEK (March 16, 2015 – March 23, 2015):

- Set up meeting to discuss redirection of project goals and scope – possible date (Wednesday, March 18)
- Create new project timeline

WEEKLY STATUS REPORT (WSR)

[Monday, March 23, 2015]

TO: [Panos Linos, Chris Bowman]

FROM: [Ashley Zegiestowsky]

SUBJECT: Status report for week [March 16, 2015 – March 23, 2015]

I. RED FLAGS: NA

II. ISSUES: NA

III. ACCOMPLISHMENTS (March 16, 2015 – March 23, 2015):

Wednesday, March 18, 2015

- Meeting w/ Chris to redefine project scope and goals
- Established weekly meeting and project deliverable for 03/25

Wednesday, March 18, 2015

- Research starting points for twitter API

IV. ACTION ITEMS FOR FOLLOWING WEEK (March 23, 2015 – March 30, 2015):

- Build prototype using Visual Studio to login to twitter and display most recent tweets
- Continue researching twitter API and visual studio examples

WEEKLY STATUS REPORT (WSR)

[Monday, March 30, 2015]

TO: [Panos Linos, Chris Bowman]

FROM: [Ashley Zegiestowsky]

SUBJECT: Status report for week [March 23, 2015 – March 30, 2015]

I. RED FLAGS:

- Do not have Windows 8.1 to run/use LINQ to Twitter

II. ISSUES:

- Trouble piecing together code into a functional prototype
- Unsure whether I need to create a dev account through Twitter

III. ACCOMPLISHMENTS (March 23, 2015 – March 30, 2015):

Wednesday, March 25, 2015

- Rescheduled meeting for Monday, March 30th
- Researched the links recommended by Chris (see Twitter Documentation Website on EPICS site)

Friday, March 27, 2015

- Found example code of possible implementation for basic prototype interacting with Twitter via ASP.NET using visual studio

IV. ACTION ITEMS FOR FOLLOWING WEEK (March 30, 2015 – April, 6, 2015):

- Continue build prototype using Visual Studio to login to twitter and display most recent tweets (possibly adding a search functionality)
- Continue researching twitter API and visual studio examples

WEEKLY STATUS REPORT (WSR)

[Monday, April 6, 2015]

TO: [Panos Linos, Chris Bowman]

FROM: [Ashley Zegiestowsky]

SUBJECT: Status report for week [March 30, 2015 – April 6, 2015]

I. RED FLAGS:

- Do not have Windows 8.1 to run/use LINQ to Twitter

II. ISSUES:

- Trouble piecing together code into a functional prototype
- Unsure whether I need to create a dev account through Twitter

III. ACCOMPLISHMENTS (March 30, 2015 – April 6, 2015):

Wednesday, April 1, 2015

- Downloaded linqtotwitter and nuget package
- Installed and explored package in visual studio

Friday, April 3, 2015

- Conducted more in depth research into the linqtotwitter documentation

IV. ACTION ITEMS FOR FOLLOWING WEEK (April 6, 2015 – April, 13, 2015):

- Continue build prototype using Visual Studio to login to twitter and display most recent tweets (possibly adding a search functionality)
- Continue researching twitter API and visual studio examples

WEEKLY STATUS REPORT (WSR)

[Monday, April 13, 2015]

TO: [Panos Linos, Chris Bowman]
FROM: [Ashley Zegiestowsky]
SUBJECT: Status report for week [April 6, 2015 – April 13, 2015]

I. RED FLAGS: NA

II. ISSUES:

- Trouble piecing together code into a functional prototype
- Difficulty creating a dev twitter account/ twitter app
- Difficulty debugging example code
 - TwitterContext()
 - search.Results()

III. ACCOMPLISHMENTS (April 6, 2015 – April 13, 2015):

Wednesday, April 1, 2015

- Continued search for online tutorials using visual studio and linqtotwitter
 - Examples posted on EPICS site (Video Tutorial)
 - Attempted to implement and adapt example code

Monday, April 6, 2015

- Continued debugging of tutorial code
 - Stuck on several error responses (unsure how to fix)

IV. ACTION ITEMS FOR FOLLOWING WEEK (April 13, 2015 – April 20, 2015):

- Continue build prototype using Visual Studio to login to twitter and display most recent tweets (possibly adding a search functionality)
- Continue researching twitter API and visual studio examples
- Set up successful app.twitter application
- Begin preparing for Final Presentation

CHAPTER 6: FUTURE WORK

Continued Research:

Due to the ambitious and broad nature of this project, there is still an abundance of research that can be conducted within both the Twitter API documentation and the associated libraries in order to make API calls.

Also, it may be beneficial to research a different platform by which to build a prototype. Although there are C#.NET libraries for the Twitter API, there may be a different library that functions better and is easier to work with. One suggestion includes looking into Python as a platform and using the Tweepy library to access the Twitter API.

Additionally, Twitter is merely one component of WFYI's social media presence. There still needs to be research conducted regarding the Facebook API and the associated libraries. It may be beneficial to research the possible platforms that could be used to access the Facebook API and select one that may work for both the Twitter API and the Facebook API.

Prototype Implementation:

Given the time constraints of this project and the many re-directions and changing of scope throughout the semester, our team was not able to build a functional prototype for the proposed requirements. In this aspect, there is much work that needs to be done in regards to the overall design and implementation of this application. Some of the areas that need work include: the platform and libraries involved, the user interface design, a search functionality, and a post/send functionality. It may also be beneficial to consult with Nate Partenheimer when beginning to implement this project as he is well versed in OAuth, RESTful APIs, and Python. He may serve as an excellent resource on topics that students may not have much prior knowledge or experience with.

Additional Requirements:

It is also important to remember that the Facebook and Twitter "Hook" were merely one component of the original project idea. For example, the user query parser, query engine, and look-up back end were three other components outlined in the initial requirements that will eventually need to be researched and implemented in order to build a fully functional product.

BIBLIOGRAPHY

Social Media Related Sources:

<http://www.wfyi.org/>

<https://www.facebook.com/WFYI.Indianapolis>

<https://twitter.com/wfyi>

<http://www.wthr.com/>

<https://www.facebook.com/WTHR13>

<https://twitter.com/WTHRcom>

<http://www.convinceandconvert.com/social-media-tools/clearing-clouds-of-confusion-the-5-categories-of-social-media-software/>

<http://www.cision.com/us/>

<http://onlinelibrary.wiley.com/>

<http://www.viralheat.com>

<https://hootsuite.com>

Twitter API Related Sources:

<https://dev.twitter.com/overview/documentation>

<https://linqtotwitter.codeplex.com/>

<https://tweetinvi.codeplex.com/>

<https://apps.twitter.com/>

<http://www.codeguru.com/columns/vb/developing-a-simple-twitter-app-with-visual-basic-and-windows-8.1.html>

<http://www.codeproject.com/Articles/676313/Twitter-API-v-with-OAuth>

<http://www.codemag.com/Article/0903071>

https://www.youtube.com/watch?v=gmP5wG3_cxk

<https://appharbor.com/>

APPENDICES

Social Media Landscape Survey Presentation:

Introduction

- Purpose
- Initial Survey (Station 13)
- Research: Best Commercial Practices of Social Media Management Software (SMMS)
- Research: Open Source Software Options
- Recommendations
- Questions?

Introduction

- Purpose
- Initial Survey (Station 13)
- Research: Best Commercial Practices of Social Media Management Software (SMMS)
- Research: Open Source Software Options
- Recommendations
- Questions?

Purpose

Project Goal = automate select responses to user interactions with WFYI's social media presence (Facebook, Twitter, Website)

Survey's Purpose = observe & analyze other station's usage and user interaction of their own social media presence

Initial Survey: Guidelines

Platforms: Facebook, Twitter

Organizations: Local and/or National TV & Radio Stations

Data Collection:

- Number of Posts
- Types of Posts (Replies, Comments, Messages, Information, etc.)
- Content Types
- Social Media Presence

Description: Usage, Central Goals, Common Themes

Initial Survey: Station 13 (Facebook)

Facebook: Methods of User Interaction

- Post directly to the Page
- Comment on a Post or Picture
- Send a private message
- Tag WFYI in a post

*Show examples on facebook page: <https://www.facebook.com/WTHR13>

Initial Survey: Station 13 (Facebook)

Content Categories:

- Direct Questions or Requests
- Opinions
- Informational
- Other

Content Types: Text, Image, Video, Link, Shared Page

Initial Survey: Station 13 (Facebook)

Response to Users:

- Direct Questions/Requests - Answered by Station 13
- Direct Questions - Answered by other Users
- Direct Questions - Unanswered
- Informational Posts - Follow-up by Station 13

*Promptness of Response: between 10 minutes - 1 hour
(See Google Doc Examples)

Initial Survey: Station 13 (Twitter)

Twitter: Methods of Interaction

- Tweet to/at Station 13
- Retweet
- Reply to a Tweet

*Show examples on twitter page: <https://twitter.com/WTHRcom>

*More difficult to decipher interactions between the users and the station on Twitter versus Facebook

Initial Survey: Station 13

Comparison:

- Facebook = website-like
- Twitter = continuous feed

Other Questions:

- User Demographics
- Content available on Facebook & Twitter vs. Website
- Different platforms (desktop, tablet, smartphone)

Best Commercial Practices (SMMS)

SMMS = Social Media Management Software

- A scientific approach to tracking, measuring, and engaging with actionable social marketing data
- Provide analytics & reports
- Dependent upon needs of company

SMMS: 5 Categories

1. Listening
2. **Conversation/Engagement**
3. Marketing
4. Analytics
5. Influencer

Source: <http://www.convinceandconvert.com/social-media-tools/clearing-clouds-of-confusion-the-5-categories-of-social-media-software/>

Table: <https://docs.google.com/a/butler.edu/file/d/0B7HXU6OkffupNmFmQkU0dzZJSTQ/edit>

Viralheat: Commercial Social Engagement Software

What Viralheat Does: <http://www.viralheat.com>

- Listen
 - Monitor conversations across social media presence
 - Create smart streams
 - Identify trends
- Analyze
 - Convert data into action
 - Identify and grow your audience
 - Provide thorough measurements and metrics of data & content
- Content
 - Source relevant content
 - Manage workflow
 - Extends reach for optimal promotion

Viralheat: Commercial Social Engagement Software

Customers/Success Stories: <https://www.viralheat.com/success-stories/>

- Men's Warehouse
- Northwest University
- Mobisquad

Pricing (Lite Version): \$9.99/month to \$89.99/month

*For exact prices, most companies ask to be contacted directly

Pricing

Viralheat(lite): \$9.99/month to \$89.99/month

Other SMMS: \$50/month to \$400/month
(maybe more...)

*For exact prices, most companies ask to be contacted directly

Free Open Source SMMS

- Free Versions/ Free Software
 - Limited
 - Platform Specific (some, but not all)
 - Less extensive reporting features
 - “The Basics”

Hootsuite: Open Source SMMS

	Free	Pro	Enterprise
	Great for: Personal Use	— 30 day free trial — Great for: Businesses (from \$9.99/month)	Great for: Corporations, Organizations, Governments
	Current Plan	Upgrade to Pro	Learn More
Plans & Pricing			
Social Profiles ?	Up to 3	50 included, up to 100	Unlimited
Enhanced Analytics Reports ?	Basic	1 included, up to 10	Unlimited
Message Scheduling ?	Basic	Advanced	Advanced
Team Members ?	None	1 included, up to 9	Up to 500,000
App Integrations ?	Basic	Basic	Unlimited
RSS ?	Up to 2	Unlimited	Unlimited
Hootsuite University ?	Optional	Optional	✓

<https://hootsuite.com/plans>

Hootsuite: Open Source SMMS

Demo:

- Adding Social Networks
- Adding Streams
- Reports
- Posting/Publishing to multiple networks

<https://hootsuite.com>

Recommendations

- Buy a commercial software (viralheat)
- Use an open source software (hootsuite)
- Build your own interface (using Facebook & Twitter API's)

EPICS Final Presentation:

EPICS: WFYI SPRING 2015

Final Presentation

Introduction

- Team Information
- Brief Client Description
- Original Requirements
- Semester Accomplishments
- Future Recommendations
- Overall Experience

Team Information

- Team Lead: Ashley Zegiestowsky
- Client Contact: Chris Bowman
- Team “Advisor”: Panos Linos



Client Description



- Organization: *WFYI Public Media*
 - Indiana's largest PBS & NPR member station
 - On-air, online, and community based resources
 - Interactive Media and Social Media Presence
- Mission: *Going Beyond Programming*
 - Community Leader (education, health, public affairs, etc.)
 - Public forum to discuss important community issues
- Client Contact: *Chris Bowman*

Original Requirements

WFYI Program Schedule 'Bot'

WFYI would like to create a system to automatically respond to user inquiries about program air dates and times. The system will poll Twitter and Facebook for user posts matching a predefined pattern*. The system will get its program information from an internal WFYI program database. A Web based interface to access program schedule data will be implemented by WFYI to fit a specification designed in collaboration with the EPICS team(s).

I initially envision several components to this project:

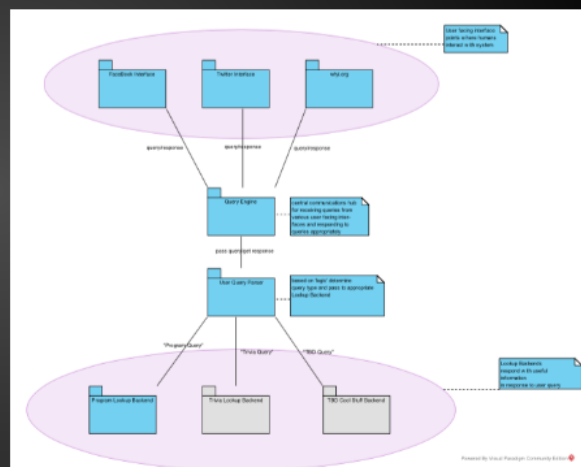
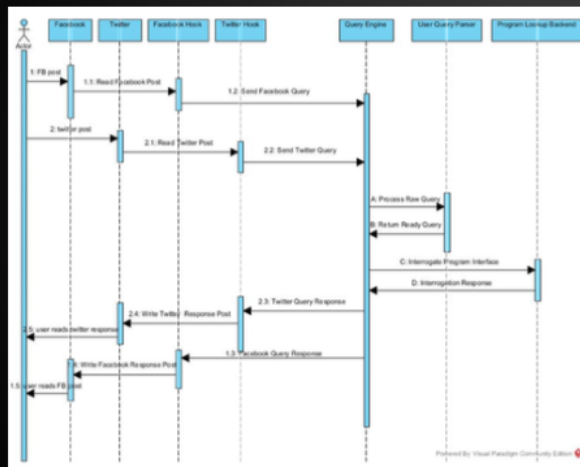
- 1) User Query Parser – parse a user's question pulling out likely program name token(s) and interrogate the Program Lookup Interface for results. WFYI would like to investigate the feasibility of trying to parse natural human language.
 - a. *Natural language parser:
 - i. Given a sample of question phrases parse out the program name(s) for sending to schedule interface to make a query.
 1. e.g. "When does Downton Abbey air next", "What time is No Limits on?"
 - ii. WFYI can provide many examples of questions.
 - b. *Script based/fixed format:
 - i. As an alternate: We may teach our users to use a specific format for phrasing questions.
 1. e.g. for twitter "#AskWFYIProgramBot <Program Name>"
 2. Not sure what to do on Facebook yet

***Project Goal** = automate select responses to user interactions with WFYI's social media presence (Facebook, Twitter, Website)

- 2) Query Engine – interface between the different user interface platforms (currently Twitter and Facebook) and send queries to the program look up back end.
 - a. Receive a raw user query from one of the platform 'hooks'.
 - b. Send the raw query to the User Query Parser to format the query into something the Program Lookup Backend understands.
 - c. Send the query to the Program Lookup Backend.
 - d. Respond to the hooks with the response from the lookup backend.
- 3) Program Lookup Backend – something WFYI will build to suite specifications defined by the design of the Query engine
 - a. Potentially a SOAP interface, or basic RESTFUL service.
- 4) Twitter Hook – listen for and respond to queries that come in on WFYI's twitter channel.
 - a. Read twitter posts with a given #hashtag (#AskWFYIProgramBot?)
 - b. Write a reply tweet with the query results
- 5) Facebook Hook – listen for and respond to Facebook posts that come into WFYI's Facebook page asking about program air dates/times
 - a. Maybe the questions will follow a specific pattern, or contain a key phrase, e.g. AskWFYIProgramBot

The technologies used to implement the components will need to run on Windows Server 2008 or Windows Server 2003. This design is also considered only a draft and WFYI encourages architectural input from the EPICS team.

Original Requirements (Diagrams)



Semester Accomplishments (12 Weeks)

1. Define Initial Project Scope (2 Weeks)
2. Social Media Landscape Survey (4 Weeks)
3. Re-evaluate Project Direction (2 Weeks)
4. Twitter API Research/Prototype (4-5 Weeks)

1. Define Initial Project Scope (2 Weeks)

- Scope: *Facebook & Twitter Hook*
- Research Twitter & Facebook API
 - Authenticate User
 - Read
 - Write
 - Use-Cases & Design (API calls needed)
- **ISSUES** (led to re-evaluation of project direction)
 - Too broad
 - Lack of tangible deliverables

2. Social Media Landscape Survey (4 Weeks)

Purpose

Project Goal = automate select responses to user interactions with WFYI's social media presence (Facebook, Twitter, Website)

Survey's Purpose = observe & analyze other station's usage and user interaction of their own social media presence

Stations Surveyed:

- WTHR 13 - Twitter, Facebook, Website
- WFYI - Twitter, Facebook, Website

Initial Survey: Guidelines

Platforms: Facebook, Twitter

Organizations: Local and/or National TV & Radio Stations

Data Collection:

- Number of Posts
- Types of Posts (Replies, Comments, Messages, Information, etc.)
- Content Types
- Social Media Presence

Description: Usage, Central Goals, Common Themes

Communication Dept. Contacts:

- Rose Campbell
- Jessica Moore

2. Social Media Landscape Survey (4 Weeks)

Research Results:

- Presentation of Social Media Data collection
- SMMS - Social Media Management Software
- Commercial Software (Paid Subscription)
- Open Source SMMS & Demo (Free - limited)*

**currently used by WFYI*

- Recommendations
- Outcome: Re-evaluation of project direction & scope

3. Re-evaluate Project Direction (2 Weeks)

- **Issue:**

- WFYI was already using a form of SMMS
- Project was straying away from technical component

- **New Project Scope/Direction:**

- Target specific type of user posts with content regarding technical problems (ex: audio not working)
- Automate process to send posts to Master Control
- Build prototype for interaction with Twitter API
- Research Approach: documentation, online tutorials, & forums

4. Twitter API Research/Prototype (4 Weeks)

Technologies & Documentation Explored:

- Twitter API Documentation
 - Overview
 - Libraries (to interact with Twitter API)
 - Linq2Twitter
 - Tweetinvi
 - OAuth (access Twitter API)
 - Twitter Dev Account & App Creation

4. Twitter API Research/Prototype (4 Weeks)

Technologies & Documentation Explored:

- Microsoft Visual Studio 2013
 - visual basic
 - c#
- AppHarbor (.NET Platform as a web service)*
- RavenDB (No SQL Database)*

**Outside of project scope*

Prototype status: **in progress**

Future Recommendations

Continued research and exploration of...

- Twitter API & Libraries
- Prototype Implementation (Visual Studio)
 - User Interface & Design
 - Search functionality
 - Post/send functionality
- Begin Facebook API research
- Revisit Original Requirements
 - User Query Parser
 - Look-up back end

Additional Contact:

Nate Partenheimer

- OAuth
- RESTful APIs
- Python

Overall Experience

Technical Lessons:

- Researching & working with many new technologies
- Sift through overwhelming amount of documentation
- Implementing prototype - fitting the pieces together

Non-technical lessons:

- Ambitious project, very broad required *perseverance*
- Rollercoaster of trial and error
- More *answers*, leads to more *questions*

Any Questions?

Thank you for your time!