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FINAL PROJECT DELIVERABLE

ABSTRACT

This paper discusses our huge effort of our team trying to cover our client's demands for the project that she offered us to work on. The final goal was to create a web app showing a map of historic NYC tax photographs that are connected with their associated address to the borough of Manhattan.

BACKGROUND AND SUMMARY

Our client's task primary was to create an SQL database that links historic NYC tax photographs to their associated address for the borough of Manhattan. Everybody had to take on some responsibilities regarding the contribution of this project. We shared tasks and everybody was given a job to do. Everybody has developed different technical skills, so we tried to get tasks that are more familiar and more relating to everybody's technical background. Rob Garfield, the most knowledgeable and experienced programmer in that field committed himself to create the SQL database. Lisa Hirschfield and I wanted to get involved more with SQL coding, in terms of learning SQL coding and trying to connect the database with various commands in order to be functional.

For me, the project was challenging because I wanted to dig more into Python and SQL code as my prior experience was limited. Being a UI/UX Designer, I had some experience in SQL files regarding the setup of various CMS platforms that I have experienced so far. Trying to connect a hosting server with a CMS platform, you need to have definitely basic SQL skills. So my background level for SQL environment was up to a certain level. Considering the fact that I have worked many times as part of a team, I was really convinced that I will get a lot of benefits from the effort we put in. Besides, it has been proved that good teamwork creates synergy, where the combined effect of the team is greater than the sum of individual efforts.

I chose to be in the group making a web app and an SQL Database with Rob Garfield and Liza Hirschfield and I was very happy about that. Quinn's Bolewicki project (our client) was very interested in all of us and we had the chance to communicate through Slack Platform with a very constructive way. We were all a bit hesitated at the beginning as we didn't know the demands of the client and also, if our programming knowledge would be efficient to cover such a demanded undertaking.

Luckily all of us were happy from that co-operation, as we managed to achieve success and satisfaction and inspire teammates to take the initiative to implement new ideas. We also learned to trust each other and to incrementally improve our team's confidence.

APPROACH AND STRATEGY

Our approach of our teamwork was to communicate effectively. In the beginning we started communicating in person during our class or after it. I just created a Slack account, so we all can register and try to make channels for every session we wanted to discuss. Rob Garfield uploaded his database which we used it develop our python coding.

In order to see the results of our progress we uploaded everything in a Git Hub account and we forked the data in our account separately. Through command line all the data was downloaded locally to the desktop cause it was easier to work.

All the team had decided to work in SQLite studio as we can better see the improvement of our tasks as we were coding. We made a channel in slack called MoSCoW methods, as we wanted to write everything down so our client can give us better feedback of what she was expecting from us. That feedback was divided by priorities: Must have, Should Have, Could Have and Would Like. The project must be delivered within a standard timeframe, as every one of us should work on his/her tasks. We agreed that we will reached the project up to a level, where the client is able to continue having all the knowledge of what the next steps would be.

In other words we promised Quinn Bolewicki that the project will be MVP(Minimum Viable Product).Using the MoSCow technique we thought that this would help us clarify at the beginning of the project and would ensure us successful outcomes. It helped us also to hierarchically prioritize the importance of the functions of the project. In the Must levels we included basic and essential factors as deadline, approval, strategy and evaluation of the project. As should we classify tasks that could be seriously considered but were not absolutely indispensable such as bug fixes, new functionalities, performance improvements etc. For the "nice to have" one, which in the Could-have initiatives, we discussed different methods that could have done but those will have much smaller impact on the outcome, if they are left out. Hence, we decided to document some of those to satisfy our client. On my side those would be to make a plan of a partial work flow design of the basic pages of the web app.

The truth is that in the beginning we were not familiar with the tasks that we should have executed .The project was advanced, so we should firstly define our milestones. None of us was a project manager to write down some of the basic principles but all of us were familiar with the steps involved in building a SQLdatabase and creating a basic application. Nevertheless we did have some of the project milestone best practices. In order to proceed with our tasks we gave each other a weekly duration to achieve our goal and review intuitively about a clear sequence or an approval of the task that built up until our home/project is complete.

Every one of us ended up being a project manager of this plan as all of us spent a part of our time reviewing lists of project milestones and measuring the team's progress. Rob Garfield was certainly the most experienced student of the team in programming, so after he build the SQLdatabase himself he led us to get responsibilities about the functionality of the database. But in terms of our communication milestone information and also the track and manage milestones throughout the project I think all of the members had their own responsibility.

PROJECT IN DEPTH

As mentioned before, the final goal was to create an SQL database which will technically be converted into a web app, where you can see images and info of the historic buildings of NYC.

Firstly, our client Quinn Bolewicki gave us a metadata schema with all the metadata categories like location, photo ids, year of the photo, borough, block number etc. Lisa Hirschfield took the task to clean up the list from various useless elements and shorting this out by filtering only the columns the client wants to keep.

We set up a secure online repository in Github account that will be used for archiving and sharing the list and also the database. This was accessible by all members of the team so we could push/pull/commit all the changes that will be taking place during the progress of the development.

What was discussed later, after we create a functional sqldatabase, was the possibility to create an interface tool to serve up the images and the data. There were different models that have been tabled. Platforms like Omeka, Scalar, Neatline, WordPress, Carto, Leaflet, Mapart were some of our ideas. I was familiar with most of them, so I was flexible to agree on any of those. Lisa Hirschfield and Quinn Bolewicki liked the idea of Omeka, as it's an open source program and is also technically familiar for them as well. Lisa Hirschfield found some tutorials on how

to install an SQL Database with Omeka, which all of us studied and learned how to run.

After some of our google hangouts we had Rob Garfield, Lisa Hirschfield and I talking about different options for the final product. We ended up with the option of making something without an CMS platform rather than focus on how to dig more in Python and SQL coding, learning functions that could be useful for the projects, for the client and also for ourselves.

I started making a code of how to simply entry form that returns a photo .My first questions began keeping me busy: This might require the user to enter the address exactly as it exists in the database, or it may be possible to configure the interface so that a drop-down menu appears that displays all addresses in the vicinity of the one entered.

One of my other technical challenges was to display a photo in a database within a Python application. For that reason Lisa Hirschfield made a very interesting research and she found various related online recourses and also tutorials in creating a very basic search/ display GUI for our app. The one that I found useful for was how can I retrieve images in Python and also how to return database images with Flask.

By experimenting my knowledge into SQL and Python coding, I dug more into the project functions, so we could have tested it in an online platform to see if our results have succeed. So we decided to use SQLite Studio. Then I had to look up and learn the basics of the sqlite4 library. As I compared some given examples with our implementation, I noticed that I used the function "fetchone" which retrieves a single entry. At the same time I tried to iterate over all found matches via for loop.

But then the question came up of what happens if there are multiple matches to be retrieved. For that reason I replaced the used function "fetchone" with the function "fetchall()" to get a list of all matching rows. Then I started investigating the database in order to comprehend, if multiple matches are even a possibility. As a result I uploaded our created database file to https://sqliteonline.com/ which enabled me to navigate manually through our database and to execute SQL statements. During my first efforts I experienced some bottlenecks, as my implementation executed the SQL statement in a wrong database table. Afterwards I managed to fix it by changing the statement to fit. I also remarked that trying to retrieve the entry row from the database the image name information was only single entry in a row. Therefore I changed my implemented SQL statement in that regard as well .Luckily trying different SQL statements in the provided web-UI, I was able to find a good example for the implementation.

After retrieving the image name information I tried to open the image, as Lisa Hirschfield had given in Github repo. In this case I realized that I had to manipulate the image name in order to remove prefixes like "(," and suffixes like ")". So I used some library functions to remove them from the image name. Accordingly I should find a relative path in my file system in order to access the chosen images. Furthermore, since the images were distributed in different folders, I had to retrieve the folder name as well. Since the folder name was part of the image name, I was able to use the string manipulation libraries to extract the folder name. Finally I created a string containing the relative path to the chosen image based on the folder structure which I shared in our Github repo.

One of my future goals will be to enter the exact street name and a map based on user interface could interact with the user via pop-up menus by clicking the point makers. Based on the clicked position the SQL statement would be executed with the right address name. The retrieved image files and also the whole set of metadata would then be provided back to the web UI as to enrich the User Experience Design.

Taking into account all the mentioned above, I can certainly assure that there were a lot of times that I needed to reverse my decision or should move backwards to go forward, but I resolved all my issues easier and achieved my goal successfully. Furthermore, switchbacks was a way for me to get more confidence on my own, as I really felt more confident about completing all those parts of that project.

RESEARCH AND EVALUATION

From the research I had during some of the references I read, I ended up focusing on some of the most interested developments that some experts have done so far and I believe those could be ideal for our project to get improved.

First and most important thing to improve our methods in our project is to manage our time better. All of us we have the same amount of time to work with every day. Time management and strategic organization are key habits for making the most of each day's potential. Time –optimizing methods come in as many variations as the people who use time. So, which organization and management techniques are the best?

The milestones practice would resolve many our pen dings or unfulfilled tasks of the project. As I referred above, a project milestone is a task that shows an

important achievement in a project. Milestones should represent a clear sequence of events that incrementally build up until the project is complete. They should be concrete, specific, measurable events (Frederick Books, 1995: 222)."The first step in controlling a big project on a tight schedule is to have a schedule, made upon milestones and dates for them" (Frederick Books, 1995: 222).Setting milestones are useful for communication and reporting because they represent the minimum points of control in the plan. If milestones are easy to use, they can be a really useful project management tool for scheduling and reports as said. There are different types of milestones often used during a project. Of course it is not always necessary that every deadline met or task completed will represent a milestone. Some examples of milestones could be the high-priority tasks or decision crucial to the completion of the project. If I have to research example the ethical and legal considerations involved for the project that could be done only by scheduling milestones.

Another example would be my goal to obtain sketches and images for the project, design or advertising some campaigns. This could be shown through checkpoints or percentages of completion. Furthermore, deliverables that meet deadlines can also be milestones(Jessica Kayes, Software Social Engineering, 2012,Chapter 7) . Designing a software or even an actual web app like that one that we managed to create so far, we need deliverables. Therefore we can measure the progress of the project, when the deliverable is completed (Frederick Books, 1995: 115,221).

Being a User Experience Designer I was convinced that prototyping is without doubt an integral part of design thinking. It allows you to test ideas quickly and improve them in an equally timely fashion. After we finalized the SQL database and its functions we should refine first all the requirements and start prototyping rapidly a web app as our client requested. The next step was to establish all the technical requirements to interface the requirement of the product. We should start planning the software activity and for that reason to allow for an extensive iteration between the client and the designer as part of the system definition (Frederick Books, 1995: 181).Good design practices can be taught and the great designs come from great designers. Software construction is a creative process. "A little retrospection shows that although many fine, useful software systems have been designed and built by multipart projects, those software systems that have excited passionate fans are those that are the products of one or a few designing minds, great designers". (Frederick Books, 1995: 182-183).

Prototyping can specify precisely and correctly the exact requirements of a project. "You can perform all the main functions and tasks of the application but make to attempt to handle the exceptions, respond correctly to invalid inputs, abort cleanly etc. The main purpose of the prototype is to make real the conceptual structure

specified, so that the client can test it for consistency and usability" (Frederick Books, 1995: 181-195).Many times, we tend to invest in exciting new ideas, brainstorming and planning for our implementation- until we realize, after launching, that our design doesn't have any kind of affinity with the users. Sometimes the assumptions we based our solutions on can lead to waste of time. Prototyping helps prevent this cause is the best way to test out assumptions, learn about the users and improve on our ideas.

After I developed my code I realize how important would be to detect of finding bugs of the code or syntax errors, what the bug fault was, where it has occurred, how it was caused etc. I think it is vital for a programmer to use debugging methods and practices in order to test the program to find whether the program functions and produces output as wished. Basically the approach is to design bug free programs .To do that, you have to think about the control structures as control structures and not as individual branch statements (Frederick Books, 1995: 139-141). Individuals involved in debugging process should understand all the causes of an error before starting with debugging. During debugging process errors are encountered of a range from less damaging (it could be an incorrect function) to a huge error (like system failure).As debugging is a difficult and time-consuming task, it is vital for us to develop a proper debugging strategy that would help in performing the process of debugging easily. The commonly-used debugging strategies are debugging by brute force, induction strategy, deduction strategy, backtracking strategy, and debugging by testing (Martin Sjoelund : 2015, 41). The most commonly used is brute force method and it used when all the others methods fail. The program is loaded with the output statements that produces a big amount of information which it analyzes and helps to identify the errors caused. It is also interesting to mention that the induction strategy as to perform this strategy, a series of steps has to be followed first as locating relevant data by identifying the incorrected functions that executed, organizing data, devising and providing hypothesis with all the possible cause of errors.(Martin Sjoelund : 2015, 41,42,43)

In terms of creating productive projects using data and code, I realized how important is to work with a powerful content management system .Digging deeper to get more knowledge what CMS actually do I noticed that its offer is multiple. Content can be delivered to the software developer in a variety of ways. Robots, search, push, browsing and portal, website or an app. All these are methodologies that require some type of content management (Jessica Kayes, Software Social Engineering: 2012,Chapter 6) ".A CMS usually focuses on intranet- or Internet-

based corporate content including data and knowledge bases. It also could expand to extranet or public web-based social networking sites" management (Jessica Kayes, Software Social Engineering: 2012: Chapter 6).

The digital content life cycle consists of six primary activities create publish, update, translate, archive and retire. It's a collaborative process by design and necessity and has some basic roles: creates and edits content, releases content for consumption, tunes and stylize content and manages release of content placing into a repository so than can be found and utilized (Jessica Kayes, Software Social Engineering :2012,chapter 6).The wiki is a popular example .Actually it's a web application that allows users to manage content, as on an Internet forum, but also allows anyone to handle the content.

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