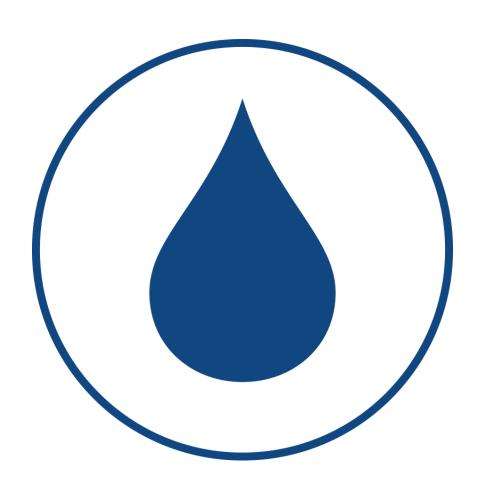# CityPay

Alcoholic Salamanders

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Problem Description/Solution Ideas

Paying bills online is commonplace for most people these days, however, Flint and other Michigan cities have had poorly functioning and degraded websites in which residences have had to use in order to recompense their housing statements. Paying bills should be quick and simple so everyone can participate and not have to worry about late payments which are concerns that many house owners can attest to. While addressing these concerns, the creation of an intuitive, modern, and effortless online and mobile service that everyone can use to simplify their billing process is the primary reasoning behind this application.

Related work/Background

This study examines the role that anxiety and social influence has on the benefits of mobile payment services. It reports that although there has been an increase in the offering and adoption of mobile payment services, there has been a slow adoption of them. This study proposes a research model that is grounded in mental theory and "investigates the intention of adopting mobile payment services by emphasizing the role of multiple benefits." Over 350 responses have been collected using an online survey. Overall, attitudes positively influence the intention to adopt mobile payment services. The findings have informed mobile payment services providers about the importance of benefits and social influence has in mobile payment services. (Park, Ahn, Thavisay, 2018)

This article discusses how consumers find and use apps. Users download apps every day but not every application is used, is never used, or is often deleted even though they are now an integral part of user's mobile experiences and uses with people "spending an average of 30 hours per month on them", according to Nielsen. To find out how consumers are using apps, Google conducted research with Ipsos by surveying 8,500 people with smartphones. The researchers uncovered new insights about consumer drive relating to installation and engagement with apps. "Search is a major source for app discovery", and according to the research one in four apps are discovered through a search engine. This is especially prevalent with local apps; "26% (local), 59% (tech), and 30% (travel)". It further divulges the best way for an application to be noticed such as in marketing. It also expresses the need for an application to clearly express what it is designed to do and to be able to do it well. (Tiongson, thinkwithgoogle, 2015)

This article highlights the development of small mobile phone applications, along with comparing on-phone to off-phone developments of said apps, and the creation of a new application development model called TouchDevelop. Programming mobile phone applications used to be niche but recently there has been a wide adoption of mobile devices, especially smartphones, with application-centric uses such as the app store and app distribution model, which has elevated support for mobile application development and programming to commonality. To support application development, major mobile app platforms have been created for the ease of programmers and users. Usually, programmers have to download the development platforms on their computers to be able to program applications, but with TouchDevelop, programmers are able to create new apps directly on their phone. This platform has made mobile applications easier to produce and develop (Nguyen, Rumee, Csallner, Computer Science and Engineering Department University of Texas at Arlington, 2011).

This study aims to divulge the security, threats, and challenges of creating, maintaining, and protecting mobile payment applications. Mobile payment systems can be divided into five

categories: "mobile payment at the POS, mobile payment as the POS, mobile payment platform, independent mobile payment system, and direct carrier billing." Although mobile payment has gained popularity due to convenience, it also faces many threats. The study presents a mobile processing model and introduces each of the five category types. The study then summarizes the desired security and security mechanisms that are currently in place for each system. Furthermore, it discusses the three security threats, vulnerabilities, and challenges in mobile payment systems. (Wang, Christen Hahn, Kruttika Sutrave, MobiSecServ, 2016)

This study describes how FinTech is accelerating customer-driven innovation in the financial service realm. Its firms across the globe are using new technologies and new business models to create better payment solutions with customer needs. Broad global trends around connected devices and mobility, as well as shifting demographics, expectations, and security concerns has caused an accelerated transformation in how users pay for services. The paper addresses how the financial landscape is impacted by global shifts in end-to-end commerce focus, advances in machine learning, advances in customization, and technological transformations in connectivity and security. The future of payments is in mobile development due to the increase in smartphone usage which has enabled real-time access to search, shopping, and services anytime, anywhere. (Weichert, *Journal of Payments Strategy & Systems,* 2017)

This study focuses on the distribution of dwell time on web pages to determine user browsing behavior. The researchers used the Weibull distribution, a mathematical function that provides time-to-failure data, to plot the probability of users leaving a web page after a certain period of time. According to the article, the number of users who leave a web page decreases over time. At the early stage of browsing a web page, users will "screen" - skim through - the web page to see if it is useful before deciding to stay. During the screening, the abandonment rate is extremely high, however, after the screening is done, the abandonment rate decreases. This is especially true for web pages that are not meant for entertainment. The time users stay on a web page varies significantly since there are many factors to visiting a web page e.g. time of day, the user's mood or the user's reason for visiting the web page, etc. so it is best not to rely solely on this model when making changes. However, it does give us a pretty good idea of user browsing behavior. We will use these findings as a guide for design. We learned that it is important to be clear about what a web page is trying to accomplish and have a better understanding as to why the current web page that is used to pay for water bills is failing. (Liu, White, & Dumais, 2010)

Methodology

In order to collect data for our application, we want to gather information by giving surveys in person and online to Flint residents. The questions will be finding out what they like about the current website and new possible designs for our application. We will take into account that people are bad at telling us what they want or need and instead use the surveys to tell us what they're good at. These questions will include app features that we will have predesigned in order to allow people to choose ones that they would like included in the application. For the surveys given in person, we will also observe how users interact with the different navigation buttons and how long it takes for users to navigate the system.

While designing our application, we will keep the answers to the survey in mind to not only design the best possible interface, but to also give Flint residents what they want. Even though we are only planning to target Flint residents for this project and application, we still plan on reaching a wide range of people in these surveys, including students, adults, the elderly, anyone who wants a more simple way of paying their utilities.

To analyze the data, we will look at answers and feedback from both the online and in-person surveys and compare the answers to how people interact with the survey and the time it takes to use them. While examining users, we will keep in mind who the user is and how much computer experience they may or may not have. Keeping all of this in mind will allow us to develop an application that has the most functionality and user-friendly interface.

Deliverable

The use of smartphones and smartphone applications is something that is here to stay. Most people would likely agree that using a smartphone app is usually faster and easier than trying to use a website. That is why our application is trying to capitalize on mobile application popularity, by offering an application to help lessen the burden on Flint residents when trying to pay their utility bills. Our app will incorporate many things, such as viewing water and property tax bills, showing past bill history to ensure you're being charged correctly, and having the cities late policy clearly displayed, which should help residents in keeping their water from being shut off. The website allows automatic payments already, and we plan on integrating this feature in our app so that users will not have to worry about forgetting to pay their bills. Our users will have the ability to set up an account, one time, which will remember you info, your address, and payment information. Our goal is to combine all these features into one application to make the bill paying process easier, faster and less confusing for all Flint residents.

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