**Kiosk Application**

**Presented to**

**Bangor Hydro Electric Company**

Proposed by

**ASAP Media Services**

University of Maine

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**Introduction**

The Bangor Hydro Electric Company is an electricity transmission and delivery company serving 100,000 customers in central and eastern Maine. Bangor Hydro has shown commitment in numerous ways including enhancing infrastructure to improve energy delivery and exploring web–based tools to improve customer energy-awareness.

Currently, Bangor Hydro offers an array of information on their website targeted at an audience ranging from children to adults. The site promotes possible energy consumption solutions as well as links to information and games for children aimed at a basic level understanding of various forms of energy and how they affect the world around us.

Bangor Hydro has approached ASAP Media Services to design and prototype a portable kiosk focused on the delivery of information to aide the costumer in making well-informed decisions pertaining to energy consumption in relation to their heat pump initiative. In addition to the web-based application, the implementation of the mobile kiosk promises to give both Bangor Hydro and the costumer an advantage in understanding and making smart energy consumption-based decisions. The foundation of the idea is focused on the concept of presenting this information to an age range of high school students and up. The hope is that providing a fun, dynamic, engaging and aesthetically pleasing medium for delivering this type of information will promote strong understanding and interest into the type of economic and energy-based issues we are faced with in today’s society.

**Audience Analysis**

High School Students

Students with access to such a kiosk will be exposed to this information in such a way that they can understand and appreciate the results of implementing various energy solutions. Once students have been exposed to the kiosk, they would have an opportunity to do further research from home with a web-based application like the one proposed by Bangor Hydro. With this high level of understanding, students would be encouraged to spread their knowledge to their friends and relatives. Affording these students this sort of information allows for them to continue on into the work force or higher education with invaluable information and knowledge that may serve as a foundation in the pursuit of progression and innovation. It is important that BHE leads by example in these respects as they, with the help of ASAP, work in designing the proposed kiosk and web application. By providing a dynamic, engaging and interactive resource, such as the kiosk, we can present these students with critical information through an effective medium that promises to seize attention and embrace a fun, educational experience.

Homeowners

Homeowners are always on the look out for choices they can make that will improve their quality of life. Many times, these decisions are financially driven and revolve around saving money both in the long and short terms. However, the average homeowner does not have access to information that can help them make these decisions. With the help of the proposed kiosk and website applications, these homeowners would be able to determine the approximate costs associated with installing a heat pump in their home. They could then compare these short and long-term costs with their current method of heating to determine the best course of action. The very fact that BHE is taking the time and resources to develop these types of applications is a testament to the company’s commitment to the consumer. Taking the initiative to provide it’s costumers with as much tangible information as possible will be recognized by Bangor Hydro’s audience as efforts in doing right by the costumer as well as the environment; reinforcing the customer’s loyalty and appreciation of the proactive nature of the company.

Trade Show Attendees

Bangor Hydro has also expressed their desire to put this kiosk application on display at various trade shows they attend. Many people who attend these trade shows are closely connected to the alternative energy and heating markets. Among these are contractors and installers that provide heat pump services who may be unsure of the success of a business venture in Maine. Seeing the strong initiative of Bangor Hydro to promote heat pump technology would encourage more of these businesses to open up branches in Maine and create new partnerships as well as showcase Bangor Hydro’s competitive commitment to innovation and sustainable thinking.

**Solution**

ASAP proposes an educational multi-touch kiosk application that will educate users about heat pumps. There are many facets of heat pump technology that should be included in order for the application to accurately inform and mediate consumer decisions. To accommodate this need, this kiosk will showcase the history, science behind, installation, economics, and environmental impact of heat pumps. Each of these sections (described in more detail below) will be presented individually on the kiosk startup screen, allowing users to explore sections most relevant or interesting to them.

History

The recent explosion of public interest in green technologies brought heat pumps into the limelight as a “new” form of alternative heating. What many people do not realize is that heat pumps have been in existence for close to two hundred years (the first one being developed and built in 1855). The theories behind heat pumps stretch even farther back to the mid 1700’s when the idea of refrigeration was introduced and demonstrated. A History section would not only be an interesting read for many users, it would also reveal possible reasons why other methods of heating are more popular (for example, the appeal in the past of cheap oil), why it is becoming more popular today, and provide a framework for where the industry is headed.

Science

The science involved in heat pump technology is difficult to conceptualize for many people. Indeed, this confusing idea that pulling heat out of the ground can modify a building’s temperature may be one reason why heats pumps are not more widely accepted. Interestingly enough, heat pump technology is based on relatively simple physics concepts, which can be broken up and presented individually to aid in heat pump education. The Science section of the kiosk will present these parts in various, interactive activities, providing all audiences with a better understanding of heat pump technology.

Installation

Installation of a heat pump system is almost as foreign to consumers as the physics that make them work. Specific installation process’, such as a geothermal, are also incredibly daunting and are a major factor when a homeowner considers what type of heating system to implement. The Installation section of the kiosk will provide an overview of the process by which a heat pump is integrated into a building, presenting the major steps in simple terms with the aid of graphics. This section will be of most help to homeowners who will walk away with a better understanding and be able to see more clearly how the installation of a heat pump will affect their property.

Economics

Of course, the most influential factor of any major purchase is the cost. This is especially true for heat pumps which, when compared to other methods of heating, have a high initial cost. Unfortunately for heat pumps, seeing such a high price tag instantly intimidates many consumers and the idea of installing one is rejected before all of the facts are collected. Thus, the goal of the Economics section is to provide users with both short **and** long term heating system cost comparisons, including maintenance and return on investment figures. Again, this section will be most beneficial to homeowners as they will be able to compare the cost installing a heat pump to their current method of heating.

Environmental Impact

When compared to other methods of heating and cooling, such as gas and oil, it is clear that heat pump technology is a step above the competitors when it comes to green efficiency. “Going green”, as previously mentioned, has been a primary concern of homeowners’ nation-wide and has been defined as a matter of “national security” by some circles. The combination of these two facts illustrates the benefits of making environmental aspects of heat pumps accessible for consumers. Thus, the Environmental Impact section of the kiosk will provide this information, as well as information pertaining to “green” government initiatives including but not limited to rebates.

A web based application will also be developed that will allow homeowners to determine costs and benefits of installing a heat pump system in their home. Much like the kiosk application, the web app will ask homeowners for physical specifications of their home such as stories and insulation. Additionally, they will also be asked for the method of heating and cooling they currently use as well as how much they pay per month. Using this data, the web application will present a comparison of the two methods of heating using costs, energy efficiency, and carbon output.

The application for the kiosk will be built using HTML5. HTML5 can facilitate the multi-touch functionality necessary for this project. Additionally, building in HTML5 will allow ASAP to develop the web application with little modification. The use of HTML5 also opens doors for future development of mobile applications.

Finally, Bangor Hydro has stressed their desire for this kiosk to be portable so that it can be brought easily and conveniently from venue to venue. To facilitate this need, ASAP proposes a 40-inch multi-touch enabled flat-screen monitor that can be easily transported to various locations. This multi-touch monitor would connect to a computer running the kiosk application as well as a power source, components that are small and portable, allowing for fast setup and breakdown.

There are multiple options to consider when determining the housing of the kiosk. Pre-constructed kiosks are available with a price range of five to ten thousand dollars. Based upon the demonstrated specifications from Bangor Hydro, a custom designed housing apparatus would be ideal. This would also allow for more customized signage and other desired specifications.

The proposed sections of this project (along with individual production times) are listed below. The project is divided into three sections based on its two major components, the kiosk and web applications, as well as the Base System, which refers to aspects of the project that are essential for both applications.

**Base System**

* Initial heat pump research and content gathering (approx. 40 hours)
* Graphic Design (approx. 35 hours)
  + This includes basic interface elements for the applications and other graphics that will be shared between the two
* Programming framework for base systems (approx. 150 hours)
  + Integration and communication with Bangor Hydro’s current system

**Kiosk Application**

* A system where users can customize house attributes such as floors, insulation, heating method, etc. (approx. 100 hours)
* An interactive, multi-touch sequence where users can go through the installation process a heat pump (approx. 250 hours)\*
  + Sequencing- programming the flow of interaction (approx. 80 hours)
  + Multi-touch use and user interaction design (approx. 170 hours)
* A system that calculates costs of various home heating methods based on user-inputted home specifications and compares them (approx. 80 hours)

**Web Development**

* A system where homeowners can input data about their home and receive a heat pump installation cost estimate (short term and long term) (approx. 80 hours)
* A mouse controlled version of the kiosk application ported for web use

(approx. 100 hours)

**Cost Analysis and Development**

The proposed project, if all previously mentioned features are designed and implemented with visual styling, will take approximately 690 hours to complete. ASAP Media Services' hourly rate is $35. A breakdown reflecting the above estimate is as follows:

**Cost Analysis**

|  |  |  |
| --- | --- | --- |
| **Section** | **Hours x Rate** | **Total** |
| Base System | 225 hours x $35/hour | $7,875.00 |
| Kiosk Application | 470 hours x $35/hour | $16,450.00 |
| Web Development | 180 hours x $35/hour | $6,300.00 |
| **Total Cost** | **875 hours x $35/hour** | **$30,625.00** |

In the proposed strategy, ASAP will work with Bangor Hydro to establish a firm understanding of heat pump technology and the effects that attributes of buildings have on heating and cooling potency. Next, ASAP will design both the graphics and the frameworks associated with the base systems, including but not limited to the kiosk application. Finally, ASAP will develop multi-touch gestures necessary for the kiosk application as well as the input system associated with both the kiosk and web application, along with the tool that compares heating methods based on inputted home specifications. At the completion of each stage of prototyping a section, its status will be sent to Bangor Hydro for review and alteration. Additionally, ASAP and Bangor Hydro will meet bi-weekly for status updates to discuss progress.

**Conclusion**

ASAP Media Services will assist Bangor Hydro in effectively disseminating heat pump information to Bangor Hydro’s costumers through the development of this web application and mobile kiosk. As a web-based project, costumers will be able to easily access and interact with a model to determine whether or not to adopt heat pump technology. This capacity will increase costumer energy awareness and improve costumer-relations as well as promote a solid understanding of the information at hand to future customers. It will also encourage the use and promotion of the heat pump to those already working and established within the industry.

By working to empower consumers with the necessary tools to understand and explore energy information, Bangor Hydro has demonstrated its commitment to its costumer base in numerous ways including, but not limited to, anticipating the future of energy consumption. ASSAP Media Services shares Bangor Hydro’s forward-looking perspective regarding technology and is excited to partner with Bangor Hydro to assist with its goal of exploring and building the future of technology to both design and realize the world of tomorrow.

Sincerely,

ASAP Media Services

**Agreement**

Original graphical elements created by ASAP specifically for the application become property of Bangor Hydro once payment has been delivered. ASAP shall retain ownership rights of interactivity designs and reserves the right to reference and reuse source components (void of Bangor Hydro’s styling, data, or information otherwise) in future projects.

We hereby agree to these terms, conditions and scope of work between ASAP and Bangor Hydro concerning research and development of the web application and mobile kiosk.

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Bangor Hydro Date Mike Scott Date

ASAP Media Services