Sustainly

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Overview

Many organizations are expressing interest in becoming more environmentally friendly. One of the best ways to accomplish this is to use products that are beneficial to the environment and more energy efficient [1]. Unfortunately, green products aren’t always the cheapest option, so some organizations are having trouble balancing “environmental-friendliness” with their overarching goal of increasing profit margins. Large companies such as Unilever, IBM, and Frito-Lay have stated that they are interested in technologies that would help them go green [1]. Our proposed solution to this problem is a browser plugin that would assist companies in considering energy-efficiency and environmental-friendliness when making purchasing decisions. This plugin integrates extra information into Amazon product search results. Its unique features allow users to compare energy ratings among products, understand environmental benefits associated with a product, and visualize energy savings resulting from purchasing a product.

Refined Task Analysis

Sustainly will be a plugin primarily used by procurement specialists to make environmentally friendly purchases. Its purpose is to assist them in making informed choices as well as simplifying actions that they routinely perform such as searching for green products or product reviews. These tasks are a significant part of procurement specialists’ duties, and as such, making the tasks more efficient would be beneficial. Sustainly’s overarching usefulness comes in its ability to visualize data. These visualizations are difficult to create, there is a lack of existing technology to simplify such a process. If a customer wished to make a visualization by hand, they would be left no other option than to do the time consuming number crunching manually. However, due to the error-prone nature of manual calculations, these visualizations might end up incorrect, costing a company thousands of dollars in misplaced product purchases. Furthermore, due to time constraints a procurement specialist simply cannot spend time comparing products as thoroughly as they should. Sustainly shines with these realities in mind. It will simplify the monotonous tasks that individuals would have to perform in their workplace and help them complete their job in a more efficient manner.

An easy task for corporate purchasers to perform is using the internet to find a product and its associated reviews. Although customer reviews are not directly related to our goal of helping corporate users find environmentally friendly products, reading customer reviews is an integral part of the purchasing process for corporate buyers. Since the last iteration, we modified this task to include identifying useful reviews, and finding reviews when Amazon does not have any. We did this because we noticed our users did not see all reviews as being equally helpful, and they identified certain reviews as more useful as others. Therefore, we want to make looking at review compilations as easy as possible for our users. Our plug-in will consolidate reviews from other sites similar to the way Google Shopper does, and it will show the most useful reviews first. The main advantage is that it allows the reviews to be accessed while remaining on the Amazon product page. This streamlines the purchasing process for many of our potential users as they will be able to continue browsing Amazon without having to go to an external site to see additional reviews.

Finding a green product on Amazon or alternatives, is a medium difficulty task for users to perform. Amazon product results don’t provide concrete statistics about actual energy usage.
Even if a product is shown to be ENERGY STAR approved, users don’t know exactly what that means in terms of energy usage, and they also have no way of comparing one ENERGY STAR approved product to another. We decided to slightly modify the task by asking the user to find a green product on Amazon straight from the search results without going to any product pages. If a user has to hop from product to product to view energy efficiency information they will be frustrated. Our plugin aims to make this task possible by including a “Sustainly suggested product” as the number one search result for any category that we have data for. Users can be sure that Sustainly suggested products are ENERGY STAR approved and also more environmentally friendly or energy efficient than other ENERGY STAR approved alternatives. In addition to integrating a suggested product into the search result page, we will allow users to view much more detailed energy-efficiency information on product pages. From the product page toolbar, users will also be able to see related alternative products that might be more energy-efficient and environmentally friendly. We will do this by aggregating data from ENERGY STAR seamlessly so that the user doesn’t need to do any extra work to find the energy statistics of the products that he is searching for. These statistics will allow users to quantify exactly how energy efficient each product is.

A hard task for purchasers to accomplish is visualizing the energy savings of a product. We modified this task to include comparing two different products side-by-side because oftentimes individuals are able to narrow down their possible choices to a list of a few products, but they have difficulty deciding which product is best. A sheer amount of factors to consider makes it difficult to compare products in various categories. Beyond researching online and using manual calculations, users cannot easily visualize energy data in a graphical manner. Our plug-in will automate the process, allowing for painless retrieval and display of: quantitative energy-use details and graphs of energy costs over time. These displays can be used to compare a product to ENERGY STAR products, standard products or to another metric of the user’s choosing. Furthermore, this will allow consumers to see the benefits a product has in terms of overall energy efficiency as well as cost savings over its lifetime. In addition users can compare products side-by-side to determine which one has the cheapest lifetime operating costs. Ultimately, these details will allow users to make more informed purchasing decisions.

**Interface Changes**

Since the previous milestone, we iterated on our designs and came up with three unique interface designs. Our first design is a toolbar on the lower part of the screen that could be expanded to display environmental information to the users, as seen in Figures 5.1 and 5.2. It’s based on some designs from last project, but we have modified it to take up less screen space and display information in a less cluttered manner by using a tabular view. The toolbar tabs will change based on whether the user is looking at an Amazon product page or an Amazon search results page. Figure 5.1 shows the toolbar on a product page, and Figure 5.2 shows the toolbar in a search results page. Our second design is a full screen design that could pop up environmental information over the Amazon page, as seen in Figure 5.3. Our third design is a new design that we created which attempts to fully integrate environmental information into the Amazon product pages, as seen in Figure 5.4.
Fig 5.1 - Toolbar Product Page
User clicks to add this product into the "Analyzer" in the sidebar toolbar that allows for side-by-side product comparison.

Toolbar sort button clicks button to expand.

When Analyzer button clicked, [Graph View]

Expandable Toolbar

See more products in the analyzer.

Fig 5.2 - Toolbar Search Result
Fig 5.3 - Full Screen Design
Fig 5.4 - Integrated Design
Selected Interface Design

The interface design we’ve chosen was the toolbar design from Figures 5.1 and 5.2. We decided to use this one because it does not require a large amount of screen real estate to use, and is the most intuitive for beginners to use. This interface builds on Amazon and offers users a smooth transition and easy learning curve. After installation the user can verify Sustainly’s status by looking for the icon in the upper-right corner of the standard browser toolbar. The interface will show up on Amazon search results pages and on Amazon product pages.

On search results pages, the plugin will modify the on-page content to include additional information with individual product results such as whether or not the product is ENERGY STAR Certified and whether or not it is suggested by Sustainly. Additionally, it will add a button “Add to Analyzer” for each product which allows users to select products to add to the Sustainly “Analyzer”, which is a tool for seeing side-by-side product comparisons. The interface for the plugin appears at the bottom of the screen with a thin toolbar that expands when clicked. The upper image in Figure 5.2 shows what the interface looks like when the toolbar is not expanded, while the lower image in Figure 5.2 shows what it looks like when it is expanded. Even when expanded, the plugin’s interface will take up a minimal amount of screen real estate. The toolbar allows the user to modify Sustainly’s settings and to view the Sustainly Analyzer. The Analyzer can be used to view graphs comparing products by certain factors. Examples of possible factors are: operational costs over expected lifetime of the product, projected annual savings, and projected energy usage over time. In addition to a graph view, the Analyzer will provide a data view that shows just the side-by-side data for each product and allows for ranking by factors like energy usage per year and lifetime cost. Clicking on any individual product will redirect the user’s browser to the Amazon product page for that product.

On the product page, the Analyzer will have the same data about energy usage and cost over time as was on the search results page. By separating that data from the data Amazon provides, Sustainly makes it easy for users to recognize the information that is being added and for them to access that information. In addition to the Analyzer, the toolbar at the bottom of the screen will have the option of viewing product reviews, which will show aggregated reviews collected from various sites across the internet. These reviews can be helpful when Amazon does not have many reviews for a certain product. An example of the toolbar on a product page can be seen in Figure 5.1.
Scenarios

1. Reviews

Suppose Joe the laundromat owner wants to purchase some new washing machines for his business. He plans to search Amazon to find machines to purchase, but he wants to make sure that he is getting quality products. In order to do that, he wants to find a wide range of reviews about each washing machine that he is considering purchasing so that he can get feedback about which would be the best to buy. Joe knows that he will be able to see reviews of each machine that he finds on Amazon, but he also knows that some of the commercial grade washing machines on Amazon don’t have many reviews, so he will have to find some way to get reviews from other sites.

Without Sustainly, Joe would have to find washing machines that he was interested on Amazon, then copy the product name into Google and search for “[product name] reviews.” Then he would have to go from site to site to read different reviews about each machine. Luckily, Joe has Sustainly installed, so he is able to instantly view multiple reviews aggregated from many different sources without ever leaving Amazon. He simply goes to the page of the washer that he is interested in and clicks the “Reviews” button on the Sustainly toolbar at the bottom of the page. The toolbar expands to show reviews aggregated from other sites, and Joe is able to see detailed consumer ratings of each product even though Amazon itself didn’t have much info about them.
Joe decides to search Amazon for commercial washing machines.

Joe's Laundromat

I need some new washing machines.

I see an Amazon ad for commercial washer/dryer. I click on it.

Search Results:

1. Awesome Washer & Dryer

This washer looks awesome! I wonder what other people think of it.

Joe opens the Sustainability Review Tool

Awesome Washer
0 customer reviews

Sustainability: Energy, Efficiency, Recycling

I click on the sustainability tool.

Amazon.com

Awesome Washer
Avg. Rating: 4.5
545 Reviews

Rob from *****

This is the best ***** more

John from ✨✨✨✨✨
2. Finding Green Product

Joe recognizes some of the merits of energy efficient washing machines including that they use less water than traditional washing machines and that they use less energy. Joe wants to buy energy efficient washing machines for his laundromat because he cares about his laundromat’s impact on the environment and because he thinks energy efficient washers might be able to save him money over time. Not only that, but Joe is a shrewd businessman, and he knows that energy efficient washers will appeal to eco-conscious customers who want to minimize their own environmental impacts. By establishing his laundromat as a green business, Joe will be able to build a loyal customer-base of eco-conscious users.

Joe already knows that ENERGY STAR-certified appliances are specially recognized for being energy efficient, so he begins his search for washers at the ENERGY STAR site. Unfortunately, the site is hard to navigate, and it doesn’t provide any links for sites he can use to buy ENERGY STAR washers. Joe then navigates to Amazon, his favorite shopping site, to try to find washers. Joe searches Amazon for washing machines, and he gets a long list of machines as his result. Luckily for Joe, he has the Sustainly plugin installed. Sustainly adds useful information to his search results like whether each product is ENERGY STAR certified, which make it easier to see which products in his results are energy efficient. Additionally, Sustainly suggests products based on energy efficiency and overall environmental friendliness. Without the plugin, Joe would have a much more difficult time figuring out which washing machines are energy efficient. Now, Joe is able to save a number of washing machine options that meet his criteria.
Joe recognizes that going green might attract environmentally aware customers to his business and lower costs.

Joe decides to see if he can find energy-efficient products on Amazon with his new sustainability plugin.

Amazon can probably help me find energy-efficient washers.

Joe searches Amazon for washing machines.

Joe opens the product page and views more details.

Sustainably gives Joe energy information.

*click
3. Visualization

Now that Joe has found a few promising eco-friendly washing machines, he notices that each ranges in the amount that he would immediately pay and the electrical cost incurred per month of use. As any smart businessman would, he wants to make the most cost effective purchase. Unfortunately, Joe is no mathematical virtuoso, the scrambled numbers he needs on each product’s ENERGY STAR spreadsheet would overwhelm him and he would quickly give up in frustration.

Fortunately for Joe, he has Sustainly installed. The daunting task of finding the most cost effective washing machine is now accomplishable without any of the number crunching. Joe finds that all that he now has to do is click “Add to Sustainly Analyzer” on the Amazon product page of each of the washing machines he wants to compare. With each added product, Joe is able to see an intuitive graphical representation of the product’s energy use over time. Finally, Joe has the information he needs to make informed decision about potential products.
Suppose Joe has already found a few green products with good reviews. Now he wants to find which of them is the most cost-effective.

I sure love money!

Joe can't figure out how to calculate cost effectiveness on his own.

Numbers confuse me!

Joe decides to try using SustainHi! He goes through his product list and adds them each to the SustainHi Analyzer.

Joe is able to see a graph of cost/time after adding all the washers, Joe opens the "Analyzer" tab.

Joe decides to compare the washers based on Annual Energy Use.
Report

We incorporated various techniques to create our lo-fi prototype through Balsamiq, Photoshop, and iMovie. Following the storyboard, the sketches were first created on Balsamiq for each of the three tasks. For each task, we simulated an animation by creating iterations of each specific action. After the Balsamic prototypes were completed, screenshots of each were taken. These images were imported into Photoshop and a variety of background frames were fitted around them. After analyzing them, we were able to choose our favorite frame. Using these frames we then transitioned to creating the video.

First, we used an iPhone to film Benson at a computer. Using iMovie, we then combined the photoshop-modified frames and combined them with the video clips. We did voiceover narration within iMovie, adding any other sounds when applicable. Finally, everything was melded together by the insertion of proper transitions and the alteration of frame speeds.

Roles
Dylan Symington - Answer task analysis questions. Design all the new interfaces. Do medium task for storyboard. Provide voiceover recordings and iMovie editing.
Sawyer Symington - Complete new interfaces writeup. Do hard task for storyboard. Create voiceover recording script, voiceover recordings, and iMovie editing.
Benson Tran - Revise iteration of project. Change overview of tasks. Provide task analysis refinement. Sketch tasks on Balsamiq.

All - Combine interface ideas, revise writeup, edit sketches, and review recordings.

CITATION LIST