

Developing an Online Application that Puts the Users and the Utility First

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ABSTRACT

Engaging customers in energy-efficiency is a balancing act: how can a utility make the process simple for the customer while still collecting the crucial data needed to effectively manage rebates and assess savings? The key to this process lies in a simple, consistent, and streamlined application. For many programs, the application is a critical tool for both customers and trade allies and may be the primary avenue for interacting with the program. If confusing or difficult, the application may also become the primary barrier to increasing program participation.

In this paper, we examine the collaborative effort between Consumers Energy, DNV, and TRC to design and test a new online application tool. First, the paper will highlight the early efforts by Consumers Energy and DNV to design a “best-in-class” application for their trade allies and customers. In addition, it will describe how a three-pronged research approach – combining internal design expertise, guided usability sessions, and rapid customer feedback – was used to refine the product during a soft launch period. Finally, the paper will present key lessons learned from the user experience research, including keys to success and potential design challenges.

Introduction

The energy industry has been undergoing several transformations - shifting away from lighting savings, transitions to new forms of generation, and stronger commitments to climate change initiatives (Wei, Sanborn, and Slaughter 2019). At the same time, the rapid innovation in digital technologies is disrupting both utility offerings and customer services, and customers expect more from businesses that serve them to meet expectations lead by the gig economy (Justus et al. 2020). Utility programs have often been slow to adapt to changing customer expectations and modernized digital resources, and this hesitancy may inhibit program growth.

In response to these shifts in the industry, Consumers Energy set out to create a modernized online application for its business energy efficiency programs in 2020. Prior to 2020, the utility only had a fillable PDF application that trade allies, contractors, or customers could fill out online or print out and fill out by hand. For many users, this process was cumbersome and did not allow for easy submission and tracking of program applications. With the development of an online application the utility sought to improve customer experience, but also saw several internal efficiency advantages: increased the efficiency of program implementation, reduced the costs of program implementation, and increased the efficiency and quality of data collection.

The decision to move to an online application was grounded in several past evaluations, which showed that trade allies and customers alike were looking for new, streamlined tools to make their participation easier. Consumers Energy knew that the application was the most critical digital resource to invest in; every project interacts with the application, and if it is difficult to complete, it can be one of the largest barriers to participation. Consumers Energy also wanted to make sure the launch of the application was smooth, and that they did not have to wait for feedback from frustrated customers or trade allies to find any potential pain points. To ensure success of the online application, Consumers Energy engaged TRC throughout the application design process with a multi-phase research approach.

This paper describes the multi-phase, collaborative effort to design an effective program application that collected all necessary program information in a streamlined, effective format. The paper starts with a description of past research findings that informed the design and development of the online application and the research approach. Next, the paper describes TRC's multi-phase research effort: (1) an early design review to ensure that the program was designed for success, (2) user testing of the soft-launched application to provide early user feedback, and (3) follow-up user surveys and marketing reviews to support a successful product launch. Finally, this paper concludes with key successes and common design challenges learned from the development and evaluation of this online application.

Research Design

Building Upon Past Research

TRC has been working with Consumers Energy on energy-efficiency program evaluation since 2009, when the non-residential programs first launched. These evaluations have included several digital products, including an online marketplace for customers, digital energy reports, and a small business customer portal.

From these digital program evaluations, TRC has learned that utility digital products must compete with other digital resources that customers might interact with in their day-to-day routine. Often, utilities look to benchmark themselves against their peers within the industry, examining similar offerings from other energy providers. However, it is unlikely that utility customers are comparing two different utilities' digital offerings. Instead, utilities must compete with other websites or digital products that customers interact with every day. For example, a customer looking to purchase a product from a utility's digital marketplace might compare their experience to purchasing a product from a popular online retailer. Thus, utilities must broaden their thinking about who their competitors are, and what research tools can help them assess their performance.

When evaluating the online application for Consumers Energy, TRC recognized that experience needed to compete not only with other utility applications, but with other digital experiences more broadly. For this reason, the research team did not simply compare the online application to other applications provided by utility peers. Instead, the research team drew on expertise in user experience research to evaluate the usability of the online application as a stand-alone experience.

The research was designed in three phases, as shown in Figure 1 below.



Figure 1. Online Application Research Timeline

Phase 1: Design Reviews

Consumers Energy and DNV began the development of the online application tool early in 2020. By summer, the online application was ready for early testing. To begin the research process, TRC conducted an initial **design review** to identify necessary changes or design issues with the online application. This review encompasses a review of a product based on usability heuristics, as well as internal design expertise (Harley 2018).

To conduct this design review, the research team submitted multiple “dummy” applications with fake information to see the application process firsthand. This effort allowed the research team to mimic the experience of submitting an application through the online tool, and identify any areas where steps were confusing. Following these submissions, the research team conducted an initial rapid design review of the online application and the traditional Consumers Energy application. This review allowed the research team to gain familiarity with the online application and informed the development of the usability testing tasks and survey guide.

TRC chose to start the evaluation process with a design review for a few reasons. First, developers of a product typically prefer to do several rounds of internal testing prior to collecting user feedback so that the product that users test already has design best practices integrated into the product and is closer to the final version. Second, while user testing is an extremely valuable and necessary component of product development, users often do not comment on more minute details of a product, such as sentence structure, formatting, and visual design. While these details may sound more trivial, they all effect a users’ experience with the product and ability to successfully complete tasks (Evergreen 2017).

Lastly, design reviews are a more cost-effective approach to testing multiple prototypes of product. User experience testing is an in-depth, qualitative effort that is driven by the user’s choices; therefore, it can be difficult to examine all prototypes of a product through user testing. Design reviews allow evaluators to move back and forth through a product to examine all potential stumbling blocks, and they are well-suited for early reviews of a product. However, it is important to pair design reviews with user testing whenever possible, as expert reviewers may not use the product in the same way as its intended users.

Phase 2: Early User Testing

By fall 2020, the program application was ready to be tested with users. TRC conducted independent **user experience (UX) testing** to ensure a simple, consistent, streamlined

application. UX testing is defined as testing that examines “user’s perceptions and responses that result from the use and/or anticipated use of a system, product or service” (International Organization for Standardization 2018). In other words, UX testing looks to understand customers’ experience with and perceptions of a tool *as they are experiencing it*, instead of asking customers to recall their experience *after the fact* (Justus et al. 2020).

Typically, UX testing asks target users to walk through a number of tasks as they talk through their experiences out loud. Evaluators observe users’ behavior as they attempt to complete the task to identify opportunities for improvement and characterize a user’s experience with the product. For the online application, this research involved asking trade allies (the primary users of the application) to complete several tasks associated with submitting a project via the new online application. The tests also looked to examine any preferences users had that were not met by the current design. The research team then provided detailed findings on each section of the application, including screen recordings that showed users attempting to complete tasks.

TRC chose UX testing at this stage based on its ability to provide detailed, user-centric feedback on the application tool. While peer research can help benchmark features of the application against other utilities or sites, it cannot determine whether those features add value for the users. The goal of developing the online application was to make a tool that was simple and easy to use; UX testing is designed explicitly to examine that ease of use. This research method is common within software and web development companies, as they require ease of use to achieve success in the market (Nielsen 2017; Barnum 2011). As utilities develop more digital tools to support customers, UX testing can be a valuable resource for ensuring those tools meet customer expectations.

Phase 3: Online Survey and Marketing Review

Lastly, TRC conducted an online survey and a marketing review of the newly launched online application from late 2020 to early 2021. The original research plan was to conduct an online survey with users as the application launched so that the evaluation team could collect additional, quantitative feedback to supplement the qualitative UX testing research. The survey was designed to collect feedback on a rolling basis as applications were completed so that DNV could make changes as the product launched. Each week, the research team would receive a list of trade allies who had completed applications through the online portal, and would then send those trade allies a link to the survey.

However, the research team found that the online application was initially used by a smaller portion of trade allies, so the evaluation team was not able to get as many completes as initially planned. This research was designed to be completed right after the product launched, so user uptake was still increasing as more trade allies became aware of the tool and finished up applications they had already started using older resources. While applications continued to be completed via the online application tool, many were from repeat users; this suggested high satisfaction among those who used the online tool, but potentially room for increasing the awareness of the tool.

Based on these findings and discussions with Consumers Energy, TRC pivoted this research to do a rapid review of marketing efforts for the online application. This review was designed to evaluate current methods for advertising the online application to trade allies and identify any improvements that could help to increase uptake of the online application.

Key Success Factors

Throughout the research process, the research team consistently found that Consumers Energy’s new online application was easy to use and aligned with best practices in user experience design. This section explores the key factors that lead to the success of the online application, both in terms of design and evaluation decisions.

Clean Visual Design that Aligns with Expectations

During the design review, TRC found that the application aligned with best practices in visual design *and* aligned with user expectations. When users come to a website, they bring expectations around how they expect the experience to be structured. In user experience, this is referred to as a user’s “mental model”, and it is important to align a digital product with a user’s mental model to make it easy to use (Nielsen 2010).

The online application used site structure, features, and coloring to help align with users’ mental models. The homepage of the application featured three callouts for the most common tasks users may want to take, as shown in Figure 2. These callouts utilized action-oriented language and large green buttons to draw users’ attention. During the user experience testing, trade allies noted that they liked the “obvious” buttons for them to start a new application or review a previous application, as they expected that to be what they would need to find immediately.

Welcome!

What would you like to do?

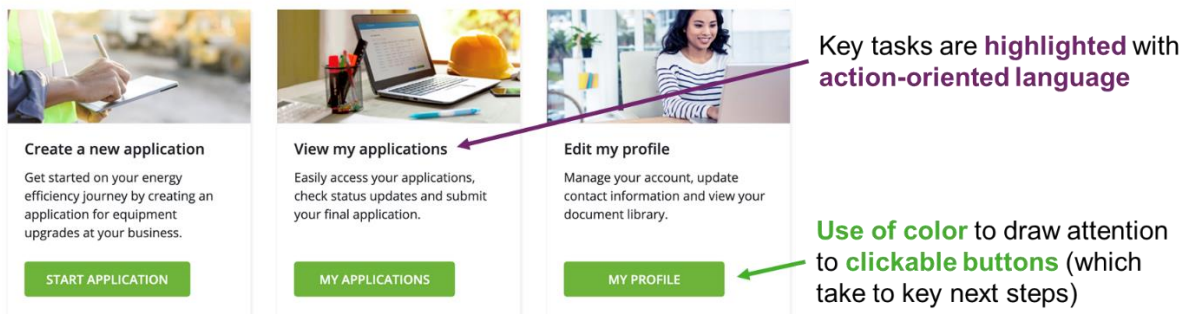


Figure 2. Online Application Homepage (Note: Image pulled at time of UX testing and may not reflect current application format.)

Additionally, the online application also aligned its structure with user expectations around how to navigate the website when looking for additional information. User experience testing showed that users liked the structure of the homepage, as they immediately were able to discern where to go to find more information. The side bar on the home page (shown in Figure 3 below) showed clear options for additional navigation, as well as easy access to Consumers Energy’s trade ally site, where users could request additional materials or find more information on the programs.

Easy access to key documents and steps via sidebar

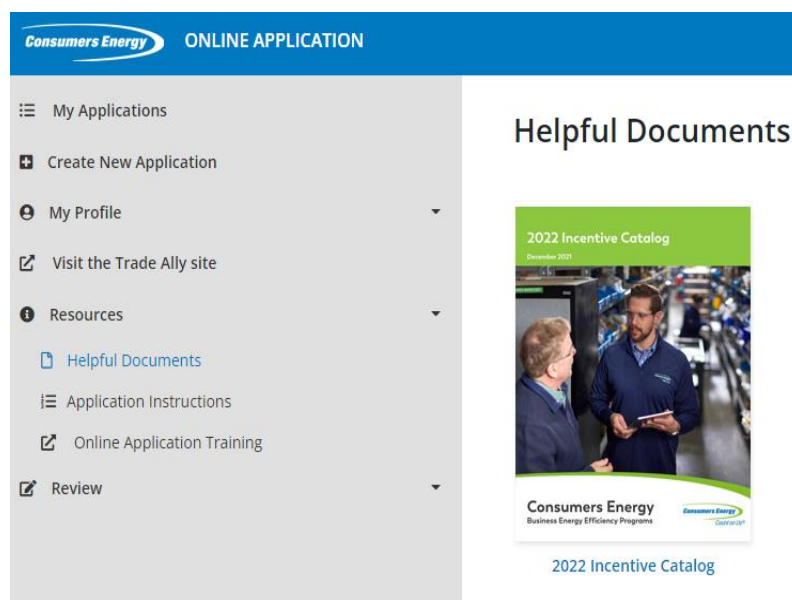


Figure 3. Online Application Sidebar (Note: Image pulled in 2022.)

Step-by-Step Navigation

The research team found the application to be easy to navigate. During the design review, researchers noted that information was easy to find and use within pages. The pages were free of “visual clutter”, which refers to extraneous details that do not promote the intended actions. Navigation was simple, and descriptions were brief and easy to understand for the intended user. The online application also had helpful descriptions of fields where they were needed (example: defining when field referred to the end-use customer vs. contractor).

The application walked users through sections step-by-step, which helps to limit the amount of information needed at one time. This design style is often referred to as a “wizard”. With wizards, users enter information in a prescribed order, and the future pages depend on information entered on the previous page. Wizards are a helpful tool for simplifying the process for the user by showing less information on each page (Budi 2017). They have a few distinct advantages over fillable forms (like the old fillable PDF form that Consumers Energy used): 1) users end up less overwhelmed by the information, 2) they decrease the cognitive load needed to complete the process by focusing only on relevant fields, and 3) users make fewer mistakes when they can focus on one section at a time.

By choosing to design the online application as a wizard, Consumers Energy helped users navigate through relevant fields much more easily than using the fillable application – and this showed in the testing with users. Trade allies rated the ease of using the online application an 8.6 out of 10 during the UX tests. All of these trade allies said they would use the online application instead of the fillable PDF in the future, and noted the ease of navigation as a top reason for that decision.

Aligning Features with Top User Needs

Throughout the application design process, Consumers Energy and DNV were very conscious to design the application specifically for their target user, based on feedback collected during past evaluations and ongoing engagement. For example, a 2019 trade ally survey asked trade allies how to improve the program application; most commonly, trade allies responded they wanted a quicker application process. The online application was designed to be faster to complete than the traditional PDF application, and trade allies responded very positively to this change. Two (out of 11) respondents even mentioned that they would be much more likely to apply for Consumers Energy programs because it was faster to fill out the online application, and that changed the value proposition for them.

Additionally, Consumers Energy knew that contractors often completed similar projects year after year, and had heard through their ongoing engagement with trade allies that they wished it was easier to repeat information across applications. In response, they added a feature to save the information within an application for later or to transfer it to another project – capabilities that were not included in the PDF format. Trade allies loved this addition, and it was a key reason why 100% of the UX testing respondents said they would continue to use the online application in the future.

Testing Early and Often

Consumers Energy and DNV were committed to designing an online application that worked well for their trade allies. To ensure it worked for users, the team tested the product several times: internally (through the implementors), with external experts (through design reviews), and with actual users (through UX testing and soft launches). These efforts allowed Consumers Energy to work out any kinks in the product prior to the full launch with all of their trade allies, and contributed to the high satisfaction we continue to find to this day.

Common Design Challenges

Throughout the research process, TRC found several overarching design challenges for the Consumers Energy team when building out their online application. These challenges are not just particular to the design of Consumers Energy's online application but apply to other utilities' online applications and digital products more widely.

Streamlining User Accounts

During both the design review and UX testing, TRC found that account setup and management was one of the largest potential stumbling blocks. Often, users thought they could use accounts they had already set up for other parts of the Consumers Energy website (including their account login and trade ally portal login) and did not realize they needed to set up a new account for the online application specifically. During user testing, several trade allies attempted to log in to the online application with their trade ally portal information, only to be confused when that did not work. These trade allies noted that they thought of the Consumers Energy website as a single site and expected to have a single way to sign in for all of their information.

This barrier can be a common problem for utilities, as there may be different actors involved in the maintenance and management of different parts of the utility website. For

example, this online application was developed by Consumers Energy's implementation contractor (DNV), which lead to additional hurdles in streamlining the log in process. Since this application was developed by DNV, there were some key technical challenges in aligning account logins across webpages. However, where possible, it is advantageous to streamline accounts to a universal log in to avoid confusion.

Using Real World Language

When creating a product, designers and program managers many times use language that they are familiar with when creating the site categories, search terms, or instructions. While for some utility programs, there may be necessary jargon to describe the programs accurately or to align with utility regulations, language used within a product should align with user's knowledge and framework as much as possible. (Nielsen 1994)

For example, during the design review of an early prototype of the online application the research team found several sections of the application that were from the viewpoint of program staff, rather than the contractor or customer filling out the application. For example, in the section with required contractor information, it was difficult to determine which information was required from a customer viewpoint and which information was required from a contractor viewpoint, as the application was approaching the information from a program manager's frame of reference.

During the UX testing of the application, the research team tested the search function of the application when adding new measures to the application. When searching for measures, experienced trade allies used terms that were commonly used to describe the products, rather than more technical terms ascribed by the measure catalog. This meant, that then trade allies were searching for measures, they were unable to easily find the measures with the terms that were familiar to them. This leads to frustration in the search process and frustration with the online application as a usable tool. Similarly, in the design review process, in the measure catalogue the research team noted that electric, gas, and combination measures were not clearly identified with everyday language, rather with the acronyms "EO" "GO" and "EG" in the measure name. While this language may be familiar to a more seasoned trade ally, for new trade allies or customers filling out their own application, the everyday terms of electric, gas, and combination will be more familiar to these users. The customer survey conducted after the user testing found that one-third of the respondents had never filled out a program application with Consumers Energy prior to filling out the online application. Therefore, the online application needs to have language approachable to new users, rather than language oriented towards experienced users or program staff.

User testing and design reviews that evaluate a product from a user or third-party perspective can be useful in flagging where there are issues with internal company language, industry jargon, or inadequate information for new users. While many program managers and designers think they are speaking a user's language, as they are not the target user, this needs to be verified through testing and research.

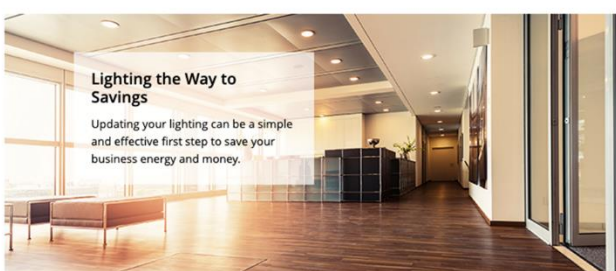
Changing User Habits

One of the most prevalent challenges with adopting a new tool is 1) ensuring widespread awareness of the tool, and 2) motivating users to change their existing habits. Even with an improved tool, users may still choose the path they know and understand either due to lack of

awareness or due to hesitancy to try something new. To help Consumers Energy understand how to best motivate trade allies to use the online application, TRC reviewed marketing of the application and found several key strategies to help increase adoption:

Ensure that the application is advertised widely and consistently across all digital media. The research team found opportunities to strengthen the promotion of the online application on Consumers Energy’s digital resources, particularly on measure-specific webpages. These pages included a sidebar that advertised the online application (shown in Figure 4 below); however, these sidebars are often used on websites as a place for third-party advertisements, so users may skim past them and not realize there is useful information in the links. Additionally, the research team recommended strengthening the language in these links to focus on the solution the online application provided for customers (example: “Online application makes it faster to apply for rebates”).

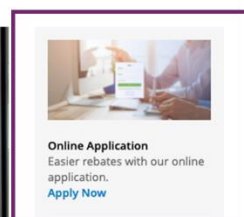
Business Lighting Savings and Rebates



Energy Efficient Lighting is a Simple Way to Save

Installing upgraded lighting is one of the easiest ways you can start improving the energy efficiency of your business. The contractors that participate in this program and the rebates we offer make it even easier.

LED bulbs, dimmers, timers and other improvements won't just save you energy and money. You'll also create a better lit, more vibrant work environment for your employees and the important work they do.



Location of callout is often used for advertisements on other websites, and doesn't draw attention

Figure 4. Advertising the Online Application (*Note: Image pulled at time of UX testing and may not reflect current website format.*)

The research team also found that some portions of the website still pointed to the PDF application, which could lead to confusion from users about which tool to use. While users should still have the option to complete the PDF application if they feel uncomfortable with the online application, the research team recommended directing customers to the online application first, and then having an option for users to select the PDF application if they desired. This way, users would be certain to be aware of the option to submit their application through the new online tool.

Optimize search engine results to promote the online application. When conducting the marketing review, the research team saw that search engine results pointed users to the PDF application instead of the online application as the first result. Search engine results are critical for advertising a digital offering; a 2020 report found that 25% of users click on the first search engine result, highlighting the importance of search engine optimization. The evaluation team recommended a paid promotion of the online application so that it appeared first in the list of results, rather than promoting the PDF tool.

Provide training resources for new users. While Consumers Energy’s online application was a well-designed tool, it is inherently complex due to the need to collect detailed

project information. During the user experience testing, almost half (44%) of respondents said that if they had not participated in the UX testing session, they would have been confused at one or more points in the process. However, once these users went through the UX testing, all felt comfortable with the tool and preferred it over their existing process. These findings show that behavior change in users is possible – but it may require additional support at the beginning as users navigate a new process.

Early adopters of the tool are also likely to be more technologically-savvy, and trainings may support wider adoption among users who feel intimidated by an online-only tool. During the UX tests, respondents' ability to use the online application effectively appeared to correlate with the respondents' general comfort using technology. As any new tool is being launched, the authors recommend setting up webinars with users and creating on-demand video trainings that users can watch to guide them through the process. Additionally, users should know who to call if they have questions and have access to an online chat function and FAQ page for simple clarifications. In response to these findings, Consumers Energy and DNV created an instant, self-guided interactive training for the online application, which is easily found on the sidebar as users navigate the tool.

Conclusion

Consumers Energy's development of an online application tool can be used as a case study in successful user-centered design. The utility and implementation contractor focused on how to make the online application appealing and beneficial to its users, and sought feedback early and often on how to meet its users' needs. The process started by incorporating feedback from past research and trade ally communications, which informed the development of the first draft of the online tool. Then, Consumers Energy focused on getting additional feedback by multiple actors – including internal testing through the implementers, expert review from evaluators, and user feedback from trade allies.

By combining research efforts throughout the development of the online application, Consumers Energy was able to identify and solve potential pain-points in the application process early and design a best-in-class solution. Trade allies raved about their experience with the online application tool, and rated their likelihood to use it again as a 9.7 out of 10.

This case study highlights the importance of understanding user needs and expectations when developing a new digital tool. The authors support a mixed-methods, staged approach to evaluating new tool development. In particular, utilities may consider UX testing, design reviews, and marketing research as methods that center the experiences of users and focus on ensuring that customer expectations are met. These research tools provide opportunities to observe how users interact with information and identify simple changes that can facilitate increased understanding and motivate actions.

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