www.roverp6cars.com
Project Report

7/1/2016

7/8/2016

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1 Introduction

1.1 Purpose

The website I chose for improvement was MGBD parts www.roverp6cars.com. The new prototype is hosted at : http://oqrhuy.axshare.com .The website is primarily for shopping of spare parts for rover cars and also provides information about the recent events involving trivial rover cars with a gallery of pictures from the past events along with updates about the fore coming events.

Some of the major concerns with the webpage were poor Home Page that distracted users from the necessary content, improper navigation panel and alignment / fonts are present in a confusing manner. The Home page also contains too many links leading to the same pages in the website. The other issue was that the shopping process had too many steps and products weren't clearly displayed to the user.

The aim of this project was to develop a prototype that focused on all of the problematic areas and to improve the tasks that were considered to meet the primary and important goals of the website, those were ordering, product details, events , homepage and navigation.

Other important aspects that were given importance in the development of the prototype were consistency, forgiveness, recoverability, familiarity.

1.2 Tasks Identified

The tasks were chosen in order to test the core functionality of the website and also reflect the user's understanding of the website and that all possible user goals are met.

Three varied tasks that pretty much cover all the essential functions are as mentioned below

Task 1: Find the description of a product

Task 2: Order a product

Task 3: Find a Gallery

More detailed descriptions of each of these tasks, their purpose will be present in the upcoming sections.

1.3 Assumptions

The important assumption made was that all the users who used this website were intermediate when it comes to knowledge of online shopping and cars.

Though the website dealt with high level and complex car parts, none of the tasks provided needed the user to have any prior knowledge other than basic knowledge of what a car is.

2 Analysis

2.1 Personas

The following are the various types of personas who might be using this website

1. Ned Stark

- *55 year old Male Car enthusiast from the north.*
- *Has a passion for Rovers and winter.*
- *Has 5 children who all depend on him to take care of the 5 vintage cars he gifted them.*
- *Has never tried online shopping before.*

2. Jon Snow

- *25 year old male.*
- *Passionate online shopper, but has never bought cars.*
- *He inherited a vintage car and wants to fix it so tries to find solutions online.*
- *Needs novice level details about car parts that suit him*

3. Daenerys Stormborn

- *20 year old female, a pets person.*
- *Is scared of online shopping due to a large number of forms.*
- *Doesn't know how to enter card details*
- *Needs help to fix her car*

4. Sri Venki

- 27 year old drag racer
- Keeps wrecking his car and needs spare parts regularly
- Is new to the place and doesn't know many shops so orders online .
- Is great with computers and doesn't need much help.
-

5. Brandon Raven

- 15 year old Disabled Male
- Has lost functionality of both legs and requires assistance from his friend for everything.
- Drives a specially designed car and requires custom made parts.
- Needs to speak with the manufacturer every time he places an order to specify instructions.

2.2 Task Analysis Tools

The tools that were used to study the usability of the website were Heuristic evaluation and cognitive walkthrough.

The cognitive walkthrough will give us an idea about the various steps and the difficulties the user's face in each and provide us feedback for the improvements we have to make.

The heuristic evaluation provided us with the overall usability score and score for individual parts to see where we go down and improve our website including any suggestions the user might have provided.

Both the heuristic evaluation and the cognitive walkthrough are attached in the appendix.

2.3 Task #1

2.3.1 Task Detail #1

The task is to locate the parts store from the home page and find the product "clutch plate and cover" under the clutch category and read the product description.

In order to verify the user's successful completion the user was asked to write down the number of days it takes to ship the product.

2.3.2 Task #1 Analysis

This tasks aims to understand the user's understanding of the homepage and the ability of the page to route the user to the required page via the navigation methods.

Also the efficiency of the Website to enable the user to find out the Product description is analyzed through the time taken and whether it is completed successfully or not.

Thus the two metrics are

Metric 1: Time on task

The time taken by the participants to complete the task were noted and tabulated as follows and a t-test was carried out to understand the significance of the changes made to the prototype.

Participant	Time on Original Website(sec)	Prototype(sec)
1- Sri Venkat	95	
2-Balaji Chandrasekaran	41	
3-Roshan Prabhakar	52	
4-Shankar M		11
5-Prashanth R		23
6-Vimal Khanna		17

The final calculated values are :

t = 8.1109
df = 4
standard error of difference = 8.014

The calculated t-value of 8.1109is smaller in magnitude than the C.V. of 8.61, therefore we can reject the null hypothesis. In other words:

There is a significant difference in the time taken between the new prototype and the original website , with the new website taking a much lesser time.

For more calculation details refer the appendix

Metric 2: Success/Failure of completion

If the participant completed the task : 1

If the participant fails/ completes the wrong task : 0

Participant	Original Website	Prototype
1	1	
2	0	
3	1	
4		1
5		1
6		1

Average Task completion in Original website: 0.66

Average task completion rate in Prototype: 1

2.3.3 Task #1 Discussion

Based on the results from the analysis from the two metrics we find that ,

- *The t-test of times revealed that there was a significant difference in favor of the developed prototype when it came to the time taken to complete the task.*
    - *This is primarily attributed to the relative simplicity of the website with proper alignment of the panels.*

- ***Familiarity:*** *the prototype was much familiar to the most common shopping websites than the original*
- ***Consistency:*** *Throughout the website in the prototype there was consistency of spacing, alignment, font style ,color and size.*

- *The success of the task was better in the prototype because the original website was hard to comprehend due to* ***Split Attention Effect****.*
  - ***Relevance****: There were too many unwanted content irrelevant to the product and the user in the original website.*

2.4 Task #2

2.4.1 Task Detail #2

In the website provided, find the Parts store and purchase the product “Number Plate lamp” (which comes under lights) and select quantity as 1 and complete the ordering successfully and identify the order number in the confirmation page.

Based on the user response and the time taken the Analysis was carried out.

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2.4.2 Task #2 Analysis

This tasks tests the most important part of the website, the Store itself. It analyses the difficulties faced by the user for completing the purchase of the product.

The two metrics used here are

Metric 1: Time Taken to complete

The time taken by the participants to complete the task were noted and tabulated as follows and a t-test was carried out to understand the significance of the changes made to the prototype.

Participant	Time on Original Website(sec)	Prototype(sec)
1- Sri Venkat	234	
2-Balaji Chandrasekaran	167	
3-Roshan Prabhakar	206	
4-Shankar M		52
5-Prashanth R		79
6-Vimal Khanna		44

t = 6.4533
df = 4
standard error of difference = 22.366

The calculated t-value of 6.4533 is significantly in magnitude than the C.V. of 4.6, therefore we can reject the null hypothesis. In other words:

There is a significant difference in the time taken between the new prototype and the original website , with the new website taking a much lesser time.

Metric 2 :

Success of completion:

If the participant completed the task : 1

If he fails/ completes the wrong task : 0

Participant	Original Website	Prototype
1	1	
2	0	
3	1	
4		1
5		1
6		1

Average Task completion in Original website: 0.66

Average task completion rate in Prototype: 1

For detailed calculations , refer the Test Results section.

2.4.3 Task #2 Discussion

The results of the test with the two identified metrics revealed the following

- The t-test of completion time was significantly reduced in the prototype because the number of pages to complete the purchase of the product was reduced from 8 to 3 pages.
    - **Navigation:** The original website had a rather complex and confusing navigation system for every action in the task leading to the user spending more time identifying certain content before performing the action, this was majorly improved in the newer website.

- **Availability/Accessibility:** The pages were easily accessible to the users in the new prototype while were hard to find in the previous website.

- **Successful completion:**
  - **Control**: In the prototype each step was properly guided and control was clear about the next task to be performed while the original site had too many contents on the page and not guiding the user about the next step.
  - **Feedback:** At every Step the user was provided with proper feedback of completion.

2.5 Task #3

2.5.1 Task Detail #3

In the given website , find the Gallery of images for the recent event named “Bressingham 2016 “ and to verify if you are in the correct gallery , find the second picture with a car on it, and identify what the color of the car is .

Based on the user response and the time taken the Analysis was carried out.

2.5.2 Task #3 Analysis

Participant	Time on Original Website(sec)	Prototype(sec)
1- Sri Venkat	42	
2-Balaji Chandrasekaran	30	
3-Roshan Prabhakar	37	
4-Shankar M		19
5-Prashanth R		13
6-Vimal Khanna		18

t = 4.9864
df = 4
standard error of difference = 3.944

The calculated t-value of 4.9864 is significantly in magnitude than the C.V. of 4.6, therefore we can reject the null hypothesis. In other words:

There is a significant difference in the time taken between the new prototype and the original website , with the new website taking a much lesser time.

Metric 2 :

Success of completion:

If the participant completed the task : 1

If he fails/ completes the wrong task : 0

Participant	Original Website	Prototype
1	0	
2	0	
3	1	
4		1
5		1
6		1

Average Task completion in Original website: 0.33

Average task completion rate in Prototype: 1

For detailed calculations , refer the Test Results section.

2.5.3 Task #3 Discussion

The results of the test with the two identified metrics revealed the following

- The Gallery was impossible to find in the original website because it was located in the middle of the homepage and not the gallery, plus the home page had an enormous amount of links with multiple fonts and improper alignment.
    - **Immersion:** The absence of immersive techniques to grab and hold the user's attention on the task and the website was absent in the original website but was handled well in the prototype.
    - **Predictability:** In order to find the gallery, the obvious choice of the user would be to look inside the gallery but the original website had a gallery with all other albums except the one in discussion, this confused and lost the users, some leading to frustration.

3 Prototype and Design

3.1 Overview of Prototype and Design Features

The prototype of a modified website for roverp6cars.com which overcomes the shortcomings of the original website was developed using the prototyping tool called Axure.

The prototype includes all the important pages as in the original website along with the content, steps that replicate the tasks , however not all pages were re implemented.

Only the pages that are involved in the core functionality i.e. the three tasks explicitly mentioned above for the study were taken into consideration and developed.

The Home page was redesigned along with the Store, Transaction system and the confirmation.

One of the major highlights of the prototype is the introduction of a pop up style description bar for the products along with indicators for availability, price and reviews.

The prototype has reduced most number of pages compared to the original website by concussing the contents on a single page.

3.2 Task # page.1

3.2.1 Task #1 Design

The updates that were made to the prototype were,

- The Home page was redesigned to overcome the split attention effect and improve the understanding of the user.
- All labels, buttons were designed with consistency and clarity
- An improved navigation panel redesigned into a proper consistent one across all pages with feedback for the user.
- There was a special pop up information box displaying the product description of individual products that prevents the user from the need to open a new page.

3.2.2 Task #1 Design Justifications

Based on the heuristic evaluation results we found that the website lacked heavily in homepage and navigation hence making it difficult to route the user to the appropriate page.

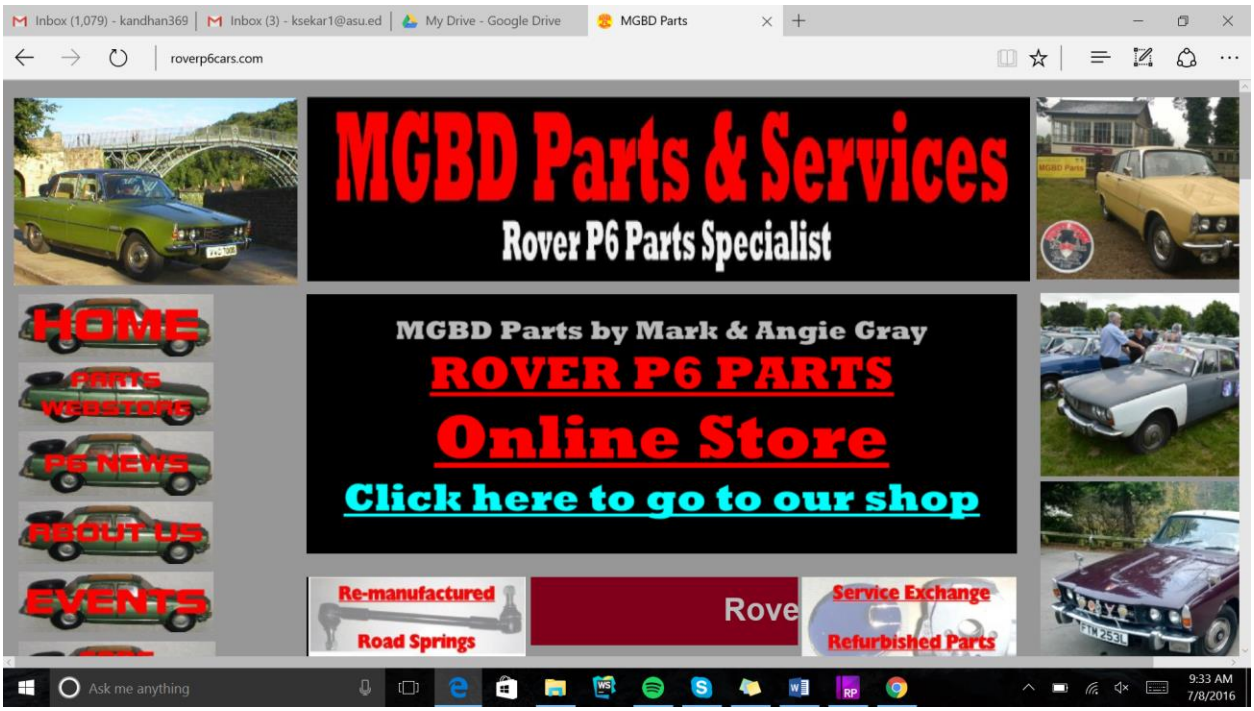
Consistency: Throughout the previous website each page had a different layout, thus making it highly inconsistent while the newer prototype had a clear consistent navigation pane, colors, quick links etc.

Predictability: None of the components of the Older website could be predicted for functionality, hence the newer components gave clear feedback about the progress.

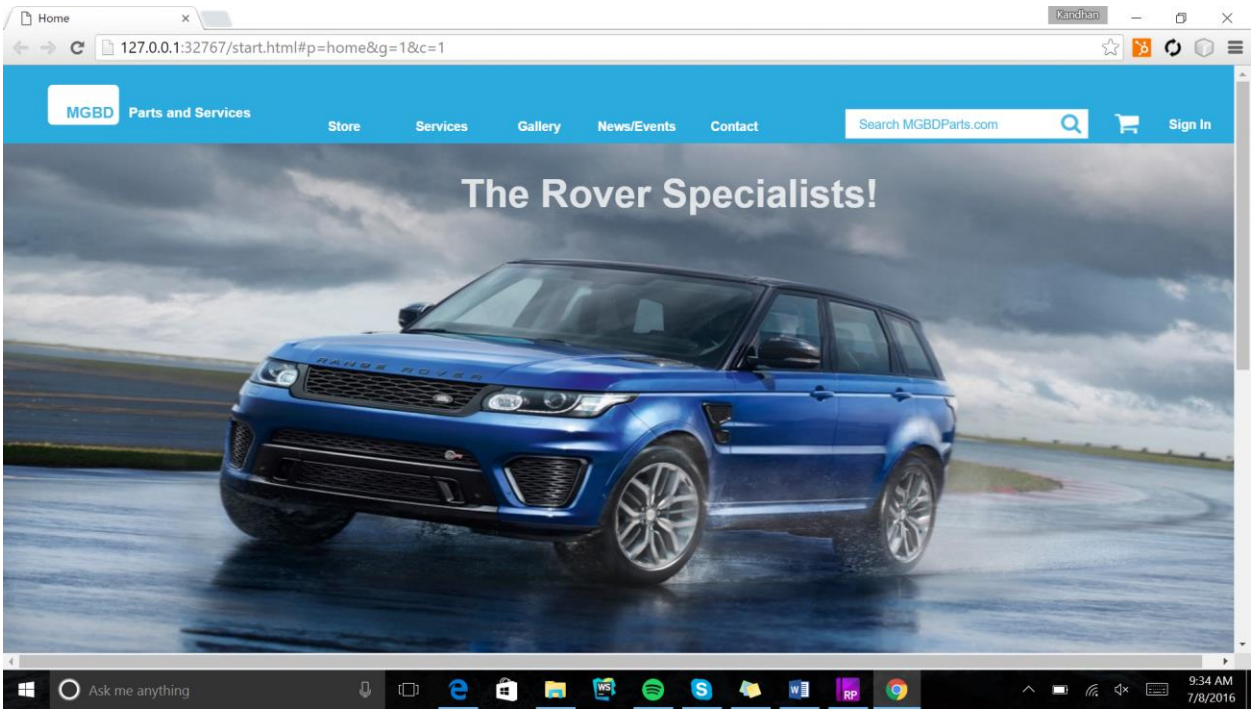
3.2.3 Task #1 Prototype

The home page was redesigned with a better layout as shown below, a new top navigation bar was developed replacing the old improper one.

ORIGINAL homepage:



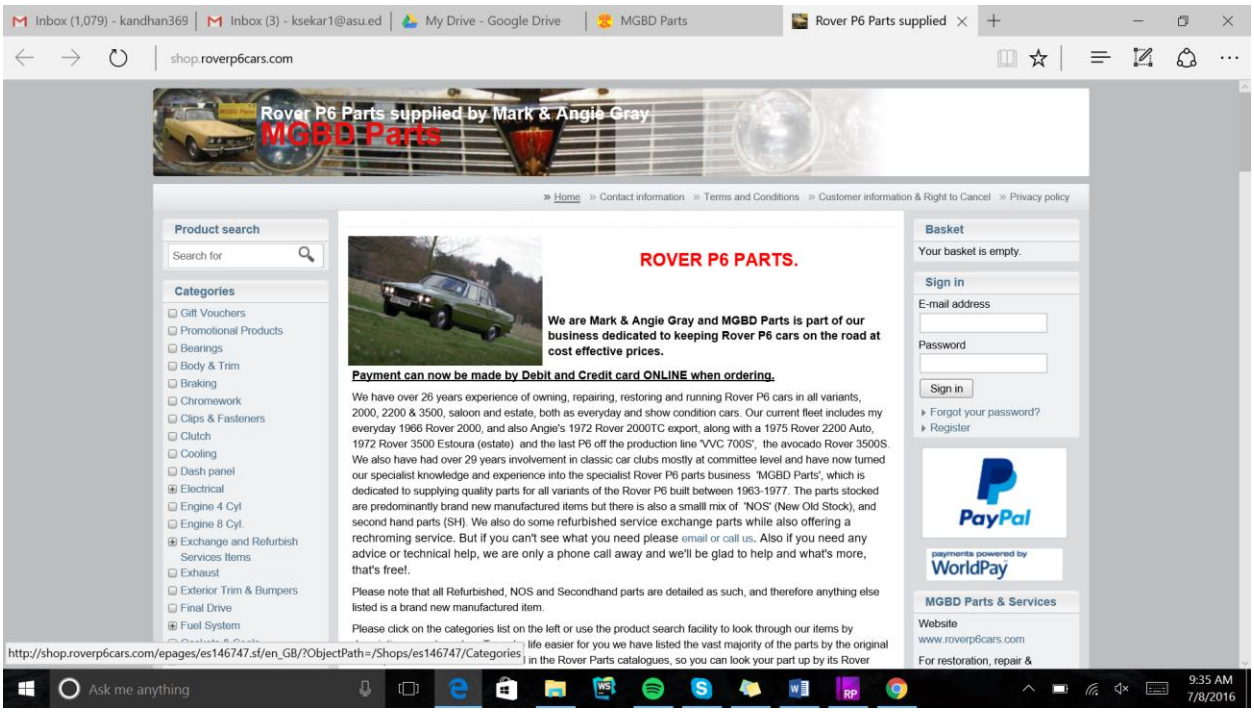
Prototype Homepage:



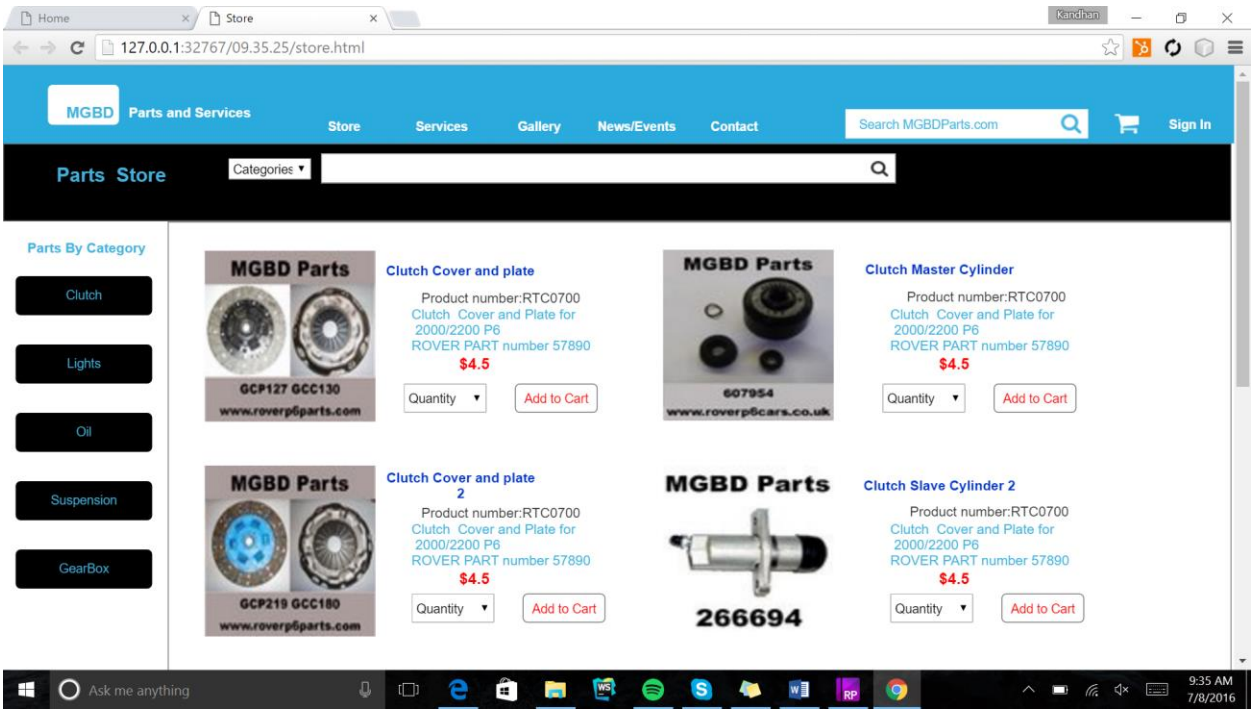
THE STORE:

The Store in the new prototype focused on the product details and removed unwanted “About us” content that took up 70 percent of the screen in the original.

ORIGINAL:



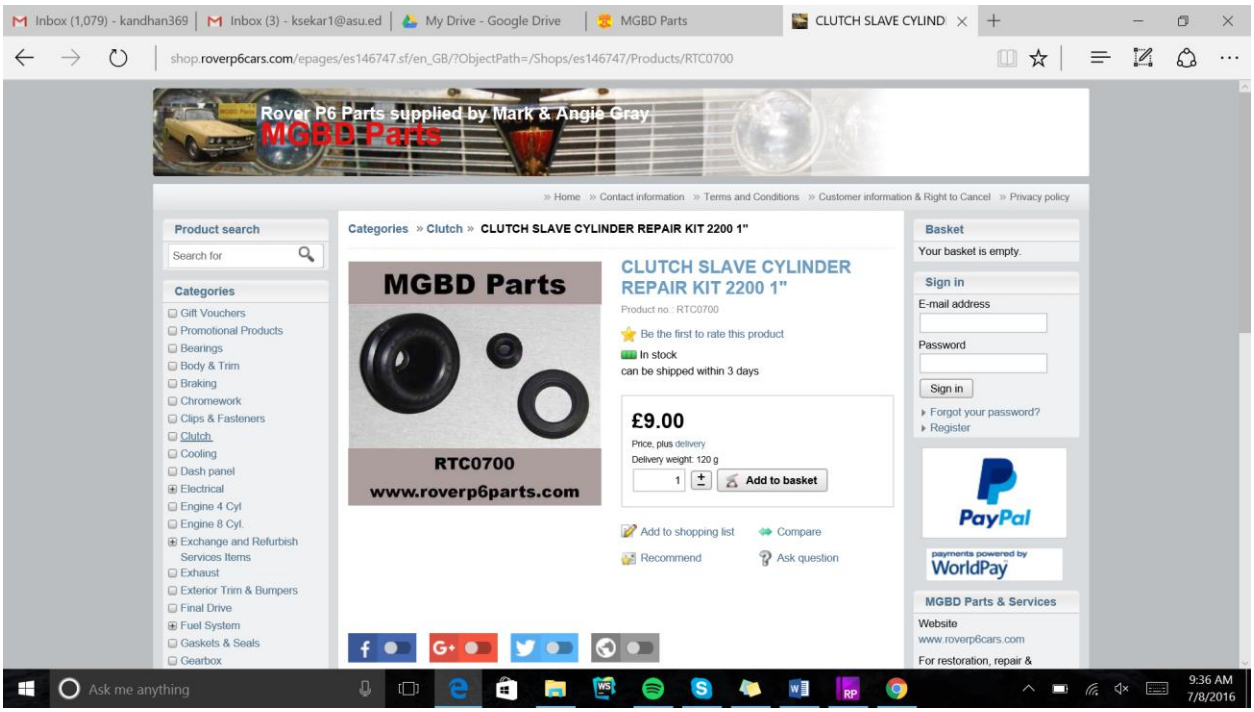
PROTOTYPE:



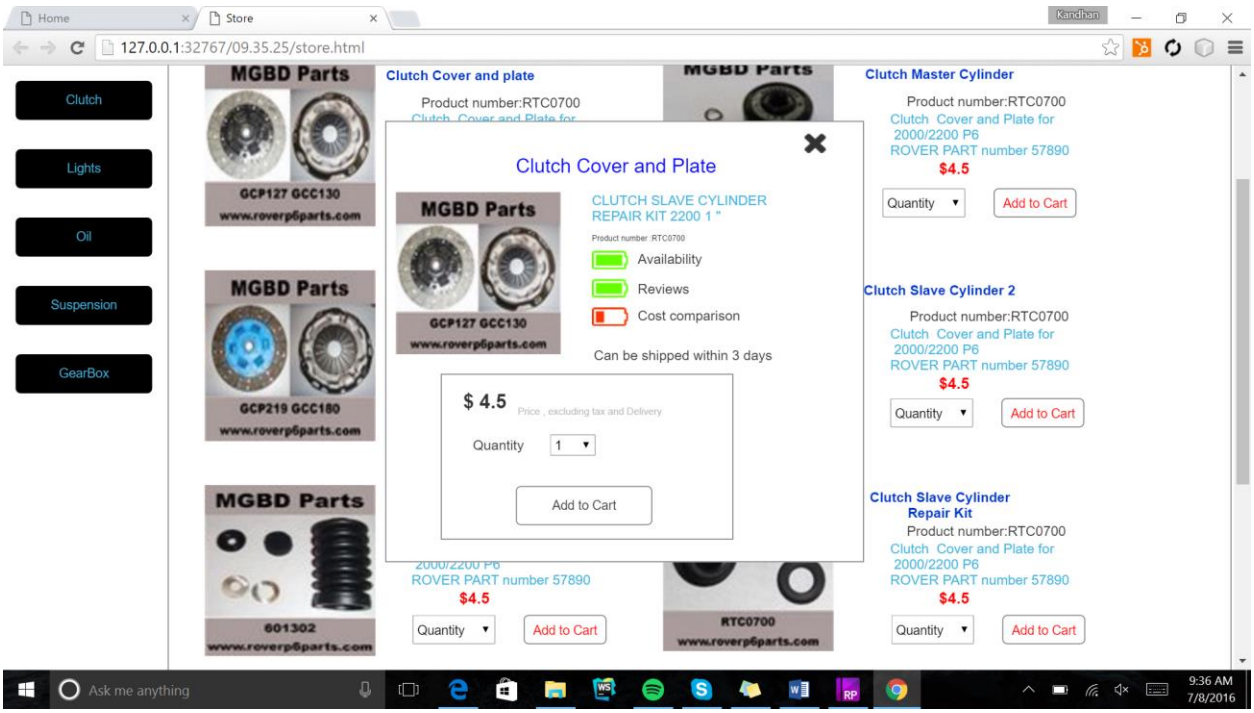
PRODUCT DESCRIPTION:

A new Pop up Bar that displays the information making it unnecessary for the users to go into a different page was developed

ORIGINAL:



PROTOTYPE:



3.2.4 Task #1 Prototype Rational

Reducing Cognitive Load:

Due to the development of Pop Up the users need not remember their previous location and go into a new page thus increasing the cognitive load, rather the user can click on any image tootle and remain at the same page and avoid unnecessary information's in the Working memory.

3.3 Task #2

3.3.1 Task #2 Design

The Study showed that this tasks took a very long time due to the excessive number of pages thus causing errors along the way , so the motive was to develop a new prototype that had a minimum number of pages yet collected all the information and at the same time gave the user feedback of correctness along the way.

This was implemented by reducing the number of Pages from 9 to 3.

3.3.2 Task #2 Design Justifications

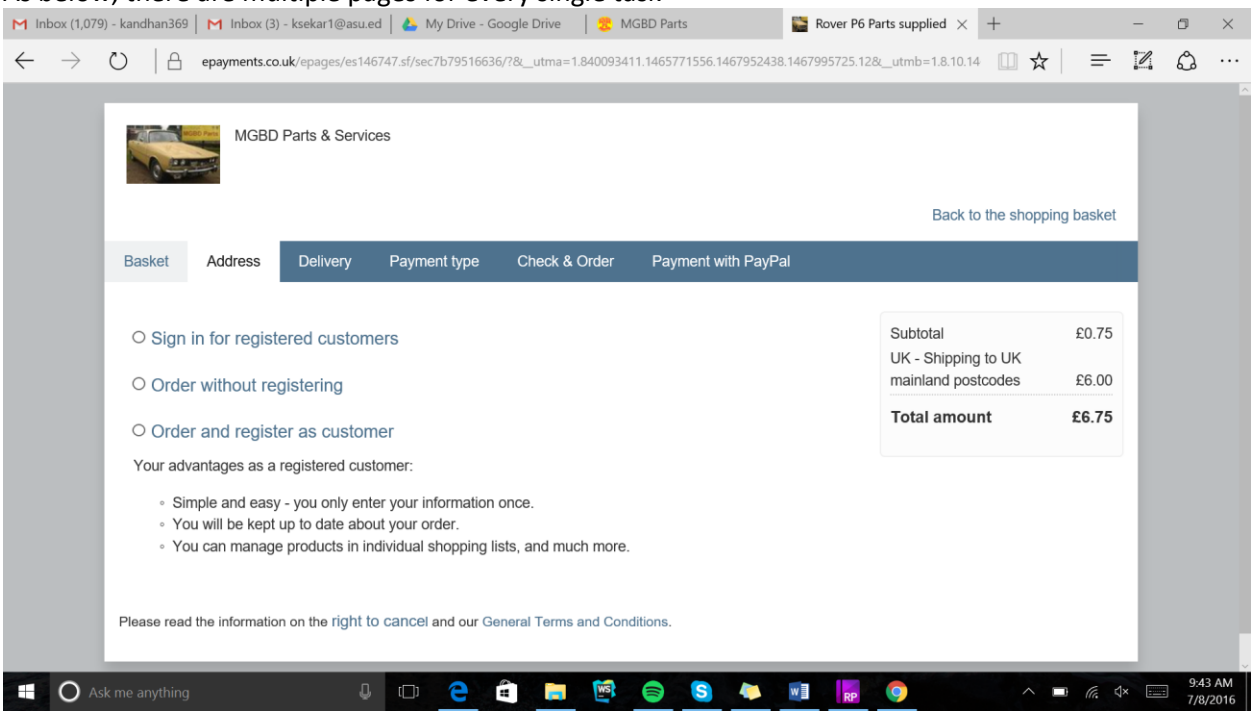
The excessive number of pages and the irrelevant information collected increased the time and frustration of the user , hence making it less usable.

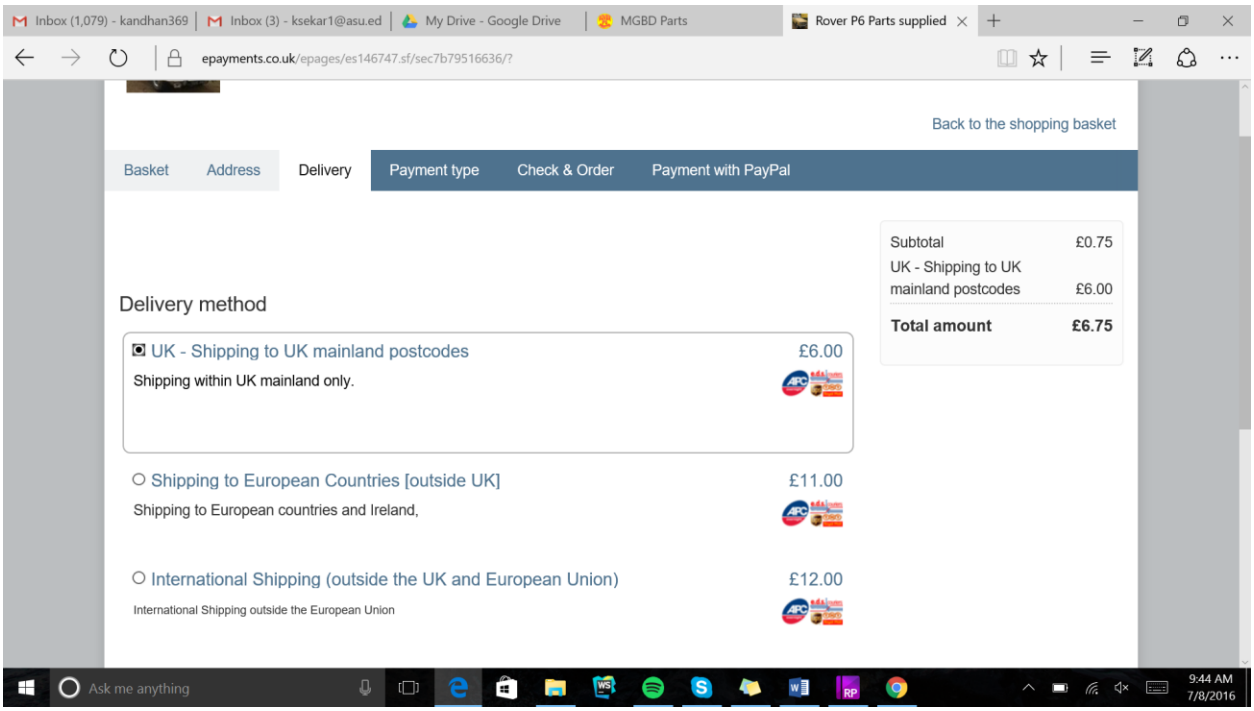
So in order to improve the user experience and immersion and at the same time achieve excellence in efficiency, the address, delivery and payment pages were integrated into one.

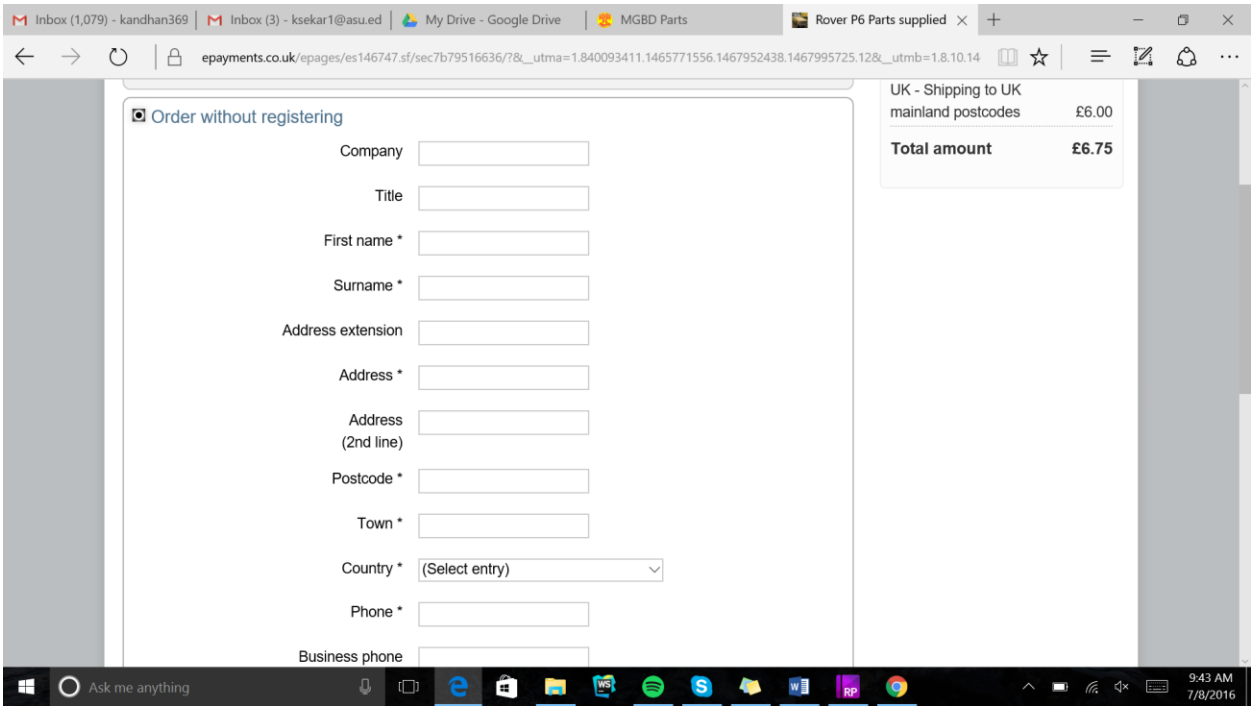
3.3.3 Task #2 Prototype

Original Website:

As below, there are multiple pages for every single task

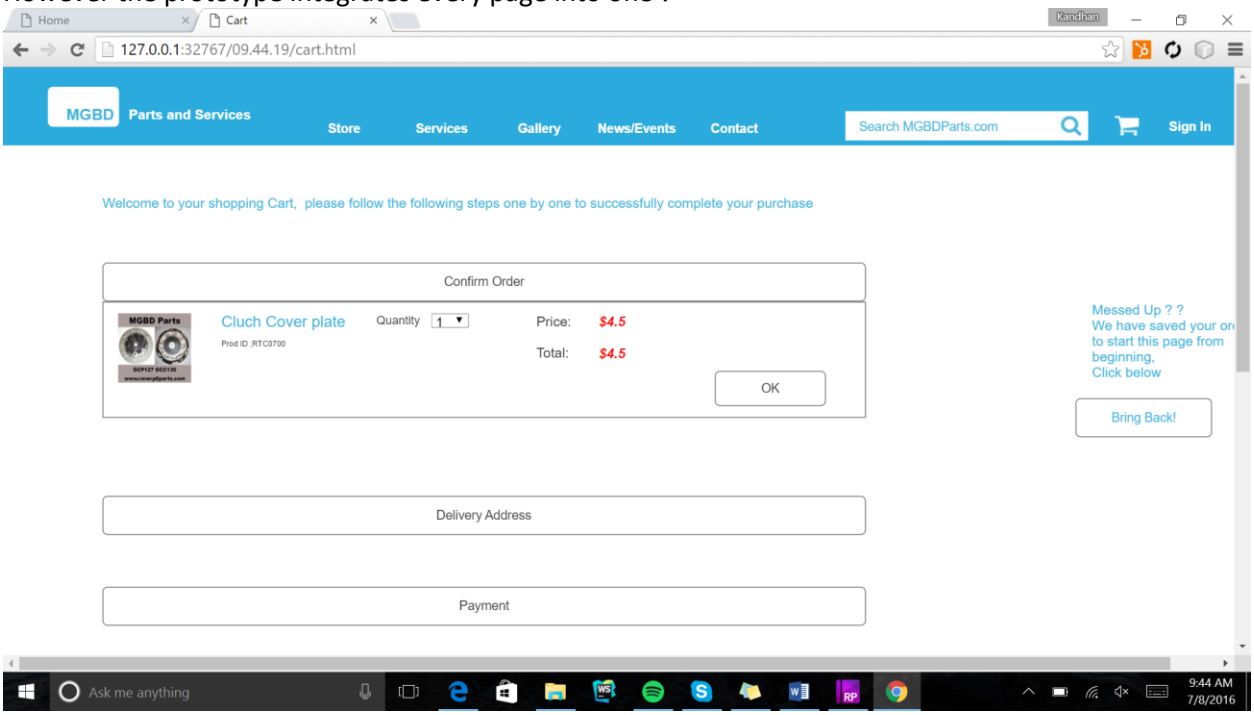



Inbox (1,079) - kandhan369
Inbox (3) - ksekar1@asu.ed
My Drive - Google Drive
MGBD Parts
Rover P6 Parts supplied
epayments.co.uk/epages/es146747.sf/sec7b79516636/?
Back to the shopping basket
Basket
Address
Delivery
Payment type
Check & Order
Payment with PayPal
Subtotal £0.75
UK - Shipping to UK mainland postcodes £6.00
Total amount £6.75
Delivery method
UK - Shipping to UK mainland postcodes £6.00
Shipping within UK mainland only.
Shipping to European Countries [outside UK] £11.00
Shipping to European countries and Ireland,
International Shipping (outside the UK and European Union) £12.00
International Shipping outside the European Union
Ask me anything
9:44 AM
7/8/2016

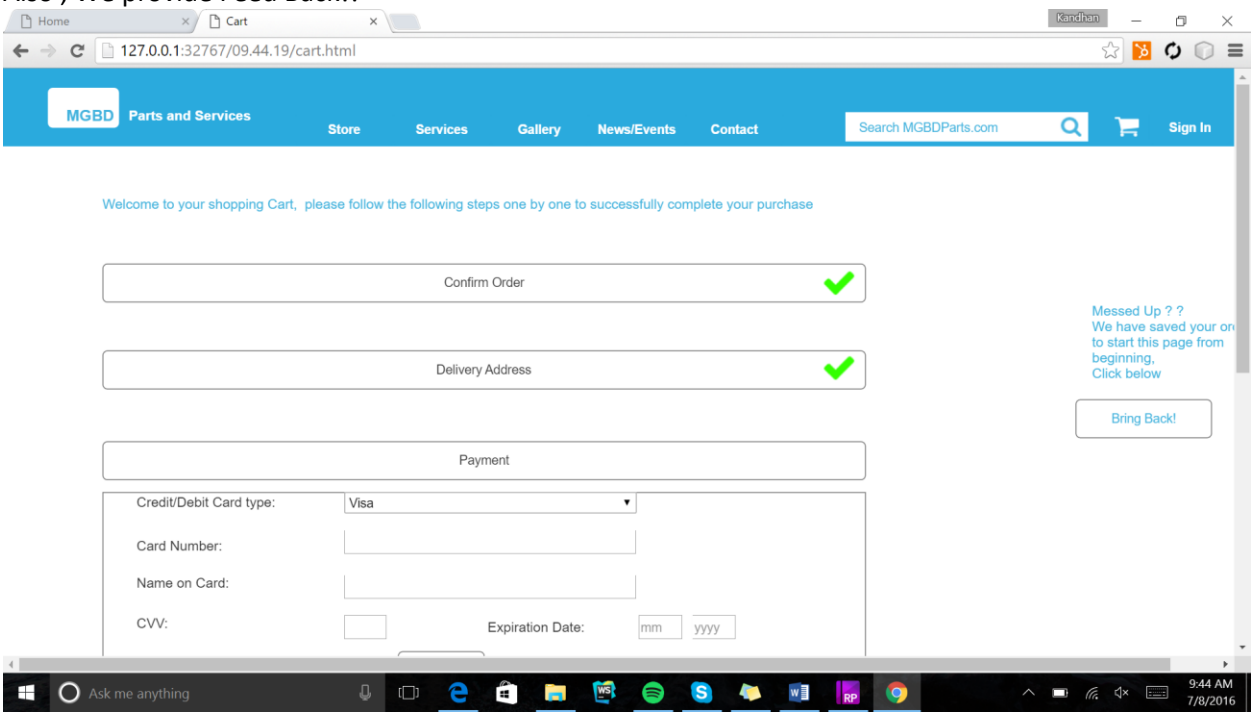

Inbox (1,079) - kandhan369
Inbox (3) - ksekar1@asu.ed
My Drive - Google Drive
MGBD Parts
Rover P6 Parts supplied
epayments.co.uk/epages/es146747.sf/sec7b79516636/?&__utma=1.840093411.1465771556.1467952438.1467995725.12&__utmb=1.8.10.14
UK - Shipping to UK mainland postcodes £6.00
Total amount £6.75
Order without registering
Company
Title
First name *
Surname *
Address extension
Address *
Address (2nd line)
Postcode *
Town *
Country * (Select entry)
Phone *
Business phone
Ask me anything
9:43 AM
7/8/2016

PROTOTYPE:

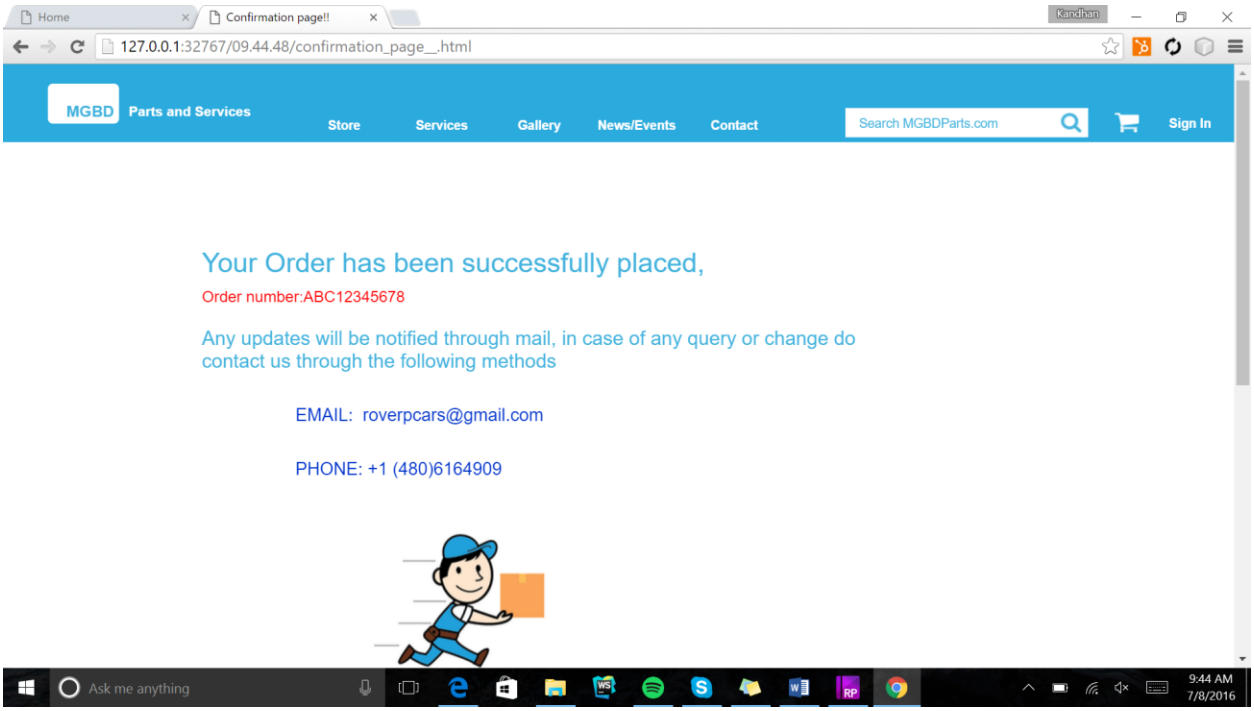
However the prototype integrates every page into one !



Also , We provide Feed Back!!



And a cool confirmation Page,



3.3.4 Task #2 Prototype Rational

Consistency: The pages were consistent in layout, colors, menu bar and actions, so that the user had a clear idea about the path he had to follow.

Feedback: Feedback was provided to the user after every step to understand the progress using Green tick marks and pop ups for errors.

Also the errors didn't disrupt the flow rather created pop ups and allowed the user to continue with the progress.

3.4 Task #3

3.4.1 Task #3 Design

The aim of this prototype was to improve the navigation to Gallery, Gallery though sounds inappropriate is of utmost importance in this website because beyond just shopping, this website is for community of Rover Car enthusiasts and hence Gallery of events that can be found nowhere across the internet are found here.

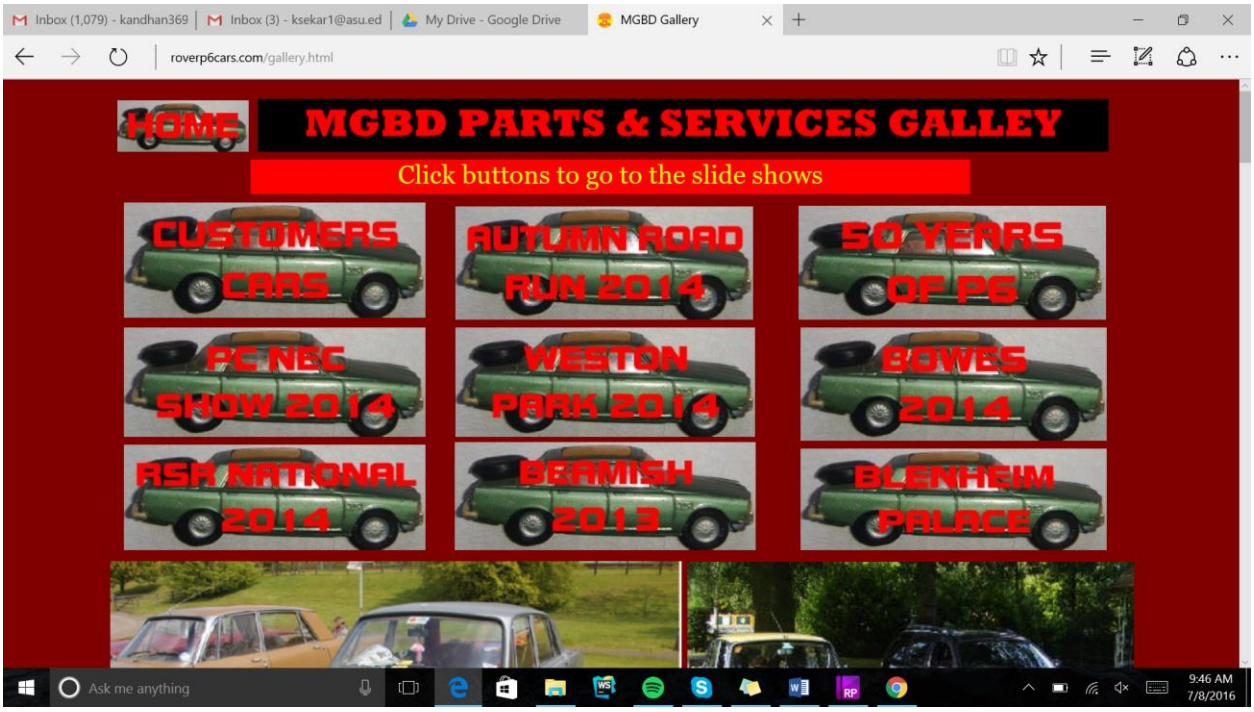
However one of the most recent events gallery was not properly mapped in the website but was present. Most people in the study couldn't navigate to this in the older Website.

3.4.2 Task #3 Design Justifications

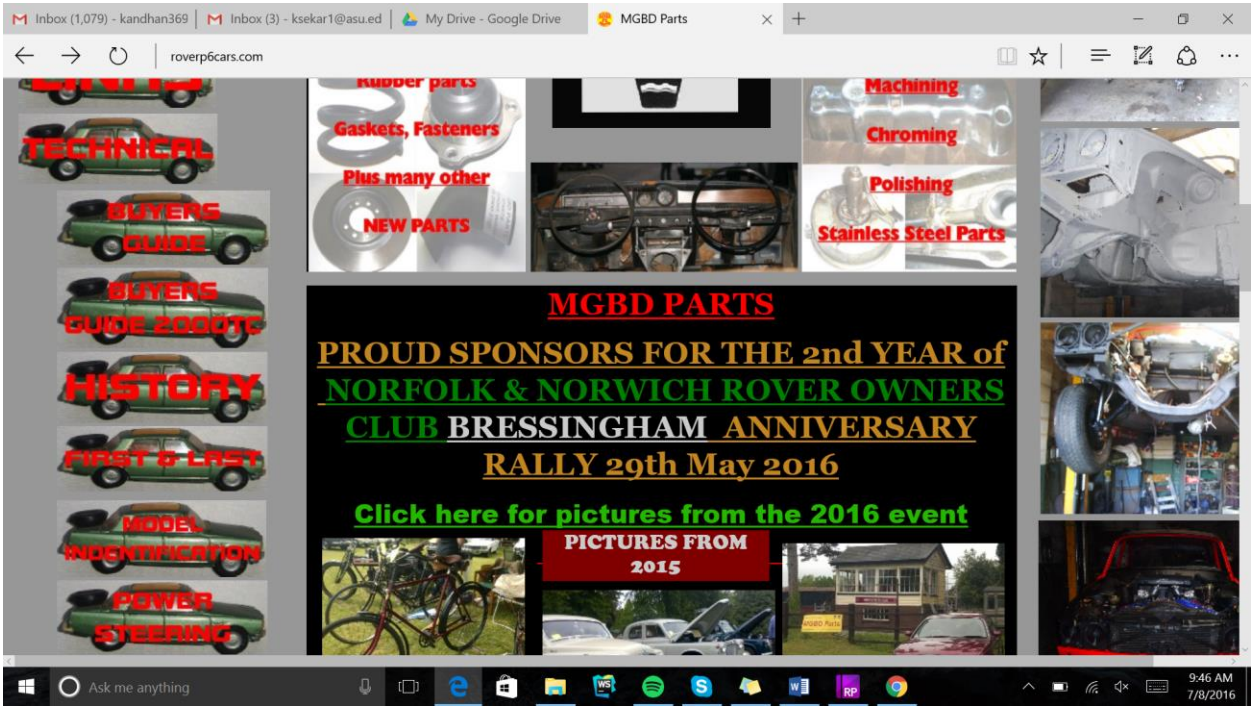
Developing a Universal Gallery that encompasses every picture in the website , hence enabling a complete repository for event and picture search, this significantly improves the time and reduces the need for the user to scroll down and search every picture.

3.4.3 Task #3 Prototype

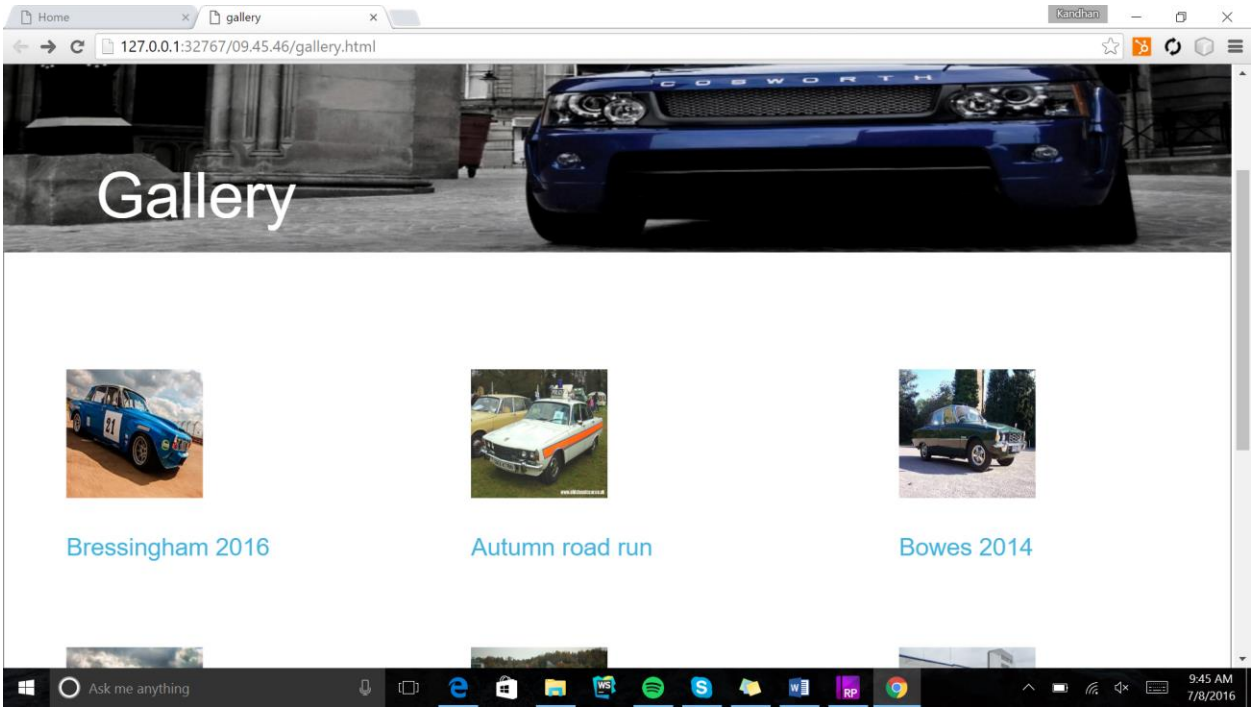
Below is the gallery for the original website, as you could see the Gallery for the task “Brssingham “ is not seen,



However in the Picture below you could clearly see that the link is present in the middle of the webpage,



However in the newer website, the gallery was clearly integrated into a single repo.



3.4.4 Task #3 Prototype Rational

Dependability:

When the user's find a gallery page, they expect you to find every Album, hence the new prototype reports this.

4 A/B Testing

4.1 Participants

A total of six participants were recruited for this study, though similar in personas due to being recruited on the basis of friends, roommates, classmates they did show a lot of diversity as subject materials. A couple of the participants were totally unaware about what to expect and what this study was for but humbly agreed. HCI knowledge was scarce within two of others.

4.2 Scenarios

The researcher guidelines, Instructions to the participant documents can be found in the appendix

Given below is the set of success scenarios or the correct pathway the user might have to proceed in order to complete the expected task.

TASK 1:

The task is to locate the parts store from the home page and find the product "clutch plate and cover" under the clutch category and read the product description.

In order to verify the user's successful completion the user was asked to write down the number of days it takes to ship the product.

Success Scenario(Original Website):

1. In the Home Page, on the left you could locate the Store Button that opens up the Store Page.
2. In the Store Page, there is a left Pane displaying all Category labels, identify the Clutch category and click on it.
3. In the Clutch Page identify the product “Clutch Plate and cover for 2000/2200”
4. Click on the product for description.

Success Scenario(Prototype):

1. *In the Home page, identify the Store Tab on the top and in the Panel click on the Parts Store Button. This opens up the Parts Store page.*
2. *Click on the Clutch Tab on the left Navigation Pane if the page is not already displaying the list of clutch products.*
3. *In the list of Products identify the Clutch Plate(which would be the first one) and click on it for displaying the description pop up.*
4. *In the description identify “the no of days to ship” information.*

TASK 2:

In the website provided, find the Parts store and purchase the product “Number Plate lamp” (which comes under lights) and select quantity as 1 and complete the ordering successfully and identify the order number in the confirmation page.

Success Scenario(Original Website):

1. In the Home Page, on the left you could locate the Store Button that opens up the Store Page.
2. In the Store Page, there is a left Pane displaying all Category labels, identify the Lights category and click on it.
3. *Identify the product “Number Plate Lamp” usually shows up on the first three items.*
4. *Click Add to Basket.*
5. *Open the Basket and Click Checkout*
6. *In the payment gateway choose order without registration*
7. *In the next tab fill out the details for Delivery Address, click Next*
8. *In the next page , include the credit/debit card details and click next*
9. *In the next age review the order and click confirm.*

Success Scenario(Prototype):

1. *In the Home page, identify the Store Tab on the top and in the Panel click on the Parts Store Button. This opens up the Parts Store page.*
2. *Click on the Lights Tab on the left Navigation Pane if the page is not already displaying the list of lights products.*
3. *Click on the product “Number Plate Lamp” , choose quantity as 1 and choose “Add to Cart”*
4. *Click on the Cart Symbol on the top of the Page*
5. *In the next page, confirm your order and enter your address and credit/debit card details and press ok.*
6. *The confirmation page will be displayed if you successfully completed the task.*

TASK 3:

In the given website , find the Gallery of images for the recent event named “Bressingham 2016 “ and to verify if you are in the correct gallery , find the second picture with a car on it, and identify what the color of the car is .

Success Scenario(Original Website):

1. In the home page , click on the link at the beginning of the page below the Bressingham event label.
2. The Gallery will be displayed,

Success Scenario(Prototype):

1. In the home page, click on the gallery tab on the top navigation page.
2. In the Gallery page, find the event name “Bressingham 2016” , click on it to enter .

4.3 Equipment

The participants were invited into a quiet closed environment, with the study involving them interacting with a laptop, HP Specter 13 inch which runs on Windows 10. Microsoft Edge was the browser used for this survey.

Some other equipment’s used were

- Stop Watch

To record the time taken by the user to complete each activity

- Paper

For the user to record their answers, complete background and Post Study Evaluation

- Pencil/Pen

To Write on the Forms mentioned above.

4.4 Subjective Metrics

Background questionnaire:

The Background questionnaire dealt with questions to identify basic details about the user’s gender, age, ethnicity, background. Then focusing on the level of expertise when it comes to shopping websites and cars. Also it focused on their past experience and skill in the field of shopping online.

The questionnaire and the response papers have been attached to the appendix below.

A post session questionnaire consisted of 10 questions on a 5 point scale basis , both positive and negative questions scaled accordingly.

The resulting answers were scored and the resulting table is found in the Test Results section.

It was found that the average usability score for the new prototype was significantly higher than the original website.

4.5 Quantitative Metrics

The two metrics that were used to evaluate the prototype are :

1. **Time on Task:**
   For each task the time taken by the participant was noted down and t-test later revealed that there were immense improvements in task efficiency with respect to time in the newly developed prototype as compared to the older

2. **Successful Task Completion:**
   The scale was just 1 or 0 , pointing to success and failure respectively, at the end of the study based on their answers , it was identified whether they were successful or not and rated accordingly. In case of partial, the decision was left to the researcher.

4.6 Test results

T-test on

For Task 1

Calculation based on Table in Task Analysis section

Confidence interval:

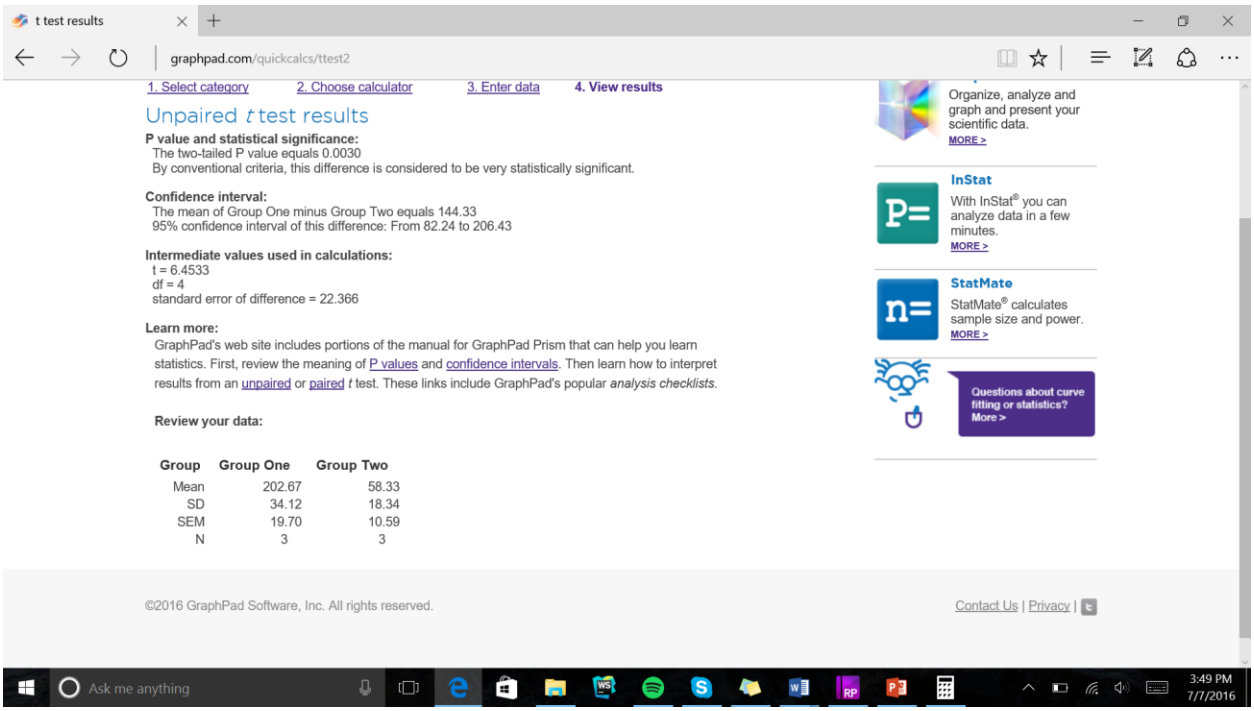
The mean of Group One minus Group Two equals 65.00
95% confidence interval of this difference: From 42.75 to 87.25

t = 8.1109

do = 4

standard error of difference = 8.014

Group	Group One	Group Two
Mean	82.33	17.33
SD	12.50	6.03
SEM	7.22	3.48
N	3	3



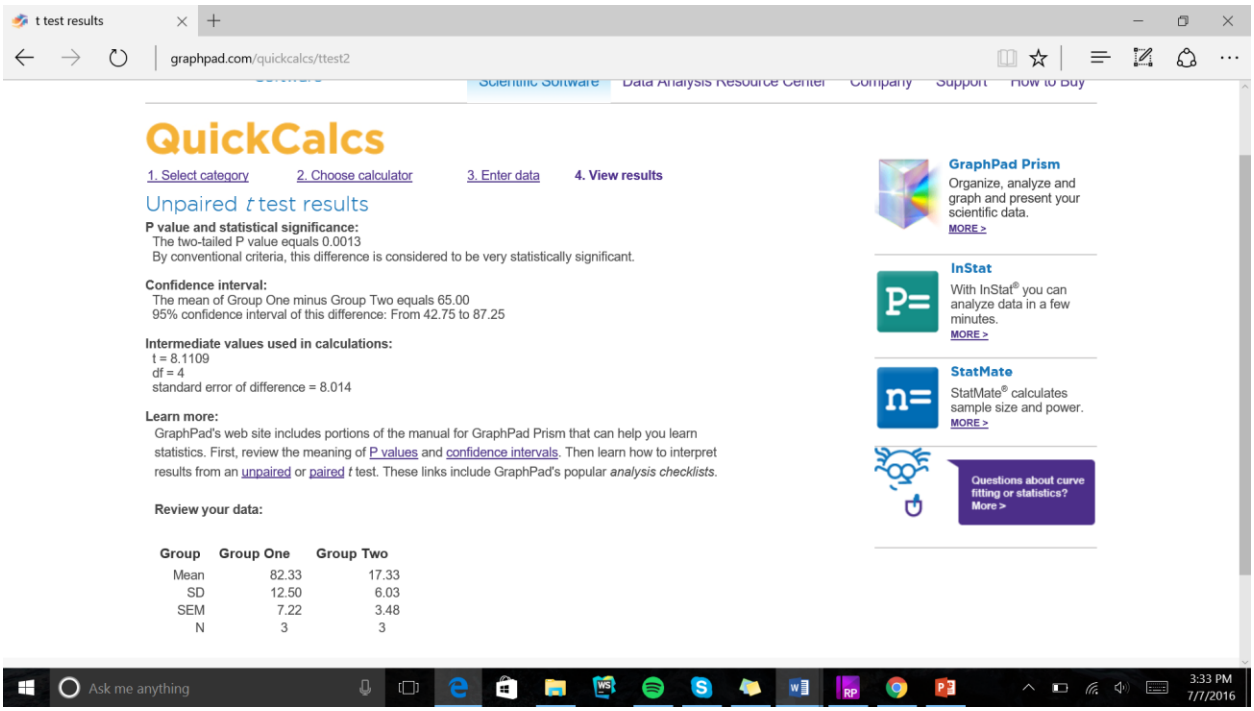
For Task 2

Calculation based on Table in Task Analysis section

t = 6.4533 original :4.6
df = 4
standard error of difference = 22.366

The mean of Group One minus Group Two equals 144.33
95% confidence interval of this difference: From 82.24 to 206.43

Mean	202.67	58.33
SD	34.12	18.34
SEM	19.70	10.59
N	3	3



For Task 3:

t = 4.9864
df = 4
standard error of difference = 3.944

The mean of Group One minus Group Two equals 19.67
95% confidence interval of this difference: From 8.72 to 30.62

Group	Group One	Group Two
Mean	36.33	16.67
SD	6.03	3.21
SEM	3.48	1.86
N	3	3

These are the results of the t-test on the different tasks for the time taken to complete each.

System Usability Scale

System Usability test results

Participant	1	2	3	4	5	6
Question 1	3	2	2	4	4	4
2	2	1	3	4	4	4
3	2	1	3	3	3	4
4	2	1	1	4	3	4
5	2	3	3	4	4	4
6	4	3	3	4	4	4
7	2	1	1	5	5	5
8	2	3	3	5	4	4
9	1	1	1	4	4	4
10	4	3	3	5	3	4
Total	24	19	23	42	38	41
average	2.4	1.9	2.3	4.2	3.8	4.1

5 Conclusions

5.1 Discussion of Results

Based on the Study conducted on Six subjects, three on the original and three on the prototype. The results of the study were confined to two metrics, time to complete each task and Successful completion.

Initially cognitive walkthrough and heuristic evaluation was conducted on both website to identify the flaws and shortcomings , so that it can be improved in the

Hence three tasks were handled here which encompassed the core functionality of the website,

The results of the studies were tabulated and t-test conducted on them and the results showed that the prototype was significantly faster in time and rate of success was much higher.

The Post session feedback from the user also showed a positive jump in the scores for the prototype than the original.

5.2 Lessons Learned

- *One of the important lessons learned was about how to conduct a Study with live subjects and the unpredictability experienced.*
- *How varied users are though they seem similar.*
- *How much effort goes behind the simple buttons we use everyday*
- *How user experience is important in any piece of software*
- *How to evaluate a good piece of design and identify pitfalls*
- *How to improve the performance of a website*
- *How to calculate scores and interpret results of studies*

The next time I make any piece of software or UI , I have learned so much that I would try to avoid every common mistake and the give the user the best experience ever.

I learned that there is more to Software development than just functionality and there is more to UI than just Colors.

5.3 Conclusion

Based on the Concepts thought in class I was able to evaluate the original website and conduct Heuristic and Cognitive Walkthrough, which gave an overall idea about the problems faced by users .

The Core functionalities were identified and these were the tasks that were needed to be improved upon.

A new prototype based on the best UI design principles was designed and tested against 6 similar yet varied users and the results were tabulated and math magic on that revealed that the new prototype beat the original in performance, time and success.

So I can fairly say that my prototype came out the way I imagined and was a success. I am particularly proud about certain styles I implemented which I have always wanted on the websites I use, such as the pop up pane , and the ratings, which I was able to deploy in my prototype.

6 Appendixes