Academic Year	Module	Assessment Number	Assessment Type
Spring 2021	Human Computer Interaction	1 (Task 1)	Individual Report

Report on Usability of Website

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1. Introduction on Usability

Usability is the term that defines the effectiveness, efficiency, engagement, faultless and user friendliness of a product with respect to its consumers. The term is often used in relation to software applications and Web pages in information technology, but it may also refer to any product that is used to complete a task for example, a fan, a microwave, a dish washer, or a motorcycles dashboard. The word usability refers to a feature of user experience design. Usability follows utility and comes before desirability and brand experience which puts it in the second level of user experience (UX). (Litwin, 2018)

The components that make up usability are listed as follows:

1) Effectiveness: While users are using the product, which is well focused in usability, the product assists users in correctly performing tasks.
2) Efficiency: People want their work done as fast as possible so the product must make sure that users can complete tasks easily by following the simplest procedure.
3) Engagement: User should be able to find the product pleasant to use and suitable for the market.
4) Error Handling: Users make a lot of mistake while using the product so the product must focus on how fast and easy the user can get their error fixed.
5) Ease of Learning: Users whether be it frequent or new users can achieve goals quickly and even more quickly on subsequent visits.

2. Importance of Usability in Web Application

In context with website design, usability is the heart of website's user experience. For instance, if the platform is simple and pleasant to use, people stay longer using it. When they first come across a user interface, users should be able to navigate around without relying on other's expertise to achieve their goals. Users gets irritated when they can't find the information they need. Website's bounce rate will rise as the product becomes more difficult to use. An unpleasant user experience can lead to less subscribers/user's referral and even less usage. However, the website which is designed with high usability, users are guided through the simplest and least time-consuming direction and make sure user locates the details that they need more quickly, increasing their likelihood of returning or even purchasing the product.

3. Literature Review

3.1. Comparative Study for Evaluating the Usability of Web Based Applications (Ramandeep Kaur, 2018)

Success of any web application is based upon the satisfaction of user so the user interface should be according to users need. Variety of user interfaces are available nowadays to interact with the users. The user-system interface has a significant impact on system approval, as well as the user's faith and pleasure. The user's satisfaction is must so varieties of user-friendly interface are being developed day by day, so more the quality of the user interfaces more is the user satisfaction on the basis of different parameters. Usability allows one to determine if user interfaces are effective enough and can easily meet the demands of users. One can measure, how user friendly is the interface by using usability evaluation methods and usability testing techniques which helps us to locate flaws in user interface. Usability testing is a tool for determining how easily a product can be used by taking into account direct observations and interactions with potential consumers. During usability testing, the user's comments, actions, and perspective during the task, as well as their views on technical advancements, are all factors that are taken into account.

The paper uses both qualitative and quantitative data to measure the customer's satisfaction with the interface. The different types of user interfaces were evaluated in this paper based on user criteria such as interactivity, ease of use, security, and availability, as well as technical aspects such as languages used, testing methods, OS compatibility, and so on. The conventional observational approach has been used to evaluate the usability of various web applications and websites. Faculty members and

students of Lovely Professional University were actively involved with the questions related to usability effectiveness, interactivity, design, popularity level and ease of use of interfaces where personal observations are taken into account as well. Different website and application were used to collect data based on these findings. For comparative analysis, famous interfaces are evaluated on the basis of common parameters such as Compatibility with iPhone/smart phone/tablet/other device, Online help center, Search bar, Complaint systems, Testing techniques, Feedback form, Security process, Network performance, Security algorithms, Languages used, User friendly interface, Data Base used/Back end, Scalability and Scalability. The comparison of interfaces is shown in the table below,

Sr. No	Parameters For evaluating the usability	Paypal[19]	Facebook [20]	Pay anywhere [21]	Western Union [18]	Skype [22] [15]	Whats app [23]	eBay[24]
1	Compatibility with iPhone/smart phone/tablet/other devices	Not supported on Android tablets	Some compatibility issues with Android	Some compatibility issues with Android	iPhone, iPad, iPod Touch and Android phones & tablets	Some issues with Windows	Not support tablets, computers, or Wi-Fi only device	Some problems with IE browser
2	Online Help center	Yes	Yes	Yes	Yes	Yes	No	Yes
3	Search	Yes	Yes	No	No	Yes	Yes	Yes
4	Complaint System	Not Up to the mark	Good	Not good	Not so Good	Not satisfactory	Not very Good	Not very Good
5	Testing Techniques	With the PayPal Sandbox URIs to live URIs	PHP Unit and Watir	Beta Testing	QTP	M-cux Test [16]	Boundary value Analysis	With the eBay Sandbox Environment
6	Feedback Form	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	Security Process	Good	Not up to the mark	Good	Issues related to security	Not upto the mark	Some Issues are there	Not up to the mark
8	Network Performance	High	High	High	High	High	HIgh	High
9	Security Algorithms	128-bit strong SSL encryption	Conceal Cryptocat	Roamdata	Adcance SSL encryption	256-bit AES	AES-192	Hashing
10	Languages Used	ASP.Net,C++ Builders,Java, PHP,	Java Script, HACK, PHP, JAVA, C++, PYTHON, ERLANG, XHP	Objective C, SDK,Java	Java Script, Java, C++	PASCAL, Delphi	Erlang	C/C++, XSLT,java
11	User Friendly Interface	Yes	Yes	No	No	Yes	Yes	Yes
12	Data Base Performance/Back end	MY SQL	MY SQL	MY SQL	MY SQL	MY SQL	Mnesia(database) /SQL	MY SQL
13	Scalability	5 Million tpd	829 million DAU	2 million users	Millions of users	4.9 Million DAU	600Million users	1 billion tpd
14	Availability	203 countries and 26 currencies	Banned in several countries	United States	200 countries and territories	Worldwide	Worldwide	Worldwide

Figure 1

Flaws were found in many of these observations, some were lacking in one feature and some were lacking in another but they can always be improved. There are many interfaces available for every age group of people however, one interface cannot satisfy all users, but they can be improved so that each interface can satisfy as more people that they can. Designers can use usability evaluation and usability testing techniques to identify issues in web applications or websites. Many of these problems can be overcome by modifying the website's architecture and testing techniques. If proper testing techniques are used from the beginning to the end of the production period, these types of small and large problems may be managed ahead of schedule.

3.2. Characteristics of web applications that affect usability (Vince Bruno, 2017)

A software application program that is created specifically to run in a web-based environment is known as web application. A web application allows information processing functions to be started from a browser and run on a web server, application server, and/or database server. Web usability refers to a web application that can be used by a specific group of users, with specific training and assistance, to complete a specific set of tasks in a specific set of scenarios, with the interaction being evaluated by a set of usability attributes. Users, tasks, technology and context are the four common factors that influence the interactive system's usability.

The study looked at the literature to see what aspects of web applications have an effect on usability. Each web application feature can reflect a range of possibilities with varying degrees of impact on the web application's usability. The four factor that have impact on usability with their review are described below,

i. Users: For a particular web application, different users group come into account for instance, primary users, secondary users, user communities, users as buyers, and surrogate users, these users' knowledge can further be categorized new comer, advanced beginner, skilled performer, and specialist, so the web application must be designed in such a way that every user can use it easily that is here, ease to use is important usability feature.
ii. Task: The type of task and its complexity, the manner in which the operations are carried out, as well as the interface's architecture have an effect on usability. Web application is constrained by the

technological aspects for the interaction style that can be used. Every one of these qualities straightforwardly influence the learnability, productivity of utilization and subject fulfillment ease of use credits of web application's convenience.

iii. Technology: Through the architecture built with the tool, the tools used to implement a web application will determine the degree of usability that is achievable. In web applications, technical characteristics have a greater impact on usability than in conventional applications. The architecture of a web application can be more distributed and reliant on a wider range of technologies. Because of the wide variety of web-enabled devices, ownership and machine variables must be taken into account when assessing web application usability.

iv. Context: An industry classification is a feature of a web application that illustrates the unique requirements of a particular industry in terms of usability. The context of the world in which the users communicate is given by an industry classification. The contextual properties of a user communicating with a web application differ from one web application to the next. The background of the consumer allows for recognition and personalization. The characteristics of a web application are contextual properties, customization, and industry classification that allow the environment to be customized to the users, their tasks, and the technology that supports interaction. These contextual characteristics can help us concentrate on usability attributes more effectively.

The characteristics of a web application encompass a broader set of stakeholders, a broader set of tasks and interaction types, a more diverse technical infrastructure, and a broader set of contextual issues then

compared to traditional application. The web application characteristics can be used to assess the usability attributes, and on the other hand, essential usability attributes will determine what features a web application should consider.

3.3. Product Review

3.3.1. Sastodeal (sastodeal.com)

Sastodeal is an ecommerce company that began its journey in December 2011 that first worked on broken furniture and chairs and worked hard. Today it is one of the leading ecommerce companies in Nepal with millions of customers and thousands of partners all over Nepal.

3.3.2. Nabil Bank (nabilbank.com)

Nabil Bank is the first private sector bank which was started in July 1984. Via its 118 points of representation, Nabil Bank offers a wide range of commercial banking services. Nabil bank is completely equipped with cutting-edge technology, including foreign banking software that enables E-channels and E-transactions.

4. Analysis

The Eight Golden Rules of Shneiderman and the Ten Usability Heuristics for User Experience by Jakob Nielsen's are two of the best rules and concepts for making a program, website, or interface more functional, interactive, and efficient. Here we are using these rules to analyse two website that is sastodeal.com and nabilbank.com.

4.1. Analysis using Shneiderman's Eight Golden Rules

i. Strive for Consistency

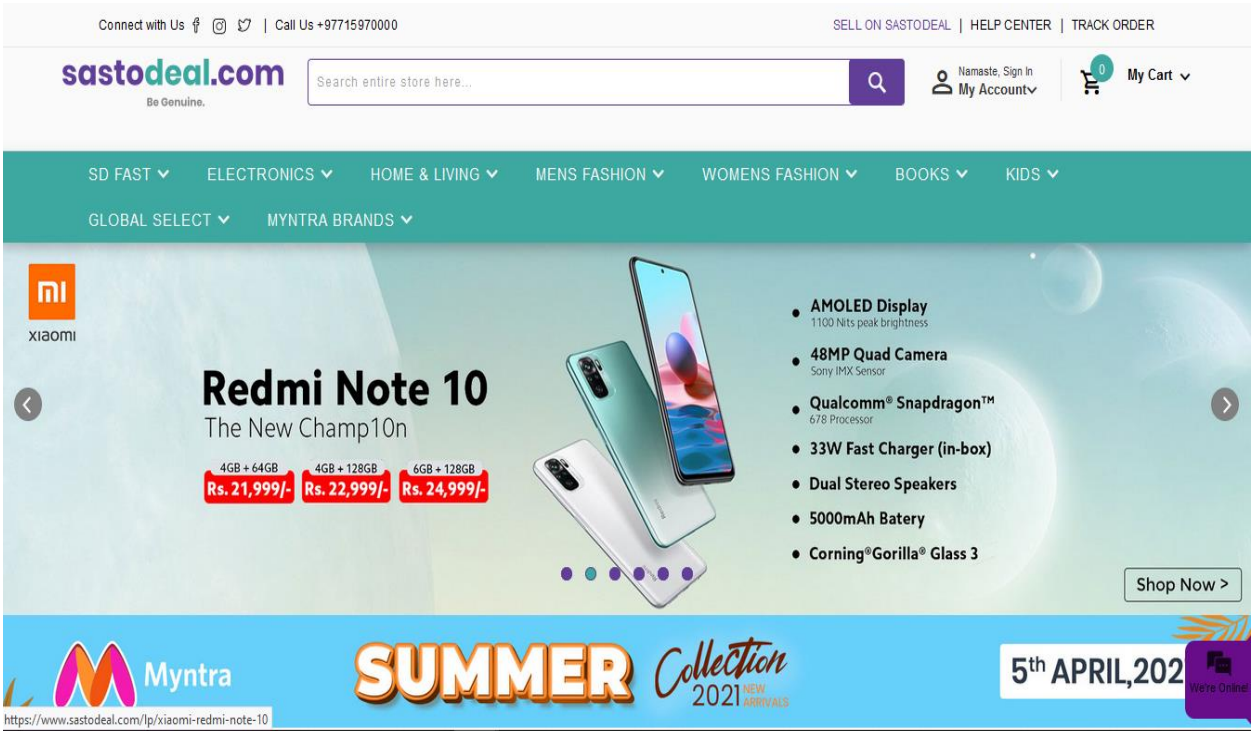

Figure 2

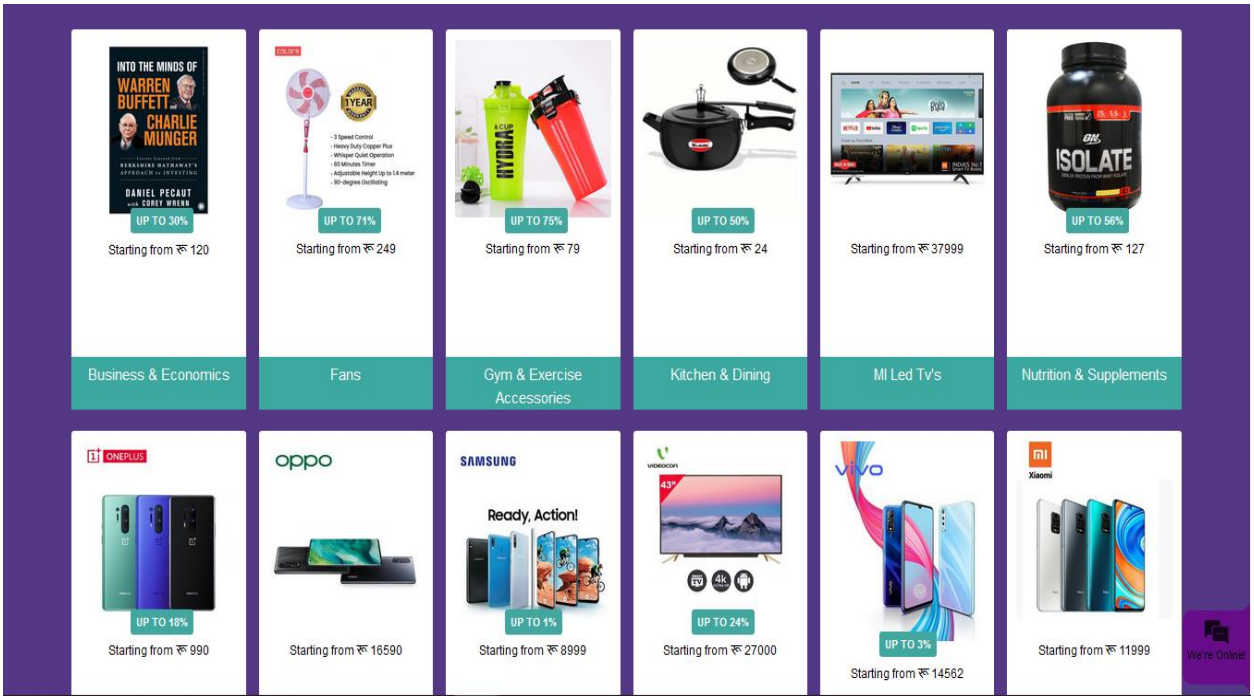

Figure 3

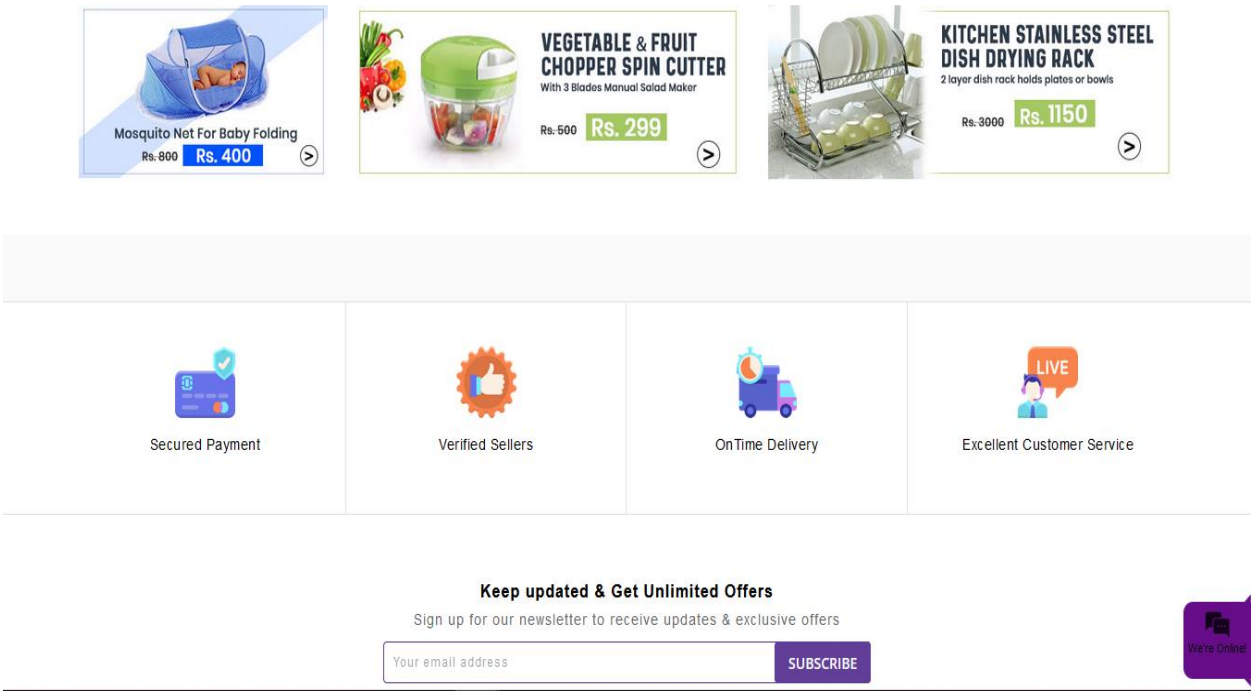

Figure 4

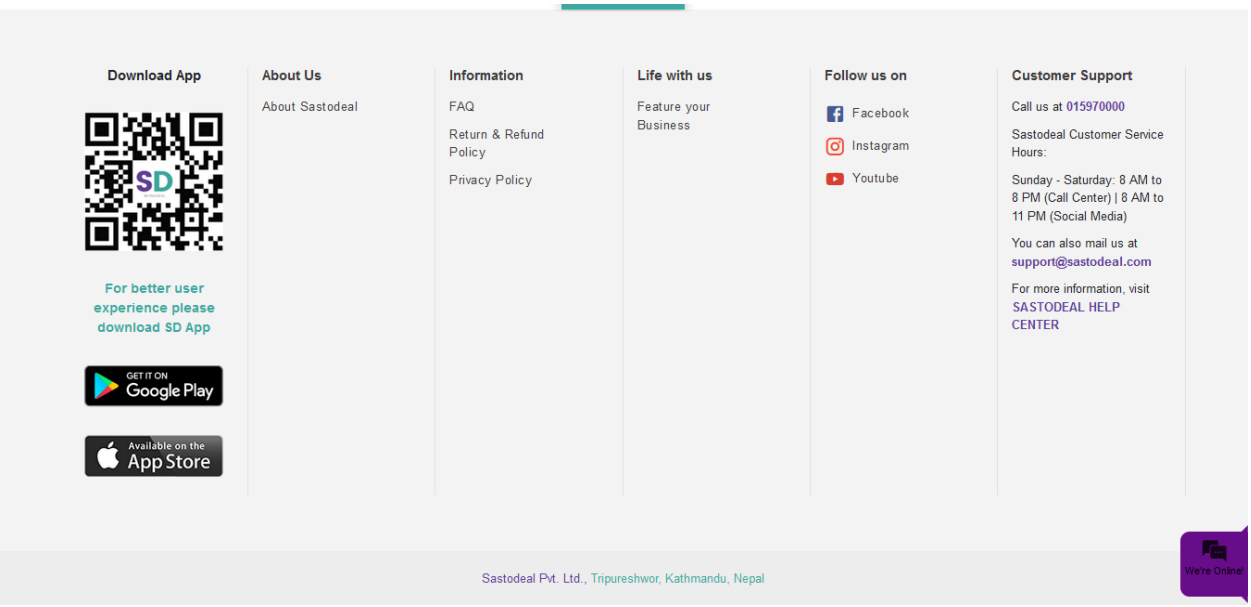

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Figure 6

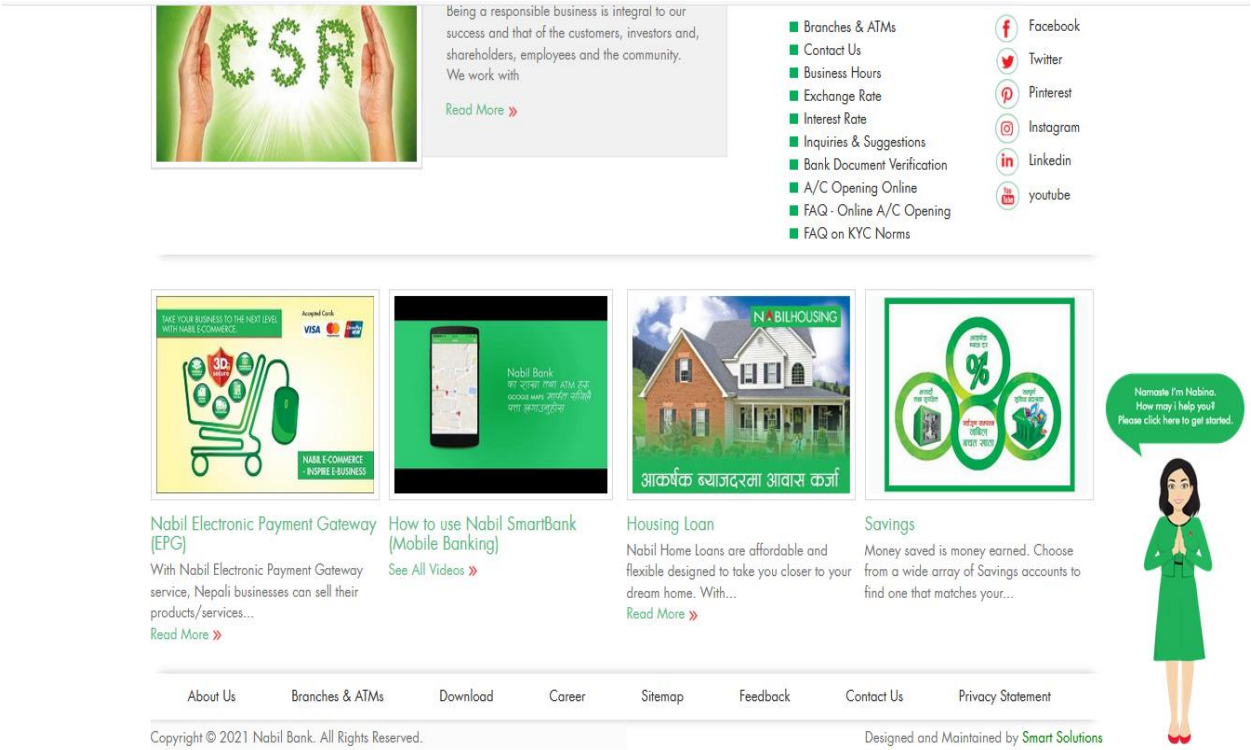

Figure 7

Here, both website sastodeal and nabil bank, have proper side spacing, icons, colors, menu hierarchy, call-to-actions, and user flows are all properly managed. Which assists consumers in becoming more comfortable with product's digital environment, allowing them to accomplish their objectives more quickly. Hence, each website follows first rule of Shneiderman's Eight Golden Rules.

ii. Enable Frequent Users to Shortcuts

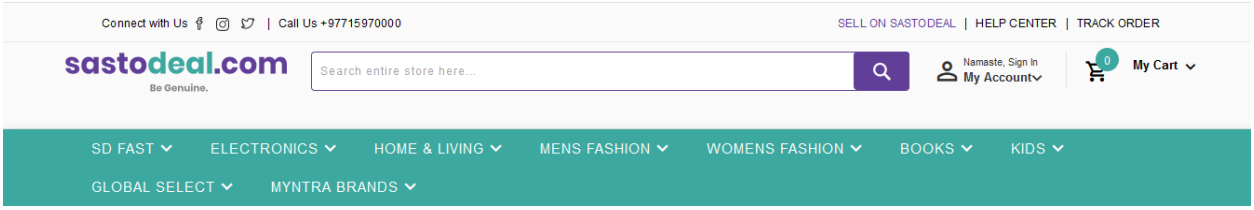

Figure 8

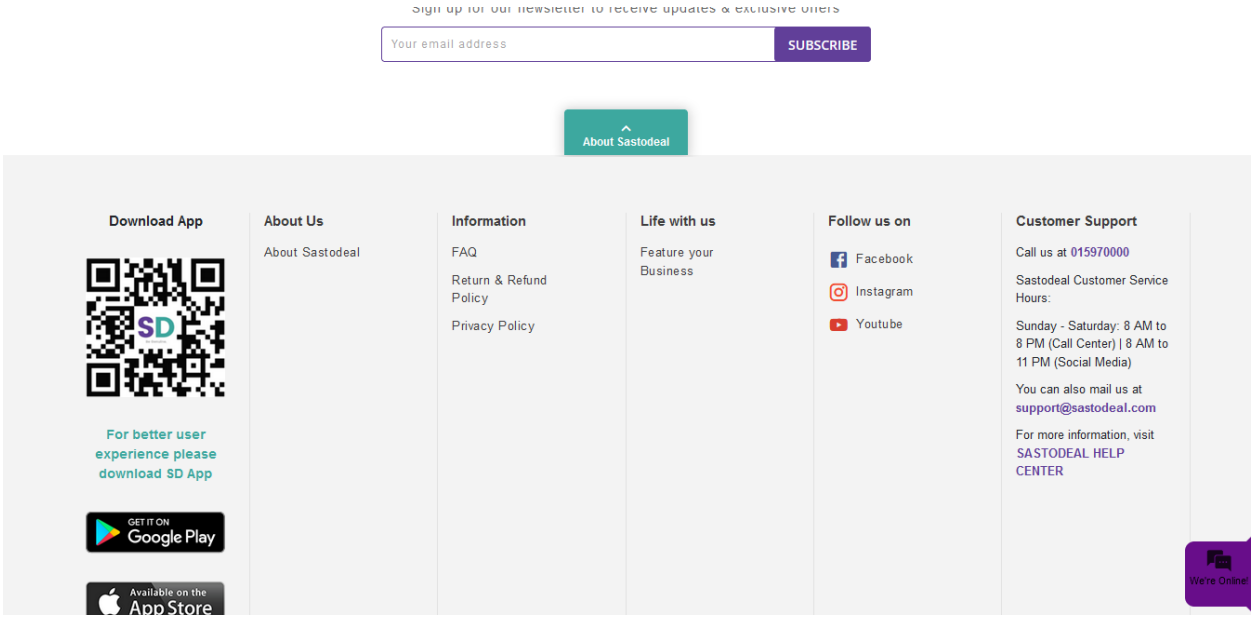

Figure 9

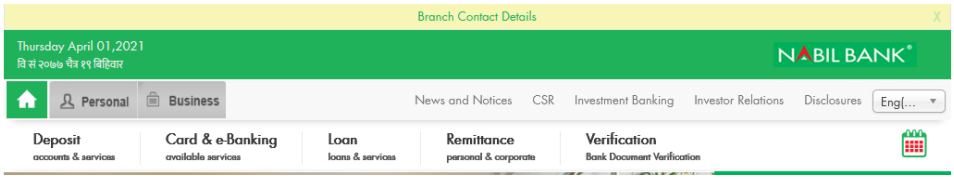

Figure 10

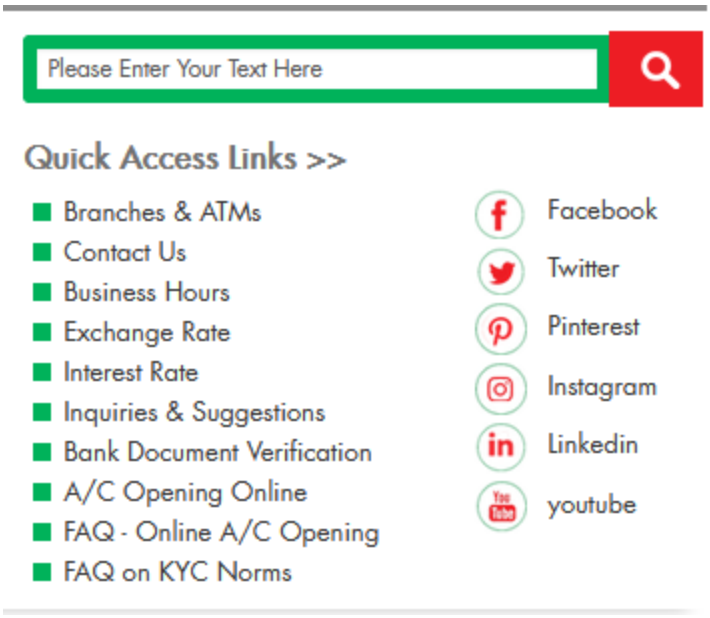

Figure 11

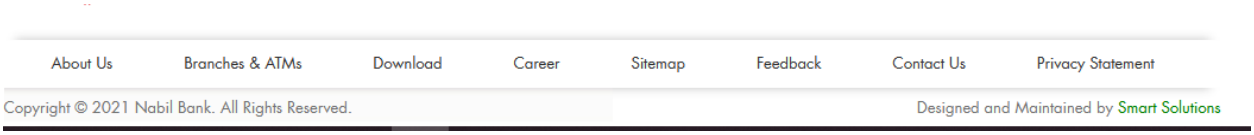

Figure 12

Here, both the website have proper header and footer, which include shortcuts to be used for users. Sastodeal have search options, links to respective items that the users are interested to and contact information, likewise nabil bank also have such options in their header and footer, furthermore they also have link to different hyperlinks on their body page as well which makes user to quickly achieve their goals.

iii. Offer Informative Feedback

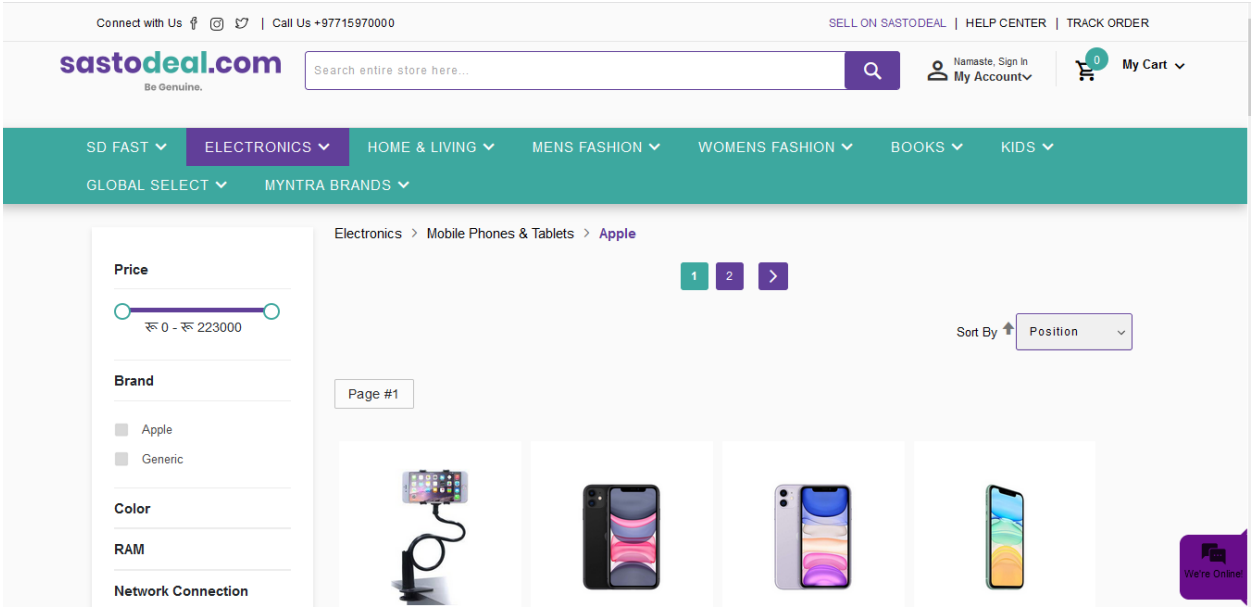

Figure 13

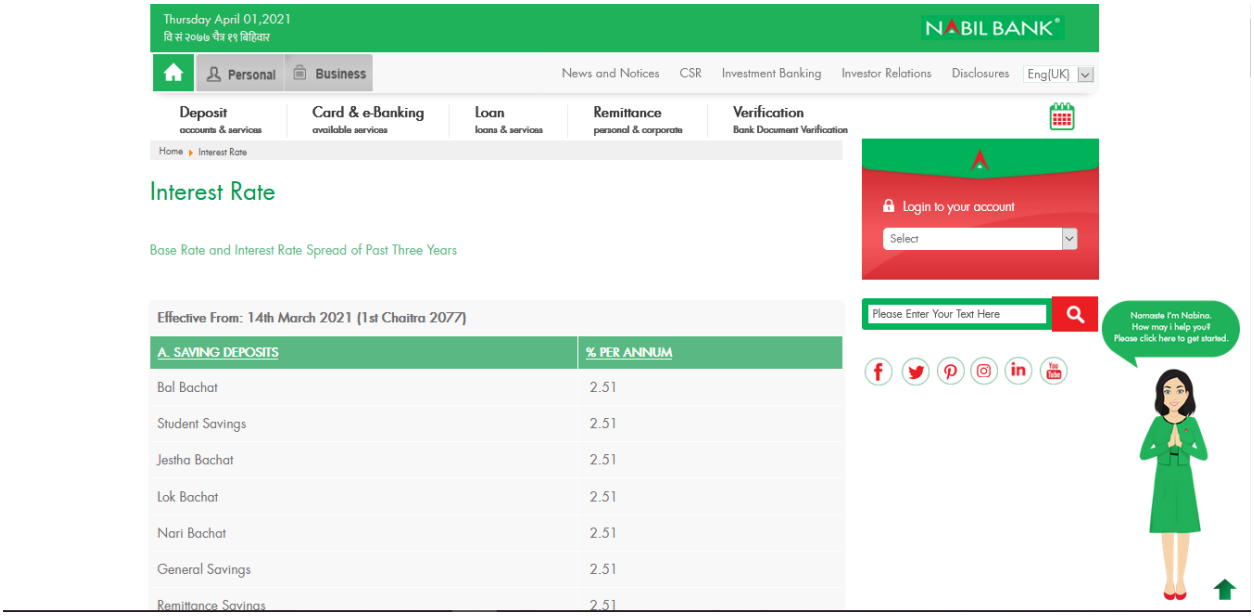

Figure 14

Here, both the website give us information on where we are currently, for instance when we click on electronics section, and the page reloads, the electronics heading is highlighted in purple color which gives us the information of header we are inside likewise in nabil bank's website when we clicked one of the quick link (Interest Rate), just below the header we are shown that we are inside Interest Rate page which is inside home. At all times, consumer can know where they are and what is going on.

iv. Design Dialogue to Yield Closure

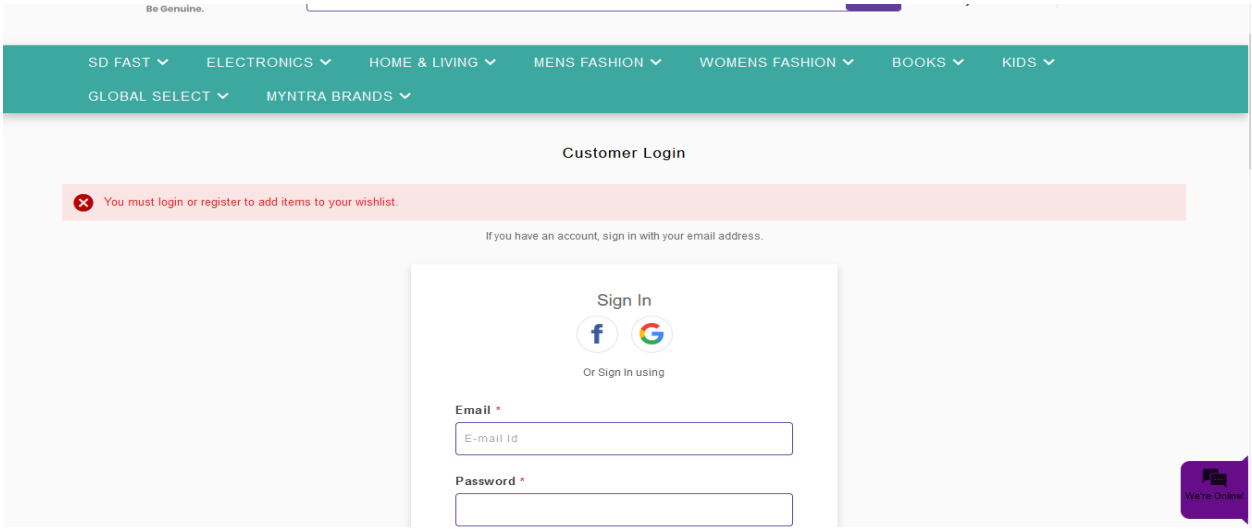

Figure 15

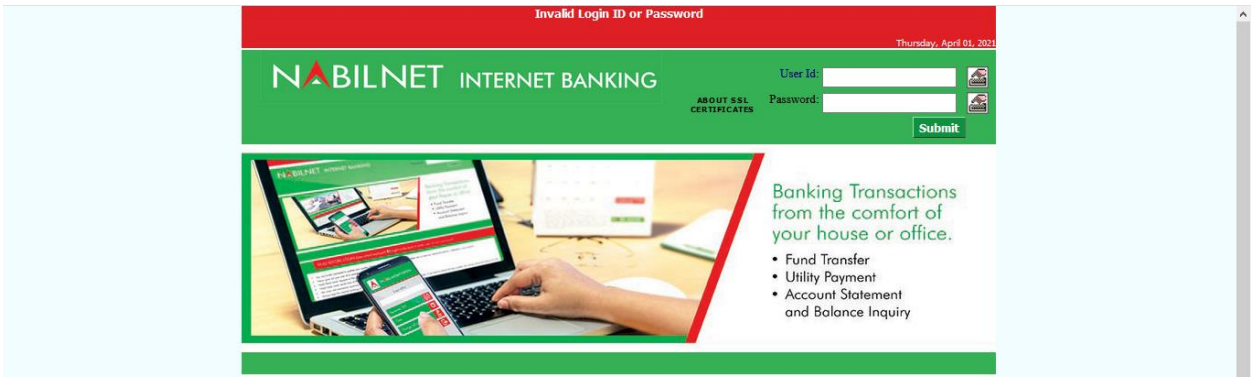

Figure 16

Here, both website informs them of the consequences of their actions through messages, highlighted in red color which is properly visible. In sastodeal website when we tried to add item to wish lists without signing in, the website gave message that “You must login or register to add items to your wish list” and opened the sign in page, and similarly for nabil banks internet banking, when we typed incorrect username and password, it informed the user that the typed username and password are incorrect

v. Offer Simple Error Handling

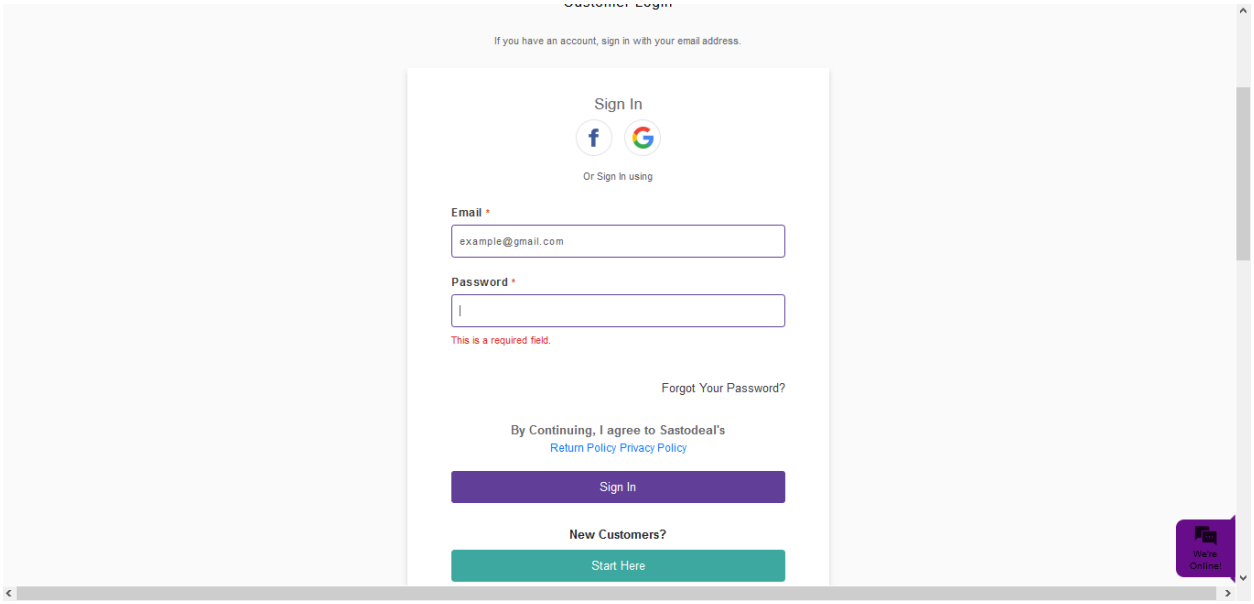

Figure 17

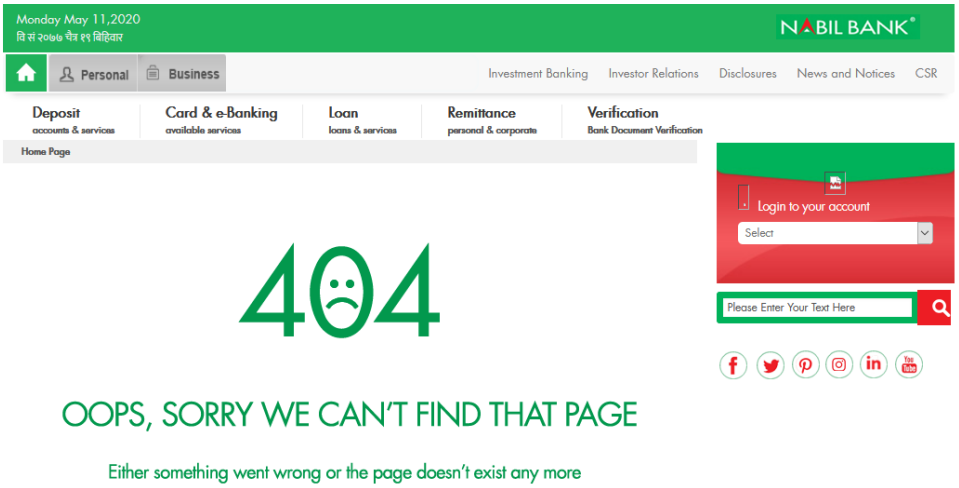

Figure 18

Here, both website handles error properly, for example, in sastodeal website if we try to login with only email if then, it informs users that password is also required. In the same manner nabil bank's handles error by presenting the pang not found or it doesn't exist anymore when we use wrong url. When inevitable error occurs, both website made sure users are given short, intuitive step-by-step instructions for quickly and painlessly resolving the issue.

vi. Permit Easy Reversal of Actions

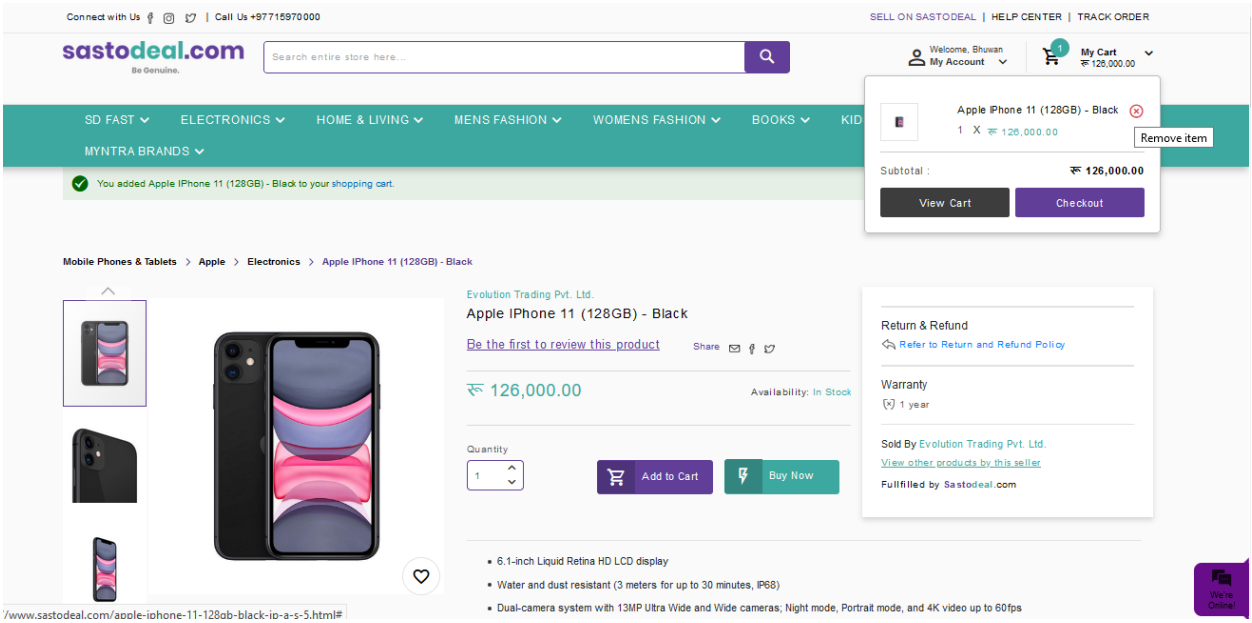

Figure 19

In sastodeal's website we can remove items from cart after adding it to cart. It is possible for user to cancel their selected product at any time which enables users to have freedom. However we couldn't find any feature that supports reversal of action in nabil bank's website.

vii. Support Internal Locus of Control

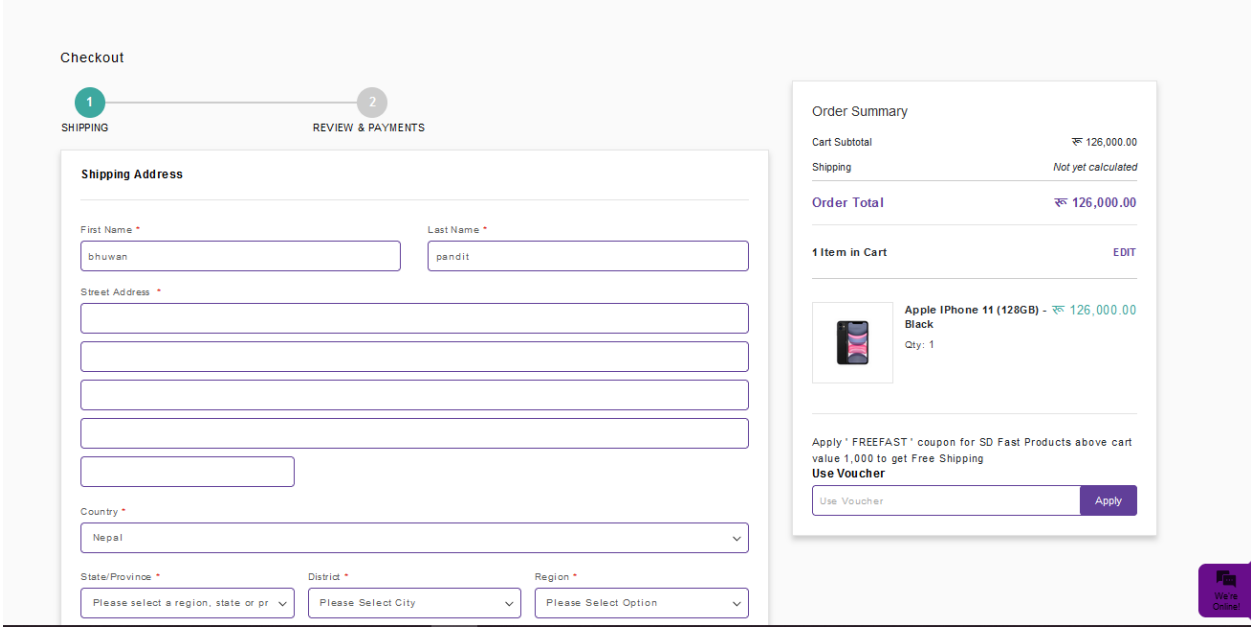

Figure 20

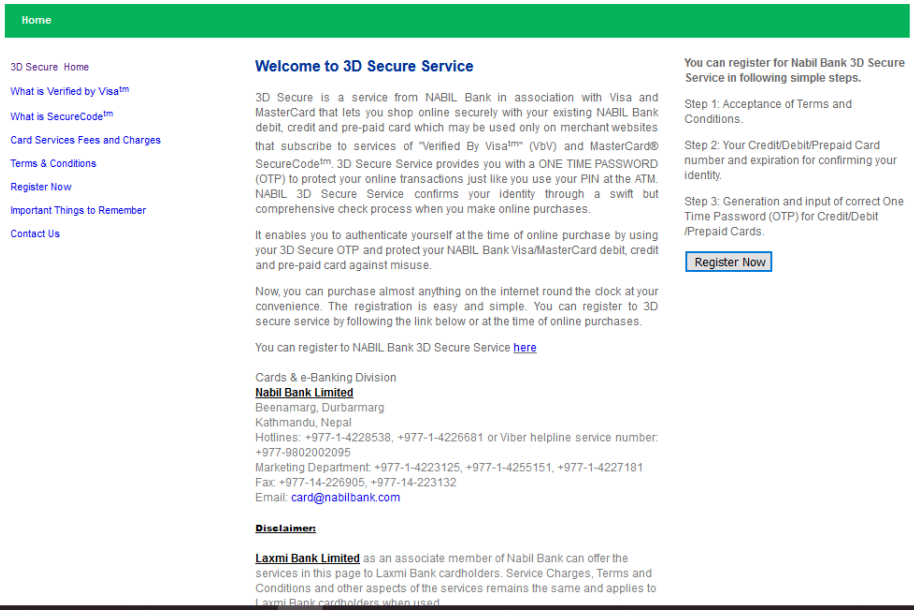

Figure 21

Here users are in complete charge of activities taking place in the digital world, as they can do as they please. In sastodeal website even after going to checkout page, customer can edit their cart at the last moment as well. Similarly, nabil bank allows users to register different services through its online portal.

viii. Reduce Short-term Memory Load

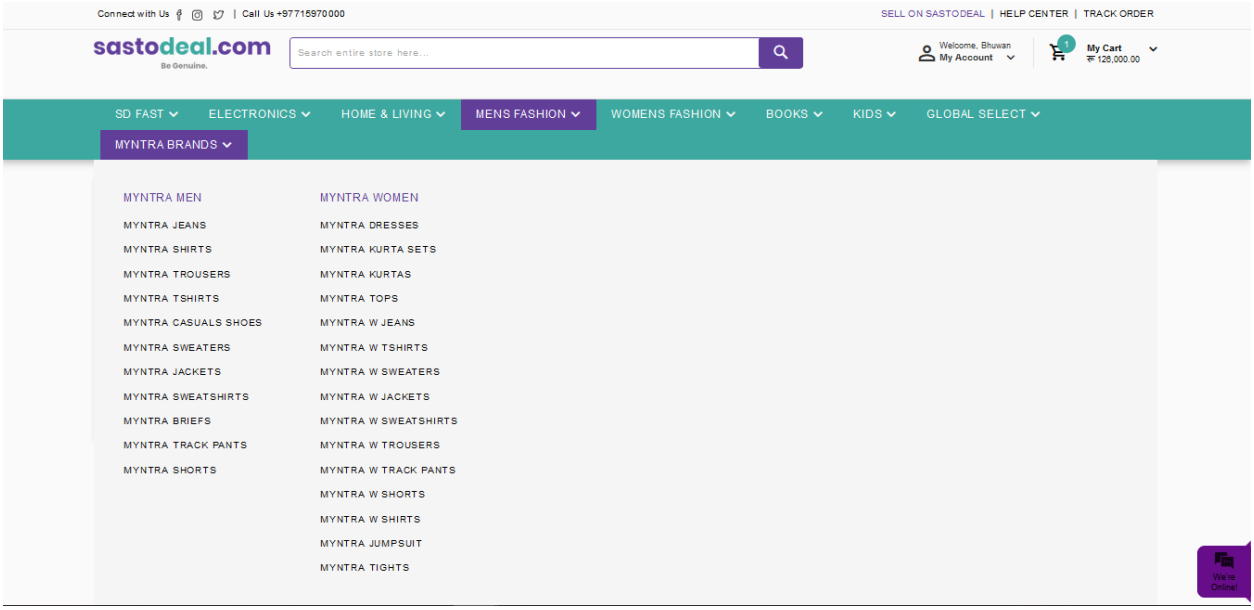

Figure 22

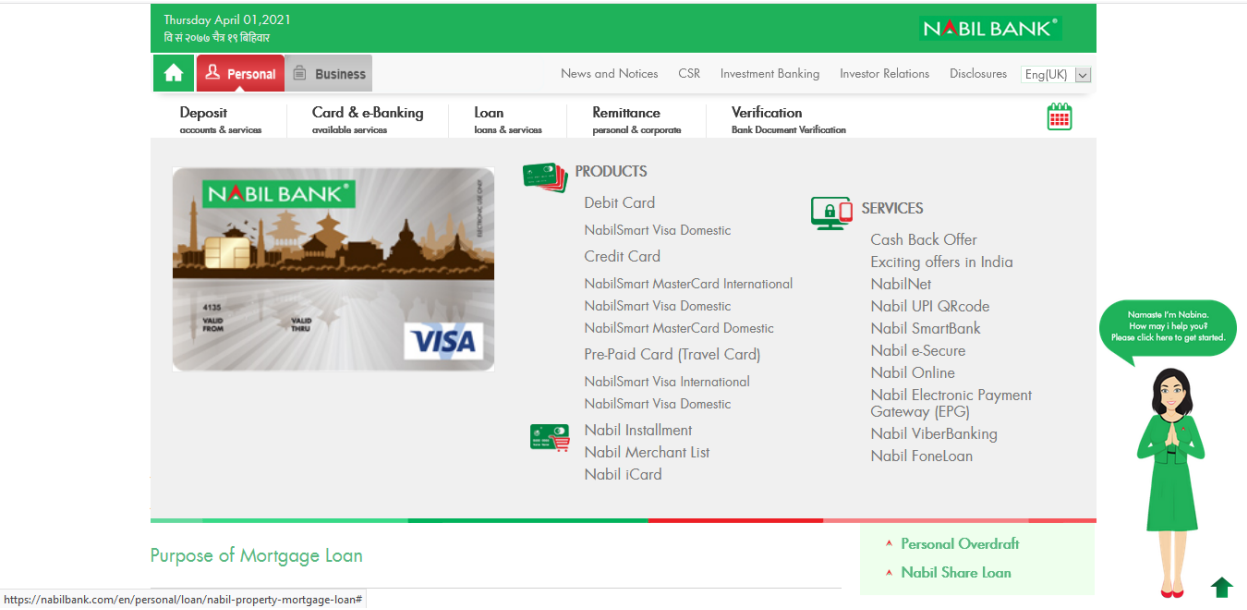

Figure 23

Here, both website have lots of information upon different topics, however they are properly managed by giving heading to the respective fields in the menu bar and when we try to hover in those field, we are given with subheadings. This decision takes into account not just the memory load, but also the performance of the system.

4.2. Analysis using 10 Usability Heuristics for User interface by Jakob Nielsen

i. Visibility of System Status

While checking , both the webiste thorughly, we could not find the function that gives user with the visibility of system status as while moving from one pasge to another or clicking on anything, any message is not shown but the page is directly opened.

ii. Match between System and the Real World

Here, both the system provides us real world experience. Sastodeal’s return policy and nabil bank’s informative feature provides users to experience real world interaction in the internet.

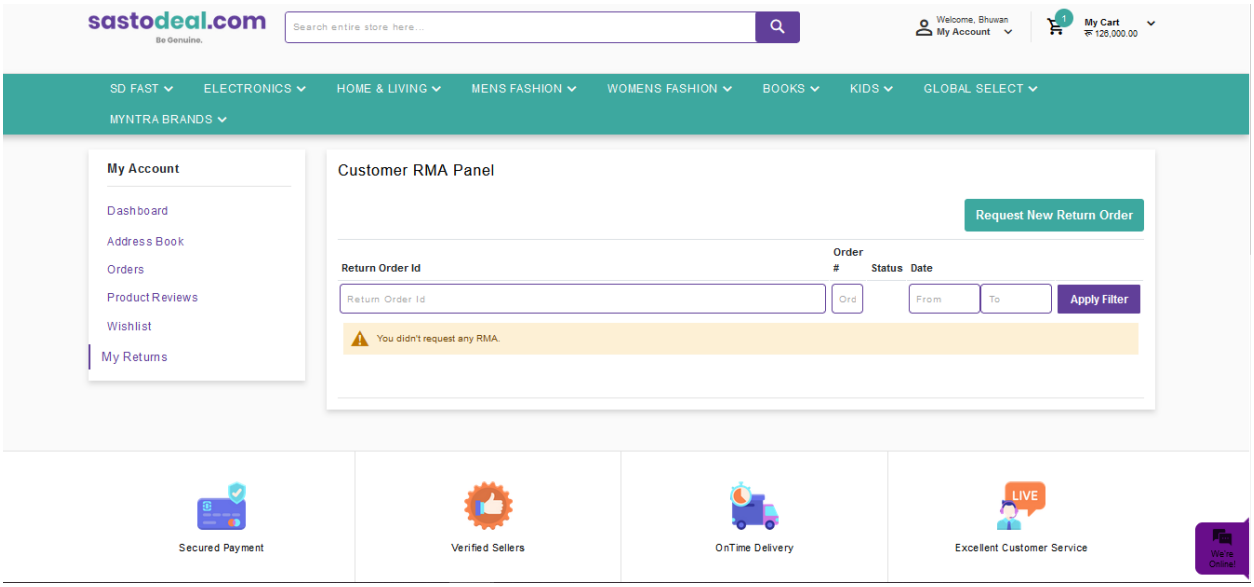

Figure 24

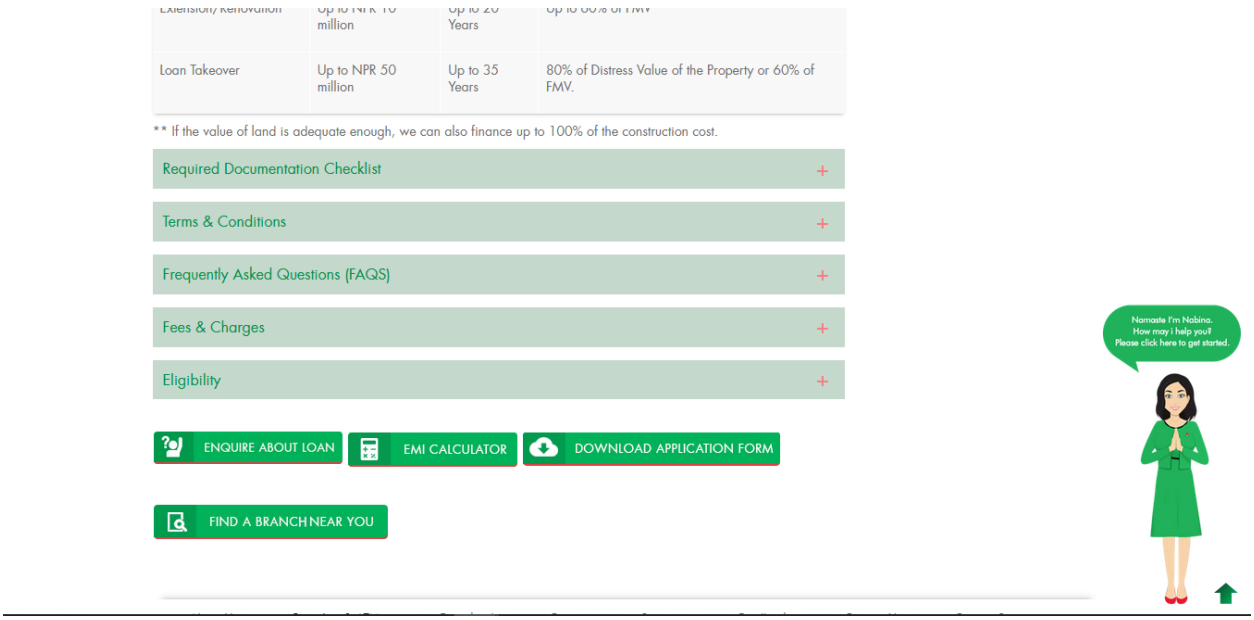

Figure 25

iii. User Control and Freedom

This theory applies to allowing the user to access and perform actions on their own. The ability to revoke some unintentional behavior. Sastodeal have this feature by allowing users to cancel their orders any time however, nabil bank's website doesn't have this feature.

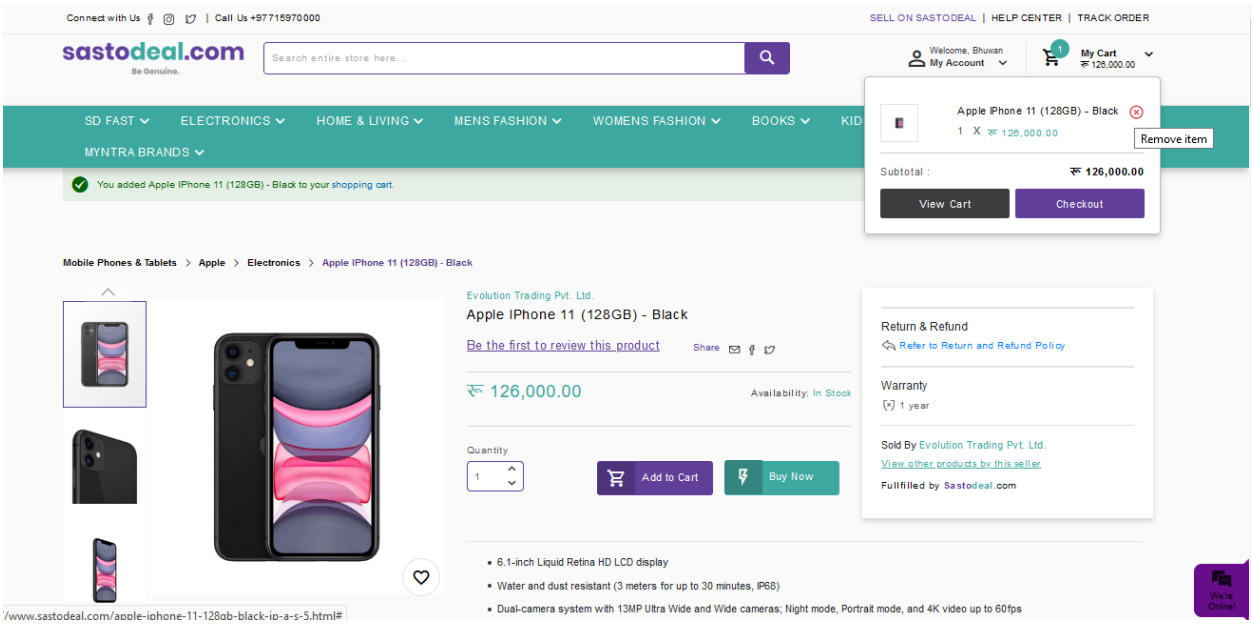

Figure 26

iv. Consistency and Standards

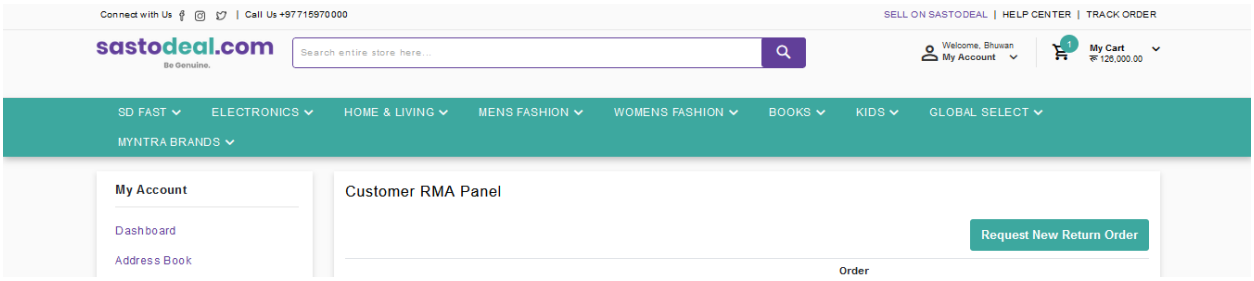

Figure 27

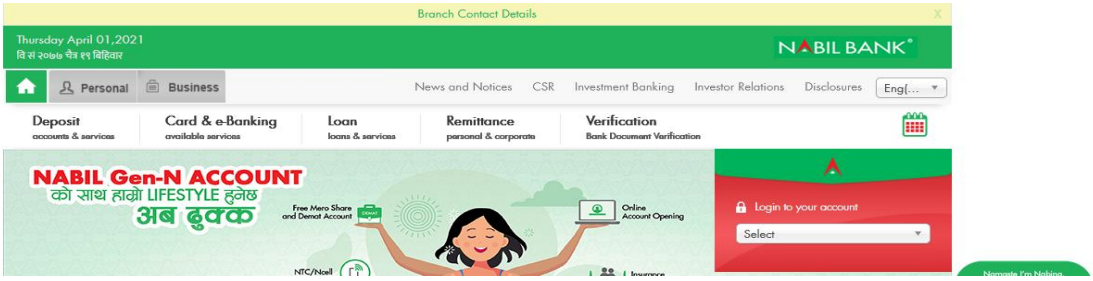

Figure 28

Both website, sastodeal and nabil bank, follows this rule as they have their website well managed and have followed the standards by having search bar at the top of the page, sign in options to the left of the search bar, menu bar just below search bar and so on.

v. Error Prevention

Sastodeal and Nabil Bank have properly handeled error in their web page and providing users with the information what to do next.

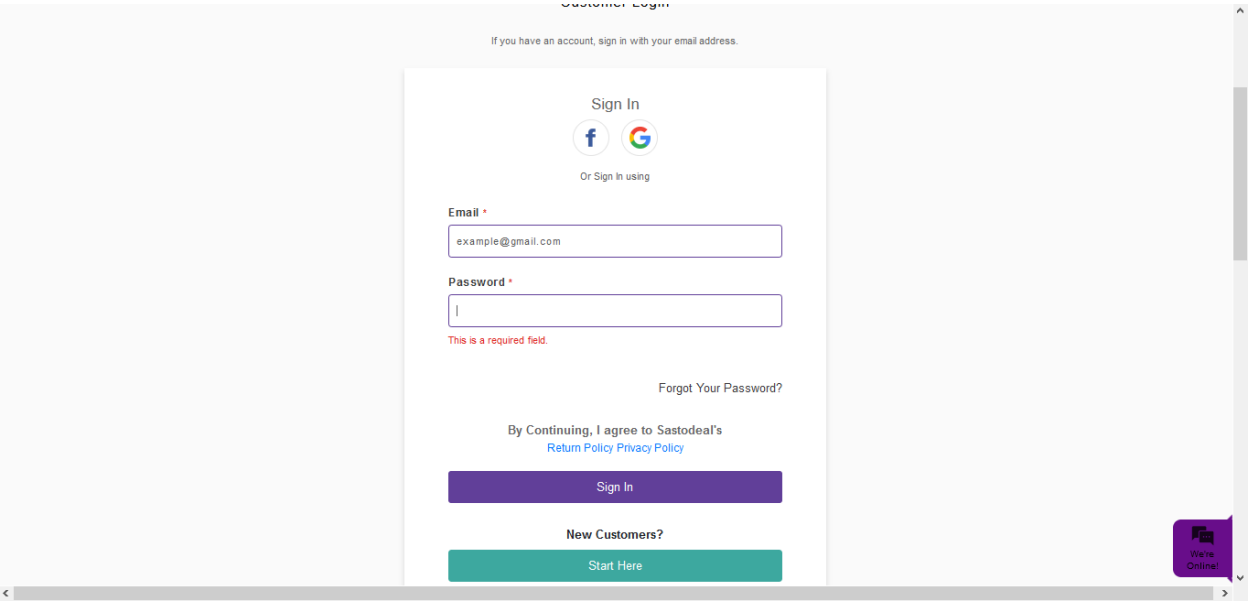

Figure 29

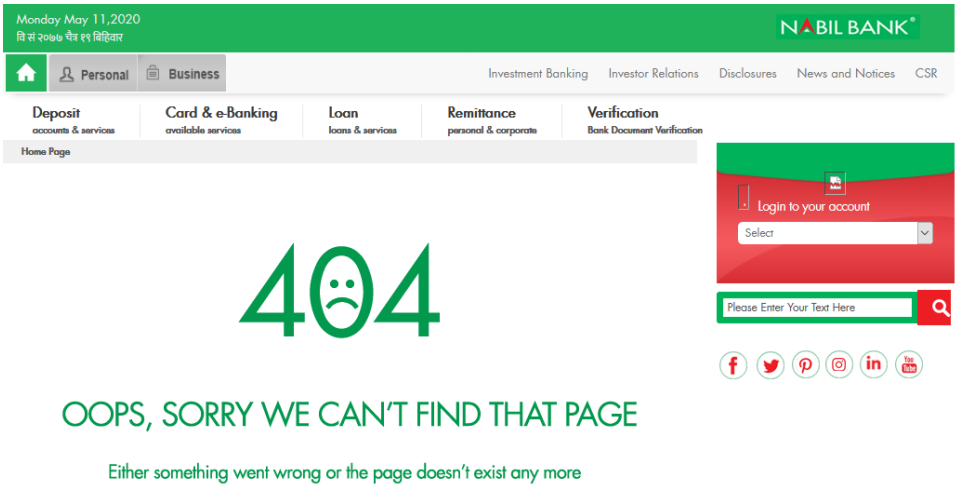

Figure 30

vi. Recognition rather than Recall

While going through both website, we could only find this function applied in sastodeal's website as it gives suggestion of what might be the user searching of however we could not find any of these feature in nabilbank's website.

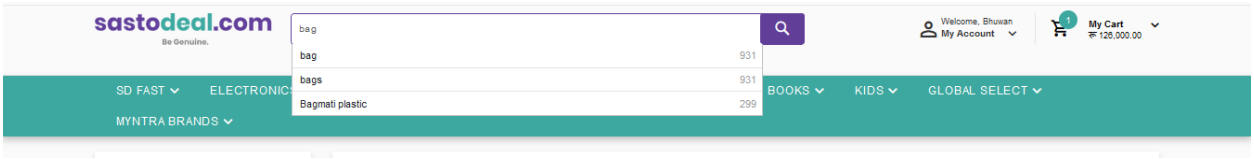

Figure 31

vii. Flexibility and Efficiency of Use

Users, are constantly guided while using both sastodeal and nabil banks website. They have options available at each step, either to buy a product in sastodeal or to verify document in nabil bank.

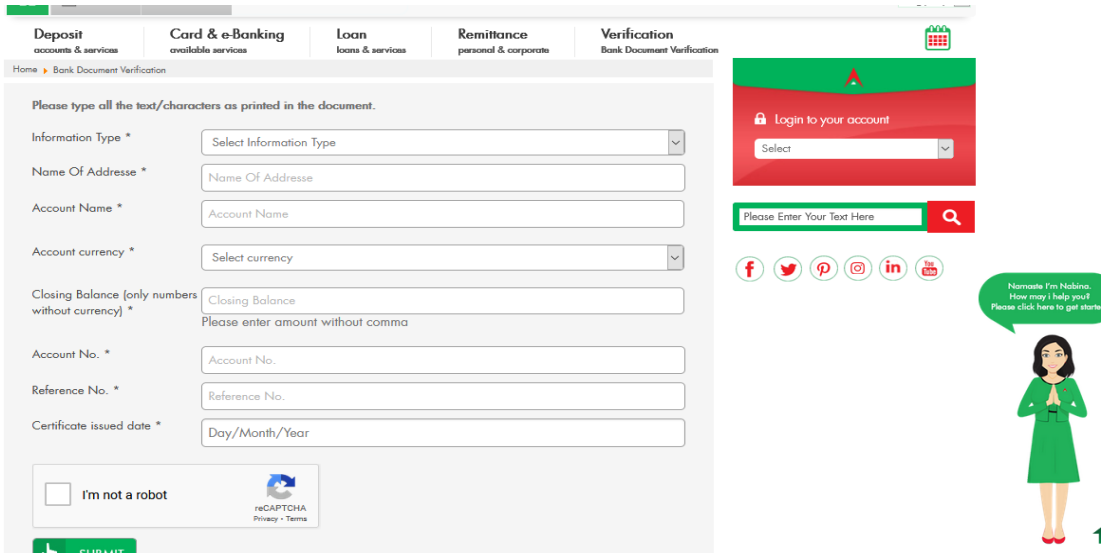

Figure 32

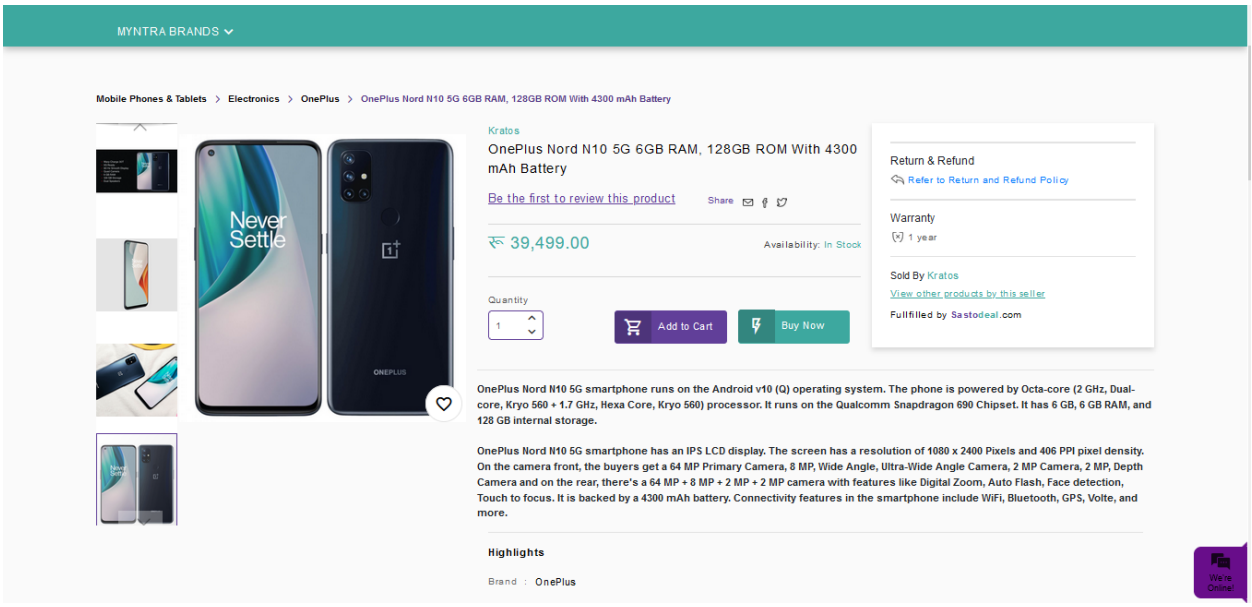

Figure 33

viii. Aesthetic and Minimalist Design

Here, both the website have more design however, every piece of information that is being displayed is relevant.

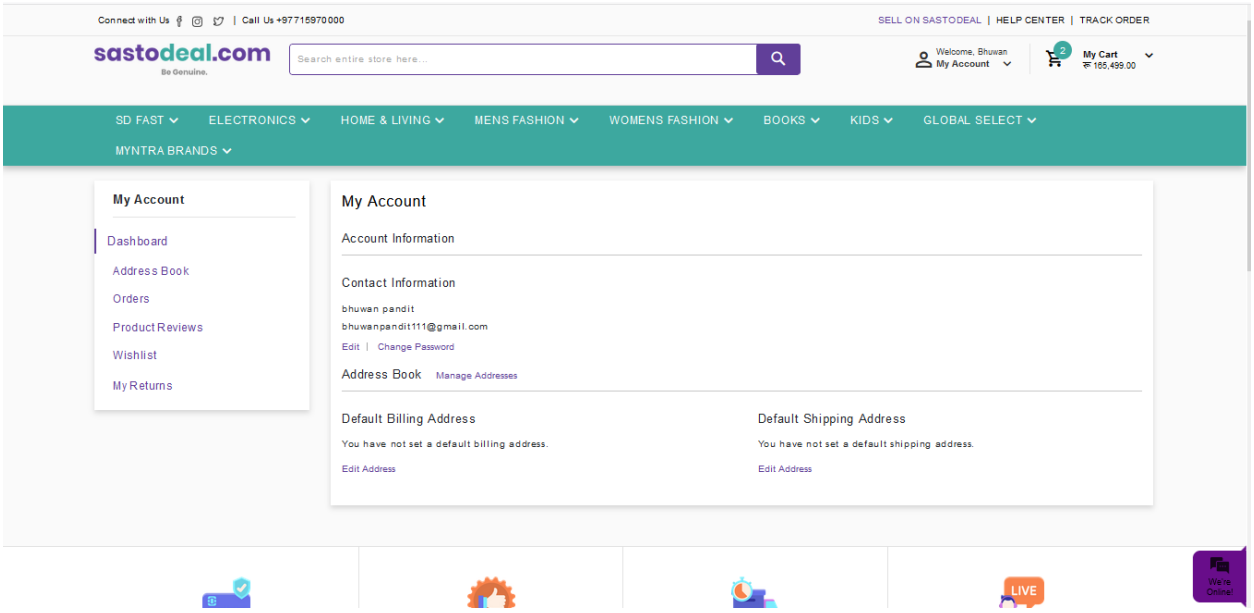

Figure 34

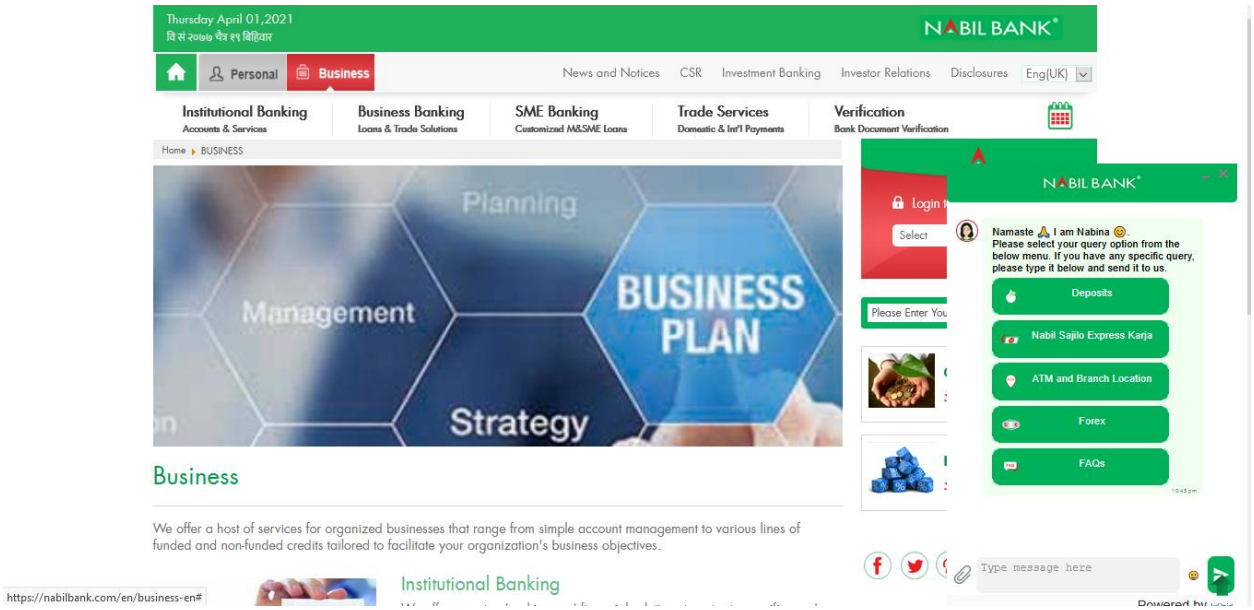

Figure 35

ix. Help Users Recognize, Diagnose, and Recover from Errors.

Sastodeal and Nabil Bank have both implemented this principal as they tell exactly where they are wrong and informs what they need to fix, for example while logging in without password, they prompt user with message stating that the password field is required.

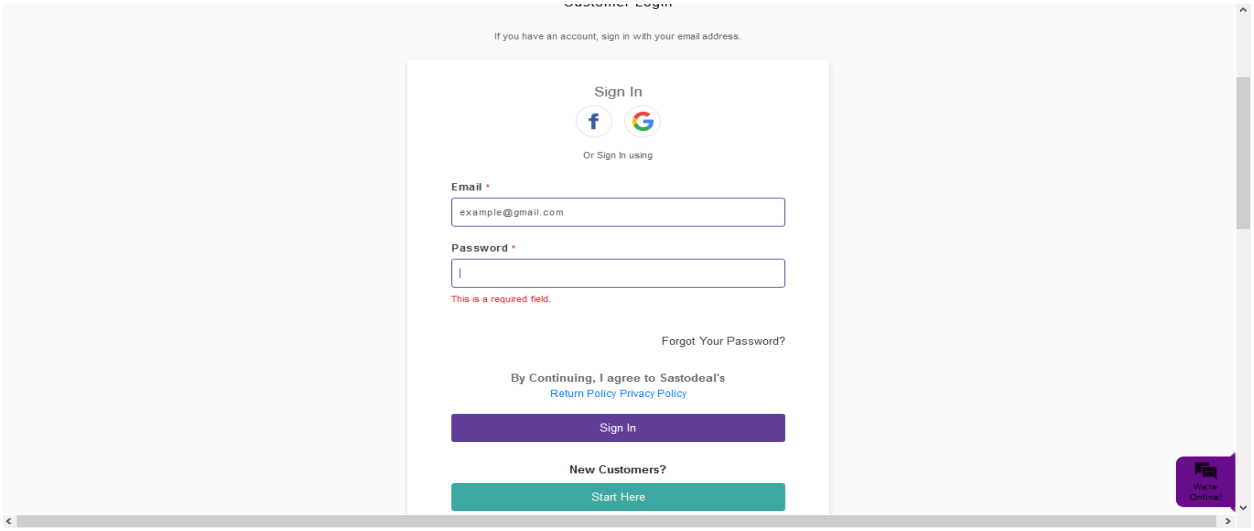

Figure 36

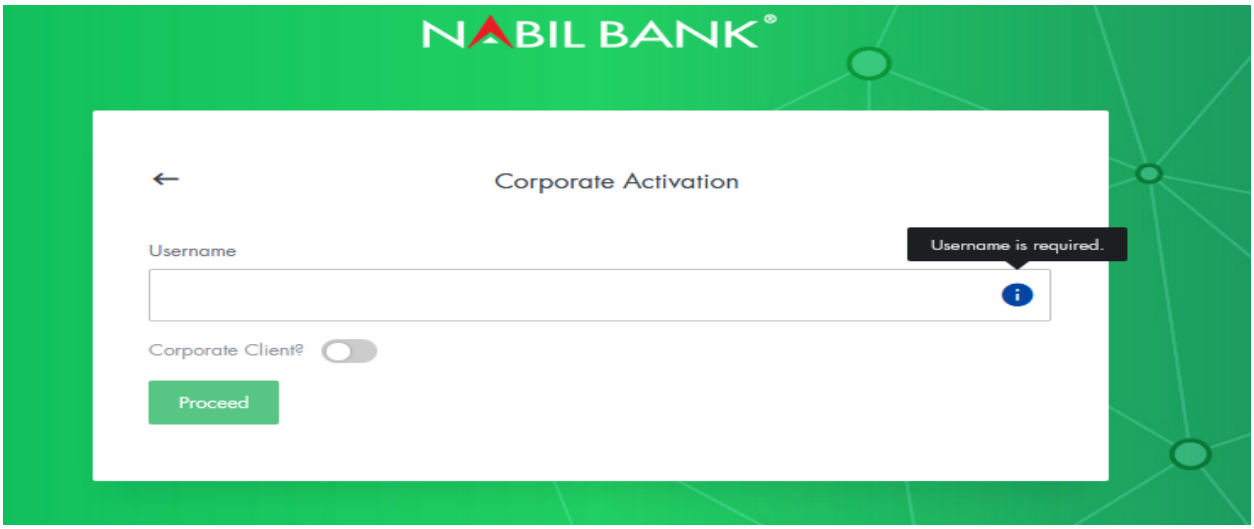

Figure 37

x. Help and Documentation

Users need guidance if they are stuck, and documentation/FAQs is one of the key that helps users to go forward from their checkpoint. So addressing these issue, both sasto deal and nabil bank have included this feature.

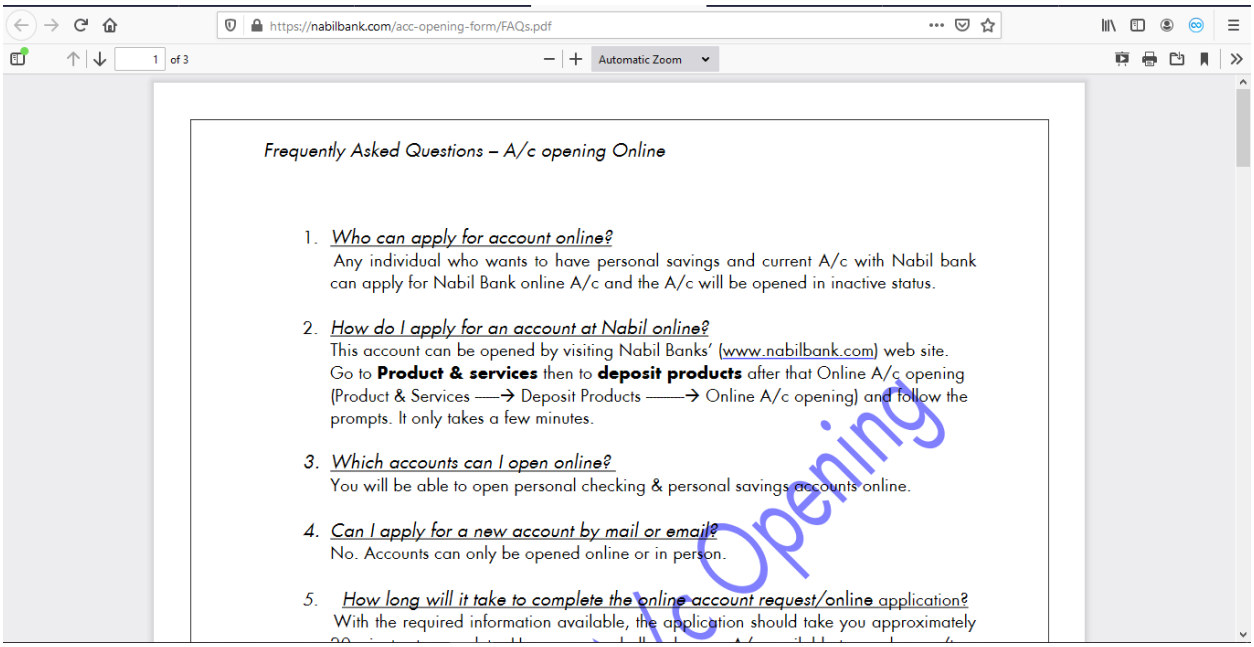

Figure 38

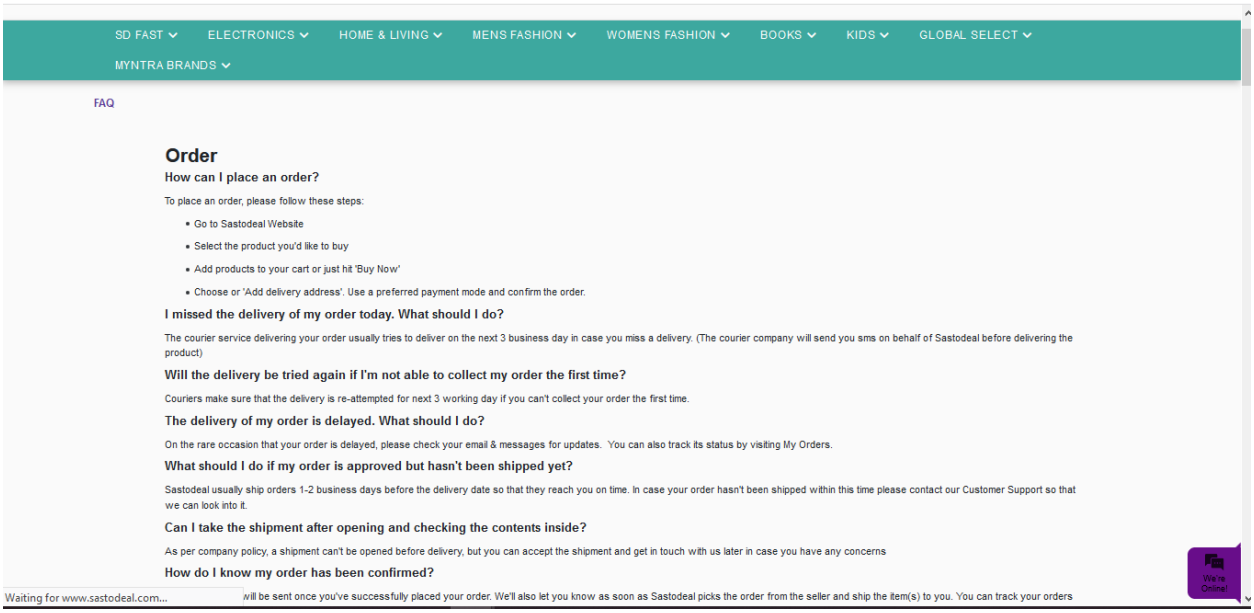

Figure 39

5. Conclusion

There are different kinds of people, and there are different user interface available however, it is always not true that one interface can satisfy all kinds of people. We can at least try to make them compatible with as many people as possible and this can be done by following the Shneiderman's Eight Golden Rules and 10 Usability Heuristics for User interface by Jakob Nielsen that provides us with proper guidelines how one interface should be designed. Most of the interface available are lacking somehow to follow these guidelines. For instance, Sastodeal's website which had most of the feature also lacked in providing visibility of system status to the user and regarding nabil bank's website, many interface design principals were missing like easy reversal of actions, recognition rather than recall, system status visibility and user control and freedom.

The interface design can always be improved. This report was very informative in terms of interface design and user experience, as it let me explore an area of computing world which I had never explored before for example, I would not search for the design rules, different perspective of users and about the design principals and their actual implementation which I know now, So, I would like my interface to not miss these features especially visibility of system status which makes the user always known with what is happening in the background for example, Gmail prompts uploading message while a file is being attached in mail.

Now I feel like I have grasped the understanding of interface design principals thoroughly with the help of analysis of two different website which will really be handy in the coming future days. I will definitely use these principals while designing any kind of interface. Once again, I would like to heartily thank all the teachers, friends and family members who helped me with this report. I am really thankful towards Herald College Kathmandu and University of Wolverhampton for giving me this wonderful assignment which have undoubtedly increased my knowledge on human computer interaction.

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