Asian Journal of Research in Computer Science

13(4): 12-33, 2022; Article no.AJRCOS.86957
ISSN: 2581-8260

Usability Evaluation of an Unpopular Restaurant Recommender Web Application Zomato

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJRCOS/2022/v13i430319

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/86957

Original Research Article

Received 05 March 2022
Accepted 11 May 2022
Published 11 May 2022

ABSTRACT

Usability evaluation clarifies the user's comfortability, satisfaction, and experience with a product. The success of the product is solely dependent on the usability factor. Web applications are excellent channels to communicate between the customers and the suppliers, for satisfying users' needs. Particularly usability evaluation of web applications plays an important role in observing the design, content, and navigation of a website. These observations help to improve the design of a web application. A proper design and content management of a web application acts as a gateway to attract more customers to use their application. Customer satisfaction would also help increase business for that particular company. The restaurant recommender web application acts as a medium for customers and restaurants. These applications help the food industry to attract customers. If the mode of communication is not effective, restaurants fail to promote their food business to the customers. Previous research studies focused on business models, restaurant reviews, and offers provided by restaurant recommenders, instead of usability evaluation. The goal of this research study is to test the efficiency and effectiveness of zomato.com through usability

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evaluation. The importance of this research study is to help both Zomato and other applications to increase their popularity. The methodology used was both think aloud and observations. The results were satisfactory and informative. The average time taken for website navigation tasks was 20.5 minutes. 100% satisfaction with restaurant reviews. 33% satisfaction for restaurant search and location information. 33% were not willing to re-use the Zomato website. These results convey that user satisfaction plays a major role in users returning to a website. This could be one reason for less web usage traffic in Zomato, hence leading to unpopularity. Recommendations and future research were also discussed.

Keywords: Usability evaluation; think aloud methodology; Zomato; website usability human computer interaction; user experience.

1. INTRODUCTION

A system whose functionalities are working as per expected is a working system [1]. To confirm that the functionalities are working, it is very much important to make sure that the system is usable. Usability is defined as the extent to which the user can use the system without any hardship or frustration. Here system can refer to a range of facilities, services, or products. For example, traffic signals, mechanical tools, software, hardware, books, cameras, mobile phones, interactive screens, and websites [2]. Usability is also applied in psychology, art, philosophy, hardware, and software fields. The main criterion of usability is to make sure that the users using the product can learn it with ease, successfully use it, and are satisfied using the product [3]. Further, the main goals of usability are effectiveness, efficiency, and ease of use.

Redish and Ginny [4] brilliantly describe usability as an effective communication the product has with the user. Initially, usability was nothing but a user experience, it was introduced to cater the needs of the common public [5]. A person with little knowledge of a product must be able to use it comfortably, and the user is not frustrated. For example, operating a mobile phone, ticket checking in a kiosk, and many more.

Zomato is one of the leading online web applications which is mainly used as a restaurant search engine, recommender, and guide. Based on the location this website provides the latest offerings a particular restaurant has to provide. It is not confined to a restaurant search but rather gives a wide variety of details such as restaurant reviews, menus, photos, approximate cost, book a table, order online, hours of operation, main highlights, address, and cuisine type offered at the restaurant. All the information provided is mainly contributed by public who are food enthusiastic, passionate bloggers or food critics. Food reviewers generally provide their valuable opinion about the food experience. On the other hand, restaurant owners, promote their business by adding their restaurant details in Zomato [6,7]. The company was started in the year 2008 in India, it slowly spread to many countries within few years. Its website mentions that it now operates in twenty-three countries covering India, Australia, the USA, Canada, and parts of Africa, South America, and Europe [8]. In 2015 it acquired Urbanspoon, one of the leading restaurant information and recommendation service based in North America [9]. Through this acquisition, Zomato made a grand entry into the USA market. Zomato acts as a medium to provide detailed, positive, and negative feedback [10,11]. The feedback is beneficial to users to make a prompt decision to choose a restaurant. This website is mainly used by food bloggers, restaurant owners, food enthusiasts, food critics and general public.

1.1 Problem

Brewer [8] conducted a study to find traffic statistics on restaurant review websites. Based on the country, Zomato was considered unpopular in the USA and ranked 2,102. This raises curiosity as to why Zomato was unpopular. What was demotivating users to return to the website? However, the results of Parashar and Ghadiyali [12] showed that Zomato was ranked as the fourth most popular application in India. The usage of restaurant aggregator applications was based on user preferences.

There is no sufficient research evidence to explain the reasons for Zomato's unpopularity. There is a lack in research studies regarding usability evaluation for Zomato's website using the Think-aloud methodology. Additionally, there is not sufficient research reporting on the usability evaluation of the Zomato website before it was launched into the market. The contrast findings by Brewer [8] and Parashar and Ghadiyali [12] motivated the current study to

dwell deep into the user experience and unpopularity of Zomato web application. The research questions for this study are:

RQ1: Will the usability evaluation of the Zomato website determine its unpopularity?

RQ2: Are users willing to re-use the Zomato website for future restaurant recommendations?

1.2 Purpose

The main agenda of system usability is to engage user interaction with no misinterpretation [1]. Usability is also known as user characteristics and its rapport with the system. User characteristics are communication, problem solving, understanding, and memory [13]. The five characteristics of usability are ease of learning, error frequency, memorability, efficiency of use, and personal satisfaction [14]. The benefits of usability are error reduction, increased productivity, user acceptance, and reputation [15]. Users with minimal or no training can easily use such systems. With so many benefits it clearly shows how important is usability. The tremendous demand for technology in various fields is forcing everyone to give importance to the usability [16]. The authors specify that everyone wants their product to sustain in the market in long run. This is achievable only when the product is usable. The user's identification with the usable system is linked with user satisfaction [17]. The better the usability, there is an increase in user satisfaction, that is related to the user's loyalty toward the system. Organizations can have huge revenue losses due to usability problems in their website [18]. The website's reason for success is majorly dependent on usability [19]. Companies can run out of business if the product the user is planning to buy is difficult to use [14]. This results in unsatisfied customers not purchasing the product. Hence, usability forms the key to the success of a company.

The purpose of the present study is to test the efficiency and effectiveness of zomato.com through usability evaluation. The evaluation is for users with minimum technical knowledge to search, book a table, or order food from the restaurants of their choice. This study will give information about learnability, satisfaction and errors encountered. To help Zomato improve its popularity, studying the user experience of users while using this app is very much necessary. These will help Zomato improve its user experience and usability statistics to gain popularity.

Hence the current study will help fill the gap by identifying the factors for Zomato's unpopularity. To explore these factors, the initial goal is to study each user while they are using the application. The final goal is to analyze these usability observations to understand their interaction and perception with the Zomato web application. The user interaction are tasks such as search for restaurants based on different categories, access the restaurants reviews, view the restaurant related photos, and book a table for a specific date.

1.3 Test Goal and Objectives

- Can the user easily find the important options such as place and search box on the home page? (efficiency, learnability)
- Can the user search for a location of their choice? (efficiency, effectiveness, satisfaction)
- Can the user find the restaurant name they are searching for? (efficiency, effectiveness,
- satisfaction)
- Can the user view the cuisine they want to select? (efficiency, effectiveness, satisfaction)
- Can the users navigate to the selected restaurant of their choice? (efficiency, effectiveness)
- Can the user book a table for a restaurant? (efficiency, learnability, effectiveness)
- Can the user order food online for a restaurant? (efficiency, effectiveness, and learnability)
- Can the user use detect place before ordering food online for a restaurant? (efficiency, learnability, error)
- Can the user benefit from the breadcrumbs options on every page for navigation? (efficiency, effectiveness)
- Can the user read the reviews of the restaurants they want to visit? (efficiency, satisfaction)
- Can the user view the food pictures of the restaurants they are interested in? (efficiency, effective satisfaction)
- Can the users rely on the restaurant search and reviews provided? (efficiency, satisfaction, learnability)

The main aim of conducting this usability evaluation is to measure the usability metrics of

the website zomato.com. As this application is mainly concerned with food related restaurants web interface, user's interaction with the interface forms the crucial part. For example, the information provided in the website portrays how the user perceives the details such as satisfied with the information, not satisfied or wanting for more details etc. Evaluating many such criteria forms the crux of this study in contributing valuable information to Zomato in improving the usability of their website.

2. LITERATURE REVIEW

2.1 Zomato

Bhotvawala et al. [20] research was based on India's food aggregator startups to understand their business model. A combination of SWOT and comparative analysis was used to analyze the study. The four companies selected for the research work were Swiggy, Zomato Delivery, FoodPanda, and TinyOwl. The selection was based on each company's unique business model. The main agenda was to understand the company's operation and growth model. The food aggregator companies were studied based on scalability, innovation, and cash-burn as bottlenecks. TinyOwl's business model performed worst as it succumbed to all three bottlenecks. The study emphasized on industry's profit rather than the correlation between usability and popularity.

Dewi et al. [21] conducted a quantitative study on Jakarta customers using the Zomato application. The study's main goal was to apply the word of mouth theory to understand the user's influence to buy a product. The electronic Word of Mouth dimension refers to Zomato's reviews, rankings, and ratings. Zomato's restaurant ranking did influence customers to buy from a restaurant. Additionally, other variables studied were timeliness, information relevance, information accuracy, value-added information, information quantity, product ranking, and purchase interest. The electronic Word of Mouth dimension for product ranking showed the highest results concluding that ranking does impact users' intention to buy. The study shows user motivation to buy a product. However, user satisfaction, reusing the application, and Zomato's popularity was not discussed.

Kothari and Shah's [22] research study focused on Zomato ratings and customer reviews. The authors adopted utilizing content mining to understand the reliability of the user rating. The study's main agenda was to understand the trustworthiness of Zomato's ratings and reviews for a restaurant.

Parashar and Ghadiyali [12] conducted a research study to understand the customer's attitudes and perceptions while using food app services. The hypothesis was accepted for the usage of the food app's dependence on user factors. Comfort in ordering scored the highest for user factors. Followed by the good condition of food and discounts offered. Fast food delivery apps were highly used followed by Foodpanda, Swiggy, and Zomato. Although the study helped to understand how a user chooses an app based on their preferences. There was no discussion on users reusing of Zomato application and its popularity.

2.2 Website Usability

The basic characteristics of the usability model are effectiveness, efficiency, learnability, and satisfaction [23]. Researchers enhanced the usability model to add security because, in fields that deal with medical devices and nuclear power, security played a major role for the users. Further, the authors mention usability's alliance with software engineering, as both are concerned with the quality and getting the best out of the product. Hence software experts and usability experts should collaborate to develop more robust methodologies related to human-computer interactions and software engineering. In recent years this partnership has been tremendous with amazing usable systems launched in the market [24]. Website usability and web engineering played a major role in evaluate websites [24]. The concept of usability engineering is applied while designing a web page [25]. A website's web page is the core reason for an organization to reach the greatest apex.

As the human-computer interaction field has been consistently helping in building usable systems, usability testing involves gauging and detecting flaws during this process (Levi & Conard, 2008). Usability testing on the website is conducted to help perk up the user interfaces and also find the real usability problem and goals [26]. Before designing an interactive system the important aspect is identifying usability goals, which mainly focuses on achieving usability criteria [3]. The usability criteria are:

- How effectively a system can be used (effectiveness)
- Maximum productivity (efficiency)
- How safe is the system to use (safety)
- Ease to grasp the functionalities (learnability)
- The benefit of using this system (utility)
- Ease of remembering the usage of the system (memorability)

Usability testing helps to improve or re-iterate design based on different life cycles of the website creation [27]. Usability evaluation is not only applicable to a website in the development phase. It is tremendously useful at any stage of development, including a post-production website. The evaluation gives a sense of hope and scope for improvement of design and finding any faults [28]. Initially, websites were very easy to use and uncomplicated. As the user's needs and demands increased website's user interface also advanced, hence receiving feedback about website usage became more complex [29]. Hence usability testing is widely used to measure users' experience when they interact with the system that helps the company to be successful in the market [30].

To summarize, all the research studies conducted for restaurant recommender apps were tremendous. Each of the studies has contributed to finding how users review, users' perspectives on facilities provided, business models, profit, and many more. However, the research studies do not elaborate or discuss if these user experience aspects were contributors to Zomato's popularity. Rather there is a lack of research to determine what made Zomato unpopular. Why is website usability given importance? The answer is simple millions of people are connected to the internet every second. This is one of the majorly used online media in getting the user's work done via a mobile phone, laptop, desktop, etc. It is highly important to continuously re-design, maintain, and update these websites with usability concepts. This way the users adhere to the website in the long run, helping in the organization's critical success. Usability evaluation for the website is one of the factors to make the company's website popular. In such a scenario, why did researchers not give importance to the usability of the Zomato website? In order to answer this question, it is necessary to conduct the usability evaluation to discover Zomato's unpopularity.

3. METHODOLOGY

There are many usability methods to conduct a usability evaluation. Choosing the correct method is important depending on the usability criteria and goals you are interested in discovering. Basic usability testing methods are comparison exploratory test, true experimental study, and observational qualitative study [2]. Among these methods, the exploratory comparison test ranked high in producing the best results. The basic usability evaluation rules are users' opinions, formal analysis, empirical and heuristic evaluation to test the interface [31]. As the technologies have evolved so did usability evaluation methods. Which is a good usability evaluation method relevant for web applications? Although automated usability evaluation has been popular and cost effective. The evaluation method used for automation is the cognitive walkthrough for the web (CWW) method [32]. It is used to evaluate website user navigation and search functionalities. MiLE+ is used to measure a website's efficiency, performance, and level of difficulty. The most common evaluation methods are cognitive walkthrough and heuristic evaluation.

Users provide negative feedback if they face difficulty using the website, this usability problem determines the critical success of an organization (Salaam & Khan, 2013). The web usability management model (WEB-UMM) was proposed to help an organization's critical success and explore user barriers. This model was intended for website development in industries. Usability guidelines implemented by Microsoft are Microsoft Usability Guidelines (MUG). It uses heuristic evaluation methodologies as a base. The list of guidelines and subcategories used for its website is:

- Content
  - Perseverance of the content to main users
  - Proper usage of multimedia
  - Depth and breadth of the topic presented
  - Up-to-date information displayed on the website
- Ease of use
  - Whether the website's main goal is met
  - How well organized is the website
  - Timely feedback with respect to user interaction
- Promotion
  - Forms the critical part of the guideline as this helps in attracting users to visits the website often

- Made for the medium
  - Motivate users to join user groups
  - Personalization
  - Refinement to update with current development
- Emotion
  - Challenge with respect to accomplishment of tasks
  - The website's interface attracting users
  - Character based on people's view towards the website
  - User's control with the tasks being performed.

Zahran, Al-Nuaim, Rutter, and Benyon [33] explain the existing evaluation methods specific to websites based on the purpose of evaluation. Below is the list of well-known evaluation methodologies the researchers have proposed:

- Web evaluation methods (WEMs):
  - Web analytics tools as Google analytics and Alexa
  - Link analysis methods such as PageRank and Webometrics methods.
- Website evaluation methods (WSEMs):
  - User based
  - Evaluator based
  - Automatic website evaluation tools as Bobby, LIFT, etc.

An un-moderated usability testing demand is in rise lately compared to conventional laboratory test [34]. The increase in the demand is mainly due to un-moderated usability test's low cost (evaluator observes the user action over a video recording), easy location setup (user's home) etc. However, this has a drastic effect on think-aloud protocol because verbalization of the user will not be accurate as the evaluator is remotely sitting [34]. During usability evaluation verbalization forms the core part of think-aloud protocol [30]. The quality of the verbalization content gathered by the evaluator has many factors associated with it as below.

- Whether the user is remotely observed
- Usability evaluation is based on predefined task list or user has freedom to explore the website on his own,
- Quality of the verbalization, which is relevant to user interface's usability criteria, evaluator's smartness to differentiate the user's verbalization to find the minutest details.

Usability evaluations are perfect for observing participant's behaviors and measuring website performance issues and collecting data about participants about the website [2,35].

Though observing in usability evaluation acts as a treasure of information there are few issues in observing the users [2]. The issues are:

- The observer should tolerate the user's behavior as each user takes their own time. Pressurizing the user leads to negative evaluation results.
- Observing users in "sit-by" sessions is more advantageous compared to remote observation. As 'sit-by" gives deep discussions between user and observer.
- The observer should quickly understand user's frustration and encourage them through the evaluation process
- Users become conscious of their behavior and may affect the user testing
- The observer should not get angry or laugh if the user commits any mistake

Observers should follow ethics to not pass comments about the user, distracting users by either talking or making noise, and not become defensive in correcting the user's testing [36]. However, human-computer interaction gives more emphasis to the design of the user interface for improving the interaction between human performance and computers [27]. The website design determines user satisfaction and user's willingness to return to the website repeatedly; hence developing a web interface to oblige the user and therefore satisfy the user's needs is a demanding task [37].

3.1 Usability Metrics

This study's usability evaluation used the following usability metrics. The usability metrics were specific to the Zomato website.

- Efficiency
  - Navigate to the selected restaurant of their choice
  - Accuracy of the breadcrumbs options available on every page for navigation
  - Total time taken to complete all the tasks and any error encountered during task evaluation
- Effectiveness
  - How quickly and easily can the participants book a table for a restaurant of their choice?
  - Can the participant order food online from a restaurant?

  - Can the participant detect a place before ordering food online for a restaurant?
- Learnability
  - Time taken to find the place in the search box
  - Count of assistance requests to help them in evaluation
  - How quickly does the participant relearn the tasks?
  - Any hassle to use the new options available to read restaurant reviews, photos etc.
  - Can the user read the reviews of the restaurants they want to visit?
  - Can the user view the food pictures of the restaurants they are interested in?
  - Can the users rely on the restaurant search and reviews provided?
  - Can the user search for a location of their choice?
  - Can the user view the restaurant name they are searching for?
  - Can the user view the cuisine they want to select?
- User Satisfaction
  - Participants' satisfaction with the overall website functionalities
  - How satisfied are the participants with the restaurant search option
- Errors
  - Number of errors encountered during any task.
- Qualitative methods
  - Participants' verbal commentary while performing the tasks as part of think-aloud protocol
  - Pre-test questionnaire was provided to the participants

3.2 Task List

Below are the ten-task list used for this study's usability evaluation:

- To know about a particular restaurant situated in a place. Please find the place of the restaurant you want to explore.
- After you have selected the place, please find the name of the food or the eating place you are curious about.
- View the eatery information displayed. Can you view the name you searched for?
- To know more about a buffet or cafeteria or pizzeria for example "The New China Buffet". Please view the details of the place.
- Before you plan to visit this café or bistro you would like to know the feedback other visitors have written about this place. Is the information provided helpful?
- You want to have a visual glimpse of each menu item restaurant serves. Can you view the visuals?
- Find out if the food place allows reservations before visiting it.
- Go back to previous search results or click on the breadcrumbs with the place you selected
- Change the place to a different name and select food delivery
- Select the food finder and the "detect" button.

3.3 Design Method

This study used the "Think Aloud" methodology and a combination of the researcher's observations. The methodology for this study was inspired by another study's concurrent think-aloud and eye-tracking observation methodology [38]. The researchers applied the methodology for sixty participants to evaluate informational websites. The results were highly satisfied with both verbalization and observations providing interesting information. An amazing find was related to participants' silence, which helped authors apply eye-tracking for facial expressions.

The Think-aloud method is the best and most treasured tool of usability evaluation methods [39]. This method has immense scope in providing detailed data as the user verbally explains the tasks performed or any frustration being faced [33]. However, the best tool can sometimes have drawbacks such as silent, non-expressive, and uncomfortable user misrepresenting the information [40]. Ichsani [41] proposed a concurrent think-aloud method to evaluate websites and stated as follows.

"Some advantages of this method are the developers of the information system can immediately understand what is experienced by end-users rather than just using a questionnaire whose data collection tends to be less real-time and make users tend to forget their real experience" (p. 116).

The main purpose of the website usability evaluation is to intensely research, analyze, and determine even before planning the evaluation process [33]. The following information gives an

overview, purpose, and the type of evaluation method to be applied:

- Website redesign: For website evaluation methods such as user testing, heuristic evaluation a tool-based evaluation is recommended. Google analytic tool is the most popular tool. R shiny application called ABCMETAapp can be used for estimating usability evaluation [42].
- Web traffic/ Web ranking: Alexa's tool bar provides web traffic and user's interaction [43].
- Popularity/ Importance: Web evaluation methods and link analytics tools such as PageRank.
- Connectivity/ Visibility: Web evaluation methods and link analytics tools such as Webometrics.

Before the evaluation started the researcher explained the participants ten-task list. Requested the participants to verbalize their emotions and opinions for each of the tasks. Additionally, the researcher observed the participants for facial expressions, mouse movement, keyboard usage, etc. The laptop was up and running with the Google Chrome web browser open. Zomato's home page was open and presented to the participant. As the participants have contributed their valuable time to this study, small reward of candies and refreshments was provided. As the Zomato website is already available globally, any suggestion provided after the evaluation will be beneficial to Zomato's development team. The think-aloud method was used for this study because of its best qualities; collection of accurate data with no training. Live feedback is advantageous, as participants are only three in number this allows the researcher to fully concentrate on interpreting the information.

3.4 Test Procedure

Below flow chart (Fig. 1) explains usability evaluation test process for this study.

3.5 Participants and User Profile

The standard sample size for any evaluation method can range from 12 to 20 participants. Whereas three participants are more than enough to find 91% of the usability problem and including an expert is optional [44]. A total of three participants were considered for this usability evaluation. The duration was one hour for each participant. The three reasons for selecting only three participants was more time can be contributed to think-aloud methodology, detailed observation, and analysis can be performed for each participant. The following criteria(s) were considered when selecting the participants:

- General knowledge of reading English
- Basic understanding of using web
- Comfortable using laptop/computer

Each of the participants agreed for the evaluation testing on the dates mentioned below:

Participant 1: April 10, 2017 at 4:00 PM
Participant 2: April 12, 2017 at 5:00 PM
Participant 3: April 9, 2017 at 8:00 PM

There was no restriction for any participant who participated. At the end of the evaluation, the participants were rewarded. The instructions for the evaluation were briefed before the test. All the participants were asked to sign the consent form.

3.6 Test Environment

The researcher's spacious reading room in Miami, Florida place was finalized after the participant's confirmation. The reading room chosen was an ideal test environment. It facilitated all the amenities from a quiet place, no distraction, comfortable seating, a perfectly placed laptop on the desk, and a perfect room temperature as per the participant's choice. A couch was provided as an option if the participant changed their mind not to use the chair. Apart from this, an extra chair was used for the researcher. The laptop was up and running before the participants started the evaluation process. Zomato's website's home page was opened and kept ready for the participant. To set up the environment it took not more than ten to fifteen minutes. The main intention of this evaluation was to observe the user's interactions with the website. As the participant's interactions will be observed by the researcher in person, no camera was required for video recording. Maximum care is taken so that both participant and researcher are not distracted. However, we can never predict any unforeseen intangibles. Following are details of the laptop used.

- Name: Lenovo ideapad 310
- Operation System: Windows 10

- System Processor: AMD A10-9600P RADEON R5
- Installed memory (RAM): 12.0 GB
- System Type: 64 bit operating system
- Web browser: Google chrome

3.7 Role(s) of the Researcher

Although the main focus is on the participants contribution for usability metrics, the researcher in this study played a critical role. Researcher's duties for this evaluation were pre-planning for the testing, good understanding, experience with user interface, selecting the participants, setting up test environment, greeting the participants, support the participants, inquiring, and data collection. The researcher was able to teach the participants and lead them during the evaluation process. Here leading the participant was more important. The researcher made sure that the participant performed the tasks with less intervention of the researcher's step by step instructions. Rubin and Chisnell [2] emphasize that if the researcher gives all the steps to perform a task to the participant, then the participant's actual interaction with the interface cannot be accurately captured. The researcher was a good communicator, observer, motivator, handled participant's frustration, understanding, a good listener, learner, and ready to face and solve any uncertainty during the evaluation [45,46]. Participants ranged from experts to apprentices; hence the researcher was prepared to handle any situation. In certain circumstances, a researcher might have indirectly played the role of a participant.

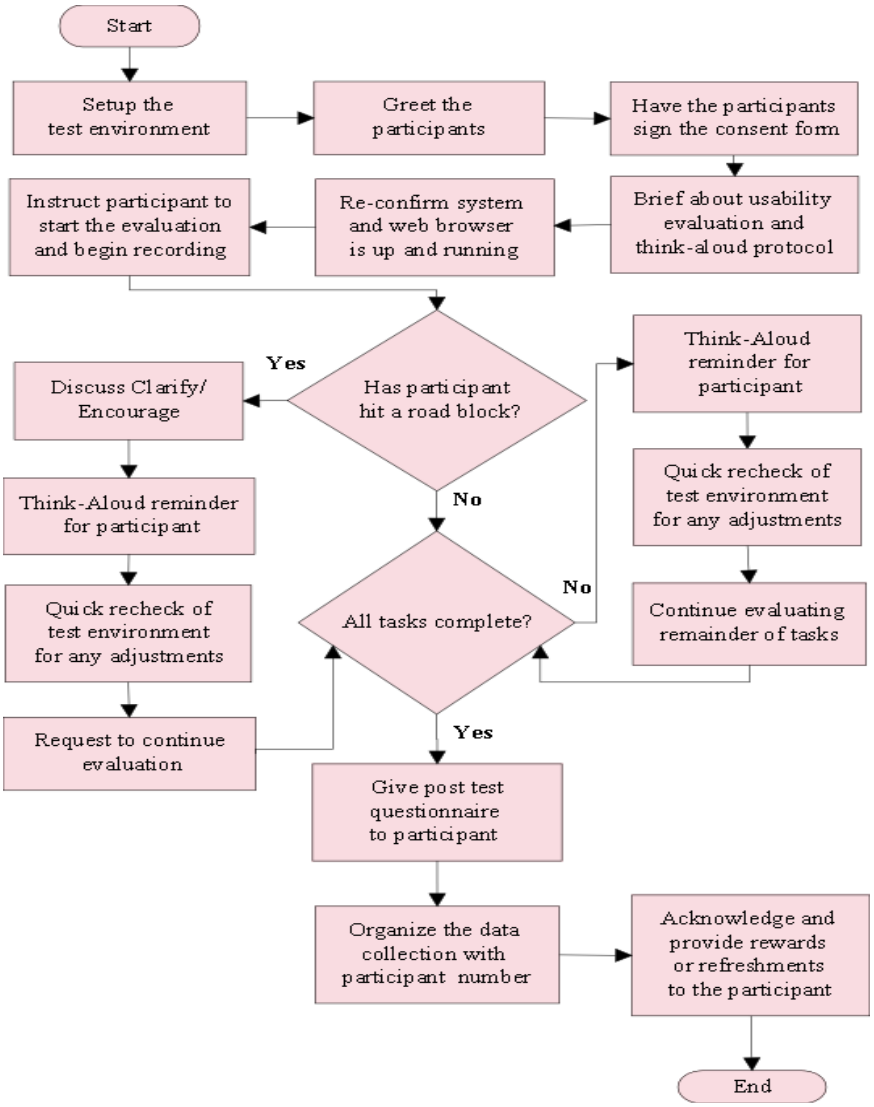

Fig. 1. Test procedure flow chart

4. RESULTS

4.1 Participant Summaries

Summation of Test Results for Participant #1: The first participant is a female aged fifty-five and the highest level of education is high school. Last year started the EOSL program in a local community college to learn spoken English. Mainly uses computers and the internet to practice English, search for new recipes on Google, and send emails to family. Facial expression during the entire evaluation was happy and energetic at the beginning, curious while performing tasks, and enthusiastic. When performing tasks like typing in restaurant or location information participant was searching for a few keys on the keyboard before typing. All the tasks were completed within the time limit. Tasks 1 to 9 were completed without any issues. Task 10 could not be performed because it did not receive proper feedback from the website for the action performed. Minimal help was asked from the researcher. Participant's verbal comments are as below:

Task 1 to 4:

"I am so happy to find my hometown on this list"

"Can I type Italian or Japanese or Chinese?"

"Wow! I can search for so many cuisines"

"I never knew that my hometown has so many restaurants currently. This is just amazing"

Task 5 to 9:

"So many details for just one restaurant interesting!" with rolling eyes.

"When was this website launched? How I wish I knew it before I spent my money on unnecessary restaurants"

"Super cool reviews"

"The food pictures are tempting I am feeling hungry now"

"All the restaurants I visited has book a table option, I am going to use this option from today"

Task 10:

"Shouldn't this option show my current location as Miami?"

At the end of task ten, participant mentioned one wish "I hope this website provided food recipe information from these restaurants".

Summation of Test Results for Participant #2: The second participant was a male, aged seventy-three and the highest level of education is in Bachelor of Civil Engineering. Started using computers and the internet from one year. Facial expression during the entire evaluation was initially tensed but later felt comfortable. When performing tasks like typing in restaurant or location, participant was searching every letter typed on the keyboard. Moving mouse pointer many times before performing any task. All the tasks were completed within the time limit. This participant had a unique way of searching for locations and restaurants. For example, searching for legacy restaurants that were hundred years old or searching a village name for the location. The participant was not happy with the search results. Task 10 could not be performed because it did not receive proper feedback from the website for the action performed. Minimal help was asked from the researcher. Participant's verbal comments as follows:

Task 1 to 4:

"I am typing my village name. I am curious to know if this website has my village name listed"

"Sad! Cannot find my village which has a very famous temple and a restaurant"

"Let me try a different location name as city"

"I have typed my favorite restaurant which is five-minute walk from my home it is serving delicious food from past hundred years"

"Interesting it does not list this restaurant!!!"

"Let me try a new restaurant I visited yesterday"

"Nice! Yesterday's restaurant did come up"

"Do you know why old restaurants were not listed in this website?"

Task 5 to 9:

"Very good work by the reviewers, very detailed information provided"

"Why is a picture of a man sitting in a restaurant posted? Isn't there supposed to be food related photos?"

Task 10:

"Why is my current location as Miami not shown?"

Summation of Test Results for Participant #3: The third participant was a male aged thirty-four and the highest level of education is Ph.D. in Statistics. Works on the computer for eight hours and the remaining hours in browsing the internet or playing games. An avid foodie visits any recently opened restaurants. Facial expression during the entire evaluation was calm and composed. Typing was pretty fast and did not look at the keyboard even once. All the tasks were completed within the time limit. The participant was very smart in detecting that for one country "book a table" was displayed, for another country it was not displayed. Very fast in performing all the tasks without any help, tried a few more tasks such as filter option, etc. Task 10 could not be performed because it did not receive proper feedback from the website for the action performed. Minimal help was asked from the researcher. Participant's verbal comments as below:

Task 1 to 4:

"Am I allowed to search for only one location or restaurant?"

"I will try combination of restaurants which are really old, new etc."

"I am trying the new restaurant I just visited yesterday"

"Cannot find the restaurant name in search results"

"No worries let me try few more restaurant names"

"Nice! Good work by Zomato for providing so many options and details of the restaurant"

"This application is simple to use with clear filter options"

Task 5 to 9:

"How come book a table button vanished for this particular location?"

"Way too many repetitive photos of same food posted by different individuals"

"Aren't the breadcrumbs supposed to take back to me previous results page?"

Task 10:

"I was expecting the current location as Miami to be detected?"

Summation of Test Results for Participants #1, #2, and #3: Overall all the participants cooperated very well to complete this usability evaluation. Participants 1 and 3 completed all ten tasks in eighteen minutes. Participant 2 completed the tasks in twenty-six minutes. Task 10 was not completed by all three participants. For task 8 participants 1 and 2 did not notice the breadcrumbs available. Instead used the back button in the browser to navigate back to the previous page. Only participant 3 observed the breadcrumbs and noticed that the navigation is not as expected. Related to task 8 only participant 3 was able to find the issue with the book table option not being available for a few countries. Participants 1 and 2 did not identify this problem as they were searching for only one country.

4.2 Qualitative Results

Table 1 below portrays the details of the information gathered from pre-test questionnaire.

4.3 Quantitative Results

Table 2 gives information about participant's task completion success rate.

Table 3 gives information about time taken by each participant to complete a task. For example, 5 = 5 minutes. Total average time is 20.5 minutes, and the mean value is 2.27 minutes. Standard deviation [42] is 0.75. Participant 1 and 3 completed all the tasks in 18 minutes and participant 2 completed in 26 minutes.

The error rates for each task are shown in Table 4. It is clear that total of two errors were performed by participant 1 and participant 2. The minor error was in typing restaurant name in location search box and vice versa.

Table 5 shows the participant's agreement, disagreement, and neutral opinions. The details were collected from post-test questionnaire answers. For example, number 3 indicates all

three participants have strongly agreed. If only one participant strongly agreed, then 1 is displayed. Percent agree column is based on total number of participants who both agreed and strongly agreed. For example if all three agreed and strongly agreed then it is 100%.

Table 1. Pre-test questionnaire details

Questions	Participant 1	Participant 2	Participant 3
Gender	Female	Male	Male
Age	55	73	34
Education	High School	Undergraduate	PhD
How comfortable are you working on a laptop?	Medium	Medium	High
About how many hours a week do you use a computer?	14	7	50
How many hours a week do you spend searching the Internet?	7	3	20
Name few common topics you search on internet?	Spoken English, Food recipes	News	News, Cricket, Blogs, Restaurants
Are you comfortable using Google chrome web browser?	Yes	Yes	Yes
Have you used the Zomato website before?	No	No	No
Do you use any restaurants search websites? If yes, Please mention the names?	No	No	Yelp, Google eats

Table 2. Each task completion success rate

Task	Participant 1	Participant 2	Participant 3	Success Rate
1	√	√	√	100%
2	√	√	√	100%
3	√	√	√	100%
4	√	√	√	100%
5	√	√	√	100%
6	√	√	√	100%
7	√	√	√	100%
8	√	√	√	100%
9	√	√	√	100%
10	-	-	-	0%

Table 3. Time completion rates for each task

	Participant 1	Participant 2	Participant 3	Total Average Time
Task 1	1	1	1	1
Task 2	3	4	2	3
Task 3	2	5	2	3
Task 4	3	2	3	2.6
Task 5	2	5	2	3
Task 6	2	3	1	2
Task 7	1	1	4	2
Task 8	1	1	2	1.3
Task 9	3	4	1	2.6
Task 10	-	-	-	-
Total Time	18	26	18	20.5
			Mean(Average)	2.27
			Standard Deviation	0.75

Table 4. Error Rates for each task performed

Tasks	Participant 1	Participant 2	Participant 3	Total Errors
1 – Search a location of your choice and select it.	1	1	0	2
2 – Search a restaurant or cuisine of your choice relevant to the location you have selected.	1	1	0	2
3 – View the restaurant search	0	0	0	0
4 – Click on any restaurant name to view the details	0	0	0	0
5 – Read the reviews of the restaurant	0	0	0	0
6 – View the photos of the restaurant	0	0	0	0
7 – Find the book table for the restaurant	0	0	0	0
8 – Go back to previous search results or click on the breadcrumbs with the location you selected	0	0	0	0
9 – Change the location to different country and click online delivery	0	0	0	0
10 – Click on Find food and detect button	0	0	0	0

Table 5. Post-Test Questionnaire details

Questions asked	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Percent Agree
Website was easy to use					3	100%
Definitely use this website for restaurant search		1	1		1	33%
Able to find restaurant names and locations			2		1	33%
Satisfied with Restaurant search results			2		1	33%
Restaurant reviews were informative					3	100%
Restaurant photos were relevant	1				2	66%
Able to view book table for the restaurants			1		2	66%
Detect location option was very useful	3					0%
Quickly find the place and search box option					3	100%

Table 6. Severity Levels with description

Severity Level	Description
1	The problem prevents performance or completion of task
2	The problem creates significant delay and/or frustration for the user.
3	The problem creates some frustration for the user.
4	The problem does not significantly affect usability.
5	Enhancement issues

Table 7. Frequency ranking with description

Frequency Ranking	Description
1	Occurs < 10%
2	Occurs 11-50%
3	Occurs 51-89%
4	Occurs > 90%

4.4 Usability Problems Summary

Tables 6 and 7 is the severity levels used to understand the usability problem.

Problem # 1: The detect location button does not function (related to task 10):

- Scope: Global
- Severity level: 1
- Frequency: 4 (Every time the button is clicked this issue occurs)
- Explanation: The detect location button does not auto-detect the location and there is no message or feedback displayed if there was an error
- Recommendations: Display appropriate message when clicked on detect location does not function

Problem # 2: The breadcrumbs links do not behave as expected (related to task 8):

- Scope: Global
- Severity level: 5
- Frequency: 4 (Every time the links of breadcrumbs are clicked)
- Explanation: If the participant is on any particular page for example restaurant review page when clicking on any bread crumb link as displayed it does not take to the page as per the name displayed on the bread crumb link.
- Recommendations: Better remove this option as it is not used by the majority of the participants.

Problem # 3: Few restaurant photos have irrelevant photos displayed (related to task 6):

- Scope: Global
- Severity level: 4
- Frequency: 1 (Participant found it for only one restaurant.)
- Explanation: A picture of a person sitting on the chair was posted instead of the food, ambiance, or amenities offered. The picture was more focused on the person than the surroundings of the restaurant
- Recommendations: The Zomato team should follow strict rules to not allow users to post pictures irrelevant to food or restaurant

Problem # 4: Book a table option is not consistent (related to task 8):

- Scope: Global
- Severity level: 4
- Frequency: 1 (Participant found this issue with only one country).
- Explanation: Book a table option is not consistent for different countries. For example, restaurants in India had an option to book a table. However, for the USA this option was not displayed
- Recommendations: Display an appropriate message saying why the book a table option is not available for a country

5. DISCUSSION

This section will discuss results and research questions associated. The research questions for this study were:

RQ1: Will the usability evaluation of the Zomato website determine its unpopularity?

RQ2: Are users willing to re-use the Zomato website for future restaurant recommendations?

All the participants (100%) agreed that the website was easy to use. However, only a few (33%) agreed to return to the website for restaurant search. Concerning restaurant and location search only 33% were satisfied to find the restaurant names and locations. The remaining 66% were neutral in their agreement. Reason one for neutral agreement, these participants were not able to find a restaurant that was hundred years old or recently opened. Similarly, only 33% agreed with restaurant search result satisfaction. In contrast, the majority (100%) of participants were satisfied with the informative restaurant reviews. More than half (66%) of the participants agreed with the relevant photos displayed. The rest of the participants (33%) strongly disagreed. A photo unrelated to food or restaurant was displayed. Most of the participants (100%) were able to quickly find the place using the search box option. Only a few participants (33%) experienced inconsistent results, in finding the book a table for a location. On the other hand, 66% did not experience any issue with a book table. Detect location option on the website showed disaster results (0%) where all the participants were dissatisfied.

These results show that although the website is easy to use there were weak areas identified. The weak areas were restaurant search results, location name listing, and restaurant listing. These did not satisfy a few participants. All the tasks were completed by all participants within a total average of 20.5 minutes. Detect location option available was the only task that failed for all participants. Only one participant identified an issue with page navigation in breadcrumbs. Overall, only two errors were made by participants by either typing the location name in the search box or search name in the location box. The errors made by participants are not major errors. One interesting observation was related to detecting location and breadcrumbs for page navigation. These two issues should have been resolved before the website was released globally. Detect location is the main feature of any restaurant recommender application. This raises a serious question, did Zomato follow correct user acceptance testing (UAT)? Why did it not detect the issue? These questions are only answerable by Zomato.

5.1 Screen Captures

Below screen displays the home page of the Zomato website.

The screen displayed below clearly shows book a table option in blue button for location “Bangalore”.

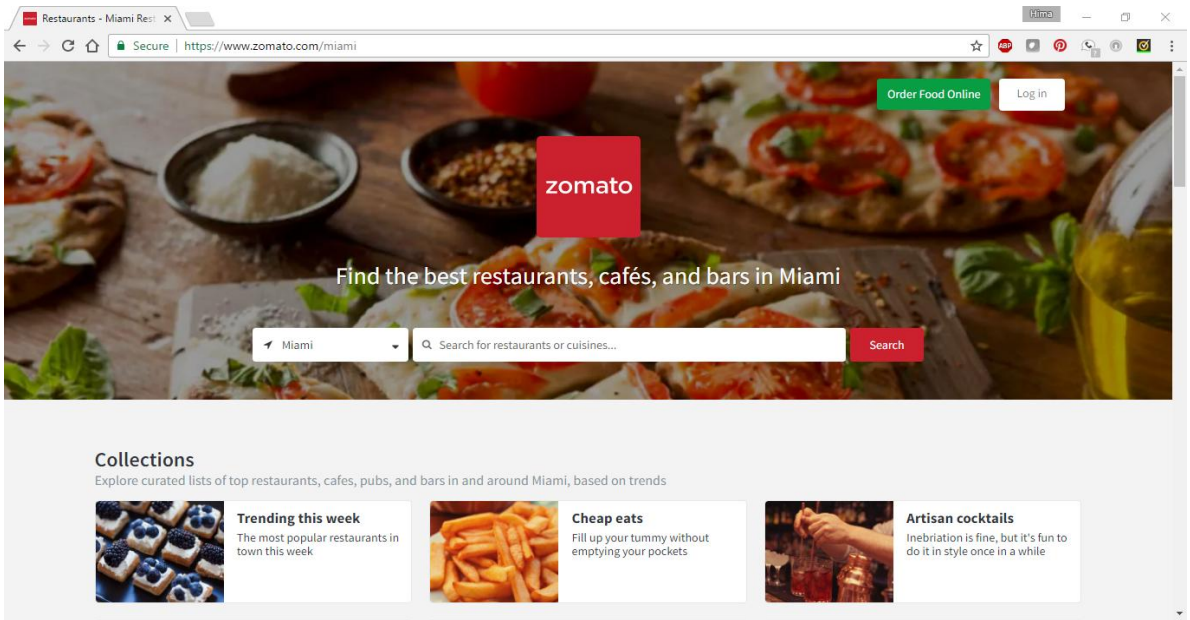

Fig. 2. Zomato Home Page

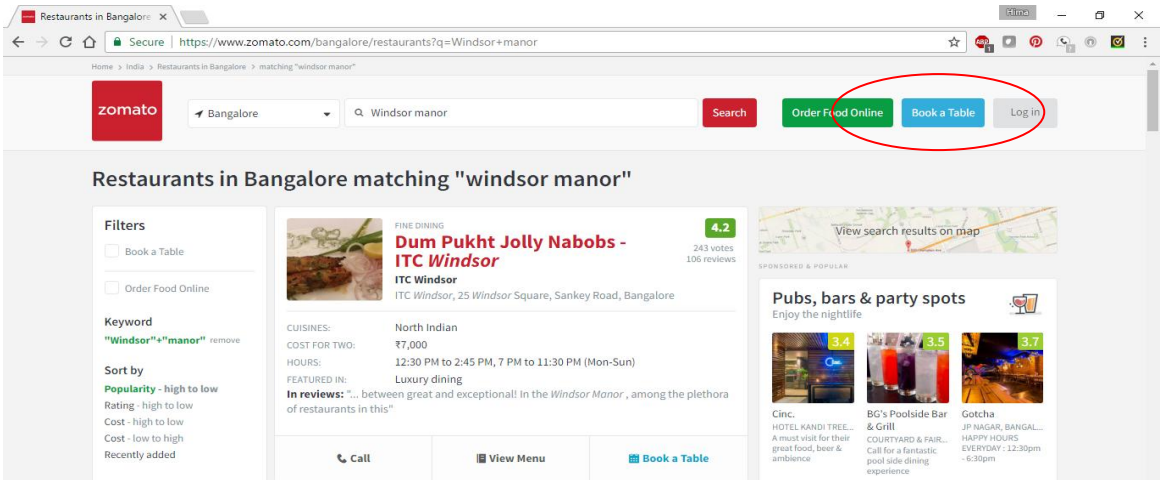

Fig. 3. Book Table button displayed for location Bangalore

Related to the book a table functionality, it can be seen that book a table option missing for location “Miami”.

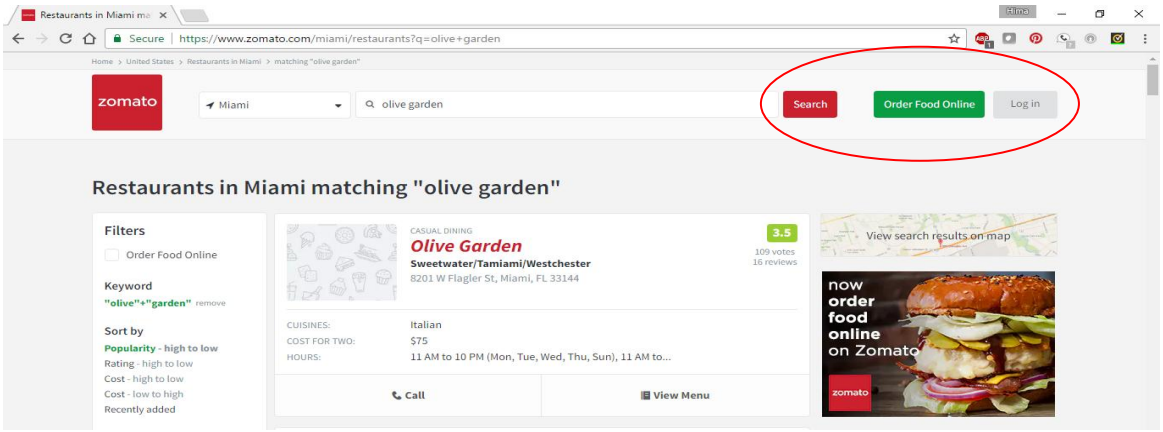

Fig. 4. Book Table button not displayed for location Miami

The breadcrumbs highlighted in yellow in below screen shows “Bangalore Restaurants” and is not consistent when navigated to next page.

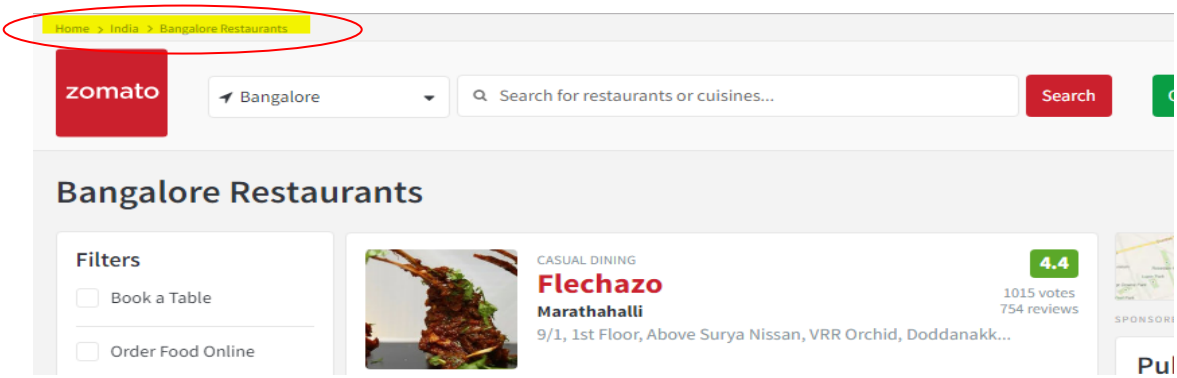

Fig. 5. Bread crumbs displayed as name Bangalore Restaurants

When the page navigates to next page “Bangalore Restaurants” changes to “Bangalore”.

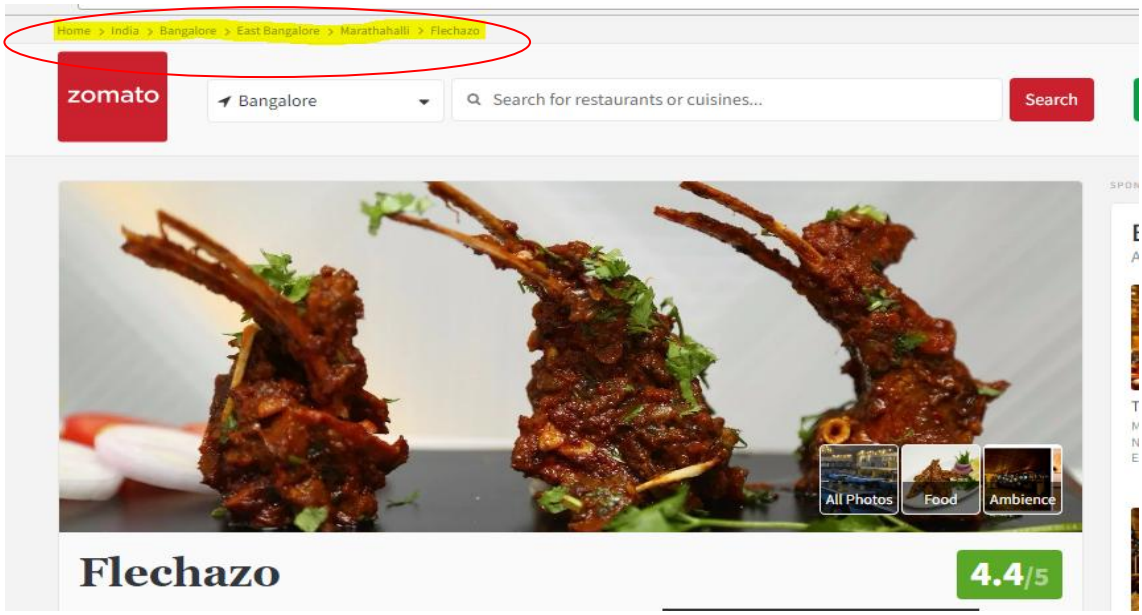

Fig. 6. Bread crumb name Bangalore Restaurants changes to Bangalore

6. RECOMMENDATIONS

Based on the results it is highly recommended that the detect location button should be fixed to auto-find the current location. Related to this detect location button, relevant message should be display if not working as expected. There are high chances for users visiting the website to search for legacy restaurants or new restaurants. Hence including legacy and new restaurant details will be an added bonus to Zomato. New filter options to search for restaurant based on number of years or year started is helpful. As the breadcrumbs links is not serving any purpose best solution is to remove these navigation links because majority of the users will not use these links. Keeping this option may leads to user confusion or frustration.

List of recommendations is as below:

- Display appropriate message when detect location button does not work.
- Display appropriate message saying why book a table option is not available to a country.
- Remove book a table option if many users do not use it.
- Include brand new and legacy restaurant information in the search.
- Fix or remove breadcrumbs links to stop confusion and frustration.

7. CONCLUSION

Usability evaluation for the Zomato website helped in learning a lot of information. Everyone's common interest in finding restaurants was their quest for delicious food. To achieve this each participant varied in interacting with the Zomato website. A very surprising factor was that website provided restaurant search options for various locations. Yet few participants were unable to find a restaurant for certain locations. Never expected that participants will search for remote villages and legacy restaurants. This is a great find for the Zomato website to update their restaurant list. Zomato should not stick to the "one size fits all" concept by providing only limited restaurant information. Many food enthusiasts have preferences for taste, locations, and cuisines. Participants' response to using the website for future restaurant searches was unexpected. As they did not want to use the website for future use. This implies that the website's ease of use, effectiveness, and learnability was not sufficient to attract customers to return to their website. Instead, more emphasis should be on user satisfaction and facilitating user needs. For example, providing content relevant to customers' requirements. One of the new emerging design issues is content management, which should be given major importance by website designers in near future [25]. Zomato's website should add more restaurants specific to

the location. Also, should update every new restaurant launched in the market.

The participants were not satisfied with the restaurant list Zomato offered. This could be one of the reasons the participants were not willing to use the application again. Hence there is a correlation between user satisfaction and users re-visiting the Zomato's website. This could be one reason for less web usage traffic in Zomato, which made it unpopular. The results of this study alone cannot determine the Zomato website's unpopularity. As this usability evaluation was conducted with three participants. Future research will be to include fifty participants. Each participant will represent a state in the USA. This will further help to understand Zomato's unpopularity in the USA. Additionally, future research will include web usage analytics tools, cameras in the test environment, and most importantly heuristic evaluation methodology. This methodology will be used to capture accurate results of usability evaluation.

This valuable usability evaluation is not only beneficial to Zomato but also to already existing and new restaurant recommender applications. The flaws found in this study will help future applications to correct these mistakes. Already existing applications will fix and find better solutions to attract more users.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Pre-Test Questionnaire Form:

(Please print or write clearly)

Name: _____

Gender: Male Female

Age:

Education: High School Undergraduate Graduate Ph.D.

How comfortable are you working on a laptop?

About how many hours a week do you use a computer?

How many hours a week do you spend searching the Internet?

Are you comfortable using Google chrome web browser? Yes No

Have you used the Zomato website before? Yes No

Do you use any restaurants search websites? If yes, Please mention the names?

Post Test Questionnaire Form:

Name: _____

Please select appropriately based on your usability evaluation experience. Feel free to add comments.

1. I feel the website was easy to use.

Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

2. I will definitely use this website for restaurant search.

Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

3. I was able to find restaurant names and location names of my choice.

Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

4. I am satisfied with Restaurant search results.

Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

5. I found the restaurant reviews very informative.

Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

6. I feel restaurant photos were relevant.

Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

7. I was able to view book table for the restaurants I chose.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

8. The detect location option was very useful

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

9. I was able to quickly find the place and search box option

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/86957