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# MOBILE USABILITY REPORT

LENOVO DCG ESUPPORT

X. XXXX

NCSU | ENG 508 | GOOGLE DRIVE

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## Executive Summary

Lenovo Data Center (DCG) Support site houses a lot of information, all pertinent to the niche users of the group. The support site offers product documentation, product downloads, as well as various links to product specific information. Over the course of the year, various analyses have been done on this site which include a heuristic analysis as well as a competitive analysis to assess usability and features across sites. As a result of these analyses, a recommendation to improve user experience was to improve the mobile adaptiveness of the site. Notable findings of this usability study include frustration with the scrolling required on the landing page, as well as difficulty comparing server types as well as finding the estimated costs of devices using the support site. Users expressed frustration, and were not favorable of the general usability of the site. Many of the issues which arose highlighted the key issue that the mobile site is not adaptive, but instead is simply responsive. This results in bugs across platforms (e.g., excessive text wrapping and overlapping text) as well as increased scrolling.

### Problem Statement

This usability report focuses on the usability of Lenovo's DCG support site on a mobile platform. Various terms of use on this support site could inform about the usability and are outlined in the method section. For the purpose of this test, objectives is to determine usability of the DCG support site by assessing discoverability, and time to completion, of various tasks

## Background

Mobile use for browsing has significantly increased over the past several years – which now equates to roughly 51% of daily media use being held on the mobile devices. A majority of users also report needing engagement of websites on multiple platforms – not restricting to desktop use, and this data is stronger for younger generations. Data supports the emphasis on mobile usability, however not all sites are adaptive or responsive. In mobile website design, these two terms differ in that:

- Adaptive designs imply that there are various layouts for type of device, designed for optimal usability on that specific device
- Responsive designs provide the optimal viewing experience of a website on the device of choice. This doesn't always lead to optimal usability in that some features are tested and designed on desktop only.

Lenovo DCG support site is responsive, however it's clear that not much consideration has been made to the use of the site on a mobile device. Specific data on mobile use of DCG customers is unknown, but it is recommended to run a survey to determine this data in support of this report.

## Methodology

This usability test aims to assess the usability of Lenovo's DCG support site using a mobile device. A pre-test questionnaire was designed to determine and document various mobile use information as well as basic expectations of use of the site. The participant then performed several guided tasks, following specific scenarios. For each task, a think aloud technique was applied to fully gather the participants experiences with the site. Finally, a post-test questionnaire was designed to assess overall usability of the site and address any pain points when completing the task, in addition the SUS score was provided to have a popular measure of usability regarding the web page itself.

### Test Goals and Objectives

The test goals of this study are to determine the usability of Lenovo's DCG support site using a mobile device.

### Participant Information

A total of 3 participants were recruited for this usability test (1 female, 2 male; average age 26.3). Participants were collected using a convenience sample. Due to the specificity of much of the information on the support page, participants were asked various questions regarding familiarity with keywords used in the tasks (e.g., on a 1 – 5 scale, rate your familiarity with DIMMs). This information was used to verify that the tasks were designed for novice users. Any words with low familiarity were explained to the participants prior to task administration. Criteria for participants include:

- User must not have experience with Lenovo support sites (DCG or PC)
- User must have access to a smart phone with a screen between 4.5" and 5.5"
- User must have the Google Chrome browsing app

To best assess the webpage on a mobile platform, two user personas were established to present context to the participants prior to beginning the experiment. Each persona (described below, and in detail in Appendix H) involved a user of the support site who had two separate goals of interacting with the support information.

Joe – An external sales rep who wants to explore the support site to relay a series of useful information to a potential client looking to purchase Lenovo servers. He's pushed for time and needs to get information to his client, and doesn't have access to his desktop.

Jim – A customer and recent recipient of a Lenovo server who is looking for relevant updates for his specific type. He's on site checking the server and can't access his desktop and needs to use his mobile device.

## Testing Environment and Equipment

The mobile usability test was conducted at a neutral location. Participants used their own mobile devices to complete the tasks. All participants had Android phones (Samsung S5; 2 LG V10's) and had several years of experience with that phone type. Two participants rated having previous experience with Apple's operating systems. Lack of an Apple device in testing is noted as a limitation, future studies should aim to incorporate Apple devices.

## Procedure

Participants were first presented with the consent form to be reviewed in conjunction with the experimenter. After consent was received, participants completed the pre-test questionnaire, which aimed to assess their mobile device use as well as their expectations for the DCG support site on a mobile platform. At that point, participants were instructed to open Lenovo's DCG support site (e.g., <https://datacentersupport.lenovo.com/us/en/>) and completed the following scenarios.

*Scenario 1: Explore the DCG support site on the mobile device as a potential customer*

Participants were asked to observe the home page, without clicking (scrolling was allowed) and give an initial opinion on the layout and structure.

Following their initial assessment, users were instructed to complete the following tasks. Their time to completion, errors, as well as general think aloud comments were documented. Time on task was limited to 5 minutes per task. This was done to control the testing time, as well as mitigate frustration. The tasks are displayed in the table below:

| TASK   | COMPLETION   | POTENTIAL ERRORS  |
|--|--|---|
| 1. Find and compare the latest generation DCG servers (ThinkSystems)                   | User identifies the appropriate servers  | Wrong navigation, wrong server selection                              |
| 2. Ensure that the above server selected can run RHEL 7.4 as the OS                    | User finds the information and verifies server. If wrong selection, user completes task 1 again. | Wrong navigation, wrong server selection, not finding the information |
| 3. Determine the approximate cost of one of these servers (identified in task 1) fully | User finds the relevant information  | Wrong navigation, can't find the information, unnecessary exploration |

|   |  |   |
|---|--|---|
| loaded with memory DIMMs  |  |   |
| 4. Find the Lenovo forum that covers the server (identified in task 1) and find relevant posts                          | User finds the forum and identifies whether or not there are relevant posts                                | Wrong navigation, wrong forum section, incorrect location of posts  |
| 5. See what product and user guides are available for this server (identified in task 1) and look through them briefly. | User finds the product and user guides for their selected server and opens them on their device to review. | Wrong documentation selected, wrong navigation, wrong server selected   |
| 6. Find the DCG YouTube channel and see if there are relevant videos for this server                                    | User finds the DCG YouTube channel and finds any relevant videos for their server                          | Can't locate YouTube videos, finds wrong server videos, incorrectly completes search prior to locating videos (e.g., determines they don't exist) |

*Scenario 2: Explore the DCG site as a previous customer*

Using the personas, the second scenario asks the participant to engage with the support site as if they have specific goals in mind instead of exploring types of servers and general information. Their time to completion, errors, as well as general think aloud comments were documented. The tasks are displayed in the table below:

| <b>TASK</b>   | <b>COMPLETION</b>   | <b>POTENTIAL ERRORS</b>  |
|---|---|--|
| 1. <i>It's been a year since you purchased the Thinksystem SR650 server, find any Firmware update guides that will help you</i> | User finds the firmware update guide appropriate to the selected server and assesses whether or not they'd update (look at recent dates less than 1 year old) | Wrong navigation, wrong server selection, wrong document selection, fails to notice updates less than 1 year old |

|  |  |  |
|--|--|--|
| <p>determine whether or not you want to update the firmware and drivers.</p>   |  |  |
| <p>2. Find the latest Update Xpress System Pack for the server running RHEL 7.4 and determine what pieces of firmware and drivers are in the package</p> | <p>User finds the update xpress system pack for the right server process. Makes determination of the firmware and drivers in the package (verbal statement).</p> | <p>Wrong navigation, wrong server selection, not finding the information</p> |

### Evaluation Metrics

Various data collection methods will be utilized following the completion of this test. These include:

- **Task time to completion** = for each task, time to completion will be documented. A maximum of 5 minutes was allowed per task.
- **Error count** = Errors will be summed for each task and categorized accordingly.
- **Pre- & Post-test responses** = The pre- & post-test will be designed to complement each other in an effort to determine the usability of the support site. The pre-test will aim to assess expectations as well as establish types of mobile use (i.e., device information, frequency of use) and the post-test will aim to assess experiences. These will determine the effectiveness of the page, as well as touch into the usability.
- **SUS scale** = To determine the mobile usability of the site, the standard SUS scale will be applied and analyzed.

## Findings

Prior to beginning the tasks, the participants took some time to explore the DCG home page using their mobile device. They were instructed to scroll, but not click on any links or items. Some initial comments from the participants identified a key frustration which is the lack of adaptability of the interface to a mobile device. They expressed frustration in the amount of scrolling required to observe all information on the home page, and felt that the arrangement didn't make sense for a mobile device. Another notable comment was the confusion on the search bars. Due to presentation on a mobile device, both search bars appear prominent but it's not clear that they are in fact two different types of search options (Figure 1).

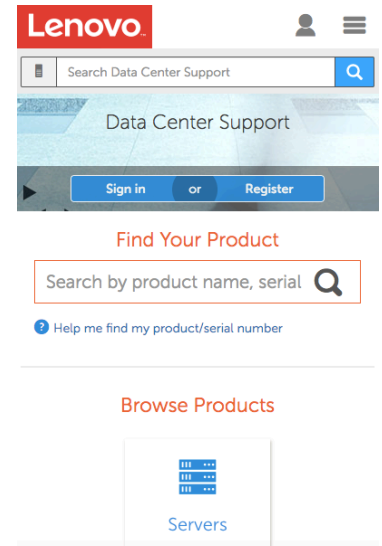


Figure 1: Home page on mobile

Findings from the usability study indicate some interesting trends towards usability of the DCG eSupport site using a mobile device. Within scenario 1, there were two tasks (tasks 1 and 3) which were not completed by any of the participants, two participants searched for the entire allotted time, whereas one participant reached a saturation point and determined prematurely to quit the search. Those two tasks (tasks 1 and 3) also had the highest amount of errors, suggesting that the eSupport site using a mobile device was not a true form of support for users. The results of errors and time on task for scenario 1 can be seen in Figure 2. Scenario 2 presented a simpler scenario, and the participants had experienced the site already therefore they had some ideas of where to search. The results of scenario 2 can be seen in Figure 3.

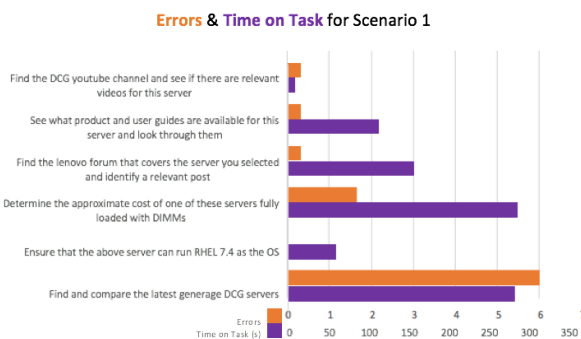


Figure 2: Results of Scenario 1

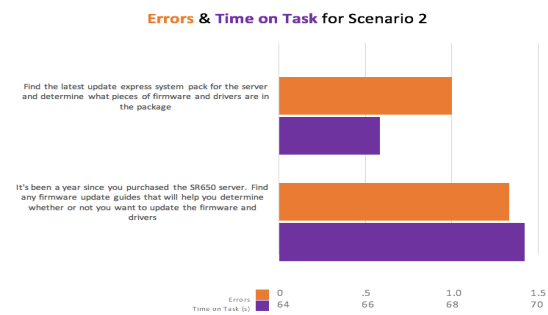


Figure 3: Results of Scenario 2



Some notable points of comments made from participants throughout the tasks and description of errors include:

- One participant resorted to google to search information instead of looking through the support site. They were instructed to return to support and find the information.
- Users mistook the label “how to’s and solutions” when searching for the forum, assuming it would be within that section.
- On a Samsung device, the presentation of documentation was so distorted the user had to change the orientation before completing the task.
- During a search, one user was guided to a site outside of the support page (Lenovo Press) and was thrown off due to the different presentation.
- To find information, two participants didn’t understand that the eye icon would present details.

Following completion of the tasks, the participants were asked to complete a post-test questionnaire. The questionnaire was to assess general feelings about their experience with the eSupport site on a mobile device as well as to assess the usability using the SUS score. Due to the audience receiving this report, a standardized usability score was applied to generalize the results company wide and present a unified context of usability for all aspects of UX within Lenovo’s brands (i.e., the SUS scale can be applied for website applications, to mobile apps, and even to hardware). Participants agreed that the site was not helpful, and that they would likely not use the support site on their mobile device if they could avoid it. All participants expressed feeling frustration with the site, with one participant noting that he imagined the documentation would be useful to employees who were on the job (e.g., in a datacenter) and needed to access support documentation – however per his experience, the documentation was not readable using a mobile device due to text wrapping and overlapped information. The results of the SUS scale (Figure 4) show that this site is unnecessarily complex, and essentially not helpful to users using a mobile device.

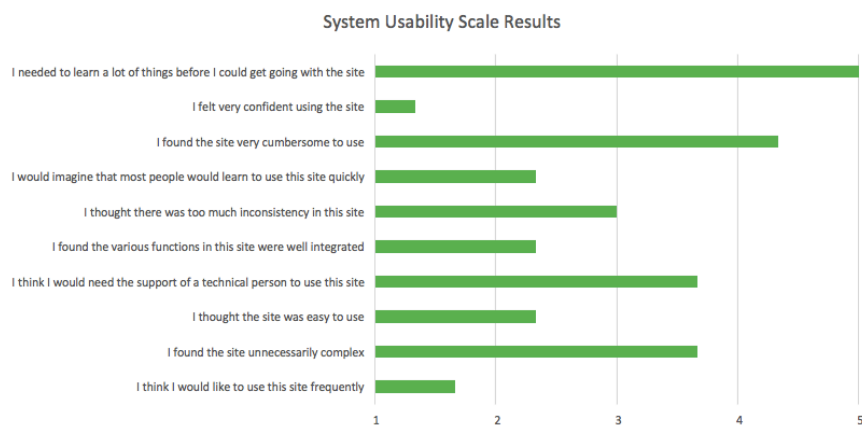


Figure 4: System Usability Scale Results

## Recommendations

A goal of this report is to establish clear recommendations for mobile usability of Lenovo's DCG support site. As mobile use increases, it's likely that users of the DCG support site will resort to their devices for key information (e.g., documentation). It's important to note that datacenters are often off site, therefore customers who would need the support site would not have access to their workstations and may be forced to use their mobile devices in times of urgency. The following recommendations were devised according to the findings of this study.

- 1) To improve mobile usability, the web design should be more adaptive as opposed to maintaining focus on responsiveness. This would allow for easier user selections and navigation through the site.
- 2) It's unlikely that users will utilize the download page from their mobile device, due to company restrictions, therefore the company should prioritize optimization of frequently used pages on mobile devices (e.g., document viewing, support forums and tips). A future study would inform of the type of information users desire for their mobile device.
- 3) In a mobile platform, with limited viewing space – limit the amount of documents and options displayed at once to the most recent updates (e.g., on the documents page, display user guide and top 5 most recent documents based on criticality). Alternative information can be displayed in a separate location, however the design should be based on the needs of the users.
- 4) Improve search functionality and appearance by emphasizing the search that is relevant to the DCG support site. Additionally, keep results limited to DCG support instead of directing users to the general Lenovo.com site.

## Future Directions

This report is a continued analysis based on a larger usability assessment of Lenovo's DCG support site. In future, it's recommended to find more knowledgeable users to participate in the testing of the support site, while novice users are helpful for general layout – the tasks utilized within this study could have been too niche specific and more experienced users could've had different time completions. Additionally, this study would benefit from a larger group of users who differentiate in phone use (e.g., Apple users).

## Appendices

## Appendix A

### Pre-test Questionnaire

The questionnaire includes the following questions:

1. What type of mobile device do you have – please provide detailed specs?
2. For how long have you had this device?
3. Do you have experience on the opposite operating system (e.g., if you have an Apple, do you have experience with Android?)
4. Have you ever used any Lenovo product support page?
  - a. If yes, why?
5. Have you ever used Dell, Cisco, or HP product support page?
  - a. If yes, why and for what?
6. Rate your familiarity with the following terms on a 5 point Likert scale (1 = unfamiliar, 5 = very familiar):
  - a. Server
  - b. Rack optimized
  - c. Sockets
  - d. RHEL as OS
  - e. Memory DIMMs
  - f. Forums
  - g. User guides
  - h. YouTube
  - i. Tutorials
  - j. Firmware
  - k. Drivers
  - l. Downloads
  - m. HTML

## Appendix B

### Post-test Questionnaire

The post-test questionnaire is designed to gauge participant expectations and understandings of the site, after use. The questionnaire includes the following questions:

1. Did anything cause frustration with your experience with the site?
2. Anything that you'd like to note as lacking? (e.g., did you expect something somewhere that wasn't? did you need more information on a certain tab?)

## Appendix C

### SUS Scale Post-test

The SUS scale is an established usability scale. This will be administered post-test to standardize the results. The scale is as follows:

On a scale of 1 – 5 (5 being the strongly agree) rate the following according to your “agreement” with the statement:

1. I think that I would like to use this system (site) frequently
2. I found the system (site) unnecessarily complex
3. I thought the system (site) was easy to use
4. I think I would need the support of a technical person to be able to use this system (site)
5. I found the various functions in this system (site) were well integrated
6. I thought there was too much inconsistency in this system (site)
7. I would imagine that most people would learn to use this system (site) very quickly
8. I found the system (site) very cumbersome to use
9. I felt very confident using the system (site)
10. I needed to learn a lot of things before I could get going with this system (site)

## Appendix D

### Moderator's Script

The following is the general script for procedural process. This includes scenarios and task items.

“Hello, you’ve volunteered to participate in our study. We will be exploring Lenovo’s DCG support site using your mobile device. Throughout the entire process, I encourage you to think aloud – informing me of the thought processes behind your decisions. At times, I may ask for clarification, or encourage further conversation regarding certain statements.

Prior to beginning, please fill out this questionnaire. *Participant completes questionnaire.*

Ok, now, please use your phone and open the Google Chrome app. Now go to the following page. *Participant enters url information.*

For the first scenario, imagine you are an external sales rep who needs to gather pertinent information regarding Lenovo’s servers for your client. You’re forced to use your mobile phone due to time constraints. Throughout each of the following tasks, we will need you to document:

- Your thoughts as you progress such as
  - Where you think you’d find this information
  - Where you wish you’d find the information
- When you think you’ve completed the task

*Participant completes the tasks per the table in the Methods section. For task 3, the user will be instructed to open another tab and guided to the appropriate site.*

Alright. Now let’s change gears. Imagine you’ve purchased the ThinkSystem SR 650 a year ago, and are now interested in checking some of the updates. You are on site, and don’t have access to a desktop therefore you need to check it on your mobile phone immediately. Throughout each of the following tasks, we will need you to document:

- Your thoughts as you progress such as
  - Where you think you’d find this information
  - Where you wish you’d find the information
- When you think you’ve completed the task

*Participant completes the tasks according to the table in the methods section.*

If the user hasn’t identified these answers already, ask the following:

- Can you discuss the usability of this page?
- Do you find the information you’d like, is there anything design-wise that you’d alter?

Alright, you've completed your tasks. Now, I would like to ask you to complete a couple of questionnaires, and then your volunteering experience will be finalized.

*Participant does post-test and SUS scale.*

Thank you for your time!"



## Appendix E

### Moderator's Checklist

#### ***Before participant arrives:***

- Prepare testing tools
- Verify that all questionnaires are printed and prepared for participant

#### ***Welcome:***

- Introduce yourself & thank the participant
- Make the participant comfortable in the testing center (or other testing location)
- Begin the script conversation

#### ***Consent form and pre-test questionnaire instructions:***

- Explain the purpose of the test
- Go over the consent form, allowing time to read and verify that all critical elements are observed (e.g., video recordings)
- Inform them to ask any questions & then when comfortable, instruct them to sign
- Once consent is received, give them the pre-test questionnaire

#### ***Instructions:***

- Following the script, explain the process of the scenarios & maintain understanding with the participant
- Explain the process of think aloud, verify understanding
- Explain the entire process of the testing procedure, emphasizing the inclusion of questionnaires following the experience

#### ***Post-test questionnaire:***

- Clarify any comments made that you found confusing
- Give post-task questionnaire

#### ***After completion***

- Thank them for their time

## Appendix F

### Consent form

The following testing aims to determine usability and understanding of a website using your mobile device. No video recordings will be taken.

No reports, or other interpretations of this data, will include your name. Any comments that can be directly related to you will also not be included in formal write ups.

By consenting, you agree to the above terms.

It should be noted that if for any reason throughout this experience you no longer wish to participate, you may withdraw consent at any time.

---

Printed Name

---

Date

---

Signature

Appendix G

Observer Form

| Participant number: |          | Date:       |                   |      |
|---------------------|----------|-------------|-------------------|------|
| Task                | Comments | Error Count | Error description | Time |
|                     |          |             |                   |      |
|                     |          |             |                   |      |
|                     |          |             | Total Time =      |      |

## Appendix H

User personas were developed as the scenarios and tasks were developed. These include the following:



Joe

“ I’m an external sales rep and I need to give my client information about these servers ASAP, but I’m not at my desk and have to use my phone. I want to explore the support site to relay a series of useful information to a potential client looking to purchase Lenovo servers. ”

Jim

“ I’m a previous customer and recent recipient of a Lenovo server who now needs to look for relevant updates for my server. I’m on site, and don’t plan to return for quite some time. Any update I make, I need to document today on-site using my mobile device. ”

