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A look into 2021 phones: A quantitative survey research study on user phone customization

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Abstract

Aim: The research in this paper aims to identify how people modify their phones, which features are most important to them, and how phone companies can use information about their customers' demographics to identify their products to them. The overarching goal of the research is to quantify user feedback better and to investigate new avenues for advanced phone customization.
Methodology: Information about the users, including information about their devices and screenshots of their lock screens and home screens, was collected using an online survey sent out privately and publicly via direct messages.
Findings: At the outset, users can alter the look of their devices by tweaking eight distinct settings: wallpaper, icons, widgets, organization, group, menu bar, launcher, and everything in between. Each user has a unique background, most of which are drawings. And then 63.75% make use of widgets, 61.25% make use of groups, and 57.50% make use other forms of organization (such as filling the screen, keeping it plain, arranging the content to see the background, using negative space, and creating patterns with the elements). Similarly, the study found that men and women use different levels of customization on their phones (men are more likely to use the basic features, while women are more likely to know the advanced ones) and that people of different ages have different levels of expertise and interest in personalizing their devices.
Implications/Novel Contribution: In one of the earliest studies of its kind, the authors examine how individuals alter their mobile devices to meet their specific requirements. The collected information can help others design better-individualized services. The study provides quantitative data on how users are customizing their phones, then examines potential gaps, and finally recommends a set of features that will hopefully give phone companies new and user-tailored ideas. The user's needs must be considered from the beginning of a product's setup to deliver effective results.

Keywords: Phones customization, Device personalization, UAE, Privacy, Android, iOS.

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INTRODUCTION

Customization, also called "personalization," is a widespread process in which people change, decorate, or rearrange places and things in their surroundings (Oulasvirta & Blom, 2008). It's the process of making places or things fit the needs of the people who use them. There are a lot of research papers about how people have changed their dorm rooms (Blom & Monk, 2003), offices (Blom & Monk, 2003), and even hospital wards (Blom & Monk, 2003).

Information and communication technology (ICT) has become more customizable over time (Oulasvirta & Blom, 2008). This can be done by the system alone (by collecting data on the user's preferences and manually optimizing), by the user, or most often by a combination of both (Blom & Monk, 2003). The smartphone, in particular, is the most common ICT tool, and it has become an essential part of daily life because it is so easy to use and helps people stay in touch. For most people, it's the first thing they touch in the morning, and the last before bed (Cui, Chipchase, & Ichikawa, 2007). It's also used in every situation. In this very competitive market, mobile phone products need to be customizable because people are becoming more aware of, used to, and expecting them (Cui et al., 2007).

External customization has been successful in some ways. It has become a defining feature of use and even a culture, like the Deco-Den trend in Japan, where people decorate their phone covers with stickers or paint them at nail salons (Oulasvirta & Blom, 2008). On the other hand, internal customization options include changing

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the background wallpaper, icon, or theme and adding widgets (Farooq et al., 2011; Ventä, Isomursu, Ahtinen, & Ramiah, 2008; Shahbaz, Jam, Bibi, & Loganathan, 2016).

Numerous studies have investigated how people alter their environments, but researchers need to pay more attention to the preferences and requirements of actual users (Oulasvirta & Blom, 2008). In addition, there have been problems where insufficiently thought-out customization options have increased the complexity of the services while simultaneously decreasing their usability and leading to lower adoption and usage rates (Oulasvirta & Blom, 2008). Last but not least, users' concerns about privacy online arise when they reveal sensitive information (Lavid Ben Lulu & Kuflik, 2016).

Research Questions

Following are the research questions of the study:

- How are users systematically customizing their phones?
- What customization features are users using the most?
- Does age or gender play a part in customization?

This paper aims to gather data on how users customize their smartphone's lock screens and home screens, which will help phone manufacturers provide better customization options for every user.

Research Objectives

The research objectives of the study are as follows:

- To provide a better understanding of how people are customizing their phones and better inform phone companies
- To determine areas in need of improvement in phone customization and suggest ways for advancement
- To better help phone companies customize their phones to suit the gender or age of the user beforehand

LITERATURE REVIEW

According to Heidmets (1994), personalization is the externalized form of the user's desire to exert agency over their surroundings. According to Blom and Monk (2003), one of the most influential works on personalization, the idea of customization has expanded to include technological means. According to their definition, personalization is "a process that modifies the functionality, interface, information content, or distinctiveness of a system to increase its relevance to an individual."

Three interconnected qualitative studies were used to develop a theory of visual customization; the authors identified six factors (user, system, and context) and three outcomes related to the customizing user (cognitive, social, and emotional). They foresee that one's capacity for customization will increase as one's disposition improves. Researchers discovered that consumers saw the product as either a reflection of themselves or the source of the feeling being studied. They've also made two checklists to help designers determine when this would be useful and what shape the features should take. As a first step, you must estimate the probability that a customer will alter the product somehow. Numerous topics are covered, some of which are listed below. The second provides criteria for evaluating whether or not certain features for customization of appearance are necessary. Many aspects of usability and customization to the user's tastes and character are brought up. (Blom & Monk, 2003; Fauzia, Farooq, & Farooq, 2012; Haq, Ramay, Rehman, & Jam, 2010) all emphasize the importance of designers carefully considering the effects and values they hope to achieve.

Similar work has been done on the factors driving customization habits Oulasvirta and Blom (2008). They looked at the data from the original study, which was published in Theory of personalization of appearance: why users personalize their PCs and mobile phones by Blom and Monk (2003). Based on their findings, they conclude that users will have more fun and achieve better results when customization options cater to their individual preferences and tap into their psychological resources. This has the potential to foster autonomy (where the user makes the technology their own), competence (where the user's actions become more effective), and relatedness (where the user expresses territory marking, ego involvement, emotion, or identity) (Oulasvirta & Blom, 2008; Waheed, Kaur, Ain, & Hussain, 2016).

Venta suggests that smartphone users form emotional attachments to their devices in a different study. In 2008, they conducted research for a paper that looked at the factors and processes that contribute to the development

of an object's attachment to its user. Forty young, active phone users were surveyed; 20 were from Finland, and 20 were from India. Seven questions were asked, both open-ended and closed. They analyzed seven processes and factors and came up with the following list: prior experience, recall, customization, adaptation, the transition from use to presence, in-phone purchase, and in-phone content. The term "personalization" was not well-known at the time, but their study did uncover some patterns indicative of individualization (for example, users frequently alter their device's wallpaper and ringtone). They concluded that people prefer to have their phones on them at all times because of the convenience features; for some, the phone didn't matter as long as it had the necessary apps.

In addition, people develop an emotional connection to their phones because of the valuable and meaningful content they store (Ventä et al., 2008; Waheed, Kaur, Ain, & Sanni, 2015). To provide more tailored experiences, a deeper understanding of the factors they brought up is crucial. There is also an inquiry into the factors that motivate the selection of particular objects for mobile phone storage. One interesting finding is that users' preferences for customization can be divided into two types: purely aesthetic and purely functional. Characteristics like uniqueness, friendliness, and beauty fall under non-instrumental qualities, while convenience and safety fall under instrumental qualities (Cui et al., 2007). Surprisingly, Venta finds the same things in his investigation.

Using a survey sample from Korea and the United States, Lee and Sundar (2015) investigated the aesthetic customization of mobile devices. The researchers looked into the mental health issues that may be linked to this behaviour and the extent to which cultural psychology factors can foretell the aesthetic motivations for mobile-phone customization. The culture was found to affect the user's other-directness directly. It causes them to alter their products for purely aesthetic reasons, which can adversely affect their sense of investment in those products and their sense of customization. People in the West, where customization is valued, tend to be less likely to alter their appearance for aesthetic reasons. But in Eastern cultures, where open displays of customization are frowned upon, cosmetic customization is more common because it expresses one's unique personality while also creating a strong emotional connection to one's electronic devices.

A study by Lulu and Kulflik explores the issue of how making groups constitutes an attempt at customization (Lavid Ben Lulu & Kuflik, 2016). According to their findings, this is done to reduce the number of times users must perform a search for a specific app. The researchers concluded that users would benefit more from a taxonomy that grouped related categories based on functionality and was automated (the taxonomy adapted to the users' needs as they installed more apps). Users have progressed with the times and, without realizing it, are now following their advice. Because producers have yet to recognize the potential of this customization choice, there's nothing left to do but improve the product itself.

It's common knowledge that privacy is at risk during modifying customization. Eighty-four percent of the people who answered a survey about the need for personalization in July 2020 were millennials (more so for millennials than the older groups). Some users are starting to understand the importance of keeping their information secure (using tools like ad blockers, privacy-focused websites, and virtual private networks) while still appreciating the benefits of personalization (provided their information is not misused). Online privacy concerns people of all ages, but only a small number of businesses take a completely transparent approach to reassuring their customers about what happens to the information they have provided. Digital publishers, the article concludes, need to strike a balance between complying with privacy regulations and building trust while interacting with their customers via this medium (Kutty, Rodriguez, Brigadir, & Aviles, 2021). Their efforts are crucial now that customization options are standard on most smartphones. They can be a beautiful roadmap for fostering long-term connections between brands and their customers. This study considers the above considerations but does not attempt to put any theories into practice. Its primary goal is to monitor user screen customization and draw connections to the cited literature.

RESEARCH METHODOLOGY

Research Design

Both quantitative and qualitative methods were used to answer the study's research questions: the former sought to quantify in-picture factors by measuring their frequency and magnitude, while the latter probed the existence of such factors concerning demographics like age, gender, and operating system to make suggestions. The study was conducted through an online Google Survey questionnaire that was shared publicly and privately through

messages. To submit the survey, participants had to answer seven questions about themselves, including their full name, age, gender, country of origin, phone operating system, lock screen, and home screen. The researcher then looks at the wallpapers and home screens of each device. People took screenshots of their home screens, but the researcher was interested in something else. Since this was more commonly seen among Android users (who may prefer to keep their home screens minimal due to the app drawer), we modified the personalized message halfway through to reflect this. Unfortunately, we also encountered dishonest participants who manipulated screens before submitting the survey.

Participants

The population pool for this survey consisted of university students, high-school students, and working adult Christians. We gathered 80 responses in 3 weeks representing both snowball and random sampling. The majority were female (63.5% while the male was 36.6%), in the 19-24 age range (51.25%, while 23.75% were 18 below and 25%, were 25-60 yrs old) and Filipino (88.8%, while 8.8% were Pakistani and 2.5%, were Indian). Other than that, 48 people (60%) were Android users, while 32 were iOS users (40%).

Table 1: Here is a summary of the respondents

Response Summary	Count | 80	Percentage	Response Summary	Count | 80	Percentage
Age			Nationality		
13-18	19	51.25	Filipino	71	88.8
19-24	41	23.75	Pakistani	7	8.8
25-60	20	25	Indian	2	2.5
Gender			My Phone OS		
Female	51	63.7	Android	48	60
Male	29	36.3	iOS	32	40

Data

Table 2: Below is the list of features per category used to rank the user's customization

Beginner
Groups (with default names)
Filled but > 2 groups
Custom wallpaper
The plain screen on Android
Intermediate
Pre-made widgets
Icon themes
Content around background
2+ non-default apps on the menu bar
Advanced
Groups (color/icon)
Custom icons
Custom widgets
Groups on the menu bar
Hides/Empties menu bar
Groups (unique names)
Expert
All aesthetic
Launcher on Android
Negative space on iOS
Element structure/pattern

Table 3: Following are the quantitative and qualitative findings from the screen shots

Response Summary	Percentage
Lock Screen Wallpaper	
Graphic	36.25
Animal	5.0
Real-life	42.5
Quote/Verse	10.0
Other (Schedule, Single Color)	3.0
Home Screen Wallpaper	
Graphic	43.75
Animal	3.75
Real-life	37.5
Quote/Verse	7.5
Other (Collage, Single Color)	5.0
Organization Features	
Filled but > 2 groups	13.5
The plain screen on Android	10.0
Content around background	16.25
Negative space on iOS	2.5
Element structure/pattern	21.25
Group Features	
Groups (with default names)	36.25
Groups (color/icon)	5.0
Groups on the menu bar	5.0
Groups (unique names)	11.25
Icon Features	
Icon themes	17.5
Custom icons	8.75
Menu Bar Features	
2+ non-default apps on the menu bar	15.0
Hides/Empties menu bar	3.75
Launcher	
Launcher on Android	1.25
All	
All aesthetic	8.75

Table 4: Summary of the age difference

Feature	Percentage					
	All	13-18	19-24	25-30	31-36	37-60
Groups (with default names)	29	7	16	1	3	2
Filled but > 2 groups	11	3	6	-	1	1
Custom wallpaper	80	19	41	4	5	11
The plain screen on Android	8	-	6	2	-	-
Pre-made widgets	36	8	19	2	4	3
Icon themes	14	4	8	-	2	-
Content around background	13	4	9	-	-	-
2+ non default apps on the menu bar	12	3	7	1	1	-
Groups (color/icon)	4	2	2	-	-	-
Custom icons	7	3	4	-	-	-
Custom widgets	13	5	8	-	-	-
Groups on menu bar	4	1	3	-	-	-
Hides/Empties menu bar	3	1	2	-	-	-
Groups (unique names)	9	3	5	1	-	-
All aesthetic	7	4	3	-	-	-
Launcher on Android	1	1	-	-	-	-
Negative space on iOS	2	-	2	-	-	-
Element structure/pattern	17	6	11	-	-	-
Can't Tell	7	3	1	-	-	3

Table 5: Summary of the gender difference

Feature	Response	
	Male	Female
Groups (with default names)	11	18
Filled but > 2 groups	5	6
Custom wallpaper	29	51
The plain screen on Android	4	4
Pre-made widgets	11	25
Icon themes	4	10
Content around background	5	8
2+ non default apps on the menu bar	5	7
Groups (color/icon)	2	2
Custom icons	-	7
Custom widgets	1	12
Groups on menu bar	2	2
Hides/ Empties menu bar	2	1
Groups (unique names)	2	7
All aesthetic	1	6
Launcher on Android	-	1
Negative space on iOS	-	2
Element structure/ pattern	5	12
Can't Tell	6	4

Sample Screens

The following statistics were selected from the most generic available to protect the participants' privacy. In their most basic form, these screenshots were collected and analyzed.

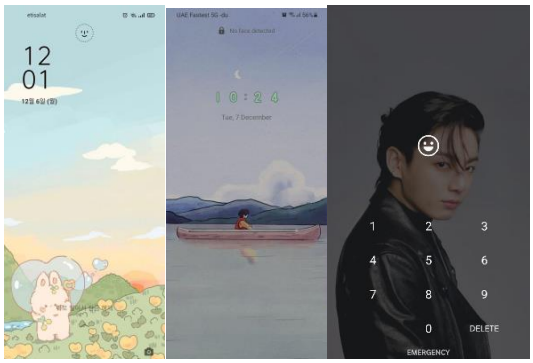

Figure 1. Android lock screens

Figure 2. iOS lock screens

Figure 3. Android home screens

Figure 4. iOS home screens

FINDINGS AND DISCUSSION

Eight distinct categories of user customization were identified throughout the study: widgets, icons, menu bar tweaks, wallpaper changes, home screen arrangement, app launcher settings, and so on. The researcher then developed a scale (beginner, intermediate, advanced, and expert while what features were in each area in the table above) to categorize respondents' levels of customization expertise and facilitate a more structured examination. Above, we saw that changing the home screen and lock screen wallpapers was the first form of customization tested. Most users set their home screen wallpaper to a graphic (random pattern, anime, drawing, aesthetic, meme, or relationship). In contrast, most lock screen wallpapers were real-life (family, idol, GF/BF, food, place, or thing). On the other hand, graphic drawing wallpapers are the most popular choice for both lock and home screens (15/80 and 17/80, respectively).

People relied on organization features like filling the screen, keeping it simple, arranging the content to see the background, using negative space, and constructing patterns with the elements the most (63.75%). The most popular customization method is widgets (61.25%), followed by icons (26.25%). (which might be due to the functionality it gives more than the icons). Following this, over half of users (57.50%) organize their apps into folders on the home screen. Only about one in five users (or 18.75%) alters the menu bar, and only about one in twenty-five (1.25%) employs an Android launcher.

The age factor in home screen customization was a hypothesized area for further study. Participants were ranked according to the above criteria after being divided into five age brackets (13–18, 19–24, 25–30, 31–36, and 37–60). We discovered an age effect, with users 30 and up using and understanding primarily the most fundamental customization options (like changing the wallpaper, using widgets, and standardly naming grouped apps). Participants under 30 are likely to be familiar with more complex ones (including creating patterns with the elements, adding custom widgets and icons, and using a launcher). Premade widgets and icon themes are used by people of all ages, while custom versions are used primarily by people in their teens and twenties (aged 13-24). We also deduced that, beyond just changing the wallpaper, most people enjoy organizing their apps into predefined categories like "productivity," "social," and "games" and arranging these categories into patterns on their home screens. We found, finally, that the younger demographic is more likely to have formed an aesthetic wherein they would alter the system (from wallpaper, icons, widgets, folders, etc.).

The study also aimed to determine if males and females differed in their degree of customization. With only 29 males and 51 females participating, the results of this survey can't be trusted. The data showed that most men use elementary features (38.03% used groups with default names, 17.24% filled the screen using fewer than two groups, and 13.79% of Android users made their screens plain). On the other hand, women tended to make more advanced use of the app's features (19.61% used icon themes, 23.53% created patterns with the elements, and 11.1% used custom widgets). One in three men (3.45%) and one in four women (11.76%) have fully customized their home screens to form an aesthetic, suggesting that men are less likely to go the extra mile. In addition, none of the men in this sample used negative space on iOS or the launcher app on Android, while 13.73% of the women did so. And lastly, women were more likely to use pre-made widgets (49.02%), groups with default names (35.29%), and custom widgets (23.53%). Males were more likely to use pre-made widgets (33.93%), create groups with default names (33.93%), fill the screen (17.24%), push content around the background (17.24%), have two apps other than the defaults on the menu bar (17.24%), leave the screen blank on Android (13.79%), and finally use an icon theme (13.79%).

To conclude, the researcher would like to recommend the following:

- Instead of offering custom patterned wallpapers, phone manufacturers should offer graphic-drawing wallpapers for the younger generation while offering (non-intrusively) selected family photos for the older generation.
- It should also follow the same theme as more people customize their wallpaper this way.
- For people aged 37+, advanced customization features, like custom icons, widgets, or overall aesthetic, should be more accessible and easy to use, encouraging users to try.
- The use of launchers for Android, overall aesthetic, negative space for iOS, and custom icons should be more accessible and easily used for males.

- One recommendation given by a participant was the ability to add stickers to iOS and Android screens.
- There could be more customization options like changing the overlap color, adding icons to groups, etc.
- Phone companies could run a survey or social media sync to gather the essential data beforehand.

Finally, the researcher acknowledges that many individualized characteristics might also be due to a combination of factors (like preference, high phone usage, necessity, the difficulty of ease and access, tech-savvy, total storage space, time constraints, or low iOS version). This study hopes to provide a bridge of communication and understanding between both parties by encouraging more users to customize their phones and making it easier for phone manufacturers to identify the gaps in their existing systems.

CONCLUSION

Smartphone users are increasingly aware of the need for customization, but they often need to learn how to modify their devices or which features to use. Although this paper does not investigate the reasons behind the motivation or intention of the user, it does provide a good starting point for phone manufacturers to begin thinking about their users and releasing features they frankly want.

All users, regardless of age or gender, should feel more encouraged to experiment with their phone's aesthetics by the suggestions mentioned above, which aim to expand the options for customization available to them. Recommendations that could raise privacy concerns and call for further discussion include routinely offering to select family pictures as wallpaper and conducting surveys to gather personal information on users. What matters is that a more robust communication channel opens up between them, resulting in a more customer-focused result.

LIMITATIONS AND RECOMMENDATIONS

Inadequacies in the survey questions represent a potential drawback to the research. The study could have benefited from asking participants more specific questions, such as how often they make changes to their phone, how long they've had their current phone, whether or not they see their phone as a reflection of who they are, etc. The answers to these questions might have shed light on their preferences regarding customization. In addition, the researcher could have been more specific about the desired home screen. The failure to prepare adequately led to this result (mostly on Android phones, since they could give false home screens). Finally, the numbers of men and women who participated needed more accuracy, rendering the results reliable.

Therefore, the researcher recommends that any scholar looking to widen this review:

- Ask more insightful questions in the survey to lessen manual labour.
- Be more specific to which screen you want to gather; else, ask for more or all their screens since this shows what else they've done to customize.
- Get even numbers of people to measure the result more accurately.

Finally, we recommend that others create the product and test it with real users to determine if the above features are essential. This is the only way to get the job done for the user. Additionally, it is a great way to add value by asking for feedback and other features they would like to see, as they may have already considered it.

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