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أهمية تصميم واجهة المستخدم في تطبيقات توصيل الطعام في المملكة العربية السعودية.

The Efficiency of UI Design for Food Delivery Applications in Saudi Arabia

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رؤى إبراهيم عساس
raassas@uj.edu.sa
(أستاذ مساعد)، قسم تصميم الجرافيك، كلية التصاميم والفنون، جامعة جدة، جدة، المملكة العربية السعودية.

Douha Youssef Attiah
raassas@uj.edu.sa
(Associate Professor), Graphic Design Department, College of Art and Design, University of Jeddah, Jeddah, Saudi Arabia.

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الملخص

تهدف هذه الدراسة الى الكشف عن أهمية تصميم واجهة المستخدم التي تركز على الجانب البصري عند تخطيط التطبيقات اللازمة لتوصيل الطعام في المملكة العربية السعودية. واعتمدت الدراسة المنهج الوصفي التحليلي، وتم بناء استبانة إلكترونية يجاب عليها من خلال وسائل التواصل الاجتماعي تدور حول العناصر المرئية التي يلاحظها المستخدم أثناء تصفح التطبيقات لتحديد مدى مناسبتها من وجهة نظرهم. وتم تطبيق الاستبانة على عينة عشوائية مكونه من 100 من المستخدمين السعوديين لتلك التطبيقات. وتوصلت الدراسة إلى أهمية البساطة عند تصميم العناصر البصرية لواجهة المستخدم لتمكينهم من الاستفادة من الخدمة المقترحة من خلال التطبيق بشكل أسرع، وإلى ضرورة جودة الصورة الفوتوغرافية في تطبيقات توصيل الطعام، والسماح لمستخدمي تلك التطبيقات بالتقاط صور لموقعهم وحفظها في التطبيق لتسهيل عملية التوصيل. وأوصت الدراسة الى حاجة المستخدم للتفاعل المباشر مع التطبيق عن طريق تطوير خدمة العملاء وزيادة خانات كتابة الإضافات المهمة للعميل داخل قائمة الطعام لتحاكي تجربة الطلب المباشر من المطاعم.

Abstract

This study aims to investigate the importance of user interface (UI) focusing on the visual aspects and layout of food delivery applications (FDAs) in the Kingdom of Saudi Arabia. The research relied on the descriptive analytical approach. This was determined via an online questionnaire aimed at Saudis who use FDAs to highlight the ways in which FDAs can improve their UIs to meet customer expectations. This is done by using an electronic qualitative-quantitative survey of a random sample of 155 Saudi users. The research demonstrates the importance of simplicity and minimalism in UI design in terms of design elements and content creation. The research also emphasizes the importance of picture quality in FDAs. Moreover, the importance of letting users take images of their location and save them in the app. Additionally, the research recommends the importance of direct interaction with the application by developing customer service and increasing the fields for writing important customizations within the menu to simulate the experience of direct ordering from restaurants.

Introduction

The evolution of mobile technology and social media have changed people as they can be used for small, simple tasks such as: taking pictures and contacting others, to more advanced tasks: i.e. editing videos, and posting on social media platforms (Gates, 2010). One of these more advanced tasks is ordering food, enabled by on-demand food delivery apps (FDAs). These have become increasingly popular among millennials due to their speed and convenience, allowing users to enjoy their favorite foods from the comfort of their homes (Manjy, 2023). The Kingdom of Saudi Arabia (KSA) is no exception to this trend. Moreover, digital platforms can produce efficiency for startup businesses, which is a priority for the KSA's Vision 2030 (Alghashian et al., 2018). To understand the current state of FDA design in Saudi Arabia, it is important to unpack various concepts connected to apps and the principles of their design.

The market for FDAs is booming globally (Ali et al., 2021). Like many listed companies, stockholder satisfaction through high profits is extremely important (Xu and Huang, 2019). The fast growth in this online service changed lifestyles and cultures (Shah et al., 2020). A study showed the importance of ease of use and that listing the restaurants along with their food items could improve customer satisfaction and cause them to return to the app (Shah et al., 2021). A different study in KSA showed that the time factor is important for customer loyalty to a specific FDA, suggesting the more users spend time on the application the more likely they will not use it in the future (Alnasser & Abaalkhail, 2024). Additional research on human-computing interaction (HCI) with food presented interesting ideas on how people can engage with food online by identifying nine themes that should be linked to HCI (Deng et al., 2023). Interestingly, one idea

linked reality within the virtual world by showing the aesthetic features of the dishes, highlighting their sensual and sociocultural qualities, with overall favorability of the app. Moreover, the same study highlighted the importance of an inclusive design. This was achieved by the integration of a user-centered design to make HCI accessible to all.

This research used qualitative-quantitative data to understand what makes a Saudi user choose a specific application for food delivery. This study also analyzed one of the most used apps to gain knowledge about FDA design trends and their innovative features and UI designs which could lead to more efficient ideas.

There are many FDAs in KSA. Annually, new FDAs enter the market with only a fraction of them remaining active by year one. This paper highlights the features of a successful FDA UI which is essential for customer loyalty. This paper will also provide a sense of what a new FDA's startup needs in terms of a design which is likely to succeed in the marketplace.

Questions or hypotheses

How efficient is user interface design for food delivery applications in Saudi Arabia?

Objectives

- Identify the most efficient UI for Saudis among all the current most prominent food delivery applications
- Reveal the efficiency in the designs of user interfaces that focus on the visual aspects when planning the applications necessary for food delivery
- Analyze user interfaces through observation, content analysis, and data collection by using a numerical questionnaire to show the advantages and disadvantages of the user interfaces of FDAs in Saudi Arabia.

- Propose a UI application feature that could be considered as a template based on visual communication built on the research.

Value of the study

- Noting the need to provide a simplified visual design for the user to benefit from the food application service directly.
- Relying on photographs in food delivery applications as a user's "quick to receive" element in the marketing plan.
- Encourage food app users to take pictures of their location and save them in the app to facilitate the delivery process within the distribution plan.
- Developing a customer service feature by providing an application based on direct interaction between the user and the application to simulate direct demand from restaurants.

Literature review

Mobile technology

Mobile devices serve multiple purposes, including: making calls, sending messages, web browsing, watching videos, and enjoying entertainment. Moreover, users can access and install mobile applications from digital marketplaces like the Apple App Store, Google Play Store, and Aptiode, and they can manage updates either through manual or automatic means. The app stores serve as platforms for discovering and downloading applications. "A mobile app is a software program designed specifically for small wireless computing devices, such as smartphones and Tablets, as opposed to desktops or laptop PCs" (Weichbroth, 2020).

Many startups use social media to promote themselves as it is an easy way to

reach a wide range of viewers and because of it's simple interface, but using social media alone is not reliable. Many startups build online platforms such as websites or applications for users to scroll and make them as beneficial as possible. Many more businesses have started designing applications because, in general, the development of web applications isn't costly because it employs a single codebase for accessing multiple platforms, unlike website design (Bhatt, 2023).

In the Saudi context, two notable areas that have seen the development of apps are related to healthcare and retail. When Coronavirus spread in KSA, many governmental and non-governmental businesses turned their modes of communication to online means. Most importantly, many developed service applications, and the government took notice of the importance of running a comprehensive application which could help to control the virus (Hidayat-ur-Rehman et al., 2021). For instance, the mobile app Mawid was developed by the Ministry of Health. This app manages appointments in primary care hospitals and tracks COVID-19 cases (Alanzi et al., 2021).

In retail, fashion websites have application versions such as Ounas, Net-Aporter, and Vouga Closet which can increase user interaction because apps are easier to use and are more time efficient when compared to traditional websites. Many virtual clothing shopping applications, with the help of AI, have added a service that allows consumers to experiment with different clothing choices using their smartphones, regardless of their locations (3DLOOK, 2023).

Ultimately, mobile apps are intended to facilitate customer service. The assessment of customer service in digital environments has been theoretically outlined using the Means-End-Chain (MEC) theory, as introduced by Parasuraman et al. (2005) and further

developed by Fassnacht and Koese (2006). The MEC model is a cognitive framework that helps to build a clear image of consumer behavior and practices by suggesting that services, or products, are obtained in order to fulfill consumer objectives or values. The attributes of a product or service are judged based on the perceived outcomes and experiences by the consumer, ultimately contributing to the realization of their goals and values, as explained by Olson and Reynolds (2001). Lidwell (2023) suggests that when communicating person-to-person in a customer service interaction, such as over the phone, customers expect a particular protocol: such as the customer service assistant welcoming the customer, demonstrating care for the customer, minimizing waiting times, and using professional courteous language. Lidwell points out that in the digital space, such as in mobile apps, customers have similar expectations (2023).

UI Design

The effectiveness of a mobile app in facilitating customer service and thus supporting a business is based on the app's User Interface (UI) and User Experience (UX). UI encompasses all the visual elements and interactivity on the screen that provide information and control for the user to accomplish a specific task in a mobile or computer interface. UI Design is a term that stands for the visual design of any digital interface such as software, applications, and websites. It involves organizing the visual and interactive characteristics of digital products, ensuring that the interface is clear for the user to use easily, and aesthetically pleasing (Malvik, 2020). Studies have described applications that use a smart interface (Goyal et al., 2003) to help produce an efficient design, and find that it is important to plan and design a guideline to accomplish the project and to study the target audience (Ji et al., 206).

UI has basic components, which can be mapped out into cultural dimensions to develop a design for these apps, or sites, that can potentially meet the norms and trends of different cultures. More importantly, visual languages: with their compositions, graphic creativity, colours, and layouts are widely applied to UI through different startups and purposes (Yifeng et al. 2016). On the other hand, UX is concerned with a person's insights and feelings caused when using a product, system, or service (Yanfi & Nusantara, 2023). Additionally, UI and UX are closely connected: a study by Miguel showed that a small alteration could impact user experience and affect their decision to use a specific application (Miguel et al. 2010).

As with any design project, the UI is crucial in shaping the visual appearance and design of a mobile application, influencing its perceived usability by users. The key determinants for a successful UI are the intended user demographic and the specific context of the mobile application. The UI/UX design process is a comprehensive journey that transforms broader concepts into user-tailored scenarios, involving various phases, such as: initial planning, design research, sketching, wireframing, visualization, and slicing (Zagorovskaya, 2023).

Dharmayanti et al. (2018) conducted research on the Comrades application, focusing on UI and UX to assess user engagement. They concluded that the 'Goal Directed Design Method' is effective, involving stages like research, modeling, requirements, framework, and refinement. Similarly, Adhitya et al. (2021) designed a web-based app for the Maiproyek application, following stages based on the target audience's needs: including understanding context, user requirements, design solutions, and evaluation against requirements.

In the realm of UI design and development, the emphasis has been on understanding user engagement and providing guidance for a positive experience (Sutcliffe, 2010). UI designers and developers recognize the importance of incorporating elements that enhance engagement, aiding in internal decision-making and educational procedures of fundamental algorithms. Meske & Bunde (2022) argue that an efficient UI design has the potential to illustrate and aid engagement with internal decision-making and educational processes of fundamental algorithms, thereby improving a user's objective comprehension.

In a study that focused on the importance of UI and UX in the development of mobile applications, the significance of a harmonious balance between the two was highlighted, given the contemporary demand for seamless interactions with devices (Sandesara et al., 2022). The survey findings depict the primary UI elements influencing the design of mobile apps are: colors, icons and shapes, typography, placements, images, and animation.

A study on governmental applications such as Tawakklana showed above average scores for attractiveness, originality, and ease of use, but it also discovered that this app lacked qualities such as creativity and innovation and many participants criticized the UI design of this app (AlGothami & Saeed, 2021). Another study about Mobile Commerce and Customers Security Perception in Saudi Arabia showed how different mobile applications such as Noon and Ounas have a distinctive design, which negatively impacts the UX (Gull et al., 2022).

Food delivery apps in Saudi Arabia

Many restaurants use a Platform-to-Consumer Distribution (Third party delivery

company). This is when "the restaurants don't have their own online application, but it creates a partnership with another platform dedicated to delivering orders from restaurants" (Aldayri et al., 2023). In Saudi Arabia, industrial reports show an increased in number of food delivery apps annually, by 6%. This indicates the continued use and increased desirability of using these kinds of apps by the Saudi population (Sudra, 2024). Some applications provide links to groceries as well as restaurant delivery services (Nagar, 2023). This industry is booming, and examples of apps centered on the delivery of food from restaurants, groceries, and other necessities in KSA included: Jahez, Hunger Station, The Chefs, Luqmety, Shagardy, Marsool, To you, and Nana. All these applications can be downloaded using Apple App Store (IOS) or Google Play Store.

In 2020, a survey was undertaken by Waad, involving 18 participants, to gather customer feedback on their experiences with the user interface and user experience (UI/UX) of the food delivery applications they utilized. The results suggested that participants had a strong interest and active engagement with food delivery apps that are simple and easy to use. According to Azzam & Wannous (2022) in their research about 'The guidelines for designing mobile application interfaces to create an efficient user experience' there are still many applications far from established in terms of usability, as they do not provide user-friendly interfaces that can help the user easily accomplish the task. In their research, they suggested a framework for the design of an effective UI and factors that should be considered when designing a UI for mobile apps (2022). Another study (Lashin & Helmy, 2021) discovered a new generation of design principles for mobile applications, in general, which focus on minimalism, which can be accomplished by incorporating white spaces, colors, content, visuals, layout, typeface,

and user flow that can be applied to FDAs, specifically.

The significance of this research is that it focuses on UI elements that can push and make startup-based applications successful and lucrative. This can be accomplished through making a visual analysis of various FDAs and contributing to a renewed desire in using them.

Methodology

Data Sample:

The research relied on the descriptive analytical approach. A qualitative-quantitative survey was conducted to explore the views of Saudi Arabian participants on a selected group of "Delivery interface designs". It explored their opinions on what they "like" and "dislike" relating to these application interfaces. A descriptive analysis was also conducted on the "delivery applications" to study their visual features.

This research used an electronic survey tool as it is easier to target the population of interest in reference to delivery app usage. Most survey items are designed to produce quantitative data to understand the importance of UI design features in delivery apps (Lewis-Beck et al., 2004:896). The last two questions are qualitative to explore the stakeholder's opinions, feelings, and interpretation of the design in order to improve it (Muratovski, 2021).

To ensure the validity of the survey questions, first, the researcher wrote questions related to design elements in UI. These questions were then shared with two Saudi professional graphic designers who helped to amend the survey questions for those with a non-design background, simplifying them to ensure they were easily understood by the non-specialist target audience. Then, the questionnaire was sent to

two non-designer academics for further feedback.

A random sampling method was used by selecting participants from a wide population (in this case, Saudi app users) to ensure that every category from this population was considered in the research. This method was chosen to increase the reliability and overview of the results and to contribute to the authenticity of the research findings (Thomas, 2023). The researcher provided the participants with an information sheet and explained the topic of the research. Furthermore, to ensure participant anonymity the survey did not contain a question about their name. The questions revolved around two axes: the use of restaurant delivery applications and UI design.

Findings and discussion

Results:

All 10 survey questions in this study showed significant differences (Chi-Square significant differences of P <0.05). Subsequently, the researcher aimed to identify the significant group/s between different answers allocated to each question category. Methodically, the total number of participants was divided equally between each answer: this was termed the 'expected normal distribution' of participant/answer (19.2, 23, 28.8, and 38.3 for questions 6, 5, 4, and 3 option questions). Observed numbers (actual distribution) were compared to expected numbers and Chi test was performed to determine the P value. To adjust the P value the Bonferroni correction was performed. The total number of participants was 115.

Furthermore, the researcher examined the 3 demographic targets of this survey (Age, Sex, Employment) and the possible variations within each group relating to their preferences towards one or more of the various options of each question in this

survey. No significant variation was found between the different groups within our three demographic targets nor any options of questions in the survey (Table 1).

Table 1. Demographic information

Age	18-23 years	24-29 years	30-35 years	36-41years	42-47 years	Above 48 years
Percentage	18%	10%	21%	28%	17%	7%
Observed N	21	11	24	32	19	8
Expected N	19.2	19.2	19.2	19.2	19.2	19.2
Residual	1.8	-8.2	4.8	12.8	-.2	-11.2
Chi-Square	19.974a					
df	5					
sig	.001					
Gender	Female	Male				
Percentage	92%	8%				
Observed N	106	9				
Expected N	57.5	57.5				
Residual	48.5	-48.5				
Chi-Square	81.817b					
df	1					
sig	.000					
Employed	NO	Yes				
Percentage	41%	59%				
Observed N	47	68				
Expected N	57.5	57.5				
Residual	-10.5	10.5				
Chi-Square	3.835b					
df	1					
sig	.050					

N=115 (Sample size)

When inquiring about the number of times participants used food delivery apps, many participants answered 3

times a week (37) (Table 2).

Table 2. The use of delivery apps

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
Don't use	2	23.0	-21.0	0.000			
once a week	31	23.0	8.0	0.311			
twice a week	23	23.0	0.0	5.000	30.522c	4	.000
three times a week	37	23.0	14.0	0.005			
daily	22	23.0	-1.0	4.078			
Total	115						

Hunger Station and Lugmati were the most and least, respectively (48 and 15) used apps (Table 3)

Table 3. The App used the most.

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
others	27	28.8	-1.8	2.825			
Jahez	25	28.8	-3.8	1.677			
Lugmaty	15	28.8	-13.8	0.012	20.061d	3	.000
Hunger Station	48	28.8	19.3	0.000			
Total	115						
Total	115						

Table 4 shows 14 out of the 27 participants chose another app: To You app. 8 participants use Marsol app, and 5 use The Chefs.

Table 4. anther app

Another app (specify):	Observed N
To You	14
Marsool	8
The Chefs	5

Table 5 shows participants were divided in their answers on the availability of photos and images of food in delivery apps. The majority were divided between medium and highly available (55 and 59).

Table 5: Availability of Images

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
low availability	1	38.3	-37.3	0.000			
medium availability	55	38.3	16.7	0.003	54.748e	2	.000
high availability	59	38.3	20.7	0.000			
Total	115						

According to the participants, colours in the apps match the logo and design (59) (Table 6)

Table 6: Colours compatible with the app design

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
match to a low level	7	38.3	-31.3	0.000			
match to a medium level	49	38.3	10.7	0.105	39.722e	2	.000

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
match to a high level	59	38.3	20.7	0.000			
Total	115						

Answers relating to the availability of iconography were divided, with the majority being between medium /highly available (51 and 57) (Table 7).

Table 7: Icons and illustrations availability

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
low availability	7	38.3	-31.3	0.000			
medium availability	51	38.3	12.7	0.037	٣٨,٨٨٧e	2	.000
high availability	57	38.3	18.7	0.001			
Total	115						

Regarding the clarity of instructions in the app, 61 participants believed that instructions were available to a medium level (Table 8).

Table 8: written Instructions in app design

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
low availability	8	38.3	-30.3	0.000			
medium availability	61	38.3	22.7	0.000	38.939e	2	.000
high availability	46	38.3	7.7	0.388			
Total	115						

Additionally, 85 participants believed that food applications were clear in terms of font size and artistic lines (Table 9).

Table 9: Typography clarity

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
clear to at low level	2	38.3	-36.3	0.000			
clear at medium level	28	38.3	-10.3	0.123	94.035e	2	.000
clear at a high level	85	38.3	46.7	0.000			
Total	115						

The availability of animations and videos was absent according to 43 participants, while the organization of the visual elements was organized to a medium level according to the majority of participants.

(78) (Table 10).

Table 10. Animation and video availability in app design

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
unavailable	42	28.8	13.3	0.017			
low availability	33	28.8	4.3	1.440			
medium availability	30	28.8	1.3	3.151	19.017d	3	.000
high availability	10	28.8	-18.9	0.000			
Total	115						

(Table 11) How organized the visual elements are in the restaurants delivery app design they use. 68% say it is organized to a medium extent. 23% believe it is organized

to a high extent. 8% think it is organized to a small extent and 1% think it is not organized.

Table 11. layout and visual elements organization

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
unorganised	1	28.8	-27.8	0.000			
low level organisation	9	28.8	-19.8	0.000			
medium level organisation	78	28.8	49.3	0.000	124.826d	3	.000
high level organisation	27	28.8	-1.8	2.825			
Total	115						

Regarding the question of whether the visual elements aided the effectiveness of the app, 73 participants believed they did (Table 12).

Table 12. visual elements effectiveness

	Observed N	Expected N	Residual	post hoc P-value	Chi-Square	df	sig
assists to a low level	3	38.3	-35.3	0.000			
assists to a medium level	39	38.3	.7	2.685	63.930e	2	.000
assists to a high level	73	38.3	34.7	0.000			
Total	115						

Qualitative data analysis was performed. A significant number of participants (34) made no comments related to what

they disliked, however, the remaining (81) participants had various opinions shown in figure (Table 13).

Table 13: dislike in app design

	Observed N	Expected N	Residual	post hoc P-value
Images	15	11.5	3.5	2.766
layout and design	13	11.5	1.5	6.410
usability	17	11.5	5.5	0.873
goal fulfilment	4	11.5	-7.5	0.197
typography	3	11.5	-8.5	0.082
colour	9	11.5	-2.5	4.371
iconography	4	11.5	-7.5	0.197
unitality satisfac-tion	14	11.5	2.5	4.371
animation	2	11.5	-9.5	0.031
no comment	34	11.5	22.5	0.000
Total	115			

This was also the case when participants were asked for any suggestions to improve the applications with 35 participants leaving no comments and the remaining 80 sharing varied opinions (Table 14).

Table 14: Suggestions

	Observed N	Expected N	Residual	post hoc P-value
Images	17	14.4	2.6	3.681
layout and design	20	14.4	5.6	0.905
usability	12	14.4	-2.4	4.018
typography	1	14.4	-13.4	0.001
colour	8	14.4	-6.4	0.577
unitality satisfac-tion	19	14.4	4.6	1.542
animation	3	14.4	-11.4	0.011
no comment	35	14.4	20.6	0.000
Total	115			

Discussion

The study showed the efficiency of food delivery apps. Users of FDAs are from a broad category (Team, 2023). Most of the respondents used restaurant delivery apps three times a week, which shows the cruciality of independence in ordering any kind of cuisine without distraction, and more importantly, that these apps match today's fast pace of life (Batra, 2023). It also reflects that people go for quick and effective approaches that save time and effort (Chaubey, 2023). A post COVID-19 study of continuance intentions of FDA users to continue using these apps shows that consumer technological preparation positively and explicitly influences their recognition of an app's benefit and usability. Moreover, when users perceive and experience an app's ease of use and the benefits that come with using it, it will have a strong and direct effect on continuance intention (Silva et al., 2022).

In Saudi Arabia, there are several food delivery apps, but Hunger Station stands out as the most widely used by participants in this study. This aligns with the app's significant user base of 1.3 million individuals, who have given the app an aggregated rating of 4.4 out of 5 on the Apple Store. This popularity can be attributed to the app's introduction in 2012, marking a pivotal moment in online food delivery in the country, and it continues to be one of the leading food delivery applications in Saudi Arabia today, as noted by Elgammal et al. (2022). Following Hunger Station's success, Marsool emerged in 2015, catering to party-related needs (Jasani, 2023). In terms of user preference, Jahez trails behind Hunger Station, with 595,000 users but a rating of 4.6 out of 5. A study by Al-Khalifa & Albatati (2022) compared the usability of Hunger Station and Marsool, finding that Hunger Station scored higher with an overall effectiveness rate of 92.27%,

compared to Marsool's 90.83%. Alghesheiry et al. (2022) highlighted the popularity of Hunger Station, Marsool, and Jahez during lockdowns related to the Covid 19 pandemic. These food delivery apps not only became widely used but also played a crucial role in sustaining food provider businesses, delivering ready-to-eat meals to users (Khan, 2020). Jahez secured the second position in this research, but in terms of users, it is recognized as the top Saudi food delivery app, boasting 3 million users and processing 20 million orders annually (Hassan, 2024).

UI designers create an overall experience by merging all visual elements and functionality in an efficient manner (Samrgandi, 2021). The results of this study show that people prefer to use an application that shows a great deal of images, they like to see what they will order, and the quality and size of images are highly important. According to Brewer and Sebby, designers need to take into consideration that images are crucial in application design, as using professional photography in laying down images increases the usage of the app, and more importantly, purchases on it (2021). These images can create perceptions in a user's mind about the sensory, hygiene, flavour, and quality of the product, which affects a user's choices while scrolling the app (Ueda et al., 2020).

In addition, the choice of colours used in the app was important, as it must be compatible with the overall design. Colour is a crucial element of visual communication, as is the amount of white space encompassing these colours. The study illustrates using a smaller colour palette is better because too many colours could make it difficult for essential elements or functions to stand out (Al Salmi & Zayid Khalifa, 2023). Harmonising the colour utilization in application design is advisable to minimize the

colour combinations to two, to three colours, maximum (Nayan, 2021). Many designers encourage the concept that 'less is more' when it comes to application and web design (Ito, 2021). Many fast-food apps use red, orange, and yellow colours in their branding, such as Hunger Station and Jahez. Such colours are eye-catching and attract people's attention to the app (Haller, 2011). One of the participants considered changing the use of red colour in Jahez app interface, even though it is the main colour of the brand, representing speed and availability. The logo is a visual representation of the brand and using the colours of it reminds the user of which application they are using (Phillips et al., 2014).

Nevertheless, the use of icons and shapes in food delivery apps is vital as well. It is an element that helps users navigate throughout the app and know the functionality of every page clearly, making the user engaged and involved (Estuar et al., 2014). Its design should also depend on the target audience. As suggested by one participant, who expressed negative views of UI when "some icon shapes differ from each other", explaining the icon design is a crucial branding element, requiring the same spirit as the logo of the app to make the design consistent (Jun et al., 2008). 'Simple icons' that share some characteristics with physical objects and are therefore realistic and familiar, can enhance usability in observational tasks (Korpilahti & Massodian, 2022). According to Sandesara et al, iconography is responsible for the first impression of the application and whether the user will complete the experience or end it (2022).

Additionally, many participants expressed a preference for the application they use to include written instructions to a medium extent. These instructions help users to navigate the app. According to Wong, designers expect users not to understand all

functions and clickable buttons and to prevent errors and enhance usability it is important to have brief instructions for every task they click (2024). Displaying text statements as instructions to help users easily navigate the app is important by recognizing every clickable button without them becoming lost with overlapping texts (Cohen, 2023).

Typography is the font size and style, which is generally an important element in design and in UI, more specifically. Having a readable type is crucial according to the target audience (Sandesara et al., 2022). Using the appropriate font and spacing between every word and letter makes a better interaction with the app (Cisneros, 2023). Most applications related to food delivery use San-serif fonts which are a modern style and are better for long paragraphs, keeping in mind that they need to be consistent with the whole design (Ye, 2023). Sans serif is commonly used in UI design because it is simple, adequate, and impartial (Dannaway, 2023). Merging typography and text with the other elements of the visual design increases a user's interest, making them more likely to continue reading (Rivel, 2021).

Videos and animations are rarely used in UI design for FDAs. Despite this sparing use, and the possibility that movement can create lively features in the interface and thus capture user attention (Sandesara et al. op.cit), some participants disliked the animation and the speed of graphics in FDAs. It seems that video and animation can become barriers for users; the feeling of pausing an order to extensively watch an animation could have a negative impact on UI (Harley, 2014).

Hunger Station App Content Analysis:

This kind of analysis gives a deeper vision of the aspects that made users favour this application to improve FDAs and to offer a better understanding of the UI design (Hurst,

2023). The Hunger Station app was chosen because it was the most popular one. The icon for the app outside appears the same as the logo and represents it on the user's device (Mor-Samuels, 2023). In the case of The Hunger Station icon, it is represented by the first letter of the service, which is 'H', in brown, on a yellow background, with a brown frame.

Figure 1: Hunger station icon
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

Figure 2: Hunger station app first page
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

When opening the app, an animated text of the Hunger Station name appears, then the delivery box appears from the bottom with a cartoonish eye giving an impression of happiness. Next, a speech balloon comes out of the box with the saying, 'Made with love in Al Khobar. After that, two heart symbols appear suggesting what is going on in the character's head, which is the feeling of love. The colour of the heart is fuchsia, which is often linked to "confidence, assurance, and vividness" (Braam, 2024). Inside the app, there is a bottom bar shown on all its pages, the bar moves while the user is navigating around. The bar is in light grey which makes it stand out against the darker grey icons, and text to highlight the four important sections that shown in simple darker grey outlined icons and text that represents these icons. The colour of the icon appears

when clicking it to move to another page.

Sections of the app:

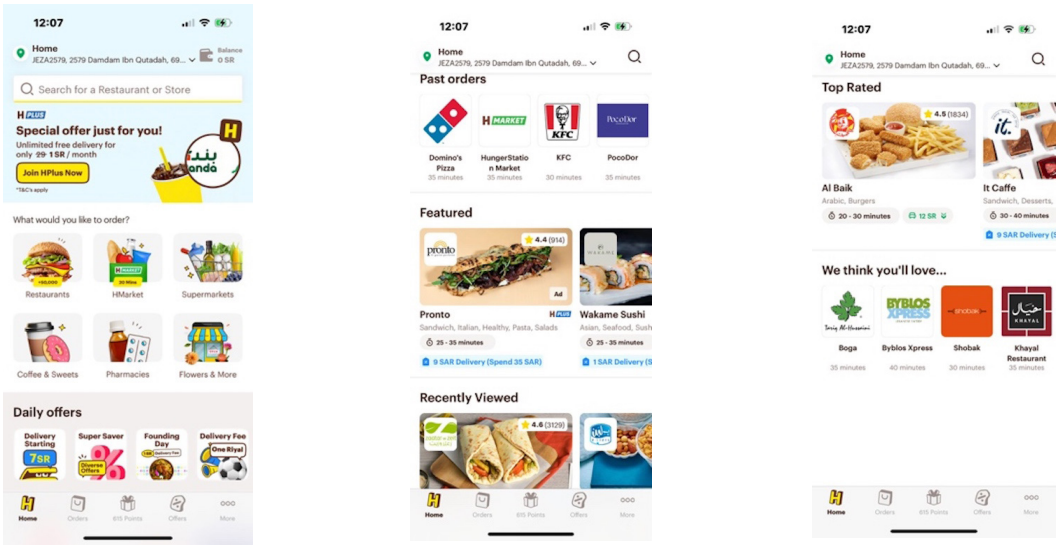

Figure 3: Hunger station Home page
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

The Hunger Station app uses a white background. On top of the app, there is a search box that turns into an icon when scrolling down on the app. The first part of the home page is in light blue and shows special offers in bold, bigger text with a moving image to draw attention to joining the 'H' plus service, where the user pays a monthly fee to gain free deliveries. Under that, the user has the option of ordering from different markets such as restaurants, supermarkets, coffee shops, pharmacies, and florists. Below, on a light gray background, there are white icons in the background with colourful cartoonish illustrations in a brown outline that show the daily offers in a big bold text. When scrolling down, the logos of past orders are shown on a white background with the name of every restaurant under each icon in dark brown.

Then, ads for restaurants appear, featuring images of dishes to represent them along with the restaurant's logo and a star rating. In front of the names, the 'H' plus icon

appears which suggests that these ads are for users who have joined and paid for the service. Also, the estimated length of time for preparation and delivery is shown with an icon of a clock to reflect it. Moreover, in bold, blue coloured text, the fees for the delivery are shown with a lighter blue background. This might be a way to encourage the user to sign into the app. Under every image is the name of the restaurant in bigger bold text, and in smaller lighter text are keywords used by every restaurant to define its products (e.g. "Sandwich, Italian, Pasta"). Then, recently viewed restaurants are presented in bold coloured headings, which show images of food that represent the restaurant with the same visuals shown in the adverts for 'H' plus. In addition, the top-rated heading of restaurants similarly shows images that represent them with the same elements shown in adverts and recently viewed vendors. Finally, a heading of bigger bold text is used to present friendly phrases to communicate with the user, saying "We think you'll love this." There are logos of different restaurants inside clickable square clickable buttons with curvy edges and below every logo the name of the restaurant in bold and under it the time it will takes for it to arrive in light small text.

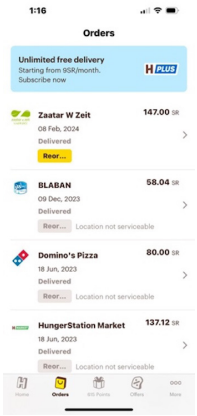

Figure 4: Hunger station orders page
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

In order to highlight the advantage of the 'H' plus service, when clicking the order icon at the top of the page, the user finds a light blue background for the 'H' plus subscription with its logo shown to emphasize it. Under it, on a white background there is a list of restaurants the user has previously ordered from, with a small logo of each restaurant and the name next to it, in bold. In front of each restaurant there is a record of how much money the user spent. Under the name of each restaurant, the date and status of the order are in smaller lighter texts.

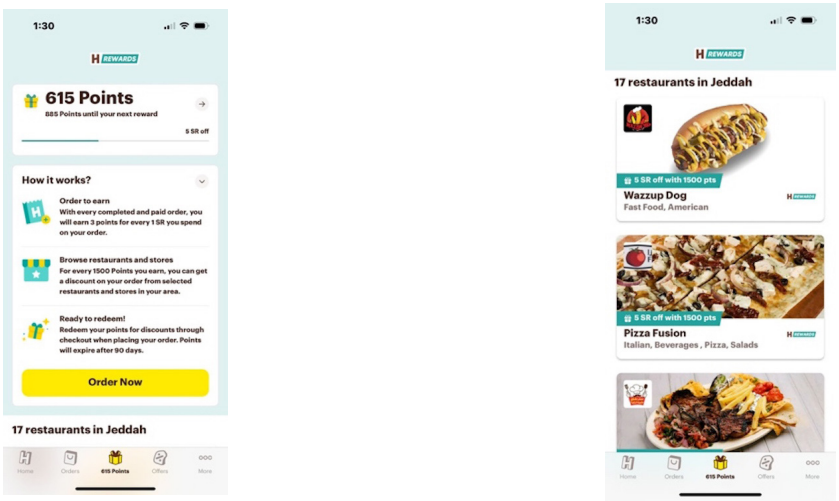

Figure 5: Hunger station points page
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

When clicking this icon, on the top of the page the 'H' logo appears dynamic, this is by using it with the word "rewards" in the same way as the 'H' plus is used on a white square background. A light tiffany-coloured background is shown and on top of it are two white boxes to highlight important heading information related to the page. The first box highlights points earned by the user from simply using the app and is in big bold text showing the number of points and next to it there is a yellow-coloured icon of a gift with a dark tiffany-coloured bow. Under the text and its icon there is smaller

text in bold of how many more points the user needs in order to earn a reward (e.g., 5 RS off). It is represented by a horizontal line, showing a dark tiffany-coloured path for points earned and a white one for the remaining points.

Under this white box, information on how to earn these points is in bold text, and next to each paragraph there is an icon that represents it in dark tiffany-colour, yellow, and white. Below this information, a yellow clickable button with the text "order now" encourages users to participate in purchasing to earn points. When scrolling down, the number of restaurants from which users can earn points in their city, appears in big bold text. This is on a white background showing the list of restaurants by using images that represent the main course, and inside the images are the restaurant logos with a dark tiffany-coloured strip under each image, an element taken from the 'H' dynamic logo. Inside it, a text in bold white explains how many riyals are discounted if the user spends points on these restaurants, highlighting the information above. Under it, the name of the restaurants are in big bold text and include lighter coloured brown keywords related to the restaurant, such as its ethnicity, and main dishes offered.

Figure 6: Hunger station offers page
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

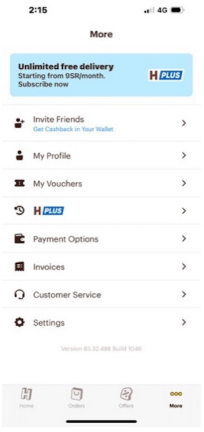

Figure 7: Hunger station More page
Source: (Screenshot by the researcher, 2024)
Screen capture with Hunger station app

When clicking "Offers" the page shows no content. When clicking on "More", which is represented by a three dot icon, the Plus advertisement, inside a sky-blue box, is shown. Under it, is a list of more facilities the user can use, which is shown in dark brown such as a clickable button inviting people to use the app to get cash back added to the user's wallet with an icon displaying the exact figure and a plus next to it that represents the concept of adding. Another clickable button is the "My Profile" button which shows the user's phone number, address, and email address with an icon of a simple figure that represents the user, in an all-white background. Another feature is "My Voucher" where the user can add a code as a voucher that they may sometimes receive when ordering from the app. A simple ticket icon represents the voucher idea. Then, the 'H' plus plan encourages participating in registration on the app to ensure that the user does not use other FDAs. An icon of a clockface is shown with an arrow around it which represents the advantages of this feature such as fast delivery. Moreover, another feature on the app is a payment option with an icon of a wallet next to it. This is where the user can add their credit card details and allocate money into the app to facilitate the payment. Another option the user has is "Invoice" with an icon of a ripped paper next to it that represents it. This is where users can see all the history of invoices they have. There is also a "Customer Service" option with an icon of a speaker where users can communicate with the service. Finally, in the settings users can change the language of the application from English to Arabic.

Ordering from a restaurant:

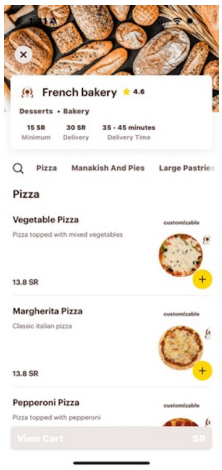

Figure 8: French bakery page in Hunger station app
Source: (Screenshot by the researcher, 2024)

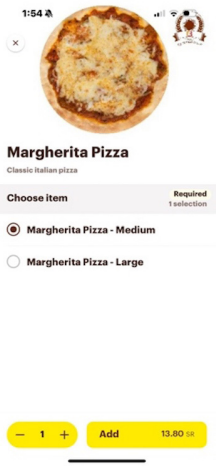

Figure 9: Choosing a dish in French bakery Hunger station app
Source: (Screenshot by the researcher, 2024)

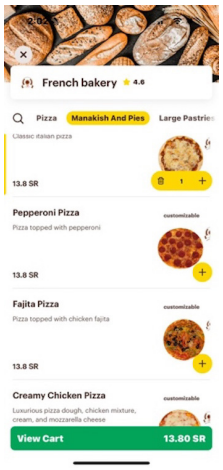

Figure 10: French bakery page in Hunger station app
Source: (Screenshot by the researcher, 2024)

When clicking on a specific restaurant on the list or using the search bar, the restaurant page emerges with the menu. The bottom of the page shows one of the dishes that the restaurant is known for. On top of the image, there is a clear white box with the name of the restaurant in big bold typeface, and next to it is the restaurant rating on one side, and on the other side is the logo of it in a smaller size. Under it, the keywords that identify the restaurant are also in bold, but in a smaller size. Underneath that, next to each other, is the minimum payment, delivery charge, and delivery time. The box is highlighted since the rest of the page is white as well. Then, under this box is the list of the dishes with their pictures in front of them. The user can scroll down to choose a dish. On top of the dishes, horizontally, is the main headings of the dishes to facilitate finding the food items they are looking for such as appetizers, pizzas, soft drinks, and so on. In addition, to simplify things, a search icon is shown so that the order can easily

be found.

When choosing the dish, it appears with its picture and the logo of the restaurant next to it. Moreover, when the user clicks on it they can select the size of the dish, and at this point, two bright yellow boxes with curved edges appear side by side. One of the boxes is used to add the number of dishes and the other to add it to the user's basket with the displayed price. When choosing the item, the app takes the user to the restaurant page showing a green coloured clickable button to view the basket with the price next to it so the user knows in advance how much they will pay. To contrast and improve readability, the text is in white.

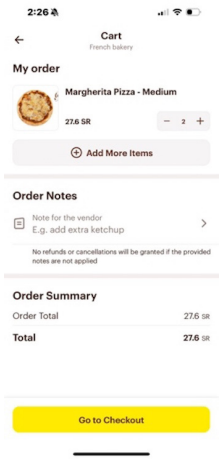

Figure 11: view cart page in Hunger station app
Source: (Screenshot by the researcher, 2024)

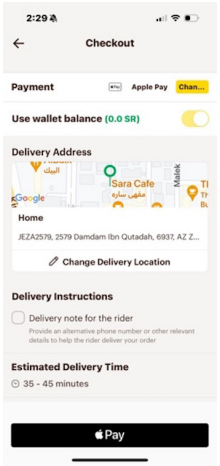

Figure 12: Checkout page in Hunger station app
Source: (Screenshot by the researcher, 2024)

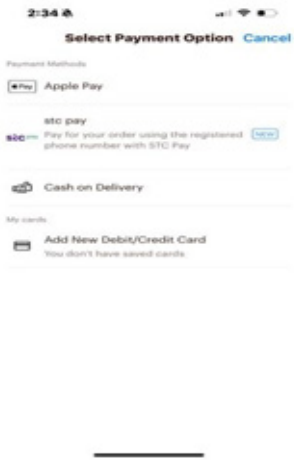

Figure 13: Payment page in Hunger station app
Source: (Screenshot by the researcher, 2024)

To finish up, after clicking the green button, the cart page appears with the orders and the total. The page is divided into three sections. The first one on top is the 'My order heading in big bold type and under it is the image of the dish with its name and price. Facing it, there is a clickable button in light brown with the number of items and a 'plus' symbol to give the user the option to add more and a bin icon to give the user

the option to delete the order. Under that, a long clickable light brown coloured button gives the user the chance to add more items from the same restaurant. The second section is ordering notes for the vendor, which is in a light text. When the user clicks on it, they can type more information about how they want their food to be done or what else they might want to add to it. A note under it says that there are no refunds or cancellations if the restaurant does not follow the notes. The final section is the order summary where users can see the overall price. Then, a clickable yellow coloured button with the text "go to check out" appear in brown.

When clicking on the check-out button, the user will find the method of payment they chose and will find it added to their profile at the top of the page. When clicking the payment button there is a list of payment options such as cash, STC pay, Apple pay or adding a credit card. Going back to the checkout, under payment, the Google map showing the address as the location of the user. The user also can change the location they want it to be delivered to by clicking on "change location." In a light brown background, there is a heading about delivery instructions, for example, more information for the driver to have related to the address, with the estimated delivery time in big bold text.

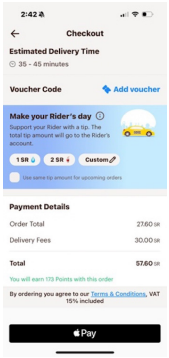

Figure 14: scrolling down Checkout page in Hunger station app
Source: (Screenshot by the researcher, 2024)

When scrolling down the page the user has the option to add a discount code or voucher where they can click on the bright blue text 'add voucher. Under it is an illustration of a yellow car that represents the company. The visual appears as moving in the city, in a simple white, and is shown in a small size on the right, and in a bright blue gradient colour, with a heading about making the rider's day by giving them a tip. Three choices are given to the user for the amount they can tip: 1SR with a water drop icon suggesting that the rider can buy water with it, 2SR with a juice icon suggesting that the rider can buy juice with it, and a 'custom with a pencil' icon suggesting to add the amount the user wants. When clicking any button, it turns into a bright yellow colour. Under it, two clickable buttons are added to apply the tip or remove it. It is also written that users can give a maximum of 1000SR. Finally, users can add a tick if they want to apply tips for future orders. At the bottom of the page, users can review the payment prices and pay.

Conclusions

This research focuses on understanding users' perspectives regarding the interface designs of food delivery applications in Saudi Arabia, to craft a more effective user interface (UI) for enhancing the overall user experience. Notably, Hunger Station emerges as one of the most frequently utilized FDAs among participants, closely followed by Jahez. The study underscores the significance of UI in these applications, particularly emphasizing the role of images, as many participants expressed their preference for a visually oriented interface.

Minimalism emerges as a key aspect of UI design, with participants favouring applications that are devoid of distractions and offer ease of use. Participants stress the

importance of clear instructions and uncluttered dish descriptions, as users generally exhibit reluctance towards lengthy paragraphs. Additionally, the choice of colours in FDAs' interfaces is highlighted, with users favouring a minimalist colour palette that is both visually comfortable and aligns harmoniously with the branding of the application. The research reveals that animations are perceived as less important by many participants, as the primary purpose of using these applications is to facilitate quick and time-efficient food delivery.

Various recommendations for UI elements surface, including the need for clear images of available dishes, a navigation bar with icons aligned with the app's branding, a user-friendly search bar, visually appealing restaurant lists, well-organized restaurant displays, and clickable functions for restaurant classifications (e.g., Asian or Italian cuisine). Participants also emphasized the importance of flexible payment options, including the ability to add cash payment upon food receipt.

Furthermore, the study emphasizes the significance of customer support communication. Suggestions include adding a dedicated phone number for complaints or support, incorporating a feedback box or evaluation bar to engage users and underscore the value of their opinions, and introducing features like displaying the user's door or location instead of relying on external communication channels with the driver. Enhancements such as clickable options or a note box under each dish for specific requests (e.g., no mayonnaise) are recommended. Lastly, participants stress the importance of providing nutritional information, such as caloric content, for each dish to meet user expectations, comprehensively.

The researcher noticed the amount of adverts Hunger Station has on its app which

can distract users and may create navigational difficulty (Gaille, 2018). Another suggestion is that this application needs to unify and maintain consistent design elements so that all pages have one spirit and do not add a surprising colour to any of the pages. It was noticed that there is a lot of white, as a negative space on the application, which is sometimes considered to strain the eyes due to its extreme contrast (Soegaard, 2024). For more usability, it is important to add notes while ordering on the same page as the restaurant, so the user does not have to move out of the page to add the comment and then come back to the ordering page again. It was also noticed that the images of dishes are of poor quality, replacing this with higher resolution images is advised. Finally, the application shows the benefit of 'H' plus even for non-members, and their options appear to non-registered people, which confuses them when browsing with an abundance of unnecessary information. The Hunger Station app is a well-known service, but in my point of view, it needs to strengthen its app design to make it more usable so as not to make users think about using other FDA competitors and keep them loyal. This is why many startup companies create FDAs to fill in the gap that is missing in the highly competitive environment.

Recommendations

This research underlines many important features of FDA UI designs and its contribution to a better user experience. Our findings present a roadmap for FDAs startups that would be of great assistance during the initial design stages. Apps should be more interactive, inclusive, and let the user hold the reins. This could be achieved by adding features such as voice responses, and more communications with costumer services. Moreover, elevating the level of user interaction with the app by allowing

user input through item reviews would provide a sense of reality to the user. Most importantly, reducing the repetition rate of advertisements and registrations prompts by subscribing to and paying for a particular service, which makes users feel the force of undergoing the application command thereby altering their decision to use it.

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