APPENDIX C

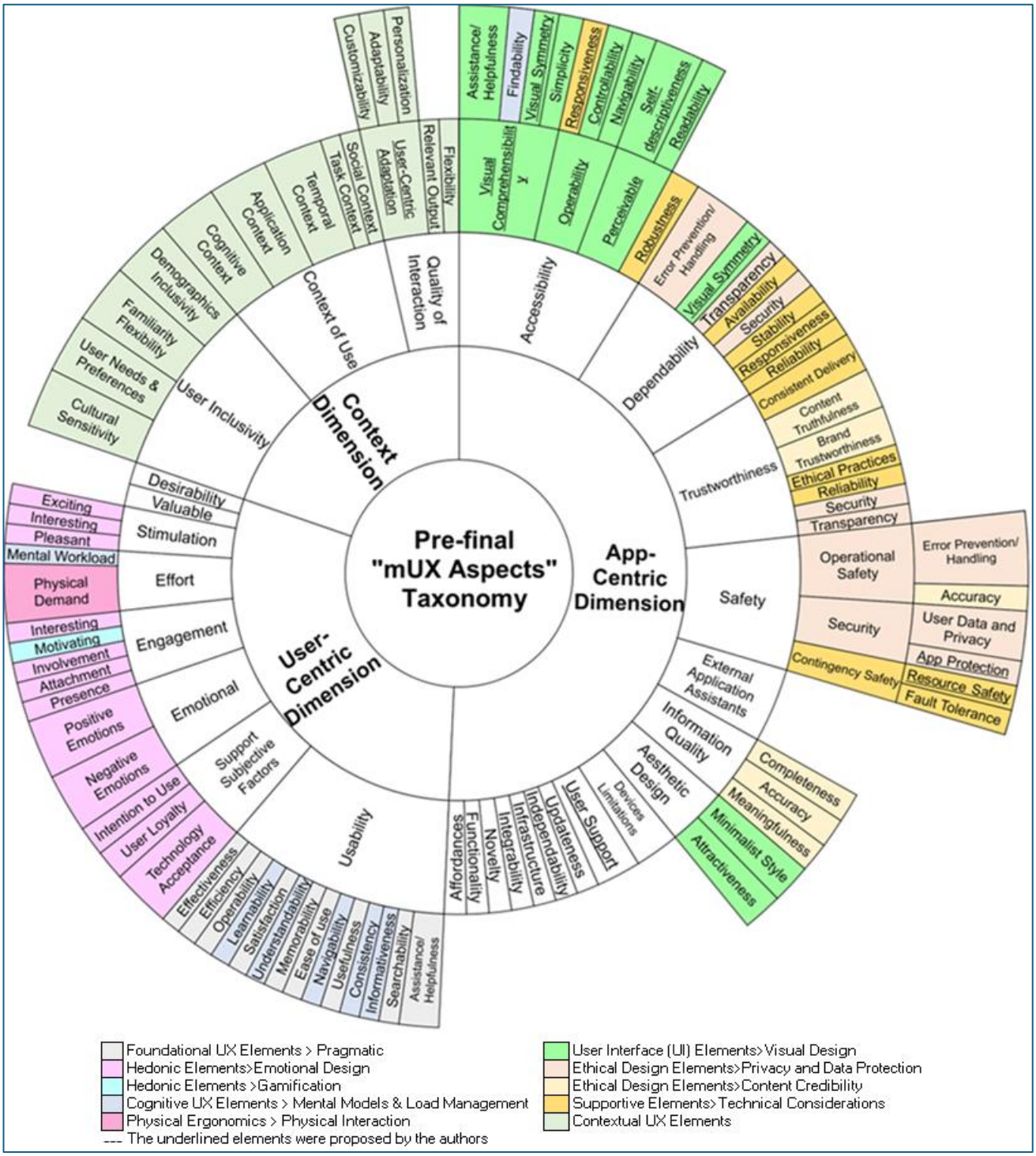

FIGURE A: THE CONSTRUCTED PRE-FINAL "MUX ASPECTS" TAXONOMY.

TABLE 8: PRE-FINAL "MUX ASPECTS" TAXONOMY SPECIFICATIONS REPRESENTING UX ASPECTS THEIR DEFINITIONS, ATTRIBUTES, SUB-ATTRIBUTES AND MEASERMENT METHODS.

NO.	Element	Definition	Adopted/ Refined/ Proposed	Resource[1]	Measurement methods[1]
User-Centric Dimension					
1	Usability	The extent to which specified users can use a product to achieve specified goals with effectiveness, efficiency, satisfaction, understandability, learnability, operability, etc, in a specified context of use.	Refined	[71], [72], [73], [74]	-
1.1	Effectiveness	The capability of the software product to enable users to achieve specified tasks with accuracy and completeness in a specified context of use.	Adopted	[72], [75], [9], [76], [22]	**Self-Reported Measurement:** Questionnaire Usability metric for user experience (UMUX) scale Post-task questionnaire (PTQ) Analyzing user reviews Think Aloud Interview **Observational Measurement:** Observation **Expert Evaluation:** Cognitive Walkthrough The Mobile Application User Experience Checklist (MAUX-C) **ALL:** User testing (Scenario testing: Task completion rate, Error rate, Time on task) Automated evaluation
1.2	Efficiency	The capability of the software product to provide appropriate performance, relative to the amount of resources used, under stated conditions.	Adopted	[72], [9], [76], [22]	**Self-Reported Measurement:** Questionnaire Post-task questionnaire (PTQ) User Experience Questionnaire (UEQ) Usability metric for user experience (UMUX) scale Analyzing user reviews Think Aloud **Physiological Measurement:** Eye tracking (measuring workload) Electroencephalogram (EEG) (measuring workload) Heart rate activity (measuring workload) **Observational Measurement:** Observation **Expert Evaluation:** Cognitive Walkthrough The Mobile Application User Experience Checklist (MAUX-C) **ALL:** User testing (Task completion time, number of steps) Performance testing
1.3	Assistance/Helpfulness	User's perception that a product or service communicates and provides useful help to achieve tasks.	Refined	[77], [78], [2]	**Self-Reported Measurement:** Questionnaire Post-Task Questionnaire (PTQ) Helpfulness Evaluation Survey Analyzing user reviews Think Aloud Interview **Observational Measurement:** Observation **Expert Evaluation:** Heuristic evaluation Cognitive Walkthrough **ALL:** User Testing with Help Scenarios
1.4	Operability	The product's ability to enable users to operate and control its functions and user interfaces effectively.	Refined	[9], [78]	**Self-Reported Measurement:** Questionnaire Post-Task Questionnaire (PTQ) Analyzing user reviews Interview **Observational Measurement:** Observation Contextual Inquiry

					Expert Evaluation: Heuristic Evaluation Cognitive Walkthrough Task Analysis inspection **ALL:** User testing Performance testing (measure how effectively the system performs under various conditions relevant to operability)
1.5	Learnability	The capability with which users can learn a product and acquire the knowledge and skills necessary to comprehensively operate it effectively, enabling them to quickly start using the system, accomplish basic tasks, and comfortably gain proficiency over time.	Refined	[78], [72], [79]	**Self-Reported Measurement:** Questionnaire Ease of use Questionnaire (USE) Post-Study System Usability Questionnaire (PSSUQ) Analyzing user reviews Interview **Observational Measurement:** Observation **Expert Evaluation:** The Mobile Application User Experience Checklist (MAUX-C) Task Analysis inspection Cognitive Walkthrough **ALL:** User testing Automated evaluation
1.6	Satisfaction	Satisfaction reflects a user's contentment with a system's learnability, ease of use, and intuitive design. This includes minimal reliance on technical support and fosters a seamless, enjoyable user experience.	Refined	[9], [79], [78], [80], [81]	**Self-Reported Measurement:** Questionnaire USE Questionnaire Questionnaire for User Interface Satisfaction (QUIS) System Usability Scale (SUS) User Experience Questionnaire (UEQ) Post-Task Questionnaire (PTQ) Usability Metric for User Experience (UMUX) scale Net Promoter Score (NPS) Analyzing user reviews Interview Think aloud **Physiological Measurement:** Heart Rate Variability (HRV) Facial Expression Analysis **Observational Measurement:** Observation **ALL:** User testing
1.7	Understandability	The degree to which users can comprehend the content, layout, and functionality of a system or interface, based on their mental models and expectations, thereby facilitating effective interaction and task completion.	Proposed	[9], [78]	**Self-Reported Measurement:** Questionnaire Post-Task Questionnaire (PTQ) Observational Measurement: Observation **Expert Evaluation:** Heuristic Evaluation Cognitive Walkthrough **ALL:** User testing
1.8	Memorability	The users' ability to recall how to use an application after a period of disuse ensures ease of returning to the system without the need for relearning.	Refined	[76], [22], [9], [72], [79], [77]	**Self-Reported Measurement:** Questionnaire **Expert Evaluation:** The Mobile Application User Experience Checklist (MAUX-C) Heuristic Evaluation **ALL:** User Testing with Re-testing After a Delay Recognition vs. Recall Test
1.9	Ease Of Use	The effortlessness with which users can learn, interact with, and complete tasks within a product, emphasizing convenience, simplicity, and user-friendliness.	Refined	[82], [83], [84], [85]	**Self-Reported Measurement:** Questionnaire USE Questionnaire Analyzing user reviews Mobile App Rating Scale (MARS) Interview **Observational Measurement:** Focus Group Observation

					ALL: User testing (Task Completion Rate, Error Rate, Time on Task) First Impressions Test
1.10	Navigability	Navigability refers to how easily users navigate the app's interface due to its structure, organization, and labeling, allowing them to move efficiently and complete tasks with minimal cognitive effort.	Proposed	[9]	**Self-Reported Measurement:** Questionnaire Mobile App Rating Scale (MARS) Interview Think aloud **Physiological Measurement:** Eye Tracking **Observational Measurement:** Focus Group Observation **Expert Evaluation:** The Mobile Application User Experience Checklist (MAUX-C) **ALL:** User Testing
1.11	Usefulness	The degree to which a product/service has a beneficial, practical use for users to achieve their goals effectively.	Refined	[77], [8], [81], [86], [87], [88]	**Self-Reported Measurement:** Questionnaire USE Questionnaire Ease of use Questionnaire (USE) meCUE questionnaire Hedonic Usefulness Scale Analyzing user reviews Interview **Observational Measurement:** Observation **Expert Evaluation:** The Mobile Application User Experience Checklist (MAUX-C) Cognitive Walkthrough **ALL:** User Testing (success rate, Task Completion Time)
1.12	Consistency	The uniformity of elements across the interface makes interactions predictable and user expectations clear.	Refined	[9], [81], [77]	**Expert Evaluation:** The Mobile Application User Experience Checklist (MAUX-C) Heuristic Evaluation Cognitive Walkthrough
1.13	Informativeness	The degree to which a product/service is instructive and properly provides all the necessary information to the user.	Adopted	[77], [83], [89], [84]	**Self-Reported Measurement:** Questionnaire Interview Think-Aloud **Physiological Measurement:** Eye tracking **Observational Measurement:** Focus Group **Expert Evaluation:** Cognitive walkthrough Heuristic Evaluation Content Audits (Information Architecture Review) **ALL:** User testing Automated evaluation (Analyze user behavior)
1.14	Searchability	The ability of an app to allow users to efficiently locate specific information or features using a search function with clear filters and relevant results.	Proposed	[90]	**Self-Reported Measurement:** Questionnaire Interview **Physiological Measurement:** Eye tracking (Heatmaps) **Observational Measurement:** Focus Group Observation **Expert Evaluation:** Search Interface Evaluation Search Log Analysis Cognitive Walkthrough **ALL:** User testing (Search performance evaluation) Automated evaluation (Analyze user behavior)
2	Emotional	The full range of feelings users experience while interacting with a product or service.	Refined	[8], [91], [92]	-

2.1	Positive Emotions	Desirable user feelings vary based on the context and goals of the interaction, making the product interaction pleasurable and engaging.	Proposed	-	**Self-Reported Measurement:** Questionnaire Self-Assessment-Manikin (SAM) questionnaire Post-Task Surveys Analyzing user reviews Interview Think aloud **Physiological Measurement:** Heart rate activity Electrodermal activity (EDA) Electromyography (EMG) Facial Expression Analysis **Observational Measurement:** Observation **Expert Evaluation:** Emocard Method **ALL:** User Testing (observing emotional responses)
2.2	Negative Emotions	Undesirable user feelings that arise from difficulties or frustrations with the product hinder the interaction and potentially lead to abandonment.	Proposed	-	**Self-Reported Measurement:** Questionnaire Self-Assessment-Manikin (SAM) questionnaire Post-Task Surveys Analyzing user reviews Interview Think aloud **Physiological Measurement:** Heart rate activity Electrodermal activity (EDA) Electromyography (EMG) Facial Expression Analysis **Observational Measurement:** Observation **Expert Evaluation:** Emocard Method **ALL:** User Testing (observing emotional responses)
3	Support Subjective Factors	A user's perceptions, attitudes, and sensations towards a product or service.	Proposed	-	-
3.1	Technology Acceptance	The user's willingness and readiness to adopt and use a new technology or system reflects their comfort, trust, and confidence.	Proposed	-	**Self-Reported Measurement:** Questionnaire Technology Acceptance Model (TAM) Survey Unified Theory of Acceptance and Use of Technology (UTAUT) Survey Interview
3.2	Intention To Use	The likelihood that a user will use an app in the future that influenced by factors such as perceived usefulness, perceived ease of use, and individual preferences.	Proposed	-	**Self-Reported Measurement:** Questionnaire Technology Acceptance Model (TAM) Survey Unified Theory of Acceptance and Use of Technology (UTAUT) Survey Interview **ALL:** User Testing with Follow-up Surveys
3.3	User Loyalty	It is a user's commitment to a particular app. It indicates a solid and enduring relationship between the user and the product, contributing to long-term user engagement and retention.	Proposed	-	**Self-Reported Measurement:** Questionnaire Customer Satisfaction (CSAT) Surveys Net Promoter Score (NPS) **Expert Evaluation:** Retention Rate Analysis App Engagement Analytics
4	Engagement	The level of involvement, interest, and enthusiasm a user has with a product or service involves capturing attention, encouraging participation, and fostering a meaningful connection.	Proposed	-	-

4.1	Interesting	The quality of an app that captures and holds a user's attention, sparking curiosity and a desire for continued interaction.	Proposed	-	**Self-Reported Measurement:** Questionnaire Customer Satisfaction (CSAT) Surveys Mobile App Rating Scale (MARS) UEQ-Emoji Questionnaire **Physiological Measurement:** Facial Expression Analysis Observational Measurement: Observation Field studies **Expert Evaluation:** Retention Rate Analysis App Engagement Analytics **ALL:** Automated evaluation (User Behavioral Analysis)
4.2	Motivating	The ability of an app to inspire and encourage users to take action, remain engaged, and pursue their goals through incentives, rewards, challenges, or meaningful goals.	Proposed	-	**Self-Reported Measurement:** Questionnaire The AttrakDiff questionnaire Mobile App Rating Scale (MARS) UEQ-Emoji Questionnaire **Expert Evaluation:** App Engagement Analytics **ALL:** Automated evaluation (User Behavioral Analysis)
4.3	Involvement	Users' active participation and interaction with an app or experience indicate their interest, enthusiasm, and commitment.	Proposed	-	**Self-Reported Measurement:** Questionnaire The AttrakDiff questionnaire Mobile App Rating Scale (MARS) UEQ-Emoji Questionnaire **Physiological Measurement:** Facial Expression Analysis **Observational Measurement:** Observation Field studies **Expert Evaluation:** App Engagement Analytics **ALL:** Automated evaluation (User Behavioral Analysis)
4.4	Attachment	The development of a deeper emotional connection between a user and the app signifies a feeling of loyalty, care, or a sense of community, fostering long-term engagement and advocacy.	Proposed	-	**Self-Reported Measurement:** Questionnaire Mobile App Rating Scale (MARS) UEQ-Emoji Questionnaire Think aloud **Physiological Measurement:** Facial Expression Analysis **Observational Measurement:** Observation Field studies **Expert Evaluation:** App Engagement Analytics **ALL:** Automated evaluation (User Behavioral Analysis) User Testing with Emotional Response Tracking
4.5	Presence	The feeling of being fully immersed and connected with the app or experience, like they're "there." This feeling is fostered by realistic graphics, immersive audio, and intuitive interfaces, enhancing enjoyment and satisfaction.	Proposed	-	**Self-Reported Measurement:** Questionnaire UEQ-Emoji Questionnaire Think aloud Physiological Measurement: Facial Expression Analysis **Observational Measurement:** Observation Field studies **Expert Evaluation:** App Engagement Analytics **ALL:** Automated evaluation (User Behavioral Analysis) User Testing with Emotional Response Tracking
5	Stimulation	Stimulation in mobile UX design refers to features that engage users by arousing their curiosity, interest, and enjoyment, leading to new impressions,	Refined	[93], [94], [95]	-

		opportunities, and insights. This can result in positive experiences, exploration of new app functionalities, and even spark creative thinking or problem-solving.			
5.1	Exciting	It refers to the ability of a product to arouse users' interest and enthusiasm.	Proposed	-	**Self-Reported Measurement:** Questionnaire UEQ-Emoji Questionnaire Customer Satisfaction (CSAT) Surveys Mobile App Rating Scale (MARS) Interview Analyzing user reviews **Physiological Measurement:** Eye Tracking Facial Expression Analysis **Expert Evaluation:** A/B Testing with Engaging Features **ALL:** User Testing with Diverse Users Automated evaluation (User Behavior Analysis)
5.2	Interesting	The quality of an app that captures and holds a user's attention, sparking curiosity and a desire for continued interaction.	Proposed	-	**Self-Reported Measurement:** Questionnaire Customer Satisfaction (CSAT) Surveys Mobile App Rating Scale (MARS) UEQ-Emoji Questionnaire **Expert Evaluation:** Retention Rate Analysis App Engagement Analytics **ALL:** Automated evaluation (User Behavioral Analysis)
5.3	Pleasant	Refers to the enjoyable, satisfying, or agreeable quality of an experience. It's the positive response or feeling elicited by a stimulus, be it sensory, activity-related, or environmental	Proposed	-	**Self-Reported Measurement:** Questionnaire Customer Satisfaction (CSAT) Surveys Mobile App Rating Scale (MARS) Interview Analyzing user reviews **Physiological Measurement:** Eye Tracking Facial Expression Analysis **Observational Measurement:** Contextual Inquiry **Expert Evaluation:** Retention Rate Analysis Expert reviews of UI design **ALL:** User Testing with Diverse Users Automated evaluation (App Engagement Analytics with metrics like session length, frequency of use, and completion rates of desired actions)
6	Effort	Refers to the cognitive and physical exertion users require to interact with a mobile application. Minimizing effort by providing intuitive interfaces, streamlined processes, and clear feedback enhances the overall user experience, satisfaction, and retention.	Proposed	-	-
6.1	Mental Workload	It refers to the cognitive effort required by users to interact with and use the app. High mental workload can negatively impact the user experience by causing frustration, confusion, and reduced task performance	Proposed	-	**Self-Reported Measurement:** Questionnaire NASA TLX questionnaire Interview **Physiological Measurement:** Heart rate variability (HRV) Galvanic skin response (GSR) **Expert Evaluation:** Cognitive Walkthroughs Cognitive Load Analysis Behavioral Metrics Analysis **ALL:** User testing

6.2	Physical Demand	Refers to the physical effort required by users to interact with the app, such as typing on a small keyboard or navigating through small touch targets.	Proposed	-	**Self-Reported Measurement:** Questionnaire NASA TLX Questionnaire Interviews Think aloud Physiological Measurement: Eye Tracking Heart rate activity (HRV) Galvanic skin response (GSR) **Observational Measurement:** Observation Focus group **Expert Evaluation:** Cognitive walkthrough Task Analysis inspection **ALL:** User Testing with Scenario-Based Tasks
7	Desirability	The ability of a product or service, through its visual appeal, emotional resonance, and alignment with user preferences, to evoke a strong desire or attraction among its target audience.	Refined	[96], [97], [98]	**Self-Reported Measurement:** Questionnaire Sentiment Analysis of User Reviews Interview **Observational Measurement:** Focus Groups **Expert Evaluation:** Emotional Response Analysis **ALL:** User testing
8	Valuable	Ensuring the app provides significant value to users, encouraging their loyalty and return. It goes beyond functionality to address user needs, solve problems, or enhance their lives. This aspect encompasses all aspects of UX design, aiming for holistic user value.	Refined	[97], [98]	**Self-Reported Measurement:** Questionnaire Value Proposition Surveys Net Promoter Score (NPS) Interview **Expert Evaluation:** Retention Rate Analysis App Engagement Analytics **ALL:** User Testing with Value-Assessment Tasks
App-Centric Dimension					
9	Functionality	An app's features and capabilities ensure the product is fully operational and aligns with user objectives.	Refined	[8], [90]	**Self-Reported Measurement:** Questionnaire Interview **Observational Measurement:** Field Studies and Contextual Inquiry **Expert Evaluation:** Bug report analysis Feature usage tracking Load Testing Stress Testing **ALL:** Scenario-Based Testing Automated evaluation (unit and integration tests)
10	Aesthetic Design	The visual harmony, appeal, and inherent beauty of the product colors, texts, grapgics, layout, audio, etc.	Refined	[8], [99], [73]	-
10.1	Attractiveness	User's perception that a product/service is pleasing, arousing, interesting, and attractive.	Adopted	[100], [83], [89], [8], [2]	**Self-Reported Measurement:** Questionnaire Analyzing user reviews Interview Enjoyment curve **Expert Evaluation:** Visual design evaluation A/B Testing with Different Design Variations attractiveness principles Evaluation **ALL:** User testing (observing users' engagement and interest)
10.2	Minimalist Style	Minimalist style is characterized by simplicity, featuring clean lines, minimal ornamentation, and a focus on essential elements to achieve a sleek and uncluttered aesthetic.	Proposed	-	**Self-Reported Measurement:** Perceived complexity questionnaire Aesthetic appeal surveys Interview **Expert Evaluation:** Design Audits/Visual inspection Simplicity heuristics evaluation

11	Safety	The extent to which the app mitigates the risk of harm to individuals or other resources, including hardware and stored information, within a defined use context.	Adopted	[9], [81]	-
11.1	Operational Safety	The capability of the software product to meet the user requirements during regular operation without harm to other resources and the environment. Criteria to be considered in evaluating operational safety include accuracy, completeness, and error handling.	Adopted	[81]	**Self-Reported Measurement:** Incident reporting surveys Contextual interviews **Expert Evaluation:** Error logs analysis Crash reports analysis Safety-focused heuristics Regulatory compliance/safety standards inspections Simulation and stress testing Code review **ALL:** User testing (Error prone task scenarios) Automated evaluation (User error tracking)
11.1.1	Error Prevention/Handling	The app proactively prevents user errors; in the event they occur, it adeptly manages unexpected situations to avert crashes or data loss by delivering clear, informative instructions.	Proposed	-	**Observational Measurement:** Observation **Expert Evaluation:** Security Heuristic Evaluation Error Handling Checklist review Cognitive Walkthrough **ALL:** User Testing with Error Injection
11.1.2	Accuracy	The degree to which data has attributes that correctly represent the true value of the intended attribute of a concept or event in a specific context of use.	Adopted	[9], [2]	**Self-Reported Measurement:** Questionnaire **Expert Evaluation:** Data Quality Audits (data architecture, data validation procedures, etc.) Cognitive Walkthrough **ALL:** User Testing with Injected Errors
11.2	Contingency Safety	The capability of the software product to operate outside its regular operation while still preventing risks. Cri teria for contingency safety include fault tolerance and resource safety.	Adopted	[81]	**Self-Reported Measurement:** Questionnaire Contextual interviews **Expert Evaluation:** Unexpected input testing Resource consumption analysis Crash reports analysis Simulation and stress testing **ALL:** User Testing with Scenarios
11.2.1	Fault Tolerance	The app's capability is to maintain a specified level of performance in cases of software faults or infringement of its specified interface.	Adopted	[81]	**Self-Reported Measurement:** Contextual interviews **Expert Evaluation:** Code review Crash reports analysis Cognitive Walkthrough Simulation and stress testing **ALL:** User Testing with Fault Injection Automated evaluation (Error/crash Tracking and Logging)
11.2.2	Resource Safety	Efficient use of device resources (battery, memory) to ensure the app can function even in low-resource situations.	Proposed	-	**Self-Reported Measurement:** Questionnaire Contextual interviews **Expert Evaluation:** Battery consumption tracking Memory usage monitoring Code analysis for resource efficiency Performance testing under resource constraints Device compatibility testing

11.3	Security	Safeguards user data and privacy, the app itself, and the environment from unauthorized access, modification, or loss.	Refined	[9], [81], [101]	**Expert Evaluation:** Security audits (Dynamic Application Security Testing (DAST)) Penetration testing (Ethical hacking) Security code reviews Authentication and authorization testing Compliance and certification evaluation Security Policy Review Threat Modeling Security Heuristic Evaluation Automated testing (Static Application Security Testing (SAST))
11.3.1	User Data And Privacy	Protecting personal information and user-related data from unauthorized access, corruption, or loss, ensuring its confidentiality, integrity, and availability through measures such as encryption and access controls.	Refined	[9], [101]	**Self-Reported Measurement:** Questionnaire Interview **Expert Evaluation:** Privacy Impact Assessment (PIA) (A systematic review of the app's data collection practices, data storage, and access controls) Security Policy Review Penetration Testing with Privacy Focus Data Flow Mapping (a visual representation of how user data flows through the app, identifying potential privacy risks) Security Heuristic Evaluation
11.3.2	App Protection	Securing the app itself from malicious attacks that could disrupt operations or compromise user data.	Proposed	-	**Expert Evaluation:** Security audits (Dynamic Application Security Testing (DAST)) Penetration testing (Ethical hacking) Security code reviews Authentication and authorization testing Compliance and certification evaluation Automated testing (Static Application Security Testing (SAST))
12	External Application Assistants	External Application Assistants are tools or resources outside the app that help users check compatibility with their devices (mobile phones, tablets) and operating systems (Android, iOS), and troubleshoot issues related to technical requirements like internet speed.	Proposed	-	**Self-Reported Measurement:** User Interview (with specific users) Analyzing user reviews Expert Evaluation: Web Analytics inspections
13	Novelty	Novelty entails introducing new and original elements or features compared to existing ones. It reflects the product's level of innovation and creativity, influencing its ability to attract user interest and engagement.	Refined	[95]	**Self-Reported Measurement:** Questionnaire Mobile App Rating Scale (MARS) Interviews with Diverse Users Analyzing user reviews **Expert Evaluation:** A/B Testing with Novel Features **ALL:** User Testing
14	Dependability	A user's trust in the app's ability to perform consistently, predictably, and securely, meeting their expectations for control and safety during interaction.	Refined	[94], [102], [103], [104], [100], [85], [105], [106]	-
14.1	Reliability	A consistent performance of the app's intended functions without degradation or failure ensures fluency, availability, system performance, and stability.	Refined	[78], [101]	**Expert Evaluation:** Code review Stress/load Testing **ALL:** User Testing with Simulated Errors Automated evaluation (Error/crash Tracking and Logging, Performance monitoring)

14.2	Responsiveness	Responsiveness refers to an app's ability to react promptly and seamlessly to user input. It encompasses two key aspects: speed and feedback.	Proposed	-	**Self-Reported Measurement:** Questionnaire Mobile App Rating Scale (MARS) Interview **Expert evaluation:** Load testing **ALL:** User Testing with Performance Measurement (measure load/response times, responsiveness to touch/input, and animation smoothness, speed, etc.)
14.3	Stability	The app's ability to maintain its functionality and performance over time, without crashing or freezing.	Refined	[101]	**Self-Reported Measurement:** Questionnaire Interviews Analyzing user reviews **Expert Evaluation:** Beta Testing with Diverse Devices Crash Reporting and Error Logs Analysis Load Testing **ALL:** User Testing with Stress Scenarios Automated evaluation (App Performance Monitoring, Long-Term Monitoring and Feedback Collection)
14.4	Security	Safeguards user data and privacy, the app itself, and the environment from unauthorized access, modification, or loss.	Refined	[9], [81], [101]	**Expert Evaluation:** Security audits (Dynamic Application Security Testing (DAST)) Penetration testing (Ethical hacking) Security code reviews Authentication and authorization testing Compliance and certification evaluation Security Policy Review Threat Modeling Security Heuristic Evaluation Automated testing (Static Application Security Testing (SAST))
14.5	Availability	Refers to the readiness of the app for users to access and utilize its functionalities when they need it.	Refined	[85]	**Self-Reported Measurement:** Questionnaire Interviews Analyzing user reviews **Expert Evaluation:** Crash Reporting and Error Logs Analysis and Networks Load Testing **ALL:** User Testing with Stress Scenarios Automated evaluation (App Performance Monitoring, Long-Term Monitoring, and Feedback Collection)
14.6	Error Prevention/Handling	The app proactively prevents user errors; in the event they occur, it adeptly manages unexpected situations to avert crashes or data loss by delivering clear, informative instructions.	Proposed	-	**Observational Measurement:** Observation **Expert Evaluation:** Security Heuristic Evaluation Error Handling Checklist review Cognitive Walkthrough **ALL:** User Testing with Error Injection
14.7	Visual Symmetry	The cohesive integration of design elements creates a seamless and aesthetically pleasing user experience, fostering predictability in interactions and clarity in user expectations.	Proposed	-	**Expert Evaluation:** The Mobile Application User Experience Checklist (MAUX-C) Heuristic Evaluation Cognitive Walkthrough
14.8	Transparency	Transparency refers to the clarity and openness of the app's operations and functionalities to users. It involves providing users with clear and comprehensive information about how the app works, how their data is collected, used, and protected, and any potential risks or limitations associated with its use.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview **Expert evaluation:** Expert Review **ALL:**

					User Testing with Information Access Tasks
15	Integrability	Integrability refers to the ease with which an app can be integrated with external systems, services, or platforms. It involves the application's ability to connect seamlessly with other software components, APIs, databases, or third-party services.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview Analyzing user reviews **Expert Evaluation:** API documentation review Security review of integration points Integration usage tracking Integration testing Compatibility testing Performance monitoring **ALL:** User testing with integrated features
16	Devices Limitations	Devices Limitations in mobile UX refer to the constraints imposed by the device's hardware, software, or platform on the user experience. This includes factors such as screen size, processing power, memory, battery life, and network connectivity. Designing with awareness of these limitations ensures optimal performance and usability across various devices and platforms, enhancing the overall user experience.	Proposed	-	**Self-Reported Measurement:** Questionnaire on Device Experience Interview on Device Experience App Store/ Marketplace Reviews **Observational Measurement:** Performance Monitoring by Device **Expert Evaluation:** Device-Specific Testing Heuristic Evaluation with Device Considerations Accessibility Review for Different Devices Performance Testing under Device Constraints Device Compatibility Testing **ALL:** Crowd testing with Different Devices
17	Infrastructure	Refers to the hardware technology that has been used to build the product from both sides (client and Server) as it has an impact on the usability and it has interaction with Service Response Time aspect	Adopted	[2]	**Self-Reported Measurement:** Questionnaire Interviews Analyzing user reviews **Expert Evaluation:** Device Compatibility Testing Server Load Testing Infrastructure Performance Testing (loading times, resource usage, etc.) **ALL:** User Testing with Limited Resources
18	Independability	The degree to which a mobile app allows users to achieve their goals and complete tasks within the app itself, with minimal reliance on external factors or assistance.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview **Expert Evaluation:** Test app usage with limited connectivity
19	Updateness	It refers to the frequency and timeliness of updates released for a mobile app. It includes the regularity of bug fixes, feature enhancements, security patches, and compatibility updates.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview Review analysis for update frequency **Expert Evaluation:** Update installation rates Version history analysis Update impact assessment Comparison with competitors
20	Accessibility	Accessibility refers to the design of mobile apps such that they can be easily used and understood by people of all abilities.	Refined	[9], [81], [77], [67]	-
20.1	Perceivable	The quality of digital content (information and UI components) is presented in a way that can be perceived by all users, regardless of their sensory abilities.	Adopted	[67]	**Self-Reported Measurement:** Questionnaire Surveys with users with disabilities Interview **Expert Evaluation:** Audio and visual cues testing WCAG (Web Content Accessibility Guidelines) Evaluation Assistive technology compatibility testing **ALL:** Automated evaluation (Color

					Contrast Analysis Tools) Automated evaluation (Screen Reader Testing) Testing with Users with disabilities Cognitive Ability Testing
20.1.1	Readability	Sufficient contrast between text and background, appropriate font size, and clear visual hierarchy ensure content is easily readable for users with visual impairments.	Proposed	[107]	**Self-Reported Measurement:** Questionnaire Surveys with Users with Visual Impairments Interviews with Users with Visual Impairments Analyzing user reviews **Expert Evaluation:** WCAG (Web Content Accessibility Guidelines) Evaluation A/B Testing with Different Font Sizes and Color Combinations **ALL:** User Testing with Users with Visual Impairments Automated evaluation (Color Contrast Analysis Tools, Font Size Analysis Tools)
20.1.2	Self-Descriptiveness	Descriptive labels, icons, and alt text for images ensure that users with visual impairments can understand the content, even without relying solely on visual cues.	Proposed	[107]	**Self-Reported Measurement:** Questionnaire Surveys with users with disabilities Interview **Observational Measurement:** Focus group **Expert Evaluation:** Manual inspections **ALL:** User testing with visual impairments Automated evaluation (Alt text analysis tools, Label review tools)
20.2	Operability	The capability of users to interact with digital content and user interface components effectively. It involves designing interfaces that users with diverse abilities and input methods can navigate, interact with, and use.	Adopted	[67]	**Self-Reported Measurement:** Questionnaire Surveys with Users with Motor Impairments Interviews with Users with Motor Impairments Analyzing user reviews **Expert Evaluation:** WCAG Evaluation with Focus on Input Methods A/B Testing with Different Interaction Methods **ALL:** Testing with Users with Motor Impairments Automated evaluation (Touch Target Analysis Tools)
20.2.1	Navigability	Clear and logical navigation structures, defined by well-designed layouts, appropriate color schemes, and readable typography, enable users with motor skill limitations or screen reader software to find the information they need efficiently.	Proposed	[107]	**Self-Reported Measurement:** Questionnaire Surveys with Users with disabilities Interviews with Users with disabilities Analyzing user reviews Observational Measurement: Observation Focus Group **Expert Evaluation:** WCAG Evaluation **ALL:** Testing with Users with disabilities Automated evaluation (user behavior analysis)

20.2.2	Controllability	Refers to the UI elements that allow users to control the pace of interaction, pause or undo actions, and adjust settings to suit their needs. This is especially important for users with motor skill limitations or cognitive disabilities.	Proposed	[107]	**Self-Reported Measurement:** Questionnaire Surveys with Users with disabilities Interviews with Users with disabilities Analyzing user reviews Observational Measurement: Observation Focus Group **Expert Evaluation:** WCAG Evaluation with Focus on User Control A/B Testing with Different Control Mechanisms **ALL:** Testing with Users with disabilities with Scenarios Requiring Control Automated evaluation (user behavior analysis)
20.2.3	Responsiveness	The app should respond to user input in a predictable and timely manner, allowing users with motor skill limitations to interact without feeling rushed.	Proposed	[107]	**Self-Reported Measurement:** Questionnaire Mobile App Rating Scale (MARS) Interview **Expert evaluation:** Load testing **ALL:** User Testing with Performance Measurement (measure load/response times, responsiveness to touch/input, and animation smoothness, speed, etc.)
20.3	Visual Comprehensibility (Understandability)	It is paramount to ensure that the information and operation of the UI are visually understandable, especially for users with disabilities. Clear communication within the app is achieved by implementing intuitive design elements, facilitating ease of comprehension, and enhancing accessibility.	Proposed	[67]	**Self-Reported Measurement:** Questionnaire Interviews Analyzing user reviews Observational Measurement: Observation Focus Group **Expert Evaluation:** WCAG Evaluation with Focus on Cognitive Clarity Cognitive Walkthrough **ALL:** Testing with Users with Cognitive Disabilities Automated evaluation (user behavior analysis)
20.3.1	Simplicity	A simple and uncluttered interface, free of unnecessary elements, clear, easy to understand, and efficient, makes it accessible for all users, even those with cognitive disabilities or limited technical skills.	Refined	[9], [81], [108], [2], [76]	**Self-Reported Measurement:** Questionnaire The AttrakDiff questionnaire Interviews Analyzing user reviews Observational Measurement: Observation Focus Group **Expert Evaluation:** WCAG Evaluation with Focus on Simplicity Cognitive Walkthrough Heuristic Evaluation with Focus on Simplicity A/B Testing with Simplified Layouts The Mobile Application User Experience Checklist (MAUX-C) **ALL:** Testing with Users with Disabilities Automated evaluation (user behavior analysis)

20.3.2	Visual Symmetry	The cohesive integration of design elements creates a seamless and aesthetically pleasing user experience, fostering predictability in interactions and clarity in user expectations. This is especially beneficial for individuals with disabilities who may encounter difficulties with change.	Proposed	[107]	**Self-Reported Measurement:** Questionnaire Interviews Analyzing user reviews Observational Measurement: Observation Focus Group **Expert Evaluation:** WCAG Evaluation with Focus on Consistency Cognitive Walkthrough Style Guide Review Heuristic Evaluation with Focus on Consistency A/B Testing with Consistent Design Elements **ALL:** Testing with Users with Disabilities Automated evaluation (user behavior analysis)
20.3.3	Assistance/Helpfulness	User's perception that a product or service communicates and provides useful help to achieve tasks. This includes descriptions of the app UI elements and features to their needs.	Refined	[77], [78], [2]	**Self-Reported Measurement:** Questionnaire Post-Task Questionnaire (PTQ) Helpfulness Evaluation Survey Analyzing user reviews Think Aloud Interview **Observational Measurement:** Observation **Expert Evaluation:** Heuristic evaluation Cognitive Walkthrough **ALL:** User Testing with Help Scenarios
20.3.4	Findability	The ease with which users can locate desired content or features within the app through clear information architecture, intuitive navigation, and appropriate use of visual cues.	Refined	[96]	**Self-Reported Measurement:** Questionnaire Interviews Physiological Measurement: Eye tracking (Heatmaps) Observational Measurement: Observation Focus Group **Expert Evaluation:** WCAG Evaluation Cognitive Walkthrough Heuristic Evaluation **ALL:** User Testing with Search Tasks: Automated evaluation (Search Log Analysis)
20.4	Robustness	The ability of digital content to be reliably interpreted and accessed by a wide range of user agents, including assistive technologies and different types of devices.	Adopted	[67]	**Self-Reported Measurement:** Questionnaire Interviews **Observational Measurement:** Observation Focus Group **Expert Evaluation:** WCAG Evaluation with Focus on Technical Robustness Assistive Technology Testing with Screen Readers and Voice Control **ALL:** User Testing with Search Tasks Automated evaluation with Different Devices and Browsers
21	Trustworthiness	Trustworthiness in mobile UX reflects the user's confidence in an app's reliability, security, and the organization behind it.	Refined	[8], [77], [109]	-
21.1	Transparency	Transparency refers to the clarity and openness of the app's operations and functionalities to users. It involves providing users with clear and comprehensive information about how the app works, how their data is collected, used, and protected, and any potential risks or limitations associated with its use.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview **Expert evaluation:** Expert Review **ALL:** User Testing with Information Access Tasks

21.2	Brand Trustworthiness	It is the confidence consumers have in a brand's reliability, quality, and ethical practices. It's built through consistent quality, transparent communication, reliability, ethical practices, and strong customer relationships.	Proposed	-	**Self-Reported Measurement:** Questionnaire Brand Trust Surveys Net Promoter Score (NPS) Customer Satisfaction (CSAT) Surveys Interviews Expert Evaluation: Brand Reputation Analysis Customer Support Analysis Case Studies and Industry Benchmarks Ethical Practice Audits Third-party certifications and award inspections
21.3	Content Truthfulness	Refers to the accuracy and honesty of information presented in digital content.	Proposed	-	**Self-Reported Measurement:** Questionnaire Content Trust Surveys Net Promoter Score (NPS) Customer Satisfaction (CSAT) Surveys Interviews **Expert Evaluation:** Ethical Practice Audits Third-party certifications and award inspections Content Verification
21.4	Security	Safeguards user data and privacy, the app itself, and the environment from unauthorized access, modification, or loss.	Refined	[9], [81], [101]	**Expert Evaluation:** Security audits (Dynamic Application Security Testing (DAST)) Penetration testing (Ethical hacking) Security code reviews Authentication and authorization testing Compliance and certification evaluation Security Policy Review Threat Modeling Security Heuristic Evaluation Automated testing (Static Application Security Testing (SAST))
21.5	Consistent Delivery	Refers to the ability of a brand or product to consistently meet or exceed the expectations of its users or customers. It implies reliability and dependability in delivering the promised quality, features, and performance consistently over time.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview **Expert Evaluation:** App Rating Trends Error Reporting and Crash Analytics User Retention and Engagement Metrics **ALL:** User Testing with Visual Impairments Automated evaluation (Alt text analysis tools, Label review tools)
21.6	Reliability	A consistent performance of the app's intended functions without degradation or failure ensures fluency, availability, system performance, and stability.	Refined	[78], [101]	**Expert Evaluation:** Code review Stress/load Testing ALL: User Testing with Simulated Errors Automated evaluation (Error/crash Tracking and Logging, Performance monitoring)
21.7	Ethical Practices	Adherence to ethical standards, social responsibility, and sustainability practices demonstrates integrity and earns consumers' trust by aligning with their values and beliefs.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview **Expert Evaluation:** Ethical Standards Review
22	Information Quality	Refers to the accuracy, meaningfulness, and comprehensiveness/Completeness of the information presented within the app or service.	Proposed	-	-

22.1	Meaningfulness	Refers to the app's capacity to provide users with data and content that is relevant, significant, and valuable, enhancing the overall quality of information presented within the app	Proposed	-	**Self-Reported Measurement:** Questionnaire Interviews Think aloud **Observational Measurement:** Observation Focus group **Expert Evaluation:** Heuristic evaluation Cognitive walkthrough Content Audit with Focus on User Needs and Goals **ALL:** User Testing with Scenario-Based Tasks and divers users
22.2	Accuracy	The degree to which data has attributes that correctly represent the true value of the intended attribute of a concept or event in a specific context of use.	Adopted	[9], [2]	**Self-Reported Measurement:** Questionnaire **Expert Evaluation:** Data Quality Audits (data architecture, data validation procedures, etc.) Cognitive Walkthrough **ALL:** User Testing with Injected Errors
22.3	Completeness	Refers to the extent to which all necessary and relevant information is provided within the app, leaving no significant gaps or omissions. It ensures that users have access to a comprehensive set of data and content, enabling them to make informed decisions and achieve their objectives effectively.	Proposed	-	**Self-Reported Measurement:** Questionnaire Post-Task Questionnaire Interview **Expert Evaluation:** Content Inventory & Analysis Cognitive Walkthrough Heuristic Evaluation Task Analysis inspection **ALL:** User Testing with Scenarios
23	Affordances	Affordances refers to the intuitive indications in an interface that guide users towards possible actions that align with the app's purpose. These cues may be visual, tactile, or auditory, and they help users understand how to interact with interface elements to achieve their objectives. Affordances are tailored to the app's domain and can include various attributes. For instance, gaming apps leverage affordances for collaboration (invite buttons), immersion (high-quality graphics), and challenge (progress bars). Similarly, shopping apps utilize affordances for luxuriousness (product photos), advertising, and delicacy (drag-and-drop features). In different domains of apps, affordances adapt to various attributes, such as the cost attribute in learning apps or the timeliness attribute in critical apps.	Adopted	-	**Self-Reported Measurement:** Questionnaire Interview Analyzing user reviews **Expert Evaluation:** Retention Rate Analysis App Engagement Analytics Heuristic Evaluation with Affordance Focus Cognitive Walkthrough with Affordance Focus A/B Testing with Interface Variations **ALL:** Usability Testing with Affordance Evaluation
24	User Support	User Support involves making assistance accessible across various channels (live chat, phone, email, etc.), ensuring users can receive help anytime and anywhere, thereby enhancing the overall user experience.	Proposed	-	**Self-Reported Measurement:** Questionnaire Support Satisfaction Surveys Interview **Expert Evaluation:** User Support Logs Analysis Support Quality Audits Support Channel Availability inspection **ALL:** User Testing for Support Features
Context Dimension					
25	User Inclusivity	User Inclusivity is the philosophy of designing experiences that cater to a diverse range of users. It delves into understanding users' unique characteristics, preferences, and backgrounds, guiding the creation of tailored app experiences that resonate with each individual. This encompasses demographics, knowledge, needs, cultural background, and personal values.	Proposed	-	-

25.1	Demographics Inclusivity	Demographic inclusivity emphasizes accommodating users from diverse demographics, such as age, gender, location, city, country, region, income, education levels, etc, depending on the app's purpose.	Proposed	-	**Self-Reported Measurement:** Demographic Survey Interviews Think Aloud **Observational Measurement:** Field Studies **Expert Evaluation:** Heuristic Evaluation with Inclusivity Focus Inclusive Design Review **ALL:** User Testing with Assistive Technologies
25.2	Familiarity Flexibility	Familiarity Flexibility is the recognition that users' knowledge, experience, and skills, such as language proficiency, typing ability, familiarity with technology and similar applications, and expertise in relevant app domains, inform their interaction with a new product or service. Highlighting the flexibility of familiarity implies that the UX design caters to users with varying experience or familiarity with the platform or product.	Refined	[81], [77], [85]	**Self-Reported Measurement:** Questionnaire **Observational Measurement:** Observation **Expert Evaluation:** Cognitive Walkthrough **ALL:** User testing (familiarity flexibility-focused)
25.3	User Needs And Preferences	Users' specific requirements and desires regarding the features, functionalities, and content of a product or service are needed to inform the design to deliver a satisfying and goal-oriented user experience.	Proposed	-	**Self-Reported Measurement:** Questionnaire user needs and preferences surveys Interview **Observational Measurement:** Observation Focus groups Field Studies **Expert Evaluation:** Cognitive Walkthrough User Persona **ALL:** User testing
25.4	Cultural Sensitivity	Cultural Sensitivity emphasizes acknowledging and accommodating diverse cultural backgrounds within the app. It considers factors such as traditions, beliefs, values, and social norms that shape user experiences and expectations.	Proposed	-	**Self-Reported Measurement:** Questionnaire Surveys Interview **Observational Measurement:** Observation Focus groups Field Studies **Expert Evaluation:** Cognitive Walkthrough User Persona Cultural Sensitivity Review **ALL:** User Testing with International Users
26	Quality Of Interaction	The quality of interaction in a mobile app's UX refers to how smoothly and effectively users can communicate with and achieve their goals within the app.	Proposed	-	-
26.1	Flexibility	Flexibility in mobile app UX encompasses the app's capacity to adapt to a diverse range of user needs, preferences, and device variations, extending beyond core functionalities to accommodate unforeseen situations or environments encountered by users. It includes customizable options and adaptive layouts to provide personalized experiences, enhancing UX.	Refined	[9], [77], [83], [89], [84]	**Self-Reported Measurement:** Questionnaire Interview Analyzing user reviews **Physiological Measurement:** Eye Tracking **Observational Measurement:** Contextual Inquiry **Expert Evaluation:** Heuristic Evaluation Cognitive Walkthrough **ALL:** User Testing with Varied Devices & Scenarios

26.2	User-Centric Adaptation	User-centric adaptation attribute combines personalization, adaptability, and customization. It dynamically adjusts the app to fit individual user preferences and the current context (location, device, time) for a tailored and flexible user experience.	Proposed	-	**Self-Reported Measurement:** Questionnaire Contextual user Surveys Contextual interviews **Observational Measurement:** Contextual inquiry and observation **Expert Evaluation:** Heuristic evaluation with adaptation focus Review of personalization algorithms Performance monitoring and optimization **ALL:** User testing with personalization scenarios Automated evaluation (User behavior analysis) Accessibility testing
26.2.1	Personalization	The process of tailoring the app experience to the individual user. This is achieved by leveraging data and information about the user to create a more relevant, engaging, and efficient interaction.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview Analyzing user reviews Observational Measurement: Focus group Contextual Inquiry **Expert Evaluation:** Cognitive Walkthrough Adaptability Metrics Analysis **ALL:** Context-Aware User Testing Automated evaluation (User Behavior Tracking)
26.2.2	Adaptability	An app's ability to automatically adjust its behavior and interface based on the user's current context (location, device, time) without requiring explicit user input.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview Analyzing user reviews Observational Measurement: Focus group Contextual Inquiry **Expert Evaluation:** Cognitive Walkthrough Adaptability Metrics Analysis **ALL:** Context-Aware User Testing Automated evaluation (User Behavior Tracking)
26.2.3	Customizability	An app's ability to be modified by the user to suit their individual preferences and work styles.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview Analyzing user reviews **Observational Measurement:** Focus group Contextual Inquiry **Expert Evaluation:** Customizability Heuristic evaluation Cognitive Walkthrough Customizability Metrics Analysis **ALL:** User Testing with Customization Tasks Automated evaluation (User Behavior Tracking)
26.3	Relevant Output	Refers to the app's ability to provide users with output that is directly pertinent to their current tasks, goals, or queries.	Proposed	-	**Self-Reported Measurement:** Questionnaire Interview Think aloud Analyzing user reviews **Observational Measurement:** Focus group Contextual Inquiry **Expert Evaluation:** Heuristic evaluation Cognitive Walkthrough Code review **ALL:** USer Testing with Task Scenarios

					Automated evaluation (Error Logging & Analytics)
27	Context Of Use	Refers to the comprehensive understanding and consideration of the circumstances, environment, and user conditions in which individuals interact with mobile devices and applications.	Proposed	-	-
27.1	Social Context	Refers to the influence of surrounding individuals on the user's interaction with the device or application. It encompasses factors such as the user's relationships, conversations, presence, and behavior, and how these elements affect the user's actions and decisions.	Refined	[110]	**Self-Reported Measurement:** Interviews with Diverse Users Think Aloud **Observational Measurement:** Ethnography Contextual Inquiry in Social Settings **ALL:** User Testing with Contextual Scenarios Automated Evaluation (User Behavior Analysis with Social Context)
27.2	Temporal Context	Referes to the social environment in which users engage with a mobile application. It considers whether the user is alone or interacting with others and how this setting affects their interaction. It also examines how social dynamics influence the user's behavior and usage patterns. For instance, it explores whether users need to be discreet while using certain app features in public settings.	Refined	[111], [2]	**Self-Reported Measurement:** Interviews with Diverse Users **Observational Measurement:** Contextual Inquiry Across Different Times **Expert Evaluation:** App Analytics with Time-Based Analysis **ALL:** User Testing with Varied Time Constraints Automated Evaluation (User Behavior Analysis Across Different Times) Longitudinal Studies
27.3	Task Context	Refers to the specific goal the user is trying to achieve with the app, including the actions they undertake and the information required for task completion. It encompasses the user's goals, intentions, and specific actions while using the mobile app, aiding designers to prioritize features, optimize workflows, and develop interfaces that facilitate efficient task completion.	Refined	[112]	**Self-Reported Measurement:** Questionnaire Task completion surveys Think aloud **Observational Measurement:** Contextual inquiry and observation **Expert Evaluation:** Task flow analysis Heatmaps with task context Cognitive walkthrough **ALL:** User testing with task scenarios Automated evaluation (User behavior analysis)
27.4	Application Context	Refer to the current state and functionalities of a mobile app that is available to the user at a specific moment. It encompasses the information exchanged between the user and the device, including user input (taps, swipes, text input), app output (displayed information, sounds, vibrations), the current screen or view within the app, and the app's internal state (data, settings, progress).	Proposed	-	**Self-Reported Measurement:** Questionnaire **Observational Measurement:** Contextual inquiry and observation **Expert Evaluation:** App state monitoring Context Modeling State management review Visual cues for context **ALL:** User testing (Error injection) User testing with contextual scenarios Automated evaluation (User behavior analysis) Accessibility testing
27.5	Cognitive Context	Cognitive context refers to the user's cognitive abilities, habits, and attitudes that influence their interaction with a system or product. It includes factors such as memory, attention, perception, problem-solving skills, learning preferences, prior experiences with technology, and emotional state. Understanding the cognitive context helps designers create interfaces that align with users' mental models, accommodate different learning styles, and support efficient information processing, ultimately enhancing UX.	Refined	[110]	**Self-Reported Measurement:** Questionnaire Interview **Physiological Measurement:** Eye tracking and attention analysis **Observational Measurement:** Contextual inquiry and observation **Expert Evaluation:** Cognitive walkthrough Cognitive load analysis Heuristics evaluation for cognitive accessibility **ALL:** User testing (Error rate analysis)

					User testing with diverse user groups Automated evaluation (Time spent on tasks) Accessibility testing