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**Chaikovska Maryna**
ORCID: https://orcid.org/0000-0002-9490-5112
Doctor of economics, Professor
Department of Marketing and Business Administration
Odesa I.I. Mechnikov National University
**Shkeda Oleksandr**
ORCID: https://orcid.org/0000-0003-3161-5983
PhD, senior lecturer, Department of Management and Marketing
State University of Intelligent Technologies and Telecommunications
**Khomenko Anastasiia**
ORCID: https://orcid.org/0009-0008-0644-4717
Assistant to the creative d*irector of the agency «Iamidea»*
(Odesa, Ukraine)

# USER EXPERIENCE AND REGULATORY REQUIREMENTS AS THE BASIS FOR MARKETING AND MANAGEMENT DECISION-MAKING IN MOBILE APPLICATION DEVELOPMENT

The article examines the relationship between user experience (UX) and regulatory requirements in mobile application development, arguing for their integration as a unified basis for marketing and managerial decision-making. The paper analyzes modern UX-frameworks, ergonomics principles, behavioral technology-adoption models while systematizing GDPR, WCAG 2.2, and data-security requirements. The UX–Compliance marketing model of app development management is proposed in which UX and compliance jointly drive strategic, tactical, and analytical processes. The study demonstrates that such integration enhances user experience quality, reduces legal risks, and strengthens the long-term competitiveness of mobile applications.

Keywords: digital-marketing, app-marketing, development-management, user experience, mobile applications development, usability, accessibility, regulatory compliance, data protection and privacy.

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**Statement of the problem in general form and its connection with important scientific or practical tasks.** The rapid growth of the mobile application market makes user experience (UX) one of the key factors in the competitiveness of digital products. Systematic reviews indicate that UX encompasses the emotional, cognitive, and behavioral responses of users during interaction with an application and directly affects satisfaction, loyalty, and the likelihood of repeated use [1]. At the same time, the development of the digital economy is accompanied by increasingly stringent regulatory requirements regarding personal data protection, transparency of information processing, and digital accessibility, particularly through GDPR, WCAG 2.2, and new European digital services acts.

For companies developing mobile applications, this creates a dual decision-making framework: on the one hand, it is necessary to optimize UX solutions according to business goals at all stages of the funnel – from capturing attention and converting installs/registrations to activating key usage scenarios, retaining and re-engaging users, generating referral activity, and monetization; on the other hand, full compliance must be ensured with regard to data protection, security, accessibility, ethical design and functionality of the application [3].

Management and marketing decisions regarding functionality, interface design, personalization mechanics, and user analytics can no longer be made solely from the perspective of "convenience" or "best design practices." They must rely on the integration of UX frameworks with legal and ethical constraints, which is especially relevant for mobile applications that handle large volumes of behavioral and sensitive data [4].

The problem addressed in this article is that existing approaches to mobile application development lack a comprehensive management model for integrating UX principles and compliance principles into the development process. UX is usually considered separately – as a matter of interface design or user satisfaction evaluation, while marketing decisions follow their own path, and compliance requirements (GDPR, WCAG 2.2, ethical data processing standards) follow theirs. This leads to a situation where UX decisions do not fully realize the marketing potential of the product, and regulatory requirements are perceived as external constraints rather than as an integral part of mobile application management. This article aims to address this gap by developing an integrated model in which UX and regulatory requirements serve as a unified basis for marketing and management decision-making in the mobile application development process.

**Analysis of the latest research and publications, which initiated the solution of this problem and on which the autho relies.** Recent studies emphasize that mobile application UX is a multidimensional construct, including usefulness, usability, emotional comfort, sense of control, and trust in the service, among other aspects [1; 3]. A systematic review by Lu, Qu, and Chen (2025) demonstrates that mobile app UX significantly correlates with behavioral metrics such as retention, frequency of use, and the likelihood of recommending the product [1]. An analysis of online reviews by Grljević (2025) confirms that negative UX factors (slow performance, unclear navigation, aggressive push notifications) directly translate into negative ratings and user churn [5].

Okonkwo (2024) explores current UX trends in mobile applications – personalization, micro-interactions, AR/VR – and shows that implementing these features without considering ethical and legal aspects can increase privacy risks and overwhelm users with excessive interaction [3].

UX/UI design manuals emphasize the importance of a systematic approach to designing mobile app interfaces, particularly through use-case modeling, prototyping, and testing with real users [6; 7]. Chemeris (2021) highlights principles of consistency, visual hierarchy, and navigational clarity as fundamental conditions for positive UX [6]. Kravchenko (2022), in methodological materials for mobile UX/UI development, underscores the role of interactive prototypes and usability testing in the product development cycle [7].

A growing body of literature addresses regulatory requirements for digital products. WIPO (2021), in a dedicated guide on mobile app data protection, stresses the critical role of GDPR principles – legality, transparency, data minimization, purpose limitation, security, and accountability – in designing mobile application functionality [8]. Kollnig et al. (2021) show that most mobile applications continue to use third-party trackers, often without proper user notification or consent, which formally contradicts GDPR requirements [9].

Amaral Cejas et al. (2025) demonstrate that mobile app privacy policies, even after GDPR implementation, are often incomplete: they fail to describe all categories of data, do not explain data subjects' rights, and are not aligned with actual processing practices [4].

A separate strand of research concerns digital accessibility. The W3C document Web Content Accessibility Guidelines (WCAG) 2.2 (2023) defines a set of testable criteria applicable to web and mobile interfaces (contrast, keyboard navigation, alternative text, focus management, etc.) [10]. Practical guides and inclusive design case studies highlight that compliance with WCAG 2.2 simultaneously improves overall usability for all user groups [5; 6]. Studies in mobile application engineering note that product quality must encompass not only technical metrics (performance, reliability) but also UX, security, and compliance with standards and regulatory requirements [11; 12].

**Highlighting the previously unresolved parts of the general problem to which the article is devoted.** Fragmentation of Approaches. Most studies focus either on UX and its impact on user behavior or on compliance (GDPR, WCAG, privacy policies). Integrated models, in which UX solutions and regulatory requirements are considered as a single framework for managerial and marketing decisions, are insufficiently described. Weak Formalization of the Impact of Regulation on UX Decisions. Existing works mainly report violations (excessive tracking/profiling, opaque privacy policies) but rarely propose specific UX patterns that simultaneously optimize user experience and reduce regulatory risks. Insufficient Adaptation of International Standards to the Mobile Application Context. WCAG 2.2 is a technologically neutral standard; however, for mobile interfaces, there is a lack of models that "translate" its principles into concrete UX requirements. Existing studies rarely describe which navigation, contrast, content presentation, or gesture patterns simultaneously ensure compliance with WCAG 2.2 and support UX and marketing goals. This creates a gap between regulatory formulations and the practical design solutions of product teams.

**Formulation of the purpose of the article (statement of the problem).** The purpose of this article is to develop a conceptual model in which user experience and regulatory requirements are considered a shared basis for marketing and managerial decision-making in mobile application development.

To achieve this purpose, the study aims to:

− Clarify the concepts of UX, usability, accessibility, and the main UX frameworks relevant for mobile applications;

− Describe a UX model for mobile application development;

− Systematize regulatory requirements (GDPR, WCAG 2.2, data security requirements) as applied to mobile products;

Propose an integrated model for marketing and managerial decision-making that combines UX goals with compliance requirements.

**Statement of the main material of the research with full justification of the scientific results obtained.** In mobile applications, user experience is formed not by individual interface elements but by the entire system of interaction, which combines users, their tasks, goal significance, properties of the interactive system, and environmental characteristics. UX becomes a central factor not because it decorates the interface, but because it ensures that a person can achieve desired outcomes with maximum effectiveness, efficiency in resource use, and high satisfaction.

Fundamentally, UX relies on understanding the context of use – the set of conditions in which the application is used: users, their tasks, hardware, software, materials, and physical and social environment. In mobile products, this context is highly variable: a user may be on the move, experience low lighting, use an outdated smartphone, or have an unstable internet

connection. Therefore, UX becomes a tool that ensures the accessibility of the application for people with a wide range of abilities – not only according to functional standards but also according to users' real constraints.

To make UX truly work for product success, developers must rely on the principles of ergonomics – the scientific discipline that studies human-system interaction and determines how to make a digital environment support natural human capabilities. Through an ergonomic approach, human-centred design is implemented, a methodology in which development is focused not on system functions but on people, their needs, experiences, and limitations. In this process, consideration of stakeholders – all parties whose needs and expectations the system must satisfy – is essential.

User experience also depends on the design of the user interface – the part of the interactive system through which the user receives information and controls actions. An effective UI is built through the creation and testing of prototypes – models or mockups of the system that allow verification of design solutions before developing the final functionality. Prototypes enable verification (checking compliance with requirements) and validation (checking alignment with expected usage) before the product enters the main development cycle.

All these elements – effectiveness, ergonomics, interface, accessibility, verification, human-centred design – collectively explain why UX is a key foundation for successful mobile applications. UX does not merely make a product "convenient"; it ensures that users with different goals, prior experience, and abilities can interact with it naturally, predictably, and safely.

The structure of user experience is not fixed. It evolves with technology, user expectations, platform development, and new behavioral models. Some UX elements gain importance – such as micro-interactions, emotional responses, transparency of data handling – while others gradually diminish. Certain UX aspects emerge only when interactive systems themselves evolve, such as the need to account for gestures, sensor interactions, biometric inputs, AI integration, or complex personalization scenarios.

Thus, UX is a dynamic, multidimensional system that constantly adapts to new conditions. Developers cannot rely on a fixed set of criteria: each generation of technology, each platform, and each change in human behavior adds a new dimension to UX while diminishing the relevance of previous ones. The ISO 9241-210 international standard defines UX as the set of perceptions and responses of a person arising from the use or anticipated use of a product, system, or service [13]. User experience includes emotions, beliefs, preferences, physical and psychological responses, behavior, and outcomes occurring before, during, and after interaction with the product. UX is shaped not only by interface design but also by brand image, functionality, system performance, nature of interaction, and availability of support tools. Prior user experience, skills, attitudes, and context of use are also important. ISO emphasizes that usability is only one component of UX and can be used to evaluate specific aspects of it.

Different researchers structure UX elements differently. At various stages of digital technology development, the focus has shifted from basic functional characteristics to emotional, aesthetic, accessibility, and content-related dimensions of UX. A summary of these changes is presented in Table 1.

Thus, mobile application UX should be considered as a multidimensional structure that combines functional, emotional, aesthetic, and content-related components. At the level of user usefulness, this primarily involves **perceived usefulness** – the feeling that the mobile application genuinely helps achieve goals – and **useful / usefulness**, which reflects the

alignment of functions with real everyday needs. These correspond to **usable / usability** and ease of use, which describe the user's ability to learn the application without excessive effort, perform tasks without errors, and quickly navigate the mobile interface.

The emotional-aesthetic dimension of UX in mobile products encompasses hedonic quality and desirability – the pleasure of interaction, positive emotions, and the desire to return to the application – as well as visual attractiveness and aesthetic in visual information, which reflect the quality of information presentation through typography, colors, structure, and visual composition of the mobile interface. Additionally, perception of instrumental qualities (assessment of practical, functional characteristics of the app), perception of non-instrumental qualities (perception of style, character, and atmosphere), and associated emotional responses – the spectrum of emotions that arise during use – are considered.

Table 1 – Evolution of Mobile Application User Experience Components

| Year | Author | UX Elements |
|---|---|---|
| 2004 | Peter Morville | Usable, Useful, Desirable, Findable, Accessible, Credible, Desirable, Valuable [14] |
| 2005 | Sasha Mahlke | Perceived usefulness, Ease of use, Hedonic quality and Visual attractiveness [15] |
| 2006 | Andrew Vande Moere | Aesthetic in visual information [16] |
| 2012 | Frank Guo | Value, Usability, Adoptability and Desirability [17] |
| 2015 | Gabor Aranyi, Paul van Schaik | Perception of instrumental qualities, Emotional responses, Perception of non-instrumental qualities [18] |
| 2018 | Virginica Rusu, Cristian Rusu | The authors follow the ideas of Peter Morville: Usable, Useful, Desirable, Findable, Accessible, Credible, Desirable, Valuable [15] |
| 2020 | Z. Huang, Y. Hong, and X. Xu | Content, Interaction, Vision [19] |

Equally important are elements that ensure orientation and trust: findable describes the ease of locating the required content or features in the mobile app; accessible refers to usability by people with different disabilities and under varying access conditions; credible reflects the perception of transparency and reliability of the service; and valuable / value indicates that the mobile application, as a product, creates real value for the user. Finally, content, interaction, and vision capture the quality of informational content, interaction methods (gestures, scenarios, navigation patterns), and the overall visual concept, which determines how the mobile product is perceived as a whole.

The application should be considered not only as an interface or a task-execution tool but as a full-fledged product that generates two types of experience simultaneously – user experience (UX) and customer experience (CX). The former focuses on interaction with the interface, task execution, emotions, and cognitive responses during use. The latter encompasses a broader framework – brand expectations, perceived product value, willingness to pay, loyalty, and recommendations to other users. In the case of mobile applications, these two experiences inevitably overlap: the quality of UX determines how positive the overall customer experience will be, while CX, in turn, shapes the expectations with which the user engages with the product.

It is useful to compare UX with the 4E customer experience model (Entertainment, Educational, Esthetic, Escapist), traditionally applied in marketing and service design [20]. Compared to Sascha Mahlke's research, it becomes clear that the 4E dimensions directly reflect the key UX elements of his model:

− Entertainment corresponds to hedonic quality (the emotional attractiveness of use);

− Educational is related to perceived usefulness (the perceived benefit of the product);
− Esthetic aligns with visual attractiveness (the quality of visual presentation);
− Escapist correlates with ease of use (the simplicity and effortlessness of interaction).

Such an overlay of models demonstrates that UX is not merely a technical characteristic of the interface, but a full-fledged driver of marketing and managerial success for mobile applications. Using UX as a foundation for product and business decisions allows for simultaneous improvement of user satisfaction, loyalty, and conversion metrics, making it a key tool in the development of modern mobile products.

In UX design studies for mobile applications, the following conceptual frameworks are most frequently mentioned.

User-Centered Design (UCD) is based on the principle that design should be grounded in real user needs rather than technical assumptions or business hypotheses. UCD involves a complete iterative cycle, including audience research, persona and use-case development, prototyping, usability testing, problem analysis, and subsequent refinement. Key elements of the framework include understanding the context of use, defining user requirements, creating human-centered design solutions, and verifying these solutions through prototypes and user testing. UCD helps reduce the risk of "misguided development", where a product meets technical specifications but fails to satisfy real user needs.

Technology Acceptance Model (TAM), unlike UCD, focuses not on the design process but on the mechanisms of technology adoption by users. The model centers on two factors: Perceived Usefulness – the extent to which a person believes that the application will help them perform tasks better or faster; and Perceived Ease of Use – the degree to which the product appears simple and understandable. These factors shape the user's intention to use, which predicts actual usage. In the context of mobile applications, TAM explains why technologically advanced products may fail to gain popularity: without perceivable value and ease of interaction, users will neither start nor continue using the app.

Theory of Planned Behavior (TPB) extends the logic of TAM by adding socio-psychological factors that influence user behavior. The model includes three components: Attitudes – personal evaluation of using the application (beneficial/non-beneficial, pleasant/unpleasant); Subjective Norms – expectations of significant social groups such as colleagues, friends, or professional communities; and Perceived Behavioral Control – how easy it is for the user to engage with the application and whether they feel capable of using the product.

In the mobile application domain, TPB explains why user behavior is influenced not only by design and functionality but also by social context, accessibility barriers, prior experience, and self-assessment of digital skills.

Together, UCD, TAM, and TPB allow for a comprehensive view of UX from the perspectives of design, behavioral psychology, and decision-making mechanisms. Their integration creates a holistic foundation for predicting how a user will interact with a mobile application and how design decisions will impact activation, retention, and long-term loyalty.

Mobile application development does not rely on a single universal scheme but on a set of methodologies and processes that organize the product creation cycle differently. Plan-driven approaches follow a "waterfall" logic: sequential stages from requirements analysis and design to implementation, testing, and deployment. In such models, the structure of stages is clearly defined in advance, and changes after development begins are considered costly and undesirable. Applied studies on university mobile applications typically identify sequential steps: analyzing user needs, designing structure and interfaces, implementing functionality, testing, and deploying to production [21].

In contrast, agile methodologies view mobile application development as an iterative process with short cycles (sprints), continuous feedback, and the ability to adjust requirements during development. Reviews of mobile development processes show that agile approaches (Scrum, XP, Kanban, and their hybrids) are most often adapted to the specifics of mobile products: platform fragmentation, the need for rapid response to user feedback, and frequent updates in app stores [22]. At the same time, there is an emphasis on combining agile practices with elements of plan-driven approaches (clear release definition, release management, version planning), effectively forming hybrid mobile development models.

Practical business guides generally describe the mobile app creation process as a series of stages that, in broad terms, repeat across sources: idea and business goal formulation, market and target audience research, platform and tech stack selection, UX/UI design, development, testing, publishing in marketplaces, and ongoing support and updates. Such models focus on practical implementation and demonstrate that regardless of the methodology (agile, waterfall, hybrid), a mobile application follows similar logical steps: from refining the value proposition to measuring outcomes and optimizing further [23–26].

Despite the diversity of approaches, common features can be identified: all models include initial formulation of goals and requirements, design and implementation of solutions, and evaluation of results and product adjustments. They primarily differ in the rigidity of stage sequences, the frequency of feedback, and the user's role in the process (from episodic testing to continuous participation in iterations). Therefore, for conceptualizing mobile application development, it is reasonable to generalize different processes into three key levels. It is demonstrated on the Fig. 1.

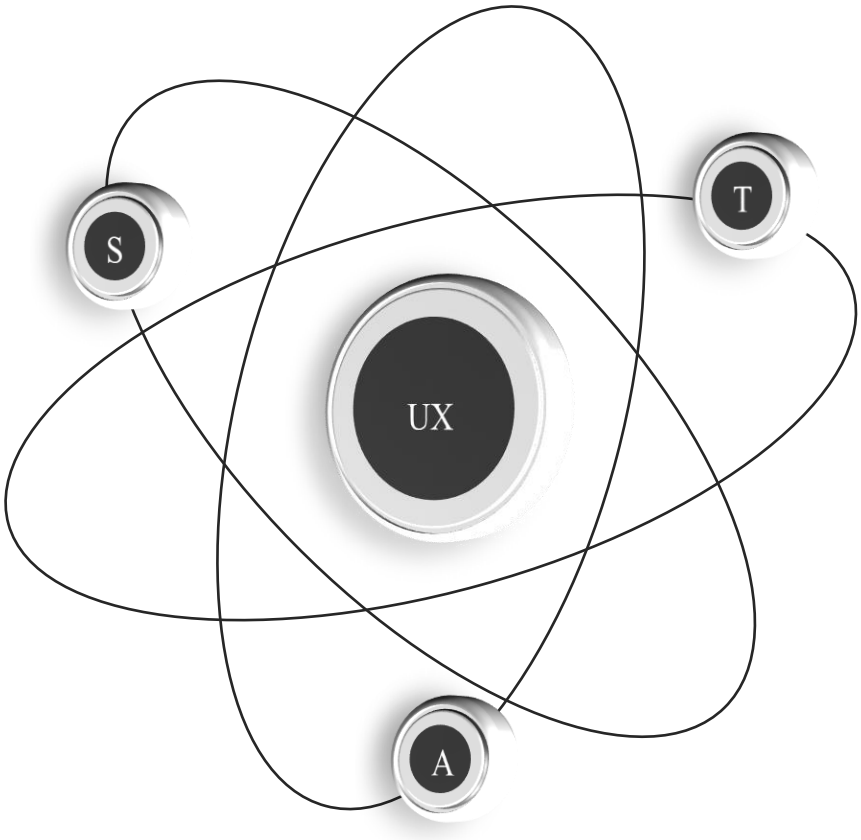


Figure 1 – UX-centered chaos of app-development marketing

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1. S – Strategic Level (Marketing and Product Management)
   - Definition of target segments and value propositions;
   - Setting UX-goals (simplicity, speed, emotional appeal, personalization, etc.) and compliance-goals (level of the transparency, data minimization, level of the accessibility, etc.);
   - Choosing a business model (paid app, freemium, advertising, subscription) while considering what data is collected and how this aligns with regulations.
2. T – Tactical (Operational) Level (Design and Development)
   - Use of UCD/UX frameworks for prototyping and screen testing;
   - Embedded compliance: legal and security specialists are involved at the design stage rather than post-release;
   - Joint design of UX patterns for: consent collection (clear, granular, without hidden or forced options); personalization settings (user controls the level of tracking); data subject rights (easy access to delete/export data).
3. A – Analytical Level
   - Measurement of UX and business metrics: MAU, DAU, retention, conversions, NPS, complaint frequency;
   - Analysis of user feedback to detect signals of UX or trust issues (“the app collects too much data”, “privacy settings are unclear”);
   - Feedback and iterative improvement.

Mobile application development is a continuously dynamic process in which stable linear models no longer reflect the actual logic of decision-making. The traditional cycle of "strategy – tactics – analytics – iteration" implies a sequential order of stages. However, in modern mobile ecosystems and with the constant evolution of digital user expectations, such a scheme loses relevance. The primary source of change is user experience, which evolves continuously – every interaction, content fragment, and micro-interaction generates new expectations and forms new behavioral patterns.

Since UX is dynamic and accumulative, new insights into user behavior can trigger changes at any development level, regardless of the stage currently in progress. If analytics indicate a drop in retention or a decrease in trust, tactical changes may be required in onboarding design, navigation simplification, or interaction patterns. Conversely, if UX research identifies shifts in user motivation or usage context, this may influence the strategic level – prompting a review of value propositions or segmentation. Likewise, sometimes tactical innovations (a new personalization method, a new interaction scenario) generate new metrics that alter the structure of analysis.

Thus, the sequence "strategy – tactics – analytics – iteration" is no longer strictly fixed. The actual development process resembles a non-linear loop, where any level can trigger changes at another. Often, changes occur simultaneously at multiple levels: strategy updates under the influence of analytics, tactics adapt to new strategic decisions, and UX metrics immediately respond to new tactical actions. Such multidimensional interaction confirms that UX ceases to be merely a design aspect – it becomes the central mechanism managing the entire lifecycle of a mobile product.

UX therefore serves as a key driver of marketing and managerial decisions: it sets the pace, defines priorities, signals problems, and shapes competitive opportunities. In the dynamic environment of mobile applications, only an approach that embraces UX as an actively changing trigger and a primary indicator of product direction can succeed.

User experience formation can be evaluated at five levels:

Level 1: Context of Use

− Users, tasks, equipment (hardware, software, and materials), and the physical and social environments in which an app is used.

Level 2: UX Artifacts

− Information architecture (navigation, screen hierarchy);
− Visual design (typography, color schemes, icons);
− Interactive patterns (gestures, animations, micro-interactions);
− Systems of guidance, onboarding, and notifications.

Level 3: UX Quality

− Usability metrics (task completion time, number of errors, perceived difficulty);
− Emotional indicators (satisfaction, trust, sense of control), measured through surveys and feedback analysis;
− Accessibility metrics (compliance with key WCAG 2.2 criteria for mobile interfaces).

Level 4: Regulatory Compliance

− Regulatory indicators: absence of user complaints regarding privacy violations, absence of fines or orders from regulators.

Level 5: Business Outcomes

− Marketing metrics: subscription/purchase conversion, retention, churn;
− Brand metrics: app store ratings, NPS, share of positive/negative reviews.

From a compliance perspective, the most significant requirements for mobile applications fall into three main groups:

1. Personal Data Protection (GDPR and related regulations)
2. Transparency and Accountability in Data Processing (WIPO guidelines and Kollnig et al. research)
3. Accessibility (WCAG 2.2, European digital accessibility acts)
4. Ethical aspects of design and data management are essential.

According to the General Data Protection Regulation (GDPR) [25], the processing of personal data in mobile applications must be based on six fundamental principles.

Lawfulness, Fairness, and Transparency. Personal data must be processed on clear and lawful grounds, with honest explanations of what happens to the information. This creates a requirement for transparent consent interfaces and clear privacy policies. This establishes trust, without which user acquisition and retention become significantly more difficult.

Purpose Limitation. Data should be collected only for specific purposes clearly communicated to users. Hidden or secondary usage without additional consent is prohibited. For development, this implies careful planning of data collection and routing; for marketing, it necessitates interaction models without aggressive tracking that could reduce loyalty.

Data Minimization. Apps should request only the data strictly necessary. Removing unnecessary requests reduces risks, improves user perception, and lowers technical costs. This approach encourages design and development teams to critically evaluate each data parameter collected, and marketers to focus on the quality rather than quantity of information for personalization.

Accuracy. Personal data must be correct and up-to-date; the app should allow easy updates. This directly affects product functionality (delivery, recommendations, profile settings) and analytics quality: more accurate data improves business metrics, segmentation, and personalization algorithms.

Storage Limitation. Data should not be stored longer than justified by the purpose of processing. Mobile products must provide mechanisms for deletion or anonymization of

outdated information. For development, this requires an appropriate infrastructure; for marketing, it avoids accumulating "dead" data that reduces model efficiency and increases risk.

Integrity and Confidentiality. Personal data must be securely protected against loss, unauthorized access, or damage. This requires encryption, access control, and thoughtful security architecture. For development teams, this is a technical responsibility; for marketing, it is a critical reputational factor: users are more willing to interact with brands demonstrating adequate protection.

According to WIPO (2021), mobile applications should: have a lawful basis for data processing (consent, contract, legitimate interest) [2]; ensure transparency and clarity in data processing notifications (plain-language privacy policies, layered and just-in-time notifications) [2; 4]; adhere to data minimization and purpose limitation principles – collect only necessary data and do not use it for incompatible purposes [2; 9]; ensure data subject rights (access, correction, deletion, restriction, portability) [2]; implement technical and organizational security measures: encryption, access control, event logging [2; 12].

Kollnig et al. (2021) found that many Android applications continue to use tracking libraries that collect user data and share it with third parties, often without proper consent mechanisms or with merely formal implementation [9]. This highlights the need for UX solutions that ensure real, not formal, user awareness.

WCAG 2.2 provides a set of criteria that make interfaces accessible to users with a wide range of impairments while simultaneously enhancing overall usability. For mobile applications, critical criteria include: sufficient contrast of text and control elements; the ability to navigate without complex motor gestures; visible focus indicators; clear active/inactive states; predictable navigation; and avoidance of "traps" for screen reader users.

Accessibility in mobile interfaces means the app is usable by people with various visual, auditory, motor, and cognitive impairments, as well as in challenging conditions (bright light, small screens, etc.). WCAG 2.2 emphasizes four core principles: perceivable, operable, understandable, and robust.

Perceivable – users can see, hear, or otherwise perceive the information on the screen. Achieved via sufficient contrast, scalable text, alternative image descriptions, captions, and independence from a single sensory channel.

Operable – users can interact with the interface regardless of motor limitations or assistive technology usage. Includes adequately sized interactive elements, clear navigation, gesture alternatives, and screen reader support.

Understandable – users can interpret information and anticipate interface behavior. Achieved through simple language, consistent structure, predictable patterns, error guidance, and avoidance of overwhelming complex actions.

Robust – the app works reliably across different devices, OS versions, browsers, and assistive technologies. Includes proper adaptive design, technical compatibility, semantic coding, and functionality under unstable network conditions.

Although WCAG was originally developed for web content, most criteria (contrast, keyboard navigation, clear button text, predictability) are directly applicable to mobile applications.

Application of WCAG 2.2 principles to mobile interfaces differs from the web and requires separate adaptation. A summary of key characteristics of each principle group and corresponding solutions for mobile applications is presented in Table 2. This provides utility specifically in the field of application development.

Table 2 – Adaptation of WCAG 2.2 Principles for Mobile Applications

| Group | Characteristic | Adaptation for Mobile Applications |
|---|---|---|
| Perceivable | Text Alternatives | Describe all meaningful images, icons, and buttons using alt texts / accessibility labels so that VoiceOver / TalkBack can announce their purpose. |
| | Time-based Media | Add captions to videos, text transcripts for audio, and, where possible, audio descriptions; provide pause/rewind functionality for media. |
| | Adaptable | Make the interface responsive to screen size in both portrait and landscape orientations, and support system font settings and “large text” mode. |
| | Distinguishable | Ensure sufficient contrast for text and control elements, do not rely solely on color, clearly indicate “active/inactive” states, and make focus visible. |
| Operable | Switch-Control Accessible | Ensure navigation is possible via Switch Control / Switch Access without “focus traps.” |
| | Enough Time | Avoid overly short timeouts; allow users to pause, resume, or disable automatic timers (banners, auto-scroll, auto log-out). |
| | Seizures and Physical Reactions | Avoid flickering and fast animations; provide users the option to disable animations and vibrations to prevent seizures or discomfort. |
| | Navigable | Ensure sequential navigation: stable menu, clear “back” path, ability to skip repetitive blocks, and always visible focus on the current element. |
| | Input Modalities | Ensure sufficient size and spacing between tap targets, avoid complex gestures as the only interaction method, and support alternative input methods (voice, hardware buttons). |
| Understandable | Readable | Use simple, unambiguous language, correctly set the interface language, and avoid unexplained technical jargon. |
| | Predictable | Ensure screens behave predictably: focus or data entry should not suddenly change context, and navigation elements remain in their usual locations. |
| | Input Assistance | Provide clear labels for fields, format examples (input masks), informative error messages and guidance on how to fix them; confirmation before critical actions. |
| Robust | Compatible | Use accessible platform components, semantically label interface elements, and test the app with screen readers and across different OS versions/devices. |
| Conformance | Levels A / AA / AAA | Define the target level of WCAG 2.2 compliance and regularly conduct accessibility audits of the mobile app, documenting issues and fixing them in releases. |
| | Full Pages Requirement | All app screens, including modals, pop-ups, and menus, must fully comply with the selected WCAG level. |
| | Complete Processes | All steps of the user flow (login, onboarding, payment, forms) must be accessible. |
| | Non-interference | Ensure that the app functionality does not conflict with assistive technologies – screen readers, text enlargement, high contrast. |
| | Accessibility Support | Components must function correctly on mobile OS (iOS/Android) and support semantic and role attributes for VoiceOver / TalkBack. |
| | Documented Testing | Conduct accessibility testing regularly, document identified barriers, and resolve them in subsequent releases. |
| | Continuous Conformance | After each update, the app must maintain WCAG compliance – a re-evaluation is conducted. |

Based on the research, an integrated model is proposed in which UX and regulatory requirements act as joint drivers of marketing and managerial decisions in mobile app development. This approach addresses the problem of UX-centered marketing chaos. The Model is presented on the Fig. 2.

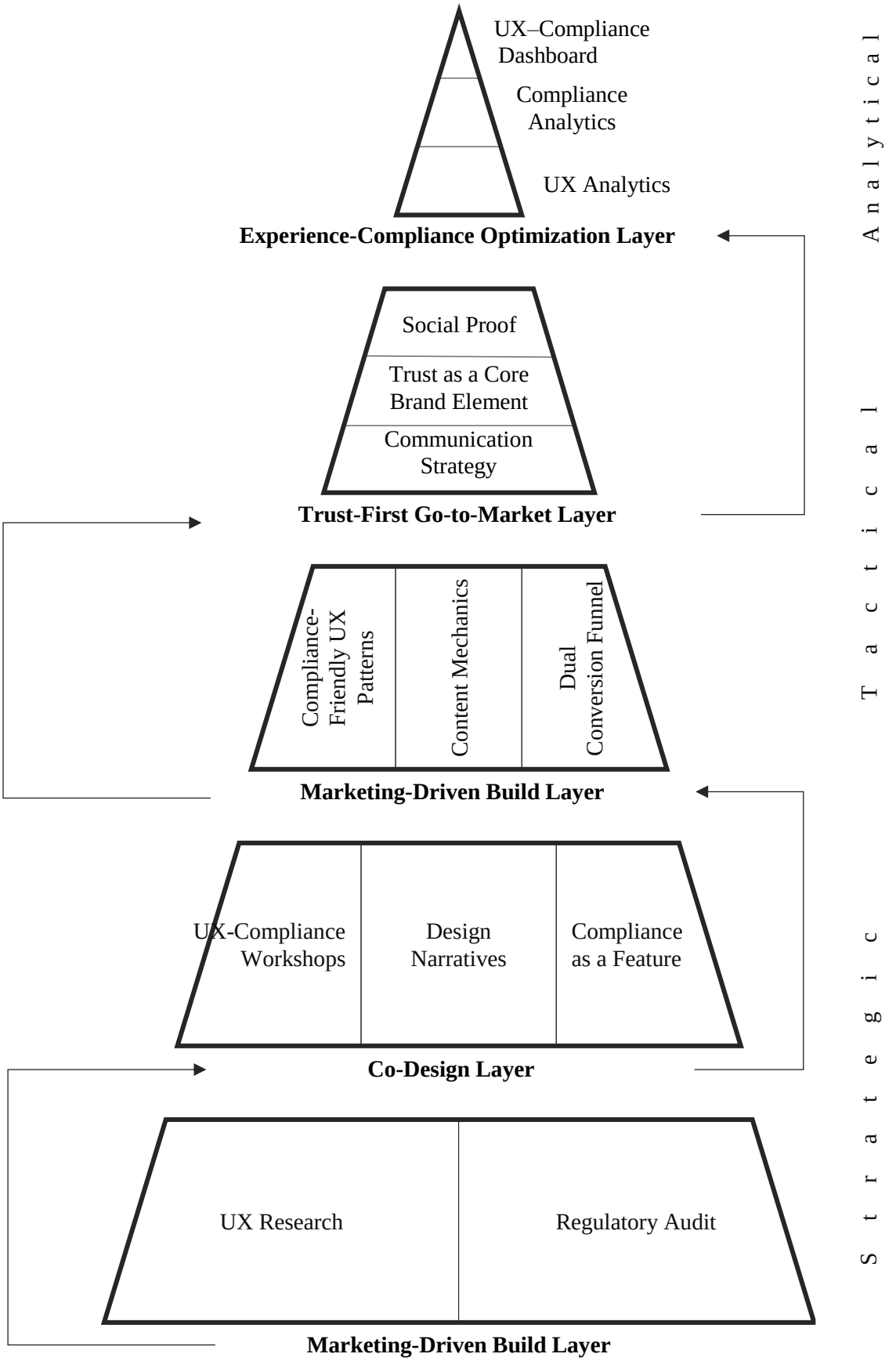


Figure 2 – UX–Compliance Marketing Model of App Development Management

The latest EU regulations (in particular, the European Accessibility Act) directly link compliance with accessibility standards to the right to enter the digital services market, as well as to financial penalties for non-compliance [11].

Alongside formal legal compliance, the ethical formation of UX is equally important: honesty in interactions, absence of dark patterns, moderation in personalization and use of behavioral data. Violations of ethical norms (for example, hiding opt-out options, intrusive notifications, manipulative onboarding scenarios) lead to decreased trust, negative reviews, and reputational damage, even if the product does not yet formally breach the law. In summary, regulatory requirements establish a "framework of safety and fairness" within which marketing and product-design decisions must be optimized. This directly creates the need for an integrated decision-making model.

Marketing-Driven Build Layer focuses on developing the core application features that directly align with market needs and the overarching marketing strategy. Its primary objective is the rapid implementation of functionalities (often an Minimum Viable Product or key differentiating features) required for initial user acquisition, generating media buzz, and validating market hypotheses. The work here is tightly linked to analyzing the target audience, competitors, and industry trends to ensure that the built features have a high conversion rate and are appealing to the press or influencers. Development proceeds with a constant awareness of how the application will be sold and perceived in the marketplace.

Co-Design Layer is critical for ensuring the application truly matches the real needs and expectations of end-users. This stage involves close collaboration among developers, designers, product managers, and, most importantly, representatives of the target audience or key stakeholders. It is an inclusive process where prototypes and mockups are continuously tested, discussed, and revised to make sure the actual user experience (UX) is intuitive, satisfying, and problem-solving. This approach guarantees high usability for the final product and helps avoid costly reworks post-launch.

Trust-First Go-to-Market Layer is part of the launch strategy (Go-to-Market, GTM) where user trust, data security, and transparency are the highest priorities. It encompasses not only technical aspects (such as encryption and fraud protection) but also communication strategies. Clear privacy policies, data handling mechanisms, and strategies for prompt and transparent incident response are developed here. The goal is to build a strong reputation from the outset, especially in a world where users increasingly value security and control over their data. The success of this layer determines whether the application receives positive reviews and high ratings, directly impacting subsequent growth.

Experience-Compliance Optimization Layer focuses on the continuous improvement of the user experience (UX/UI) and ensuring full regulatory compliance. From an experience perspective, this involves A/B testing, monitoring performance metrics (speed, stability), collecting detailed analytics, and perpetual iteration to enhance user retention. From a compliance perspective, it mandates regular checks against local and international data laws (e.g., GDPR, CCPA), app store policies (App Store, Google Play), and industry-specific standards (e.g., HIPAA for healthcare). This is an ongoing process essential for sustaining success, avoiding penalties, and maintaining the application's standing in the market.

Integrating user experience and regulatory compliance constraints into all stages of mobile app development reduces iterations at the strategic, tactical, and analytical levels. Reactive actions driven by user behavior and regulatory requirements become more predictable and manageable. An explanation of this effect is presented in Table 3. This ties together all the words and processes described, which are carried out throughout each layer, with the UX and Compliance.

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Table 3 – Integrating UX and Compliance into mobile app development at various levels

| Layer | Process | Explanation |
|---|---|---|
| Marketing-Driven Build Layer | UX Research | In-depth user interviews |
| | | Competitor friction analysis |
| | | Identification of compliance-related pain points |
| | | Development of UX personas with regulatory sensitivity attributes |
| | Regulatory Audit | Mapping of all relevant standards and regulations |
| | | Identifying critical compliance triggers (KYC, data collection, transactions, permissions) |
| | | Creating a list of "compliance blockers" |
| Co-Design Layer | UX–Compliance Workshops | Joint creation of user flows |
| | | Simplification of compliance-related steps |
| | Design Narratives | Translating complex procedures into simple, user-friendly language |
| | | Positive framing of security and verification processes |
| | Compliance as a Feature | Positioning compliance requirements as a competitive advantage |
| Marketing-Driven Build Layer | Compliance-Friendly UX Patterns | Auto-fill |
| | | Document scanning |
| | | Real-time smart hints and suggestions |
| | Content Mechanics | In-app micro-education modules |
| | | Transparent onboarding communication |
| | | Status notifications and progress updates |
| | Dual Conversion Funnel | UX funnel (completion rate, drop-offs) |
| | | Compliance funnel (verification success, data completion, consent rates) |
| Trust-First Go-to-Market Layer | Communication Strategy | Messaging focused on safety, clarity, and simplicity |
| | Trust as a Core Brand Element | A dedicated Trust Center |
| | | Certifications, audit information, and plain-language explanations |
| | Social Proof | Testimonials |
| | | Compliance audit reviews |
| | | Public trust signals |
| Experience-Compliance Optimization Layer | UX Analytics | Qualitative UX Signals |
| | | Interaction Analytics |
| | | Product Experience Metrics |
| | | Qualitative UX Signals |
| | Compliance Analytics | KYC / AML Metrics |
| | | Consent & Privacy Compliance Metrics |
| | | Fraud & Risk Metrics |
| | | Audit and protocol metrics |
| | Unified UX-Compliance Dashboard | Top-Level KPIs |
| | | Friction Map |
| | | UX–Compliance Correlation Matrix |
| | | Risk & Opportunity Panel |
| | | Funnel Fusion |

Decisions regarding data collection can no longer be made solely from the perspective of marketing benefits. They must be evaluated in accordance with GDPR principles, user expectations, and their impact on UX (overloading users with permission requests, reduced trust in the app). Decisions on onboarding design simultaneously affect user and the quality of consent provided by users (Fig. 3).

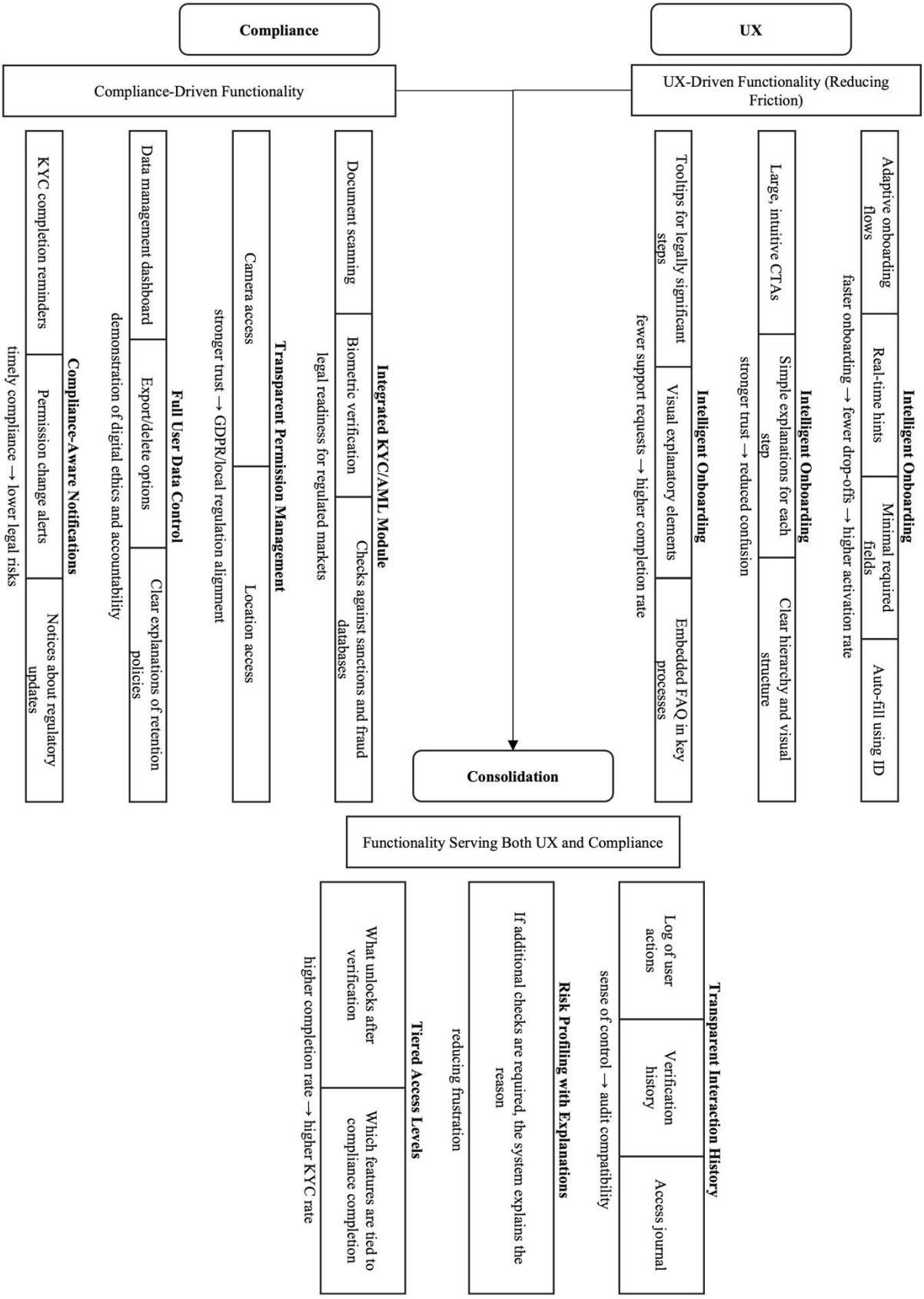


Figure 3 – Dependence of functionality on the integration of the UX-Compliance approach

Investments in accessibility not only reduce regulatory risks but also expand the audience, improve overall usability, and increase conversion, since many WCAG requirements overlap with “good UX” principles (contrast, font size, predictability).

Non-compliance (opaque policies, aggressive tracking, lack of mechanisms to exercise user rights) leads to a combination of legal, financial, and reputational risks, which directly affect brand value and the ability to scale the product in international markets.

Thus, integrating UX and regulatory requirements into a single decision-making model allows them to be viewed not as mutually exclusive constraints but as complementary drivers of sustainable value for a mobile product.

**Conclusions from this research and prospects for further developments in this area.** In conclusion, user experience and regulatory requirements are interrelated and should be considered as a unified foundation for marketing and managerial decision-making in mobile app development. Based on contemporary Ukrainian and international sources, this study has: clarified the meanings of UX, usability, and accessibility in the context of mobile applications; proposed a UX model for mobile product development linking context of use, design artifacts, UX quality, and business outcomes; systematized key regulatory requirements (GDPR, WCAG 2.2, data security requirements) and demonstrated their impact on mobile app design and functionality; developed an integrated model for marketing and managerial decision-making, in which UX goals and compliance requirements simultaneously determine product development priorities.

Future research could focus on the empirical validation of the proposed model using specific mobile applications (educational, fintech, e-commerce); development of quantitative indicators of “ethical UX” and methods for integrating them into product management dashboards; and detailing industry-specific variants of the model (e.g., for medical or financial apps with higher confidentiality and reliability requirements).

Integrating UX and regulatory requirements at the strategy, design, and operational levels of mobile products enables the simultaneous improvement of user experience quality, minimization of legal risks, and creation of long-term brand value in the competitive mobile services market.

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***Чайковська М. П***. *l-р. екон. наук, професор, професор кафедри маркетингу та бізнес-адміністрування, Одеський національний університет імені І. І. Мечникова (Одеса, Україна).*

***Шкеда О. О***. *д-р філософії, ст. викладач кафедри маркетингу та менеджменту, Державний університет інтелектуальних технологій і зв'язку (Одеса, Україна).*

***Хоменко А. В***. *асистент креативного директора агенції «Iamidea», (Одеса, Україна).*

**Досвід користувача та регуляторні вимоги як основа для прийняття маркетингових та управлінських рішень у розробці мобільних застосунків.**

*У статті досліджено користувацький досвід (UX) як динамічну багатоаспектну основу розробки мобільних застосунків, що поєднує функціональну корисність, юзабіліті, емоційні та естетичні чинники, доступність і довіру. Доведено, що UX формує маркетингові та управлінські рішення на всіх етапах розвитку продукту, а також визначає напрям змін у стратегічному, тактичному й аналітичному циклах розробки. Проаналізовано ключові фреймворки (UCD, TAM, TPB), принципи GDPR і вимоги WCAG 2.2 у контексті мобільних інтерфейсів. Створено і обґрунтовано інтегровану модель, у якій UX та регуляторні комплаєнси виступають спільною основою створення конкурентоспроможних та етично коректних цифрових продуктів.*

Ключові слова: цифровий маркетинг, маркетинг мобільних застосунків, управління розробкою, досвід користувача, розробка мобільних застосунків, юзабіліті, аксесабіліті, регуляторні комплаєнси, захист даних та конфіденційність.

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