

Designing the Storyboard for the SmartShifa Application to Support Learning Arabic Communication in Healthcare Settings

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ABSTRACT

The growing number of Arabic-speaking patients seeking treatment in Malaysia has increased the demand for effective communication support in healthcare settings. However, public relations officers often have limited proficiency in Arabic, creating communication gaps during patient registration, consultation, and follow-up. This has created a need for a structured Arabic-language learning tool tailored specifically to the healthcare communication context. This study addresses this gap by designing the storyboard for SmartShifa, a mobile application intended to support public relations officers in learning practical Arabic communication skills. The study aims to extract essential storyboard elements from previous research and design a structured storyboard as part of the Design and Development Research (DDR) approach. A qualitative research design was employed, using content analysis to identify storyboard elements from selected literature, guided by the PRISMA model for systematic paper selection. Findings show that effective storyboards require key elements such as homepage design, navigation structure, user interface layout, instructional modules, and interactive exercises. These elements were systematically incorporated into three storyboard stages—thumbnail, rough storyboard, and clean-up storyboard—to produce a structured, content-appropriate design blueprint for SmartShifa, laying the foundation for future development of the application.

Keywords: Application, Arabic Communication, Design, Storyboard, Healthcare

INTRODUCTION

The increasing mobility of Arab patients seeking medical treatment abroad, including in Malaysia, has intensified the demand for healthcare institutions to strengthen their communication capacity in Arabic (Ismail et al., 2024). Public relations officers, who serve as the primary point of contact between medical staff and patients, are frequently required to bridge linguistic and cultural gaps despite limited formal training in Arabic for specific purposes (Alanazi, 2022; Al-Kandari et al., 2019). This growing communicative burden highlights an urgent need for structured, accessible, and context-specific learning support that equips public relations officers with practical Arabic communication skills for real healthcare interactions, ranging from patient registration to consultation assistance and post-treatment follow-up (Khan et al., 2021). Similar to English for Specific Purposes (ESP) initiatives that address workplace language barriers in technical fields (Rafiq, Hashim & Yunus, 2024), Arabic for healthcare communication purposes represents a comparable and equally pressing professional-language need.

Mobile-assisted language learning (MALL) has emerged as a viable solution to this need, offering flexibility, contextualized content, and interactive engagement that traditional classroom-based instruction often cannot provide within a demanding hospital work environment (Yuen & Schlote, 2024; Alisoy et al., 2024). However, the effectiveness of any mobile learning application depends heavily on the rigour of its design process, particularly during the early planning stages where content structure, learning sequence, and interface flow are conceptualized (Wang et al., 2024). Within this process, the storyboard serves as a foundational blueprint that translates identified user needs into a coherent visual and instructional plan prior to full application development,

ensuring that the final product is pedagogically sound, linguistically accurate, and practically usable by its intended audience (Reyes et al., 2024; Rafiq et al., 2025).

This paper focuses specifically on the design of the storyboard for SmartShifa, a mobile application intended to support the learning of Arabic communication among public relations officers in healthcare settings within the Design and Development Research (DDR) approach, which was widely applied in the design of language-learning tools and modules to address complex educational and communicative challenges (Rafiq et al., 2025; Zainuddin et al., 2024). This study aims to design the storyboard of an Arabic communication application platform for hospital public relations officers to facilitate effective interactions with Arabic-speaking patients. In doing so, the paper contributes to the growing body of literature on mobile-assisted language learning for professional and workplace-specific purposes (Pérez-Paredes & Zhang, 2022), while addressing a practical gap in Arabic communication training for the healthcare public relations workforce.

LITERATURE REVIEW

In the Malaysian healthcare and medical-tourism context, where the number of Arab patients seeking treatment has grown steadily, research on this population indicates that Arabic-speaking patients frequently experience communication breakdowns arising from public relations officers' limited command of formal and dialectal Arabic, compounding difficulties in registration, consultation support, and post-treatment follow-up (Alanazi, 2022; Al-Kandari et al., 2019). Needs-analysis studies conducted with Arab patients at Malaysian healthcare centres further confirm that patients themselves identify Arabic-language competence—including translation and interpretation support—as a decisive factor in their satisfaction with hospital public relations services (Ismail et al., 2024). Because public relations officers occupy the interface between medical staff and patients, their communicative competence directly affects diagnostic accuracy, treatment compliance, and the overall patient experience (Khan et al., 2021).

Parallel developments in mobile health (mHealth) technology reinforce the case for a structured, technology-mediated solution. Studies on multilingual health-communication applications demonstrate that mobile platforms incorporating Arabic-language support significantly improve comprehension and reduce miscommunication between healthcare providers and non-native-language-speaking patients, even in emergency and cross-border care scenarios (Noack et al., 2021; Solomou et al., 2025). Similarly, research on culturally responsive mobile interface design shows that health applications must account not only for linguistic accuracy but also for cultural context, dialectal variation, and user-interface readability when Arabic is among the target languages (Ross & Gao, 2016); a design consideration that remains salient in more recent multilingual health-app evaluations).

Beyond its role as a general design blueprint, the storyboard within the DDR approach is typically constituted by several interrelated elements that collectively determine the coherence and usability of the final module or application. Within the Design and Development phase, this commonly involves restructuring the content program, organizational chart, storyboard, flowchart, and screen design, alongside a repeated cycle of refinement before the module proceeds to evaluation (Ahmad et al., 2024). Likewise, in the development of the ME4STEM mobile module, the design stage was shown to involve the construction of learning objectives, components, materials, flowchart, and storyboard based on the outcomes of needs analysis and functional-language requirements, with multiple learning theories embedded into the storyboard to ensure the resulting module is holistic and pedagogically sustainable (Rafiq et al., 2025). Such structured decomposition of storyboard components within DDR is essential in ensuring that no critical instructional or linguistic element is overlooked during the transition from conceptual design to functional prototype, particularly when the target content involves specialized professional communication such as healthcare Arabic.

The credibility and effectiveness of a DDR-based storyboard, however, depend not only on its structural completeness but also on systematic validation involving relevant experts. Across DDR studies, the design and development phase is consistently followed by a content validation process in which the formed elements are assessed by a panel of experts to determine the extent to which the developed components have been successfully and appropriately defined, often using structured techniques such as the Fuzzy Delphi Method or expert-consensus scoring to establish content validity (Wan Ab Kadir et al., 2026; Jaya et al., 2021). Similarly, DDR-

based module development studies report that content and instructional-design experts, together with language practitioners, are engaged to review storyboard and module elements for clarity, engagement, and practical use prior to implementation, reinforcing that expert validation is a defining and non-negotiable stage of the DDR design phase rather than an optional add-on (Padzil et al., 2021). For the development of SmartShifa, such validation is particularly critical, as the storyboard must simultaneously satisfy pedagogical soundness, technical feasibility, and the linguistic and cultural accuracy required for effective Arabic communication in healthcare settings. Incorporating expert feedback at the storyboard stage therefore reduces the risk of costly revisions during later development phases and strengthens the overall reliability of the resulting application within the DDR framework.

These findings collectively justify the systematic, instructional-design-based development of a dedicated Arabic communication application—such as SmartShifa—for use by public relations officers in healthcare settings. Within instructional design frameworks such as DDR, the storyboard occupies a pivotal position in the design phase. A well-constructed storyboard therefore serves as the critical bridge between identified user needs—in this case, the Arabic communication needs of public relations officers attending to Arab patients—and the eventual functional prototype of the application. Designing the storyboard for SmartShifa accordingly represents not merely a technical documentation step, but a needs-driven translation of empirical findings on healthcare communication gaps into a concrete, learnable, and usable digital communication tool.

METHODOLOGY

This study employed a qualitative research design underpinned by content analysis to systematically extract the essential elements required for designing the storyboard of the SmartShifa application. Content analysis was selected as the principal method because it enables the researcher to identify, categorize, and interpret recurring patterns, themes, and design components embedded within existing literature, instructional materials, and prior mobile/language-learning application designs (Krippendorff, 2019; Elo & Kyngäs, 2008, as commonly applied in recent instructional-design research, 2020–2025). Through this process, the researcher systematically reviewed documents pertaining to storyboard construction, screen-flow architecture, navigation logic, multimedia elements (text, graphics, audio, and interactivity), and language-learning content structuring, particularly those relevant to Arabic communication for healthcare and public relations contexts. The extracted elements—comprising narrative sequencing, dialogue scripting, cultural and linguistic accuracy, user-interface layout, and interactive learning components—were then thematically coded and organized to form the conceptual and structural basis of the storyboard. This qualitative-analytical procedure ensures that the storyboard is not arbitrarily constructed but is empirically grounded in validated design principles and needs identified from prior scholarship on Arabic communication challenges faced by public relations officers in healthcare settings.

To identify and select relevant research papers for the content analysis, the study adopted the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model, which provided a transparent and replicable procedure for literature identification, screening, eligibility assessment, and final inclusion (Page et al., 2021). The literature search was conducted across established academic databases, using keywords related to storyboard design, mobile application development, Arabic language learning, healthcare communication, and instructional design models such as Design & Development Research (DDR).

Inclusion criteria comprised peer-reviewed articles within the year 2020–2026 and conference papers published within a defined recency window, studies explicitly discussing storyboard development, mobile/app-based language-learning design, or communication technology in healthcare settings, and papers presenting sufficient methodological detail on the design or development process. Exclusion criteria eliminated non-peer-reviewed sources and articles unrelated to storyboard or instructional design components. Following the PRISMA flow of identification, screening, eligibility, and inclusion, the final set of selected papers was analyzed to derive the storyboard elements, which subsequently informed the design phase of the Design and Development Research (DDR) approach by Richey & Klein (2007).

FINDINGS AND DISCUSSION

Determining the elements of the application

The content analysis of this study identifies the storyboard as a foundational step in application development, functioning as a visual representation that illustrates the narrative flow, interaction, and display of the application (Handayani & Hasanah, 2025). A carefully designed storyboard ensures that instructional content remains aligned with educational objectives and learner needs, while also simplifying the construction of a logical and effective interactive flow within the learning media (Purba & Haryani, 2024).

From this study, three core stages of storyboard development were extracted, following the model proposed by Sauri (2019):

1. Thumbnail stage — the initial stage, involving small, simple sketches used to quickly explore basic ideas and the visual composition of each scene.
2. Rough storyboard stage — an elaboration of the thumbnail stage, adding clearer detail to characters, movement, expression, and camera positioning, typically accompanied by annotations explaining key elements.
3. Clean-up storyboard stage — the finalization stage, in which visuals are refined with clean lines, complete technical notes, and adjusted proportions and perspective, making the storyboard ready to serve as a production guide.

These three stages are complementary and interdependent, working together to produce a storyboard that is both structured and effective as a design foundation (Agari, 2019). For the design of SmartShifa's storyboard, this staged process offers a transferable model: beginning with simple sketches of key screens (e.g., patient registration, consultation dialogue scenarios), progressing to a more detailed rough version incorporating dialogue scripts and Arabic-language content flow, and culminating in a finalized, production-ready storyboard aligned with the application's instructional and interface requirements.

Recent studies also highlight navigation, interface design, and homepage layout as key storyboard elements. Poorly planned navigation and cluttered interfaces increase learners' cognitive load, showing that these elements must be carefully planned in the storyboard, not added later during development (Ahmad Faudzi et al., 2023). Similarly, in designing a mobile English-learning module, the interface and navigation pathways were mapped together with the learning content during the design stage, ensuring the homepage served as a clear entry point linking users to all other screens (Rafiq et al., 2025).

Modules and exercises are equally important storyboard components. One DDR-based study storyboarded its module content by organizing it into structured, sequenced units—refined through pilot testing—rather than a single continuous flow (Aris et al., 2025). Another study found that adding clear exercise modules and simplified navigation significantly improved usability, raising task-completion success from 68% to 87% (Hwang et al., 2025). Together, these elements—homepage, navigation, interface consistency, modules, and exercises—form essential storyboard components for designing SmartShifa, ensuring Arabic communication content is structured, easy to navigate, and usable by public relations officers.

Designing the storyboard from the selected elements for the application

Figure 1 shows the thumbnail stage of the storyboard planning for SmartShifa. This is the earliest and simplest stage, involving quick, rough sketches that outline the basic structure of the application before any detailed design work begins. At this stage, the sketches cover several key screens: the homepage icon and button, which serves as the user's entry point into the app; the module homepage, which organizes the learning content into different sections; and the dictionary homepage, which introduces the Arabic–English dictionary feature. Within the dictionary section, themes are sketched out to reflect vocabulary relevant to Health Tourism, such as terms used in patient registration, consultation, and hospital navigation.

Figures 2, 3, and 4 represent the two subsequent stages of storyboard development: the rough storyboard stage and the clean-up storyboard stage. Building on the initial thumbnail sketches, these stages add greater detail and refinement to the overall design. During these stages, the positioning of icons, the navigation pane, and the overall user interface were adjusted to improve clarity and ease of use. Character designs for the Arabic communication modules were also developed, tailored to themes relevant to healthcare settings, to make the learning content more relatable and contextually appropriate for public relations officers using the application.

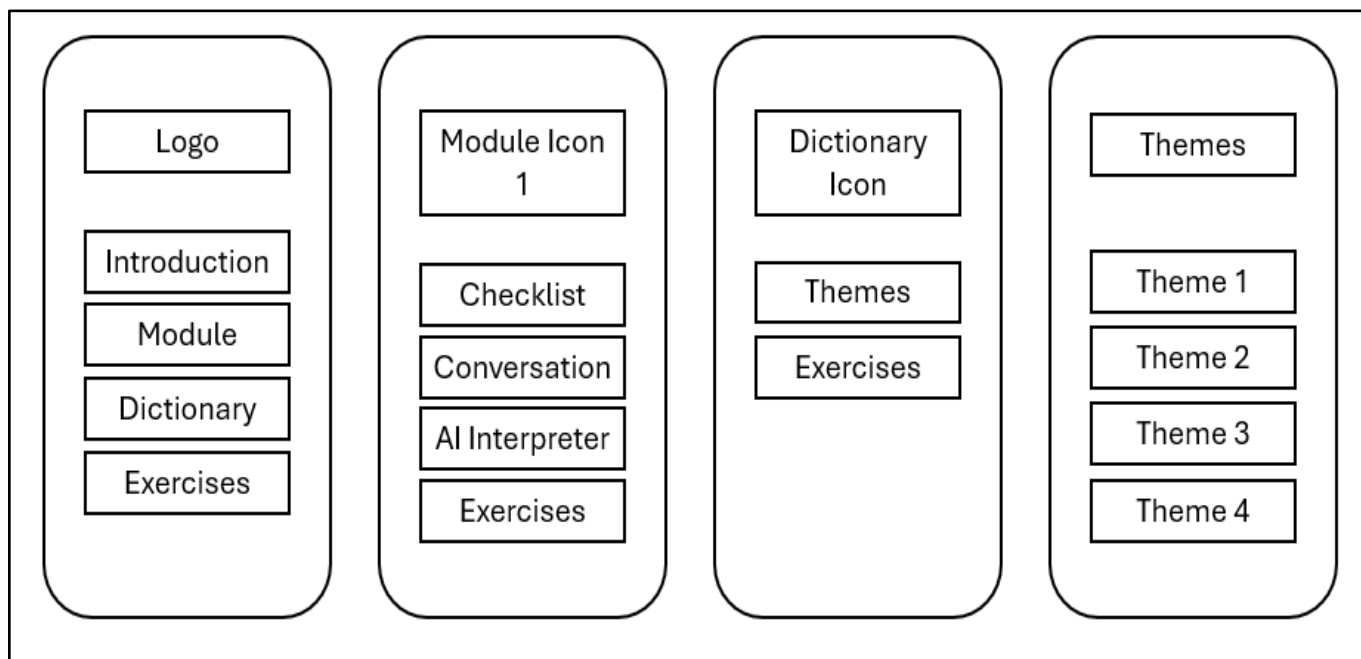


Figure 1 Thumbnail stage of the storyboard



Figure 2 Storyboard of SmartShifa User Interface (Homepage)



Figure 3 Storyboard of SmartShifa User Interface (Modules)



Figure 4 Storyboard of SmartShifa User Interface (Module, dictionary and themes)

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