Developing an Integrated Physical-Digital Smart Travel Ecosystem for Muslim Women: The H.E.R Smart Travel Kit

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ABSTRACT

Muslim-friendly tourism research has traditionally focused on what destinations provide, with less attention to how travellers themselves manage faith-related, personal-care, nutrition, connectivity, and information needs as they move between different settings. This study develops and conceptually positions the H.E.R Smart Travel Kit (Halal Essentials for Recreation), a modular physical-digital product-service system designed for Muslim women across professional, leisure, family, and everyday mobility. Using an innovation-oriented, design-based development approach informed by human-centred design principles, evidence from Muslim-friendly tourism, female travel, digital tourism, and phygital tourism was translated into design requirements and an initial prototype. The prototype brings together four functional domains—Halal Nutrition, Prayer and Spiritual, Hygiene and Beauty, and Technology-Driven Smart Support—in a 40-in-1 modular configuration connected to the QR-based H.E.R Smart Guide. Rather than assuming one fixed use case, the system is designed for five mobility contexts and allows different combinations of modules according to journey needs. The study introduces portable Muslim-friendly preparedness as a traveller-held complement to destination-based Muslim-friendly provision and argues that the main contribution of H.E.R lies in configuration-level integration rather than in the novelty of individual items or QR technology. Three design propositions are advanced: modular integration may reduce the burden of coordinating separate travel products; a lightweight digital layer may extend the usefulness of the physical kit; and perceived value is likely to depend on context-specific configuration. Because the prototype has not yet undergone systematic user, ergonomic, technical, or market validation, these propositions remain to be empirically tested. The study therefore provides a conceptual and design foundation for subsequent user-centred validation, component optimisation, digital-service evaluation, and product refinement.

Keywords: Muslim-friendly tourism, Muslim women travellers, physical-digital integration, modular design, travel product innovation

INTRODUCTION

Muslim-friendly tourism is now a substantial part of the global travel market. The Mastercard-CrescentRating Global Muslim Travel Index 2026 reports 196 million Muslim international arrivals in 2025 and projects 262 million by 2030 (Mastercard & CrescentRating, 2026). Women account for a large share of this mobility. The Muslim Women in Travel 2026 report estimates that Muslim women represented approximately 48% of global

Muslim travellers in 2025, or about 90 million travellers (Mastercard & CrescentRating, 2026). These figures show the commercial importance of the market, but they do not by themselves explain the design problem. A more practical question is whether existing tourism products and services adequately support Muslim women as they move across different travel contexts while maintaining religious practice, personal well-being, safety, and connectivity.

Muslim-friendly tourism research has historically concentrated on destination attributes such as halal food, prayer facilities, suitable accommodation, and service environments that enable religious observance (Battour & Ismail, 2016; Han et al., 2019; Oktadiana et al., 2016). More recent reviews show that the field has expanded towards technology, experience quality, sustainability, and differentiated traveller behaviour (Chantarungsri et al., 2024; Hendrik et al., 2024). This expansion is important because destination readiness does not eliminate the need for traveller-held resources. A traveller still moves between home, transport terminals, aircraft, workplaces, conference venues, hotels, restaurants, and leisure spaces, and may encounter gaps between available services and immediate personal needs.

For Muslim women, these travel needs can be especially varied. Research on female travellers repeatedly highlights safety, risk, mobility, social expectations, identity, and the negotiation of constraints (Zhang et al., 2024). Studies focusing specifically on Muslim women further show how gender and religion may intersect with safety concerns, moral surveillance, cultural expectations, and destination context (Nisha et al., 2025; Nguyen & Luong, 2026; Rostami et al., 2026). This evidence cautions against treating Muslim women as a single, uniform traveller segment. Needs may differ across solo, family, professional, leisure, and everyday travel, although the practical need to coordinate faith, personal care, information, and preparedness can recur across these settings.

Digital technology has become increasingly important in Muslim-friendly travel. Travellers now use digital tools to search for halal food, locate prayer facilities, access destination guidance, and support personalised travel decisions (Hendrik et al., 2024). Smart tourism technology has also been linked with destination innovation and more holistic experiences among Muslim tourists (Suhartanto et al., 2024), while recent tourism research views physical and digital touchpoints as parts of a connected phygital experience (Zheng et al., 2025). Even so, digital information cannot replace tangible items such as prayer essentials, hygiene products, food, or charging equipment. Likewise, a conventional travel organiser cannot provide up-to-date, location-sensitive information. The challenge, therefore, is not the absence of either physical or digital support, but how the two can be brought together in a useful way.

The H.E.R Smart Travel Kit (Halal Essentials for Recreation) was developed in response to this integration problem. It combines four functional domains within a portable modular architecture and connects the physical kit to a QR-based H.E.R Smart Guide. The product is intended to support business travel, conferences and professional events, staycations and leisure, family and weekend trips, and daily mobility. The term "smart" in the product name is used in a limited operational sense to denote connected access to digital support and organised functionality. The current prototype does not incorporate autonomous artificial intelligence, sensing, or adaptive computation.

This study therefore asks three design-oriented research questions:

RQ1: How can recurring Muslim-friendly and women-centred mobility requirements be translated into a modular portable product architecture?

RQ2: How can a low-complexity digital service layer be integrated with tangible travel essentials without overstating technological novelty?

RQ3: What design propositions and validation priorities emerge from the initial physical prototype?

The study contributes by shifting attention from destination readiness to portable Muslim-friendly preparedness, by positioning physical-digital integration as a product-level design problem, and by treating Muslim women as multi-context mobile users rather than a homogeneous leisure-tourism segment.

LITERATURE REVIEW AND CONCEPTUAL POSITIONING

Muslim-Friendly Tourism Beyond Destination Attributes

Muslim-friendly tourism is commonly defined through the capacity of tourism environments to support Islamic values and practices, particularly halal consumption, prayer, modesty, privacy, and faith-compatible services (Battour & Ismail, 2016; Mohsin et al., 2016). Earlier work established the importance of destination-level attributes and service provision, while later scholarship has broadened the field towards behavioural, technological, sustainability, and experience-based questions. A bibliometric analysis of 304 Scopus-indexed halal tourism publications identified growing attention to technology integration and Muslim tourist experience alongside established themes such as Islamic principles, risk, and customer satisfaction (Chantarungsri et al., 2024).

This development suggests that Muslim-friendly tourism should not be reduced to a checklist of facilities. Moufakkir (2026), for example, cautions that halal tourism can become overly commercialised or surveillance-oriented if religious practice is treated only as a market category. This critique is relevant to product innovation. A travel product designed for Muslim women should support agency and convenience without assuming that all users have identical religious practices, comfort preferences, travel purposes, or interpretations of modesty. Consequently, H.E.R is positioned as a configurable support system rather than a prescriptive definition of what every Muslim woman must carry.

Muslim Women as Multi-Context Mobile Users

Research on female travellers has expanded substantially, but the evidence remains uneven across cultures, identities, and travel purposes. Zhang et al. (2024) show that female tourism research repeatedly engages with risk, motivation, sexuality, social relations, and constraints. For Muslim women, these themes interact with religious identity and the sociocultural context of mobility. Nisha et al. (2025) demonstrate that gendered and religious identities can compound marginalisation in tourism. Nguyen and Luong (2026) show that Indonesian Muslim women negotiate travel constraints through motivation and coping strategies, while Rostami et al. (2026) demonstrate how gender, religion, nationality, finances, and social scrutiny can reinforce each other in decisions about solo travel.

These studies strengthen the rationale for women-centred design, but they also expose a weakness in simplistic product segmentation. Muslim women cannot be treated as a single stable persona. The same traveller may move through professional, family, leisure, religious, and everyday contexts, and her priorities can change by journey, destination, companion group, duration, and local infrastructure. The Mastercard-CrescentRating Muslim Women in Travel 2026 report similarly describes a market in which women participate across multiple travel personas and decision roles (Mastercard & CrescentRating, 2026). A design response should therefore prioritise modularity and choice rather than assuming that a fixed kit configuration will be optimal for every journey.

From Fragmented Solutions to the H.E.R Physical-Digital Smart Travel Ecosystem

Information technology has become integral to Muslim-friendly travel. Hendrik et al. (2024) identify technology-enhanced halal tourism, digital marketing and communication, and quality and satisfaction as central themes in the IT literature. Digital services can provide dynamic information about halal dining, prayer facilities, destination conditions, transport, and journey planning. Empirical work also indicates that smart tourism technology can contribute to innovation quality and holistic tourist experience in Muslim destination contexts (Suhartanto et al., 2024). Recent research continues this direction by linking halal-oriented behaviour with smart tourism adoption (Suhud et al., 2026). Earlier work specifically addressing Muslim women tourists also demonstrates the relevance of user requirements in the design of mobile travel applications, reinforcing the need for a women-centred digital service layer rather than a generic technology add-on (Muhammad Suhaimi & Lokman, 2018).

However, the functions of digital systems and physical products are not interchangeable. A mobile service can locate a mosque but cannot provide a prayer garment. It can identify a halal restaurant but cannot replace a snack

needed during transit. It can provide safety information but cannot organise personal items inside a travel bag. At the same time, physical products cannot dynamically update destination information. This functional asymmetry creates a case for deliberate physical-digital integration.

Tourism research increasingly uses the term phygital to describe the interaction of physical and digital experience layers. Zheng et al. (2025) synthesise evidence across physical, virtual, and user-location spaces and show that value emerges through the relationship between embodied activity, technology, and spatial configuration. H.E.R uses a simpler form of physical-digital integration than immersive phygital tourism systems. Its digital layer is a QR-enabled gateway rather than an immersive environment. The relevant principle is therefore continuity between tangible preparedness and digital access, not technological sophistication for its own sake.

Integration Gap and Design Proposition

Existing product categories address many component needs individually. Prayer bags provide portable faith support. Personal-care organisers support hygiene and grooming. Food and beverage products support immediate consumption. Power banks and travel accessories support connectivity. Muslim-friendly applications support information search. The gap is not the absence of these solutions. It is the burden placed on the traveller to assemble, organise, and coordinate them across separate categories.

In this study, portable Muslim-friendly preparedness refers to a traveller's ability to carry or access a coordinated set of faith-compatible, personal-care, nutrition, connectivity, and information resources across changing mobility contexts. The term is introduced as a design concept rather than a validated psychological construct. It complements destination readiness by recognising that some forms of support can also be organised around resources carried or accessed directly by the traveller.

Accordingly, the proposed model conceptualises integrated Muslim-friendly travel support as the combination of physical preparedness and digital accessibility.

Table 1. Evidence-to-design requirements traceability

Evidence theme	Illustrative literature	Design requirement	H.E.R response
Faith-compatible travel needs	Battour & Ismail (2016); Oktadiana et al. (2016)	Support religious practice and halal-conscious consumption during mobility.	Prayer and spiritual module; halal nutrition module
Women-specific mobility, risk, and constraint negotiation	Zhang et al. (2024); Nisha et al. (2025); Nguyen & Luong (2026); Rostami et al. (2026)	Enable flexible configuration, personal preparedness, and context-sensitive support.	Modular selection; Hygiene and Beauty module; SafeHER information layer
Digital information and smart tourism	Hendrik et al. (2024); Suhartanto et al. (2024); Suhud et al. (2026)	Provide dynamic access to halal, prayer, mobility, and travel information.	QR-based H.E.R Smart Guide
Physical-digital or phygital tourism	Zheng et al. (2025)	Connect tangible resources with digital access as one user journey.	Integrated physical kit plus digital service layer
Multi-persona Muslim women travel market	Mastercard & Crescent Rating (2026b)	Avoid a single fixed use context.	Five mobility contexts and configurable modules

Conceptual Framework Of The H.E.R Physical-Digital Ecosystem

The conceptual framework turns the integration problem identified in the literature into a practical design architecture. It is not intended as a causal model, nor does it assume that simply possessing the H.E.R kit will improve travel outcomes. Instead, it shows how user-need domains are translated into product functions, physical-digital integration, mobility contexts, and anticipated forms of user value.

The framework begins with four need domains: faith, nutrition, personal care and well-being, and technology and connectivity. These domains are complementary, but their salience varies by journey. They are translated into four physical modules, Prayer and Spiritual, Halal Nutrition, Hygiene and Beauty, and Technology-Driven Smart Support. The architecture is intentionally modular because recent Muslim women travel research demonstrates substantial heterogeneity in constraints, identities, and travel circumstances (Nisha et al., 2025; Rostami et al., 2026).

The third layer connects the physical kit to the QR-based H.E.R Smart Guide. The Smart Guide contains six intended support areas: Pray & Faith, Halal Near Me, SafeHER, Work on the Go, Wellness & Self-Care, and Choose My Journey. These functions extend the product beyond stored items by connecting users to information that is dynamic or location-sensitive. The digital layer remains a gateway and content architecture at the current stage. Reliability, link governance, accessibility, privacy, and user acceptance require subsequent evaluation.

The fourth layer recognises five mobility contexts: business trips, conferences and professional events, staycations and leisure escapes, family and weekend travel, and daily mobility and lifestyle. The final layer identifies preparedness, organisation, accessibility, and connectivity as anticipated forms of user value. These outcomes remain propositions because no primary user data are reported in this study.

Figure 1. Conceptual framework of the H.E.R physical-digital travel ecosystem

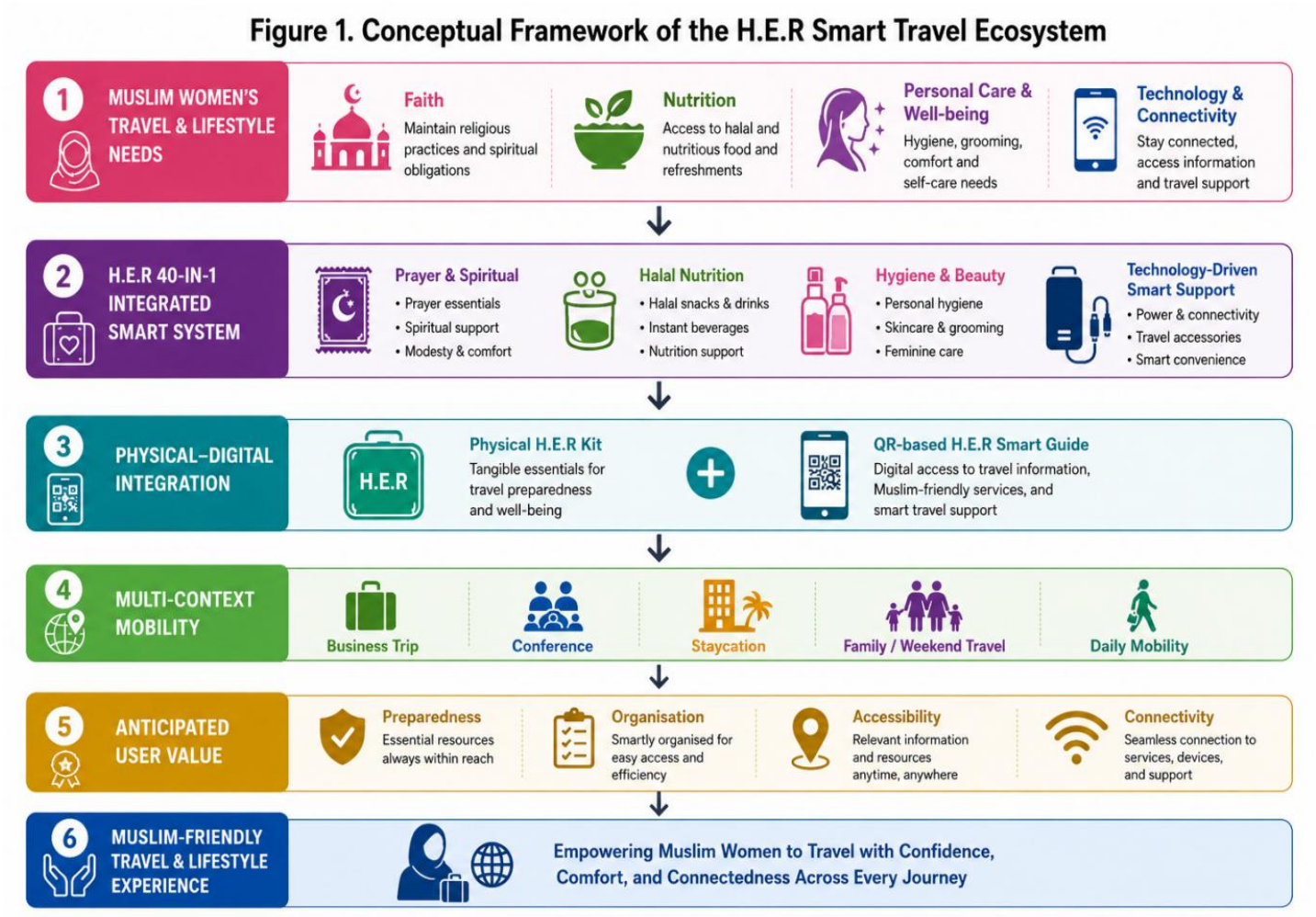


Figure 1 maps four user-need domains into a modular product architecture, a QR-enabled digital layer, five mobility contexts, and anticipated user-value outcomes. The arrows represent design translation rather than empirically tested causal relationships.

METHODOLOGY

Study Design and Scope

This study adopts an innovation-oriented design-based development approach informed by Design-Based Research (DBR) and human-centred design principles. DBR is useful for iterative development of practical interventions because it connects problem framing, design decisions, artefact development, and refinement (Design-Based Research Collective, 2003; Wang & Hannafin, 2005). Human-centred design principles place intended users, context of use, accessibility, and iterative improvement at the centre of design decisions (International Organization for Standardization, 2019; Norman, 2013).

The scope of the methodology also needs to be stated clearly. This study did not include interviews, surveys, co-design workshops, or usability experiments with Muslim women. It therefore does not claim to represent a complete user-centred design cycle. Rather, the work is described as DBR-informed development guided by human-centred design principles. User needs were inferred from published research, industry evidence, and the design problem, and these assumptions will need to be tested directly with users in the next stage of research.

The unit of analysis is the product-service architecture and its initial physical prototype. No claim is made regarding effectiveness, behavioural intention, satisfaction, safety improvement, market demand, or commercial viability. The study evaluates whether the proposed integration concept can be translated into a coherent tangible configuration and identifies what must be tested empirically next.

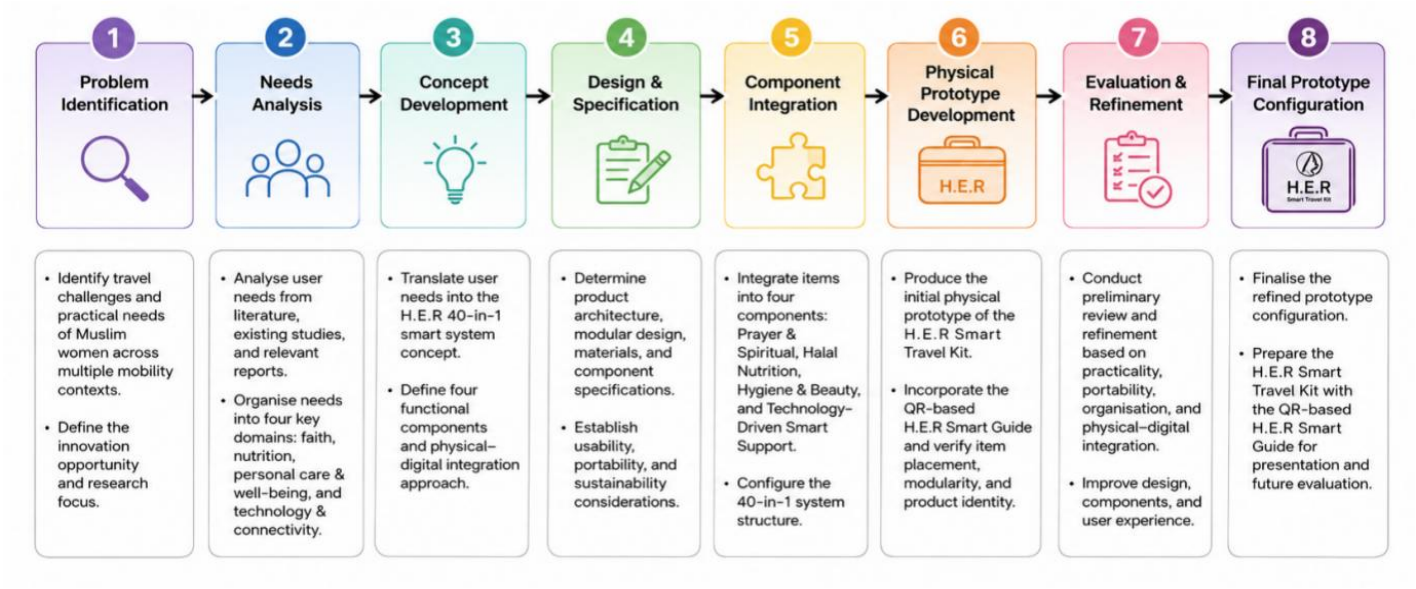
Evidence-to-Design Translation

The development stage relied on a structured narrative synthesis of evidence rather than a systematic literature review. The aim was to identify research that could directly inform the design problem, not to provide an exhaustive account of the field. Sources were selected for their relevance to six areas: Muslim-friendly travel needs, Muslim women travellers, female travel constraints, digital halal tourism, physical-digital tourism, and human-centred product development. Recent peer-reviewed studies were included to reflect developments through 2026, while industry reports were used only to describe market scale and current travel trends. Because the synthesis was design-oriented, it did not follow a systematic-review protocol or claim comprehensive coverage. The themes identified from this evidence were then translated into the design requirements and prototype responses summarised in Table 1.

Innovation Development Process

Prototype development took place across eight iterative stages: problem identification, needs analysis, concept development, design and specification, component integration, physical prototype development, internal evaluation and refinement, and final prototype configuration. Figure 2 summarises these stages and the main activity associated with each one. In practice, the process moved from identifying fragmented traveller needs to grouping those needs into functional domains, specifying the modular architecture, selecting representative components, producing a physical prototype, and refining the overall configuration. Stage 7 involved an internal review by the research team, with attention to practicality, organisation, portability, component fit, and physical-digital integration. As no external participants or independent evaluators were involved, this stage is treated as design refinement rather than evidence of usability, desirability, or effectiveness.

Figure 2. H.E.R innovation development process



Comparative Positioning

A category-level comparison was used to position H.E.R relative to common travel solution types. This comparison is not a systematic market audit and does not support a claim of first-to-market novelty. Its function is to clarify the configuration-level difference between specialised physical products, digital applications, and the proposed integrated system.

Table 2. Category-level positioning of H.E.R relative to existing solution types

Solution category	Primary strength	Typical limitation for the present design problem	Position relative to H.E.R
Prayer or multifunctional faith bags	Portable worship support	Faith-focused and usually limited in personal care, nutrition, or digital functions	H.E.R includes faith support as one module within a wider architecture
Personal care and travel organisers	Hygiene, grooming, organisation	Usually not designed around faith-compatible travel requirements	H.E.R connects personal care with prayer, nutrition, and information access
Nutrition products	Immediate consumption and contingency	Single functional category	H.E.R treats nutrition as one configurable preparedness module
Travel technology accessories	Charging and connectivity	Technology-specific	H.E.R combines device support with physical essentials and information access.
Muslim-friendly apps and web platforms	Dynamic halal, prayer, and destination information	Predominantly digital and cannot provide tangible essentials	H.E.R uses a digital layer to complement physical preparedness
H.E.R prototype	Cross-category integration	Not yet user-validated or market-validated	Configuration-level innovation requiring empirical validation

Prototype Boundary and Research Ethics

No human-participant data are reported in this prototype-development paper. The present outputs consist of a conceptual framework, evidence-to-design translation, modular product architecture, physical prototype, and

QR-based digital service layer. Any subsequent study involving interviews, surveys, usability tests, biometric measures, or observation of users should follow the relevant institutional ethics and informed-consent requirements.

The current study also does not verify product certification, packed weight, liquid volumes, battery restrictions, airline compatibility, lifecycle environmental performance, or willingness to pay. These are treated as validation variables for the next development stage rather than assumed product attributes.

Results: Product Architecture And Prototype Outputs

The results are organised to address the three design-oriented research questions directly. Sections 5.1, 5.2, and 5.4 address RQ1 by showing how literature-informed requirements were translated into a modular architecture and adapted across mobility contexts. Section 5.3 addresses RQ2 by documenting the low-complexity QR-based digital service layer. Section 5.5 addresses RQ3 by stating the design propositions that emerge from the prototype and that require subsequent empirical testing.

Translation of Needs into a Modular Architecture

The main design outcome is a four-domain modular architecture that brings together functions usually spread across several product categories. The current prototype uses a 40-in-1 structure, with ten items in each functional domain. This number is treated as a starting configuration rather than an ideal or final solution. The most useful combination of items will need to be established empirically, since unnecessary components may add weight, cost, complexity, and packing burden.

The four domains are Halal Nutrition, Prayer and Spiritual, Hygiene and Beauty, and Technology-Driven Smart Support. Their primary functions are summarised in Table 3. The modules are intended to be separable so that users can carry a reduced configuration when the full system is unnecessary.

Table 3. Functional architecture of the H.E.R prototype

Module	Primary function	Design rationale
Halal Nutrition	Portable halal-conscious refreshments and hydration support	Addresses short-duration consumption needs and travel contingencies
Prayer and Spiritual	Prayer and faith-related preparedness	Supports continuity of religious practice across changing environments
Hygiene and Beauty	Personal care, grooming, modesty, and well-being support	Responds to personal readiness across professional and leisure settings
Technology-Driven Smart Support	Power, connectivity, travel accessories, and access to the H.E.R Smart Guide	Connects tangible device support with dynamic travel information

Physical Prototype and Modular Configuration

The initial prototype shows how the four functional domains can be organised within a single portable case using separate compartments. The design aims to make items easier to see and reach while allowing modules to be rearranged according to the journey. Portability and cabin-baggage suitability were considered during development, but no compliance claim is made at this stage. Final dimensions, packed weight, liquid volumes, batteries, and restricted items will need to be checked against airline-specific requirements.

Figure 3 presents the current design board and prototype architecture. The visual board functions as a design artifact, not empirical evidence. It documents intended materials, modular organisation, representative component categories, QR integration, and cross-context positioning. The branding and aesthetic identity are secondary to the research contribution, which concerns functional integration and modular configuration.

Figure 3. Design and modular architecture of the H.E.R Smart Travel Kit

Physical-Digital Integration through the H.E.R Smart Guide

The QR-based H.E.R Smart Guide provides the digital service layer of the prototype. Its six intended support areas are Pray & Faith, Halal Near Me, SafeHER, Work on the Go, Wellness & Self-Care, and Choose My Journey. This architecture reflects the distinction between tangible needs and information needs identified in the literature. The kit carries selected physical resources, while the guide connects users to information that may change by place and time.

The QR code itself is not presented as a technological innovation. Its usefulness depends on the quality, relevance, accessibility, currency, and trustworthiness of the information it leads to. Hendrik et al. (2024) show that digital halal tourism increasingly depends on information quality and technology-enabled service. Similarly, recent work on digital tourism emphasises continuity between physical and digital touchpoints rather than technological novelty alone (Zheng et al., 2025). In H.E.R, QR access is therefore used as a simple and practical way to connect the physical prototype with a digital support layer.

The integration of the physical H.E.R kit with the QR-based H.E.R Smart Guide constitutes the proposed physical-digital travel ecosystem.

Figure 4. QR access point for the H.E.R Smart Guide

The QR code shown in Figure 4 represents the current digital access mechanism. Before deployment in a user study or commercial context, the linked content should undergo reliability checks, accessibility review, privacy assessment, link-maintenance planning, and version control.

Multi-Context Adaptability

The prototype is designed for five mobility contexts: business trips, conferences and professional events, staycations and leisure escapes, family and weekend travel, and daily mobility. The key design implication is not that all 40 items should be carried in every context. Rather, the common platform permits different module combinations and component priorities.

Recent research on Muslim women travellers makes this flexibility especially important. Evidence on intersectional constraints and context-dependent mobility suggests that a fixed, universal configuration could reproduce the same one-size-fits-all assumption that women-centred design is intended to avoid (Nisha et al., 2025; Rostami et al., 2026). The prototype should therefore develop as a configurable system in which the case, modules, and refill items can be selected according to the journey and the preferences of the individual user.

Figure 5. Conceptual illustration of proposed H.E.R use across five mobility contexts

Figure 5 presents conceptual use scenarios across the five mobility contexts. These scenarios illustrate the intended adaptability of the prototype and should not be interpreted as evidence of adoption, preference, or performance in any user group.

Design Propositions for Empirical Testing

Three design propositions emerge from the prototype.

DP1: Cross-category modular integration may reduce the coordination burden associated with managing multiple separate travel products.

DP2: A lightweight digital layer may extend the usefulness of a physical travel kit by providing access to dynamic Muslim-friendly information.

DP3: User value is likely to depend on context-specific configuration rather than the maximum number of included items.

These propositions are intentionally stated as testable expectations, not findings about user behaviour.

DISCUSSION

From Destination Readiness to Portable Muslim-Friendly Preparedness

The main conceptual contribution of the study is to extend discussion beyond destination-based provision to include a traveller-held layer of preparedness. Muslim-friendly tourism research has rightly emphasised destination attributes because halal food, prayer spaces, service practices, and accommodation conditions strongly shape travel experiences (Battour & Ismail, 2016; Han et al., 2019). H.E.R does not replace or challenge this destination-level support. Instead, it focuses on the moments between these touchpoints, when travellers may need immediate access to resources regardless of what the next venue provides.

Portable Muslim-friendly preparedness can therefore be understood as an additional layer within the wider service system, not as a substitute for destination infrastructure. Some resources remain destination-based, some can be carried by the traveller, and others can be accessed digitally. This framing avoids suggesting that a travel kit alone can create a Muslim-friendly tourism experience. At most, the product contributes one practical layer to that broader experience.

Women-Centred Design Requires Configurability, Not Stereotyping

One of the clearest lessons from recent research is that Muslim women should not be treated as a homogeneous consumer group. Gender, religion, nationality, marital status, culture, safety, and economic conditions can intersect in different ways (Nisha et al., 2025; Rostami et al., 2026). Research on Indonesian Muslim women also shows that travel constraints are negotiated differently across individuals and situations (Nguyen & Luong, 2026). A product built around one fixed set of 40 items could therefore overgeneralise the very users it is intended to support.

This has an important implication for the design. The future value of H.E.R is likely to depend less on the claim of 40-in-1 completeness and more on modularity, customisation, refillability, and context-sensitive selection. The 40-in-1 configuration is useful as an initial prototype because it makes the integration concept visible. It should not become a design constraint if user studies show that fewer, differently grouped, or culturally differentiated components create greater value.

Physical-Digital Integration and the Meaning of Smart

The digital layer places H.E.R within the broader shift towards physical-digital tourism systems. Recent phygital research argues that tourism value increasingly emerges through interaction between physical settings, digital affordances, and the user's situated experience (Zheng et al., 2025). H.E.R adapts this principle at a product level by linking carried essentials to a digital information gateway. This is a modest technological intervention, but modest technology can still be useful if it reduces friction and connects resources coherently.

In this study, the term “smart” is used in a deliberately limited sense. QR access, charging accessories, and organised digital support do not amount to artificial intelligence or adaptive smart technology. The more defensible claim is that H.E.R creates a connected product-service architecture that could support more advanced functions later, if user evidence shows they are needed. Possible extensions include multilingual content, location-aware recommendations, refill reminders, journey-specific checklists, and AI-assisted support, but these remain future development options.

Configuration-Level Innovation

H.E.R does not claim to invent prayer items, personal-care products, snacks, power banks, QR codes, or Muslim-friendly information services. Its innovation lies in how these existing functions are brought together around a specific user problem within a modular product-service architecture. Making the level of novelty explicit is important because it allows the contribution to be judged on the integration logic rather than on exaggerated claims about individual components.

Configuration-level innovation can still be academically relevant when the design exposes a new problem framing or integration logic. In this case, the problem is the fragmentation of traveller-held resources across physical and digital categories. The prototype makes that integration tangible and generates testable propositions about portability, usefulness, modular configuration, and the relationship between physical preparedness and digital access. These propositions provide a basis for subsequent user-centred validation rather than evidence that the proposed benefits have already been achieved.

Limitations And Future Research

The most important limitation is the absence of direct user validation. The study develops and documents a prototype, but it does not yet establish usability, desirability, safety, effectiveness, or market acceptance. The next stage should therefore involve Muslim women with varied ages, travel purposes, levels of religious observance, family situations, and travel experience. Sampling should also avoid assuming that Malaysian users represent Muslim women more broadly.

Second, the evidence synthesis and comparative product review were not conducted as a systematic review or comprehensive market audit. Future work should use a transparent search protocol for academic evidence and a reproducible product-benchmarking procedure that records brands, functions, dimensions, prices, certification status, and digital features. This would allow the integration claim to be evaluated against a defined competitive landscape.

Third, the 40-in-1 configuration has not been optimised. Direct user research should test component relevance through methods such as card sorting, best-worst scaling, or discrete-choice tasks before finalising the bill of materials. Usability testing can then evaluate task completion, access time, packing logic, errors, portability, and perceived workload. Standardised measures such as the System Usability Scale may be appropriate for the digital guide, although scale selection should match the final research questions.

Fourth, physical performance requires objective measurement. The next prototype should report empty and packed weight, dimensions, material specifications, durability, liquid quantities, battery capacities, and compliance with relevant airline and transport rules. Ergonomic evaluation should examine carrying comfort, reach, visibility, and one-handed access where relevant.

Fifth, the H.E.R Smart Guide requires technical and information-quality validation. Future studies should evaluate content accuracy, source credibility, broken-link rates, mobile accessibility, privacy, multilingual usability, and user trust. If personalised or AI-assisted features are added, the research should examine recommendation transparency, data governance, bias, and failure modes rather than treating AI as an automatic enhancement.

A staged validation pathway is therefore recommended: expert review, user-needs research, usability and ergonomic testing, component optimisation, digital-service validation, consumer acceptance and willingness-to-pay analysis, pilot deployment, and only then commercial scaling. This sequence converts the current design propositions into empirical evidence.

CONCLUSION

This study presents the H.E.R Smart Travel Kit as a modular physical-digital prototype intended for Muslim women across different mobility contexts. Its contribution does not rest on novelty in individual travel items or

QR technology. Rather, it lies in the way faith-related essentials, nutrition, personal care, connectivity, and digital travel support are brought together within one configurable product-service architecture.

The study also proposes portable Muslim-friendly preparedness as a traveller-held complement to destination-based Muslim-friendly provision. This concept helps explain why physical and digital resources can remain fragmented even in destinations with strong Muslim-friendly services. By treating Muslim women as heterogeneous, multi-context mobile users, the design moves towards modularity rather than a fixed universal solution.

At this stage, the prototype shows that the design concept can be translated into a coherent physical-digital configuration; it does not yet demonstrate benefits for users. Preparedness, organisation, accessibility, connectivity, acceptance, and commercial value still need to be tested. The next stage should therefore prioritise direct user involvement, reproducible benchmarking, objective ergonomic measurement, and empirical evaluation of the H.E.R Smart Guide. These steps will show whether H.E.R can move from a promising prototype to a validated travel innovation.

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