

When Touch Cannot Be Digitized: ArchiMate Enterprise Architecture for Omnichannel Wellness Services

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Abstract: Wellness providers such as massage studios are digitalizing their booking, membership, and home-visit channels, yet the service they sell still happens through a therapist's hands, a condition that omnichannel services and phygital services research, grown largely out of retailing, rarely translates into architectural specification. This study designs an enterprise architecture for a micro-enterprise wellness services provider in Banten, Indonesia, that plans three channels, namely regular on-site massage, monthly membership, and home service. Following design science research and TOGAF ADM phases A to D, six ArchiMate models were developed and then analysed through a digitizability lens that classifies every touchpoint as fully digitizable, digitally mediated, or irreducibly physical. Five of the nine normalized activities are fully digitizable and every one of them is information handling, two are digitally mediated, and the two irreducibly physical activities, the therapist's travel and the massage itself, appear in none of the six models. That omission is precisely what makes a distinct family of frictions architecturally invisible. Twelve anticipated frictions are therefore separated into boundary frictions, which exist because the service is physical, and generic digital frictions. The resulting target architecture surrounds the physical activity with an information envelope of identity assurance, shared availability, arrival status, and safety tracing. What cannot be digitized can still be surrounded by information that reduces uncertainty. The artifact is evaluated analytically and ex ante, no implementation exists yet, and systematic measurement is the necessary next step.

Keywords: ArchiMate; design science research; digitizability; enterprise architecture; micro-enterprise; omnichannel services; phygital services; wellness services

INTRODUCTION

The wellness economy is digitalizing quickly. Customers compare prices, read reviews, and expect to book from a phone, and providers that cannot offer it steadily lose visibility to competitors who can (Global Wellness Institute, 2025). Yet for a massage studio, the thing being sold still happens through a therapist's hands, in a treatment room or in a customer's home. Software can arrange the encounter, confirm it, and collect payment for it, but it cannot perform it.

This distinction matters more than it first appears. Omnichannel thinking developed largely in retailing (Verhoef, Kannan, & Inman, 2015), where a product can be photographed, listed, paid for, and shipped, so integrating channels is mainly a matter of keeping data consistent as the customer moves between them. Recent work on phygital experience has begun to take the blend of physical and digital touchpoints seriously, showing that customers move fluidly between the two and evaluate the journey as a whole (Batat, 2024; Mele & Russo Spena, 2022). That literature, however, describes what customers experience. It stops short of stating what an organization must build.

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Enterprise architecture (EA) is the discipline that answers the second question, linking goals to processes, applications, data, and technology so that dependencies become visible (Ahlemann, Legner, & Lux, 2021; Pattij, van de Wetering, & Kusters, 2022). But EA practice tends to treat touchpoints as uniformly automatable: a process is modeled, an application is assigned, a data object is defined. When part of the service cannot be automated at all, that assumption quietly fails, and the architecture ends up saying nothing about the part of the journey where the customer's trust is actually won or lost.

This paper reports a design study located in that gap. The case is a micro-enterprise massage provider in Banten, Indonesia, planning three channels: regular on-site massage, monthly membership, and home service. Four supporting applications have been designed, none has been built, and the organization keeps no operational records. The first author owns and manages the business and developed all six architecture models; this position is declared openly in the method section, because it shapes both the access that made the study possible and the bias it introduces.

Three questions guide the work. First, which touchpoints in the planned journeys can actually be digitized, and which cannot? Second, which frictions arise specifically because part of the service is physical, as distinct from frictions that any digital service would face? Third, what architecture responds to the first kind without pretending that the physical part can be removed?

The contributions are threefold: a digitizability classification for wellness touchpoints; a separation of boundary frictions from generic digital frictions; and an information envelope design principle, instantiated as an ArchiMate target architecture. In the terms of Gregor and Hevner (2013), this is exaptation rather than invention, since known architectural solutions are extended to a problem domain in which a core activity resists digitization.

LITERATURE REVIEW

Phygital Services and the Physical-Digital Boundary

Batat (2024) introduced the phygital customer experience framework to describe settings in which customers use physical and digital touchpoints simultaneously rather than in sequence. Mele and Russo Spena (2022) analyse what they call the architecture of the phygital customer journey, describing an interplay between systems of insights and systems of engagement. Their use of the word architecture is metaphorical: it organizes a way of thinking about experience rather than specifying components. Empirical work in this stream examines involvement and patronage (Banik, 2021), hedonic factors in phygital retailing (Banik & Gao, 2023), which technologies suit which journey phase (Barile, Secundo, & Del Vecchio, 2025), and how consumers evaluate hybrid against traditional touchpoints (Lecointre-Erickson et al., 2026). Almost all of this work measures perception, and almost none of it takes the step from experience to architecture: no study states which business processes, application components, or data objects an organization needs in order to manage the boundary itself.

Enterprise Architecture and ArchiMate in Small Enterprises

EA creates value not by producing diagrams but by improving shared understanding, coordination, and decision-making across organizational layers (Ahlemann et al., 2021). ArchiMate provides a single language spanning motivation, strategy, business, application, and technology, which is what makes cross-layer traceability possible (The Open Group, 2022a, 2026); TOGAF supplies the development cycle (The Open Group, 2022b); and ISO/IEC/IEEE 42010 requires that every view answer identified stakeholder concerns (ISO/IEC/IEEE, 2022). Recent studies continue to extend the language, for instance by combining it with UML and BPMN (Sanyoto, Saputra, & Aknuranda, 2024), while reviews keep linking EA management to digital transformation capability (Pattij et al., 2022; van de Wetering, 2022; Syamfithriani, Wibisono, Munir, Wibowo, & Rahayu, 2024). For very small firms, however, established frameworks are widely judged too heavy, which has motivated simplified metamodels aimed specifically at small and medium enterprises (Bernaert, Poels, Snoeck, & De Backer, 2016). A micro-enterprise with no IT function, no legacy systems, and no operational data is an unusual EA setting: there is nothing to migrate, but equally nothing to measure.

Digital Servitization and the Limits of Substitution

Digital servitization research examines how firms add digitally enabled services, and reviews record persistent obstacles across strategy, design, and implementation (Burton, Story, Zolkiewski, & Nisha, 2024; Minaya, Avella, & Trespacios, 2024), with particular difficulty for smaller firms (Le-Dain, Benhayoun, Matthews, & Liard, 2023). The literature is dominated by manufacturing, where a physical product is accompanied by digital services. The wellness case inverts this arrangement: the digital layer accompanies a physical act of labor that cannot be productized, stored, or shipped. Sousa and Voss (2006) argued that multichannel services combining virtual and physical delivery must be decomposed before quality can be managed, and Lariviere et al. (2017) describe the service encounter as an interdependent system of technology, employees, and customers. Both point toward the boundary that this paper makes explicit.

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Research Gap

The gap is therefore neither a lack of attention to physical and digital blending nor a lack of architectural method, but the absence of a connection between the two. Phygital research explains the experience without specifying what to build; EA research specifies what to build while implicitly assuming that every touchpoint is equally automatable. This study proposes that architecting a high-touch omnichannel service requires classifying touchpoints by digitizability first, deriving frictions separately for each class, and responding to each class differently.

METHOD

Design Science Approach and Researcher Position

The study follows the design science research methodology (Peffer, Tuunanen, Rothenberger, & Chatterjee, 2007), which is oriented toward artifacts that address practical problems while producing prescriptive knowledge (Hevner, March, Park, & Ram, 2004). Of the six activities in that methodology, this paper completes problem identification, definition of objectives, and design and development. Demonstration is limited to an illustrative walkthrough, and evaluation is *ex ante* and analytical; in the terms of the FEDS framework, the strategy is artificial and formative (Venable, Pries-Heje, & Baskerville, 2016). The design process itself follows TOGAF ADM phases A to D (The Open Group, 2022b), and each view is documented against stakeholder concerns as required by ISO/IEC/IEEE 42010 (ISO/IEC/IEEE, 2022).

The first author owns and manages the case organization and developed all six architecture models. This dual role is what made the study possible, since no external researcher would have had comparable access to strategic intent, but it also introduces bias: the frictions reported are structured anticipations rather than independent observations. Three safeguards are applied. Each friction is derived from published customer journey and service literature rather than from personal judgment alone. Each architectural response is traced to a friction and to a stated business goal, so the chain of reasoning can be audited. And the study makes no empirical claim of any kind.

Source Artifacts

Six ArchiMate models constitute the design under analysis. The stakeholder and driver view identifies management and customers, with concerns spanning revenue growth, profitability, therapist quality, package variety, and price. The business goals and principles view, shown in Fig. 1, records the intended causal chain from time-consuming manual scheduling through reduced operating costs, higher satisfaction, retention, and transaction growth to the annual profit margin target, together with an outcome of ninety percent of customer interactions and bookings performed online. The strategy view specifies customer intimacy, supported by digital customer management and data-driven services.

Three process views describe the planned channels. Regular massage covers schedule booking, massage type selection, payment, and a satisfaction questionnaire. Monthly membership adds registration, package selection, and therapist selection. Home service, shown in Fig. 2, is the most complex because it adds both therapist selection and visit scheduling. All three views expose four planned application components named Pijat Mania, VR Mania, E Mania, and Puas Mania, their supporting databases, and a single server node.

Two of the six views are reproduced here in redrawn form, preserving the same elements and relationships so that they remain legible in print; the remaining four are summarized in Table 1, which enumerates every activity across all three channels, and are provided as supplementary material. It must be stated plainly that none of these applications exists. The models represent an intended design rather than a description of a running system, and the organization keeps no transaction records, application logs, or customer survey data.

Analytical Procedure

Analysis proceeded in four steps. Activities across the three channels were first normalized to six generic stages, which makes channels with different activity counts comparable. Each activity was then classified by digitizability, as reported in the result section. Frictions were then derived per class. Candidates were drawn from three literature streams, namely customer journey and touchpoint research (Tueanrat, Papagiannidis, & Alamanos, 2021), phygital and multichannel service quality (Batat, 2024; Mele & Russo Spena, 2022; Sousa & Voss, 2006), and service failure and recovery (Tax, Brown, & Chandrashekar, 1998; Michel, Bowen, & Johnston, 2009), located in Scopus and Google Scholar using combinations of the terms customer friction, pain point, service failure, touchpoint, and omnichannel. A candidate was retained only if it could be traced to a specific activity, or a specific missing activity, in the six source views, and discarded if its cause lay outside the architecture. Coding was performed by the first author alone and was not independently verified. Finally, architectural responses were synthesized, reusing the planned components wherever possible rather than proposing replacements.

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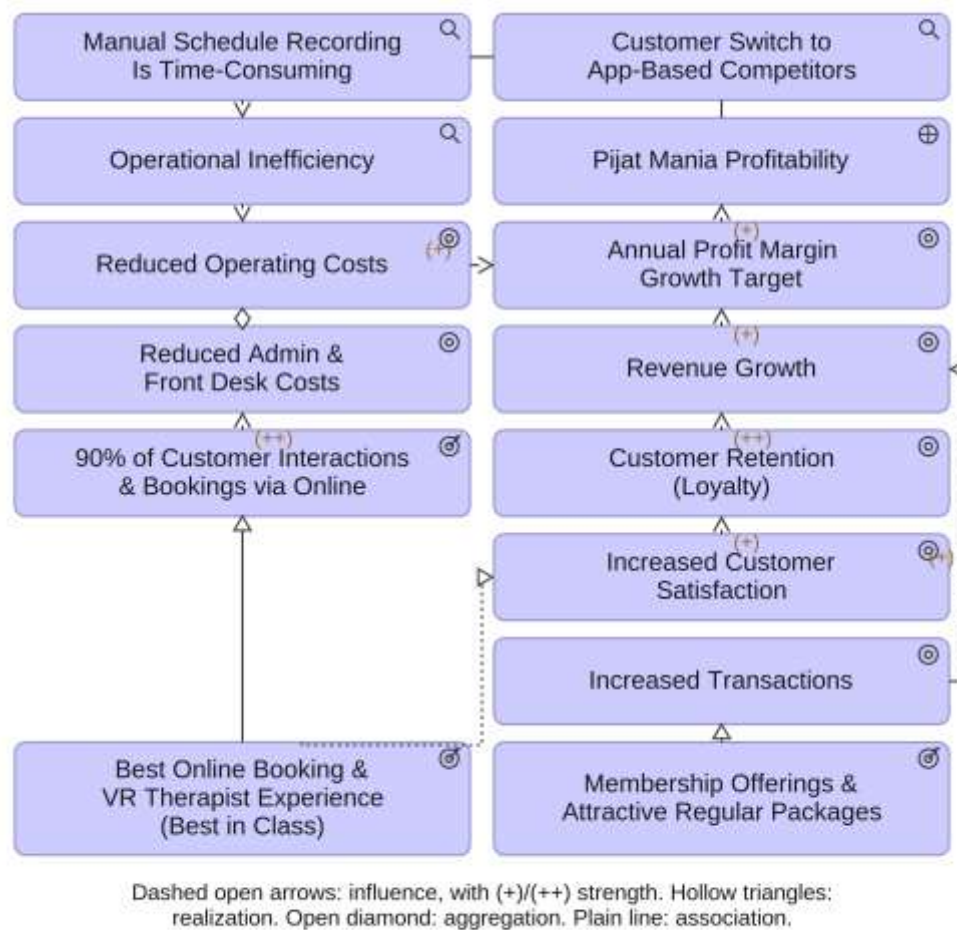


Fig. 1 Business goals and principles view of the case organization, showing the intended causal chain from manual scheduling to the annual margin target (source: design developed by the authors)

RESULT

Digitizability of the Planned Touchpoints

Table 1 classifies every activity in the three process views into three categories. An activity is fully digitizable when a system can execute it from end to end; digitally mediated when software coordinates it but a person or physical resource performs it; and irreducibly physical when no digital substitute exists at all.

Five of the nine normalized activities are fully digitizable, and every one of them is information handling: registration, service and package selection, payment, and the satisfaction questionnaire. Two are digitally mediated. Therapist selection looks like a data operation on the surface, but what the customer is really choosing, namely competence, manner, and the quality of touch, is not contained in the data. Visit scheduling is similar: a slot is a record, yet whether that record is feasible depends on travel time and on a therapist being physically present.

The most consequential result is what the classification exposes rather than what it confirms. The two irreducibly physical activities, the therapist's travel to the customer's home and the massage itself, appear in none of the six models. The process views move directly from payment processing to the satisfaction questionnaire, so the activity that constitutes the entire value of the service is architecturally invisible.

This omission is not unusual, and it is not carelessness. Process models built to specify information systems routinely abstract away work that no system performs, and doing so is normally harmless. Here it is not harmless, because the omitted activity is exactly where trust is created and where the customer's uncertainty is concentrated. If the massage and the therapist's journey are absent from the model, then no architectural element owns the information that surrounds them: who the therapist is, whether they are competent, when they will arrive, and whether the customer is safe. The classification therefore does more than label touchpoints. It predicts where the architecture will be silent.

Table 1. Digitizability classification of the planned touchpoints

Normalized stage	Activity in the models (channel)	Class	Basis of classification
Register / book	Schedule Booking (R); Registration (M); Home Services Registration (H)	Fully digitizable	Information and identity capture
Select service	Massage Type Selection (R, M, H)	Fully digitizable	Catalogue lookup and selection
Select package	Membership Package Selection (M)	Fully digitizable	Catalogue and entitlement rules
Select provider	Therapist Selection (M, H); absent in R	Digitally mediated	The choice is data; competence and quality of touch are not
Schedule arrival	Visit Schedule Selection (H)	Digitally mediated	A slot is a record; travel time and presence are physical
Pay	Payment Processing (R, M, H)	Fully digitizable	Gateway settlement and reconciliation
Travel to customer	Not modeled (H)	Irreducibly physical	Human mobility; no digital substitute
Deliver massage	Not modeled (R, M, H)	Irreducibly physical	Manual therapy performed by a therapist
Evaluate	Satisfaction Questionnaire (R, M, H)	Fully digitizable	Structured post-service feedback

R = regular massage; M = monthly membership; H = home service.

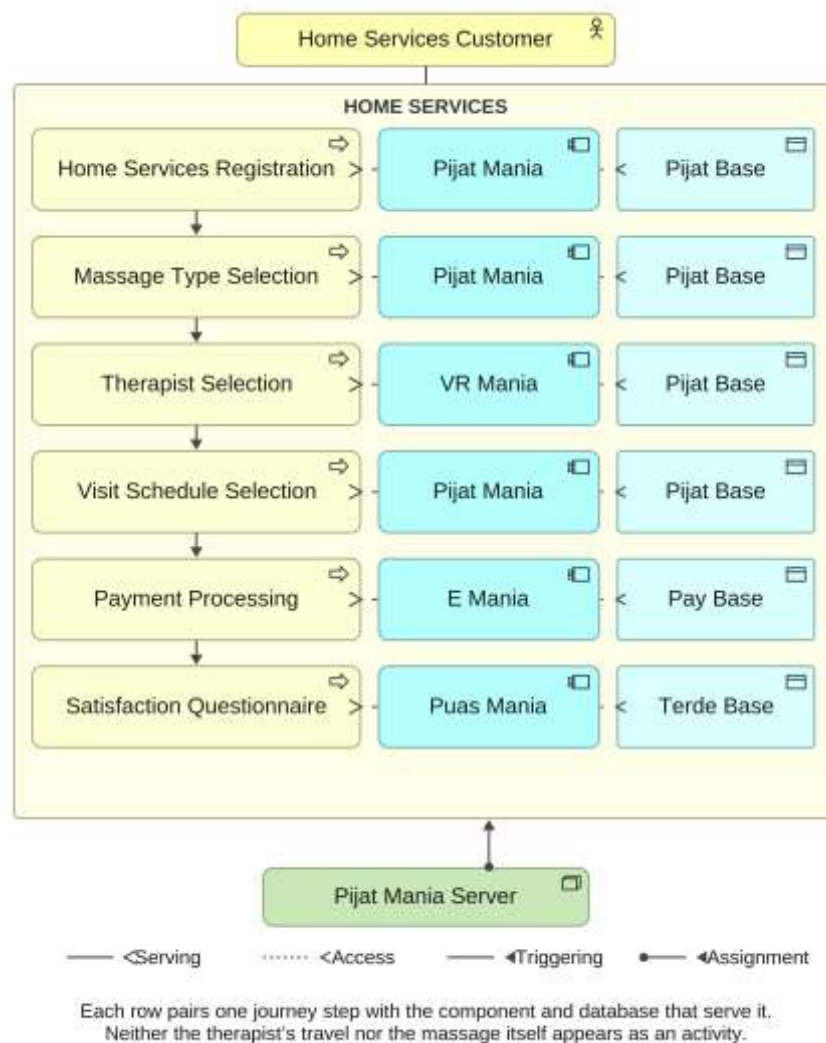


Fig. 2 Home service process view, the most complex of the three planned channels (source: design developed by the authors)

Boundary and Generic Frictions

Twelve frictions were derived and are listed in Table 2. Their separation into two families is the analytical contribution of this section.

Boundary frictions exist because part of the service is physical, and they would not arise in a fully digital service. Therapist competence and identity remain uncertain because the attributes that matter cannot be fully represented as data (B1; Batat, 2024; Sousa & Voss, 2006). Capacity is bounded by human availability and travel time rather than by computing resources (B2; Sousa & Voss, 2006). Arrival is invisible, since the customer cannot tell whether a therapist has been assigned or is already on the way (B3; Tueanrat et al., 2021). Personal safety and the privacy of a home address are at stake in a way that no retail transaction matches (B4; Mele & Russo Spena, 2022). Physical service failure, such as discomfort, mismatched technique, or lateness, cannot be undone by a refund and requires human recovery (B5; Tax et al., 1998). And a therapist's reputation can be damaged by ratings shaped by factors outside their control (B6; Michel et al., 2009).

Generic digital frictions, by contrast, would appear in any multi-channel digital service (Verhoef et al., 2015; Tueanrat et al., 2021). Customers re-register when moving between channels because identity is not unified (G1). History is fragmented across channels (G2). Membership packages remain static because usage is never analyzed (G3). Terminology, prices, and statuses diverge between channels (G4). Payment settlement does not update booking state (G5). And management sees indicators per application rather than per journey (G6).

The distinction is practical rather than merely taxonomic, because the two families demand different architectural treatment. Generic frictions can be removed by familiar means: shared identifiers, integration,

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canonical catalogues, and event propagation. Boundary frictions cannot be removed at all, because their cause is the physical nature of the service itself. They can only be reduced by supplying information that lowers the customer's uncertainty about something the architecture does not control. This asymmetry is the reasoning behind the design principles stated below.

Table 2. Boundary and generic frictions with architectural responses

ID	Friction	Architectural cause	Response in the target
B1 Competence uncertainty	The customer cannot judge the therapist in advance	Attributes that matter are not represented as data	Verified therapist profile with rating context
B2 Human-bound capacity	Slots conflict with real availability	Availability is not exposed as a shared service	Shared availability with travel buffer
B3 Invisible arrival	The customer cannot tell if anyone is coming	No journey state for assignment or transit	Arrival and service status service
B4 Safety and location exposure	Home address and presence create risk	No consent or location-handling policy	Safety, consent and recovery trace
B5 Unrecoverable physical failure	A refund does not repair a bad session	No exception path for service quality	Human recovery workflow with escalation
B6 Unfair reputation effect	Ratings reflect factors beyond control	Rating stored without context	Rating combined with schedule and complaint context
G1 Repeated registration	Re-entry when switching channel	Customer identity not unified	Single identifier with consent-based reuse
G2 Fragmented history	No single view of the customer	Data held separately per channel	Unified customer and service data hub
G3 Static packages	Benefits drift from real usage	Usage and feedback never analyzed	Package analytics and configurable benefits
G4 Channel inconsistency	Terms, prices and statuses diverge	No canonical catalogue	Canonical service catalogue and journey status
G5 Payment discontinuity	Booking state lags settlement	Settlement does not update the journey	Payment settled event and reconciliation rule
G6 Limited visibility	Management reads per application	No journey-level measurement	End-to-end journey dashboard

Boundary frictions (B) arise because part of the service is physical; generic digital frictions (G) would arise in any multi-channel digital service.

Target Architecture

Fig. 3 presents the target architecture. It retains the three channels as distinct offerings, normalizes them onto a single customer journey, and keeps all four planned applications rather than replacing them. Two components are added: a journey orchestration service and an adaptation engine. The design rests on four principles, stated so that they can be reused and tested independently of this case.

DPI - Information envelope. An activity that cannot be digitized cannot be automated or removed; it can only be surrounded. To reduce boundary friction, supply information services that lower the customer's uncertainty about the physical activity rather than attempting to replace it.



Fig. 3 Target enterprise architecture; the shaded, heavy-bordered element is the irreducibly physical activity and dashed elements are newly introduced components (source: research result)

Four information services form the envelope. Therapist identity and competence assurance publishes verified profiles, qualifications, and rating context, addressing B1 and B6. Shared availability with a travel buffer turns therapist capacity and realistic travel time into one service consumed by all three channels, addressing B2. Arrival and service status visibility exposes assignment, departure, and arrival as explicit journey states, addressing B3. Safety, consent, and recovery tracing records how location data is handled, what the customer consented to, and which escalation path applies, addressing B4 and B5.

DP2 - Reuse before replacement. Where planned components already cover a capability, extend them with explicit contracts instead of introducing new applications, because in a micro-enterprise the binding constraint is integration effort rather than functionality.

DP3 - Logical before physical unification. To obtain a single customer view in an organization with no IT function, unify identifiers, metadata, and access rules in a data hub rather than merging databases, because logical unification can be introduced incrementally and reversed.

DP4 - Governance concurrent with integration. Because home-delivered services process location and bodily-preference data, design consent, role-based access, minimization, retention, and audit in the same increment as the integration layer, in line with the obligations of a data controller under Indonesia's Personal Data Protection Law (Republic of Indonesia, 2022).

Integration is expressed as events rather than point-to-point links, including customer created, booking confirmed, therapist assigned, payment settled, service completed, and feedback submitted. At this scale the events may initially be implemented as simple API calls or scheduled batch transfers; what matters is that each component publishes and consumes a defined contract. Table 3 traces each target element to a business goal and an indicator, so that the architecture can later be assessed rather than merely described.

Table 3. Traceability from target elements to business goals

Business goal (source view)	Supporting target element	Indicator
Reduce operating cost	Shared availability; profile reuse; event integration	Admin time per booking; manual handoffs
Ninety percent of interactions and bookings online	Unified journey; journey status; canonical catalogue	Digital completion rate; abandonment
Increase customer satisfaction	Therapist assurance; arrival status; recovery workflow	Journey satisfaction; on-time arrival
Customer retention (loyalty)	Feedback capture; adaptation engine; preference reuse	Repeat booking; membership renewal
Increased transactions	Omnichannel continuity; package analytics	Conversion; booking frequency
Annual profit margin growth	Capacity optimization; margin-aware packages	Contribution margin; therapist utilization
Market share growth	Home-service reliability; differentiated experience	New customers; referral rate

Analytical Evaluation

Because nothing has been implemented, evaluation is ex ante and rests on properties of the artifact rather than on outcomes (Venable et al., 2016). Three criteria were applied, followed by an illustrative demonstration.

Completeness requires that all nine normalized activities, all four planned applications, the six core data subjects, the twelve frictions, and governance are represented, and all of them are. The two activities absent from the source models, therapist travel and massage delivery, are added to the target journey, which is itself a design outcome rather than a correction.

Consistency was checked by comparing each target element manually against the six source views. No target element contradicts a process, application component, or goal stated in those views, and every relationship conforms to the ArchiMate relationship table (The Open Group, 2022a). No automated model validation was performed, because the target architecture is presented as a design specification rather than a tool-resident model.

Traceability requires that each of the twelve frictions maps to at least one architectural response, and that each target element maps to at least one business goal in Table 3. No orphan elements remain, which means that no component was introduced without a stated justification.

For demonstration, a home-service booking was traced from end to end, including one exception path in which the therapist is delayed: the shared availability service recalculates the travel buffer, the arrival status service notifies the customer, and the recovery trace records the escalation and its outcome. The walkthrough confirms internal coherence. It does not demonstrate feasibility in practice, and it should not be read as evidence of effect.

DISCUSSIONS

The theoretical contribution is a bridge. Phygital research has established that customers experience physical and digital touchpoints as one journey (Batat, 2024; Mele & Russo Spena, 2022); this study translates that insight into architectural specification, which the phygital literature does not attempt. Conversely, EA research offers cross-layer traceability while implicitly assuming automatability; the digitizability classification makes that

assumption explicit and shows what follows when it does not hold. Following Gregor and Hevner (2013), the contribution is exaptation. The individual components, namely identity assurance, shared availability, status tracking, consent management, and recovery workflow, are conventional and are not claimed as new. What the study contributes is the criterion by which they are selected and grouped: their function in reducing uncertainty about an activity the architecture cannot control.

A reasonable objection is that a customer data platform combined with a commercial experience-management suite would deliver much of this without architectural work. For the generic frictions that is largely true, and the design deliberately does not compete there. The boundary frictions are different. Off-the-shelf suites assume the journey they orchestrate is executed by software; none models therapist competence as an assurance obligation, travel time as a capacity constraint, or arrival as a journey state. Those obligations must be specified by whoever understands the service, and specifying them is architectural work whichever products are bought. The contribution is the specification, not a claim that it must be built from scratch.

The result also refines how the boundary itself should be treated in modeling practice. An irreducibly physical activity is not noise to be abstracted away but an element that must appear in the model precisely so that the information services surrounding it can be assigned an owner, a data object, and an indicator. Omitting it does not simplify the architecture; it silently removes the part of the journey that carries the most uncertainty for the customer.

For practitioners, the implication is a sequence. Identity, journey status, and shared availability come first, because they carry the highest ratio of friction reduction to cost. Feedback-driven adaptation comes last, because it presupposes data that does not yet exist. Building applications first, which is the intuitive order for a small business, would reproduce the blind spot identified in the digitizability analysis.

The limitations are substantial and deliberate. There is no implementation, no operational data, and no stakeholder assessment, so the frictions are anticipations derived from literature rather than observations, and no quantitative claim is made. No independent evaluator has assessed the artifact, and friction coding rests on a single coder. A single case supports analytical rather than statistical generalization, and the first author's ownership of the case is a source of bias that open declaration mitigates but does not remove. The structure is likely transferable to other high-touch services such as physiotherapy, salons, home care, and personal training, which share the pattern of digital coordination around irreducibly human delivery, but that transferability remains untested.

CONCLUSION

This paper designed an enterprise architecture for a wellness micro-enterprise whose core service cannot be digitized. Classifying touchpoints by digitizability revealed that the two irreducibly physical activities were absent from all six source models, and that this absence is what renders a distinct family of boundary frictions architecturally invisible. Separating boundary frictions from generic ones led to the information envelope principle: what cannot be digitized can still be surrounded by information that reduces uncertainty. The target architecture instantiates that principle through therapist assurance, shared availability with a travel buffer, arrival status visibility, and safety and recovery tracing, while reusing the four planned applications rather than replacing them.

The study is limited by the absence of implementation, operational data, and independent evaluation, and by the first author's dual role as owner of the case organization. The immediate next step is therefore neither a larger model nor a new application, but measurement. The organization currently keeps no records at all. Beginning to log booking requests, confirmation times, cancellations, and complaints would, within a few months, produce the baseline that this study lacks, and would in turn enable expert validation, a prototype of one channel, process mining against the designed models, and before-and-after comparison of customer effort and satisfaction.

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