Reconfiguring Tourism Services: The Role of Modularity and Human Resource Readiness in Digital Platform Architecture

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ABSTRACT

This study examines the role of digital platform architecture modularity and human resource (HR) readiness in supporting the reconfiguration of travel services. The underlying research gap is the limited body of literature simultaneously linking technical platform modularity with organizational HR readiness within tourism services. Employing a mixed-method approach, a Systematic Literature Review (SLR) guided by the PRISMA protocol across Scopus-indexed databases was integrated with empirical survey data (N = 65) collected from students, lecturers, and industry partners at Politeknik Pariwisata Bali. SLR data were tabulated using NVivo 12 and Microsoft Excel. The literature synthesis reveals that modular platform architecture enables flexible recombination of service components, but its operational success relies heavily on HR capabilities. Empirical questionnaire results demonstrate high readiness to participate in digital training (mean = 4.1) and high basic digital literacy (mean = 3.8), whereas conceptual understanding of platform service modularity remains low (mean = 2.9). Cronbach's Alpha coefficient of 0.884 confirmed high instrument reliability. This research provides an integrative framework positioning HR readiness as a critical enabler of modular service reconfiguration. Destination managers and vocational educators must align digital training with modular system designs to achieve sustainable service transformation.

I. INTRODUCTION

Digital transformation has driven the tourism sector to integrate various travel services into a single interconnected platform ecosystem (Buhalis & Leung, 2018; Khatami et al., 2024). Modern digital platform architecture allows travel service providers to flexibly reconfigure service modules to respond to changing tourist preferences (Baldwin & Woodard, 2008; Weng et al., 2024). The principle of modularity in platform architecture provides the technical capability to decompose services into components that can be exchanged and recombined according to market needs (Pastrakis et al., 2026; Tiwana et al., 2010). This module recombination capacity expands opportunities for creating new solutions within digital ecosystems, including in the tourism domain (Autio et al., 2018; Weitzman, 1998). Relatedly, human resource readiness is a key determinant of the success of digital transformation in the tourism industry, as new technology demands new digital competencies from employees (Bresciani et al., 2021; Issakov et al., 2023). This condition is even more relevant post-pandemic, as the need to reset the tourism industry has driven the restructuring of digital-based services (Sigala, 2020).

Although platform modularity is widely discussed in the literature, research that specifically links modularity with HR readiness in travel services remains limited (Xiang & Fesenmaier, 2017). Most tourism platform architecture studies focus on technical aspects such as sensors and data integration, while organizational and human dimensions are relatively neglected (Sabbioni et al., 2022). Little is known about how the service reconfiguration process affects the work readiness of staff at tourist destinations and educational institutions (Buhalis et al., 2019; Issakov et al., 2023). The literature also does not yet adequately explain how a resource-based perspective can be used to assess HR readiness in the context of modular platform architecture (Barney, 1991). Prior research shows that integrating tourism services into a modular architecture can improve operational efficiency and personalize tourist experiences (Pastrakis et al., 2026; Sabbioni et al., 2022). Studies on digital platform evolution confirm that a well-managed modular structure accelerates the creation of new services through component recombination (Tiwana et al., 2010). Support for digital HR readiness is also found in research showing that technological competency strengthens workforce capacity to cope with change (Vrontis et al., 2022). Recent systematic studies confirm that HR strategies aligned with digital transformation contribute positively to overall tourism performance (Zhang et al., 2025).

The novelty of this study lies in combining the perspective of modular platform architecture with HR readiness simultaneously within travel services (Baldwin & Woodard, 2008; Bresciani et al., 2021). Unlike prior research treating platform modularity as a purely technical issue, this study views modularity as a variable interacting directly with human operational capacity (Tiwana et al., 2010). This study offers a mixed methodological approach combining an SLR with a field questionnaire among a tourism higher-education population, producing conceptual and contextual insights (Adeyinka-Ojo, 2021; Moher et al., 2009). A further novelty is the integrative framework positioning HR readiness as both an enabler and a constraint on platform-based service reconfiguration (Xiang & Fesenmaier, 2017). Taking vocational tourism education as the locus enriches the literature on digital platform architecture (Buhalis & Leung, 2018; Issakov et al., 2023), while providing empirical questionnaire data on actual HR readiness rather than normative assumptions (Vrontis et al., 2022). Finally, practical recommendations assist destination managers in aligning HR strategies with modular platform architectures (Zhang et al., 2025).

Table 1. Summary of Research Novelty

No	Novelty Aspect	Condition in Prior Research	Contribution of This Research
1	Integration of modularity and HR	Modularity discussed separately from HR readiness (Baldwin & Woodard, 2008)	Combines both dimensions simultaneously
2	Methodological approach	SLR generally stands alone without field data (Adeyinka-Ojo, 2021)	Combines SLR with a field questionnaire
3	Research locus	Platform architecture studies focus on the general digital industry (Sabbioni et al., 2022)	Takes up the context of vocational tourism education
4	Empirical evidence of HR readiness	HR readiness is often assumed normatively (Vrontis et al., 2022)	Provides real questionnaire data as empirical evidence

Table 2. Research Gap

No	Identified Gap	Reference Source	How This Research Fills the Gap
1	Technical focus, minimal human dimension	Sabbioni et al. (2022)	Adds the HR readiness dimension
2	Cross-sector generalization of modularity	Tiwana et al. (2010)	Contextualizes to tourism services
3	HR readiness not linked to platform architecture	Bresciani et al. (2021)	Directly links the two
4	SLR without field validation	Adeyinka-Ojo (2021)	Adds a field questionnaire
5	Vocational tourism education locus rarely studied	Xiang & Fesenmaier (2017)	Makes Poltekpar Bali the research locus

II. METHODOLOGY

This study uses a Systematic Literature Review (SLR) approach combined with qualitative and empirical analysis to address five Research Questions (RQ) regarding digital platform architecture modularity and HR readiness in travel service reconfiguration. The SLR process followed the PRISMA protocol across Scopus-indexed databases using search terms: tourism services, digital platform architecture, travel services, reconfiguration, and modularization (Moher et al., 2009). Data management, bibliographic extraction, and thematic coding of literature were executed using NVivo 12 software and Microsoft Excel to construct comparative synthesis matrices.

The systematic search initially retrieved 284 articles. After removing duplicates (n = 62) and screening titles/abstracts based on inclusion criteria (peer-reviewed articles published in English focusing on digital tourism architectures or HR readiness), 142 records remained. Full-text eligibility appraisal excluded 94 articles lacking architectural or HR specifics, leaving 48 papers for detailed review, from which 6 core studies were extracted for primary comparative synthesis. To empirically validate the SLR synthesis, a survey was administered at Politeknik Pariwisata Bali, targeting N = 65 purposively sampled respondents (40 tourism business students, 10 lecturers, and 15 industry

partner representatives). Empirical questionnaire findings validated the literature synthesis by contrasting technical platform affordances against operational workforce competency levels.

The research instrument comprised a structured 5-point Likert scale questionnaire (1 = Strongly Disagree to 5 = Strongly Agree) assessing platform modularity, HR readiness, and service reconfiguration. We established instrument validity through Pearson product-moment correlation analysis, with all items yielding r-calculated values exceeding the critical table value ($r > 0.361$, $p < 0.05$). Internal consistency reliability was confirmed with an overall Cronbach's Alpha value of 0.884, indicating large-scale reliability. Complementary semi-structured interviews were conducted to elaborate upon questionnaire trends qualitatively.

The research procedure followed seven structured steps: (1) formulating five Research Questions (RQs); (2) defining search keywords; (3) database querying; (4) PRISMA screening; (5) article quality appraisal; (6) NVivo-assisted thematic synthesis; and (7) field validation via questionnaire and qualitative triangulation.

Table 3. Research Subjects Breakdown

No	Subject Category	Role in the Research	Number of Respondents
1	Tourism Business Students	Users of digital tourism platform services in academic practice	40 respondents
2	Study Program Lecturers/Instructors	Curriculum managers & observers of digital HR readiness	10 respondents
3	Industry Partners/Travel Agencies	Service providers operating the digital platform	15 respondents

Table 4. Research Questionnaire Instrument and Reliability

Variable	Indicator	Sample Question Item	Scale	Source
Platform Modularity	Understanding of separable/combinable service components	I understand that tourism services on the platform can be flexibly combined	1-5	Baldwin & Woodard (2008)
HR Readiness	Basic digital literacy	I feel able to operate digital tourism service applications/platforms	1-5	Xiang & Fesenmaier (2017)
HR Readiness	Readiness to participate in digital training	I am willing to participate in training to improve my digital competency	1-5	Bresciani et al. (2021)
Service Reconfiguration	Adaptation to service changes	I am ready to adapt when tourism services are reconfigured through a new platform	1-5	Tiwana et al. (2010)

III. RESULTS AND DISCUSSION

The literature synthesis summarized in Table 5 illustrates that platform architecture modularity functions as a technical enabler, while HR readiness serves as an organizational enabler governing implementation success. Reconfiguration of travel services is optimal only when both technical flexibility and human capability advance in tandem (Bresciani et al., 2021; Pastrakis et al., 2026; Tiwana et al., 2010).

Empirical questionnaire data presented in Table 6 show that while respondents possess strong readiness to participate in digital training (mean = 4.1) and high basic digital literacy (mean = 3.8), their conceptual understanding of platform service modularity is low (mean = 2.9). This confirms that while psychological readiness and foundational digital skills are present, technical concepts of modular system architecture remain unfamiliar to operational stakeholders (Bresciani et al., 2021; Xiang & Fesenmaier, 2017).

Addressing RQ1, platform architecture modularity in travel services is realized by decoupling transportation, accommodation, and activity modules into reconfigurable bundles (Baldwin & Woodard, 2008; Pastrakis et al., 2026). For RQ2, HR training readiness directly dictates platform adoption efficacy, supporting Vrontis et al. (2022). For RQ3, service reconfiguration occurs incrementally relative to HR absorption capacity (Tiwana et al., 2010). Regarding RQ4, cognitive gaps regarding modularity represent the primary barrier, whereas training motivation acts as the main catalyst (Bresciani et al., 2021). For RQ5, platform modularity and HR readiness function as complementary assets for sustainable reconfiguration success (Zhang et al., 2025).

In discussion, technical platform modularity cannot deliver expected flexibility without corresponding workforce literacy in modular architecture (Baldwin & Woodard, 2008; Weng et al., 2024). High willingness to undergo training presents an immediate opportunity for vocational institutions to bridge this cognitive gap through structured curricula (Issakov et al., 2023; Vrontis et al., 2022). Sustainable digital transformation requires destination managers to pair platform infrastructure investments with human resource capacity building (Khatami et al., 2024; Zhang et al., 2025).

Table 5. Summary of Systematic Literature Review Results

No	Author(s) & Year	Research Focus	Method	Main Findings
1	Sabbioni, Villano, & Corradi (2022)	Smart tourism service integration architecture	Architecture case study	Modularity supports personalization of tourism services
2	Tiwana, Konsynski, & Bush (2010)	Platform architecture evolution	Conceptual	Modularity accelerates recombination of service components

3	Buhalis & Leung (2018)	Smart hospitality ecosystem interconnectivity	Conceptual	Platform interoperability is crucial for tourism services
4	Bresciani, Ferraris, Romano, & Santoro (2021)	HRM and digitalization	Conceptual/case study	Digital HR readiness is a prerequisite for transformation
5	Vrontis et al. (2022)	Advanced technology and HR management	Systematic review	Continuous training improves digital HR readiness
6	Zhang, Chen, Li, & Jiao (2025)	Digital transformation and tourism performance	SLR	HR strategy aligned with technology improves performance

Table 6. HR Readiness Questionnaire Results (1-5 Likert Scale, N = 65)

No	Indicator	Average Score	Category
1	Basic digital literacy	3.8	High
2	Ability to adapt to new technology	3.4	Moderate
3	Understanding of platform service modularity	2.9	Low
4	Readiness to participate in digital training	4.1	High
5	Digital self-efficacy	3.5	Moderate

IV. CONCLUSIONS

This study demonstrates that digital platform architecture modularity and HR readiness are interdependent determinants of successful travel service reconfiguration. While modular architecture yields structural flexibility for component recombination, workforce readiness dictates operational execution. Empirical findings highlight high training willingness (mean = 4.1) alongside a distinct gap in modularity literacy (mean = 2.9).

It is recommended that vocational tourism education institutions integrate platform architecture and modular system dynamics into technical curricula. Destination managers must synchronize platform technology acquisitions with targeted employee upskilling programs to ensure long-term digital agility and sustainable service transformation.

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