

Calibrated Digital Hybridity in Hotel Operations: A Secondary Qualitative Analysis of Technology, Human Judgment, and Operational Resilience

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ABSTRACT

Hotel digitalization is often evaluated through adoption, acceptance, or investment, yet the operational value of technology depends on whether systems, employees, infrastructure, authority, and fallback routines continue to work together under routine and disrupted conditions. This secondary qualitative study reanalyzes 11 interviews with hotel owners, managers, and frontline employees from seven hotels in Tagaytay City, Philippines. The interviews were originally collected for a broader mixed-method study but are reexamined here using different research questions and a socio-technical resilience lens. Reflexive thematic analysis generated four interrelated themes: technology becomes operational infrastructure; efficiency introduces new points of fragility; digital capability is produced through uneven learning ecologies; and resilience depends on calibrated digital hybridity. Participants described digital systems as central to reservations, room status, billing, reporting, inventory, personalization, and service coordination, while also identifying internet outages, aging hardware, system errors, restrictive permissions, human encoding mistakes, training differences, and cost constraints as sources of operational vulnerability. Calibrated digital hybridity is proposed as an interpretive concept describing the deliberate matching of automation depth to transaction scale and complexity, workforce capability, technical reliability, investment timing, and the continued availability of human discretion and manual fallback. The findings extend hotel technology research beyond willingness to adopt technology by showing how digital systems become embedded in everyday work and how hotels preserve service continuity when those systems fail or employees encounter exceptions. Managerially, the results support staged automation, exception-focused training, clear decision rights, infrastructure audits, and documented fallback procedures. The study positions digital hospitality as a socio-technical resilience problem rather than a technology-acquisition problem alone.

Keywords: digital hospitality, operational resilience, socio-technical systems, hotel employees, digital transformation

INTRODUCTION

Digital technology now mediates a substantial share of hotel work. Property-management systems, point-of-sale platforms, online reservation channels, cloud reporting, mobile tools, digital payments, and connected devices link departments and make service information available at speed. The value proposition is straightforward: less repetitive work, faster access to information, more consistent transactions, and greater capacity to personalize service. Recent hospitality research confirms that digital transformation is increasingly treated as an organizational rather than purely technical phenomenon, with technology adoption, stakeholder outcomes, service quality, workforce effects, and firm performance forming major research streams (Peng et al., 2024).

Employee research, however, has often emphasized readiness, usefulness, ease of use, attitudes, and adoption intention. Meta-analytic evidence demonstrates the relevance of these acceptance variables in hospitality workplaces (Guo et al., 2023), while tourism-employee research shows that technological readiness shapes

attitudes and intention to use smart technologies (Cimbaljević et al., 2024). This literature explains an important precondition of digitalization: whether people are willing and able to engage with technology. It is less informative about what happens after a system becomes part of the operating core of a hotel.

Once embedded, technology redistributes work. A reservation platform can coordinate arrivals and room inventory, but an internet outage can interrupt check-in. An interface can simplify routine transactions while making a single erroneous click consequential. Role permissions can protect data integrity yet limit frontline recovery. Training can turn a system into a shared organizational capability, whereas informal self-teaching can leave knowledge unevenly distributed. In other words, digitalization changes both efficiency and vulnerability.

This operational tension matters in hospitality because many failures are immediately visible to guests. Service production is time-sensitive, often simultaneous with consumption, and dependent on employees' ability to improvise within organizational rules. Hotel operational resilience research has therefore begun to emphasize e-readiness and adaptive capability rather than technology possession alone (Ghazi et al., 2024). Recent work also suggests that IT infrastructure generates stronger value when combined with human expertise (Oikonomou et al., 2025), reinforcing the need to analyze technological and human resources jointly.

Socio-technical systems theory provides a useful lens for this problem. The classic perspective argues that organizational outcomes arise from the interaction of technical and social subsystems, not from the technical subsystem in isolation (Bostrom & Heinen, 1977). Contemporary hospitality research similarly frames digital hospitality as a joint configuration of technology and human-resource practices (Radović et al., 2025). From this perspective, the key question is no longer simply whether a hotel has adopted a system, but whether technology, people, authority, routines, infrastructure, and backup capacity remain aligned when work conditions vary.

The present article revisits interviews originally collected for a 2024 master's thesis and later incorporated into a broader mixed-method publication (Bajado, 2025). Rather than reproducing the earlier descriptive themes or guest-satisfaction analysis, this study restricts attention to the 11 owner/manager/employee interviews and asks new questions about operational embeddedness, breakdown, learning, discretion, and continuity. This form of qualitative secondary analysis is appropriate when existing data are sufficiently rich to address new questions, provided that data fitness, context, and ethical reuse are made explicit (Ruggiano & Perry, 2019).

Three research questions guide the analysis: (RQ1) How do hotel owners, managers, and frontline employees describe the operational value of digital technologies in everyday service work? (RQ2) What socio-technical vulnerabilities constrain digitally mediated hotel service? (RQ3) How do learning arrangements, human judgment, and fallback practices shape service continuity? The analysis culminates in the proposed concept of calibrated digital hybridity, which describes a context-sensitive approach to combining automation and human capability rather than treating digital maturity as a simple progression toward more technology.

LITERATURE REVIEW AND CONCEPTUAL LENS

From technology adoption to operational embeddedness

Hospitality technology research has established that perceived usefulness and ease of use influence employee adoption, and that readiness and attitudes matter when organizations introduce new systems (Guo et al., 2023; Cimbaljević et al., 2024). These variables remain important because systems that employees perceive as difficult or irrelevant are unlikely to be used effectively. Yet adoption is only the beginning of the organizational process. When a technology becomes embedded in reservations, billing, room assignment, inventory, or service communication, it also becomes part of the hotel's dependency structure.

Operational embeddedness refers here to the extent to which a digital tool becomes necessary for routine coordination rather than merely available as an optional aid. Embedded systems can compress transaction time, make information visible across departments, standardize records, and extend organizational memory. Oikonomou et al. (2025), for example, report that hotel technology can improve operational efficiency when

IT resources are combined with human expertise. The implication is that technology creates value through a bundle of resources and routines rather than as a stand-alone asset.

Embeddedness also means that failures can propagate. If a critical system becomes unavailable, the interruption can spread across check-in, room assignment, payment, reporting, or interdepartmental coordination. The analytical problem is therefore dual: what a system enables under normal conditions and what operational exposure it creates when technical or human components fail.

Digital capability as a learning and support system

Digital competence in hotels is often described as an employee attribute, but it is also organizationally produced. Training support is associated with more favorable employee outcomes during technology adoption (Tavitiyaman et al., 2024), and hotel technology performance depends on the interaction of technical resources with human expertise (Oikonomou et al., 2025). These findings suggest that digital capability should be treated as an operating capability created through training, practice, peer support, vendor assistance, supervision, and access to troubleshooting resources.

Learning systems can nevertheless vary substantially within the same destination. Formal vendor instruction and recurring refresher sessions create different conditions from observation, self-teaching, or dependence on a senior colleague. The issue is not simply whether learning occurs but whether knowledge is sufficiently distributed for employees to detect errors, recover from exceptions, and continue serving guests when routine scripts fail. From a socio-technical perspective, training is therefore part of the system's reliability architecture.

Socio-technical resilience and e-readiness

Bostrom and Heinen (1977) argued that information-system problems often reflect misalignment between technical design and the social organization of work. In hotels, the technical subsystem includes software, hardware, networks, data structures, integrations, and permissions. The social subsystem includes employees' skills, role boundaries, authority, routines, communication, and service expectations. Failures can originate in either subsystem but become consequential through their interaction.

Operational resilience adds a temporal question: can service continue, adapt, and recover when normal operating conditions are disturbed? Hotel research links organizational e-readiness to operational resilience (Ghazi et al., 2024), while recent socio-technical hospitality work shows that the performance of digital service depends on alignment between technological adoption and human-resource practices (Radović et al., 2025). Together, these perspectives suggest that resilience is not equivalent to technological sophistication. A technologically advanced hotel may be brittle if connectivity is unstable, permissions are too restrictive, or employees lack recovery knowledge. A less automated property may remain resilient if its tools fit transaction volume and manual continuity is preserved.

This study therefore treats socio-technical systems theory as a sensitizing lens rather than a predetermined coding frame. Participants' accounts are first analyzed as descriptions of work; concepts such as dependency, capability, discretion, fit, and redundancy are then used to interpret why particular technology configurations appear robust or fragile.

Conceptual proposition: calibrated digital hybridity

The literature increasingly rejects the assumption that digital transformation is simply a matter of replacing people with technology. Human expertise remains a complementary resource (Oikonomou et al., 2025), and socio-technical alignment matters for both workforce and service outcomes (Radović et al., 2025). Building on this logic, the present study proposes calibrated digital hybridity as an emergent interpretive concept rather than a pre-existing theory imposed on the interviews.

Calibrated digital hybridity refers to deliberately matching the depth of automation to five conditions: transaction scale and complexity; workforce capability and learning support; technical reliability and integration; human discretion and fallback capacity; and the cost and timing of investment. The concept

anticipates that neither maximal automation nor maximal manual control is inherently optimal. The more useful configuration is the one that produces efficient service without creating avoidable dependence on a brittle technical chain. Figure 1 presents this logic as a provisional framework to be tested in future research.

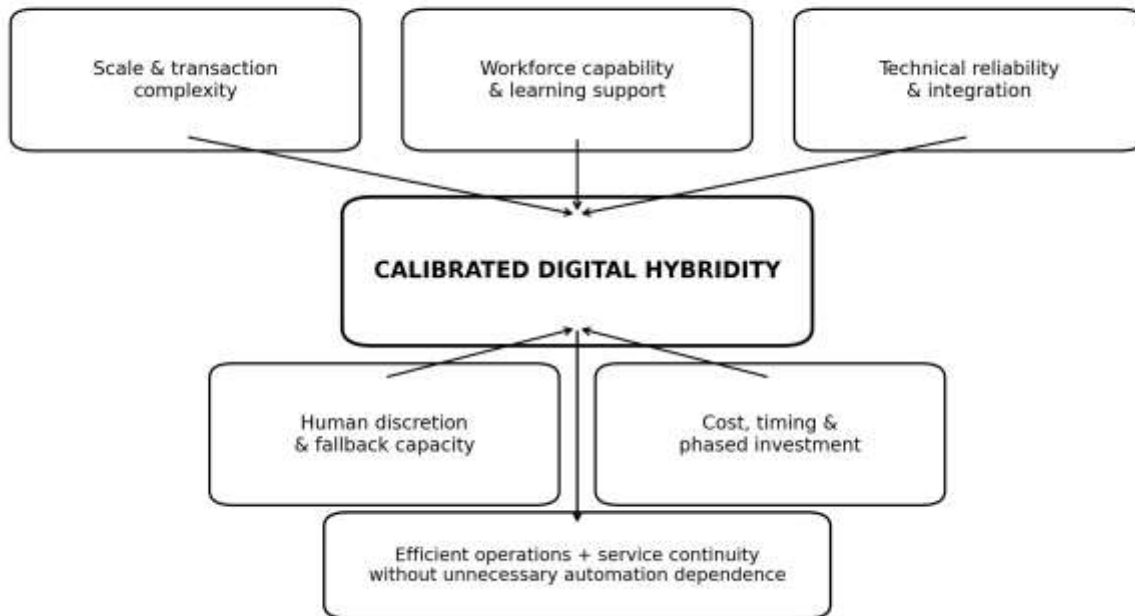


Figure 1: Calibrated digital hybridity as a socio-technical configuration logic.

METHODOLOGY

Study design and relationship to the source study

This article uses qualitative secondary analysis of interviews collected by the same researcher for a broader mixed-method master's thesis completed in 2024. A condensed mixed-method article based on that broader study was subsequently published (Bajado, 2025). Qualitative secondary analysis can address questions that differ from those of the source study, but it requires explicit consideration of data fit, contextual knowledge, analytic independence, and ethical reuse (Ruggiano & Perry, 2019).

The present reanalysis was designed to minimize analytic duplication. It excludes all 211 guest survey records, the 56 stakeholder survey records, and all guest interviews. It does not reuse the source study's original theme structure as its analytical frame. Instead, the 11 industry interviews were reread and recoded around operational questions concerning technology-dependent work, breakdowns, learning, authority, and continuity. Table 1 makes the analytical boundary explicit.

Table 1: Analytical distinction between the prior publication and the present secondary analysis

Dimension	Broader mixed-method publication (Bajado, 2025)	Present qualitative reanalysis
Primary purpose	Relationship between hotel technology usage and guest satisfaction	How digitally mediated hotel work becomes efficient, fragile, learnable, and resilient
Data used	Quantitative guest/stakeholder data plus manager, staff, and guest qualitative material	11 owner/manager/employee interviews only

Primary lens	Guest satisfaction, information quality, system/service quality, technology usage	Socio-technical systems, operational resilience, human judgment, fallback capacity
Qualitative output	Broad descriptive themes including information, service integration, inconvenience, limitations, and training	Four newly developed interpretive themes culminating in calibrated digital hybridity
Claims avoided here	Guest-satisfaction effects; technology usage levels; hotel-wide adoption rates	No quantitative claims and no re-reporting of the original mixed-method results

Data fitness and analytic boundaries

Before recoding, the 11 transcripts were assessed for fitness for the new research questions. All contained at least one substantive account of technology-enabled work, training, operational difficulty, or service consequences. The interviews varied in depth: some participants provided detailed narratives of system failures and workarounds, whereas others described routine use briefly. No transcript was excluded solely because it was short. Instead, thin accounts were used only for claims they could directly support.

The source interview guide was not originally designed around socio-technical systems theory. This limits the depth available on topics such as formal governance, cybersecurity, vendor contracts, and business-continuity planning. Conversely, the original questions directly elicited benefits, effectiveness, training, problems, and recommendations, making the dataset sufficiently aligned with the present operational focus. Because the same researcher collected the source interviews, contextual distance from the original field setting is lower than in secondary analysis by an external analyst; however, familiarity also creates a risk of reproducing prior interpretations. The new research questions, exclusion of guest material, and explicit audit trail were used to create analytic distance.

Participants and data source

The reanalysis included 11 industry participants drawn from seven hotels in Tagaytay City. Four occupied owner or management roles and seven were staff working in front-office/front-desk, restaurant, housekeeping, or other operational functions. Two source transcripts contain inconsistencies between the department label recorded in the transcript header and the duties described by the participant. These records were not silently corrected; the participants are reported as operational staff in the current analysis.

Table 2: Participant profile used in the reanalysis

Code	Participant group	Role reported for reanalysis
M1	Owner/manager	Hotel owner
M2	Owner/manager	General manager
M3	Owner/manager	General manager
M4	Owner/manager	Hotel manager
S1	Staff	Operational staff; source role/department label inconsistent
S2	Staff	Front office
S3	Staff	Front desk

S4	Staff	Restaurant/F&B
S5	Staff	Housekeeping
S6	Staff	Operational staff; source role/department label inconsistent
S7	Staff	Front desk

The semi-structured interviews covered the perceived contribution of technology to work and guest service, effectiveness, training or guidance, difficulties encountered, and recommendations. Interviews were conducted in English, Filipino, or Taglish. The analysis was performed on the original bilingual transcript rather than on a fully translated dataset.

Researcher positionality and reflexivity

The sole researcher conducted the source study and is therefore both the primary researcher and secondary analyst. This position provides contextual familiarity with the interviews and setting but also increases the possibility of confirmatory reading. Reflexive thematic analysis treats researcher subjectivity as part of knowledge production rather than as noise to be eliminated; quality therefore depends on making interpretive choices visible and methodologically congruent (Braun & Clarke, 2024).

Three safeguards were used. First, the current questions were formulated after completion of the original study and focus on operational resilience rather than guest satisfaction. Second, candidate themes were required to account for enabling and constraining cases rather than only positive technology narratives. Third, a quotation-to-code-to-theme audit was maintained so that conceptual claims could be traced back to specific source material. The study does not claim coder neutrality, inter-coder objectivity, or statistical saturation.

Analytical approach

The transcripts were reanalyzed using reflexive thematic analysis (RTA), following Braun and Clarke's emphasis on coherent, interpretive theme development rather than treating themes as self-evident categories waiting to be discovered (Braun & Clarke, 2021, 2022, 2024). The analysis was abductive. Early coding stayed close to the language of work—speed, reports, room status, errors, internet loss, old computers, training, permissions, cost, and manual backup. Later interpretation used socio-technical concepts to ask how technical and social elements produced those experiences.

The reanalysis involved six iterative activities: (1) full rereading and memoing at participant level; (2) semantic coding of work processes, benefits, breakdowns, learning arrangements, constraints, and recovery practices; (3) clustering related codes into candidate patterns; (4) checking candidate themes against all 11 transcripts, including less enthusiastic or contradictory accounts; (5) refining themes so that each expressed a central organizing idea rather than a topic list; and (6) interpreting relationships among themes to develop the calibrated digital hybridity framework. Theme importance was determined by explanatory value for the research questions, not by simple frequency.

RTA does not require inter-coder reliability when used within its reflexive methodological assumptions. Accordingly, the analysis did not calculate Cohen's kappa or percentage agreement. Instead, rigor was supported through a documented audit trail, reflexive memoing, attention to negative and boundary cases, transparent reporting of source inconsistencies, and explicit separation from the earlier analysis. This approach follows recent guidance emphasizing methodological congruence in reflexive thematic analysis (Braun & Clarke, 2024).

Translation and quotation strategy

Selected Filipino and Taglish excerpts were translated into concise English for the manuscript. Translation prioritized semantic meaning rather than word-for-word equivalence, and ellipses were used only to shorten

filler or repetition without changing the claim. Quotations are labeled as translated where applicable. A bilingual quotation audit trail is retained as supporting documentation for source verification.

Ethics and transparency

The source study reports informed consent, voluntary participation, confidentiality, anonymity, and protection of participant identity. The original 2024 thesis did not undergo separate Ethics Review Board review. Subsequent written correspondence from the Philippine Women's University Ethics Review Board clarified that, in 2024, the dean, panel of examiners, and/or adviser determined whether student research needed referral for ethics review and that retrospective approval cannot be issued after data collection. No new recruitment, participant contact, intervention, or data collection was undertaken for this secondary analysis. Hotel and participant names appearing in the source transcripts are not reproduced in the findings. The full institutional context is disclosed in the Ethics and Institutional Oversight statement after the conclusion.

FINDINGS

Four themes explain how technology was experienced as part of the hotel operating system. They are presented as an interpretive sequence rather than as mutually exclusive categories: technology first creates operating capacity, that capacity generates dependencies, those dependencies increase the importance of learning, and resilience depends on how the hotel calibrates the boundary between digital and human work.

Table 3: Thematic structure

Theme	Central organizing idea	Illustrative subthemes
1. Technology becomes operational infrastructure	Digital tools create a shared operating picture and compress the time required to coordinate service.	Time compression; information visibility; cross-department coordination; workload reduction; organizational memory
2. Efficiency introduces new points of fragility	The same dependence that speeds service exposes operations to network, hardware, interface, user-input, and authority failures.	Connectivity loss; obsolete hardware; system failure; interface-induced error; booking/payment conflict; restricted permissions
3. Digital capability is produced through uneven learning ecologies	Competence is created through different combinations of formal training, refresher sessions, supervision, IT support, OJT, and self-teaching.	Vendor training; departmental refreshers; peer learning; supervisor guidance; prior practicum; self-directed learning
4. Resilience depends on calibrated digital hybridity	Hotels preserve continuity by matching automation depth to scale, capability, reliability, cost, and available human/manual fallback.	Manual backup; human checking; phased investment; customization; scale fit; frontline discretion

Theme 1: Technology becomes operational infrastructure

Participants described digital tools less as optional amenities than as the infrastructure through which everyday hotel work became manageable. Managers emphasized visibility across reservations, room status, inventory, and reporting. M2 described how reservation information could be checked immediately and how housekeeping could see which rooms needed cleaning and which were ready for sale. M3 described a connected flow from reservations and front desk to food service, housekeeping, inventory, and accounting. These accounts frame value as coordination: technology creates a shared operational picture across functions.

Frontline employees translated the same benefit into time saved. S4 described the workload of order taking, kitchen transmission, bill computation, discounts, and inventory as difficult to complete manually within

normal duty hours. S2 and S7 similarly emphasized that booking information could be retrieved quickly enough to answer guests without prolonged waiting.

“Without a computer, our duty hours would not be enough. From taking orders, sending them to the kitchen, computing bills and discounts, up to month-end inventory, we accomplish much more because of the system.” (S4, translated from Taglish)

Technology also extended organizational memory. M4 explained that system records allowed the hotel to recognize returning guests and retain information that employees could not realistically memorize across repeated stays. Rather than treating personalization as a purely interpersonal skill, the account shows how digital records can make prior interactions available at the point of service.

The theme therefore concerns more than automation. The common thread is that digital systems change the temporal and informational conditions of work: employees can see more, coordinate faster, and retrieve organizational knowledge at the moment it is needed.

Theme 2: Efficiency introduces new points of fragility

The infrastructure that accelerated work also created dependency. Participants described failures involving internet connectivity, intercoms, aging computers, hotel software, booking/payment workflows, and incorrect user input. M1 illustrated the guest-facing consequence of a simple infrastructure problem: when an intercom was unavailable, a guest had to physically approach staff for a basic request; weak Wi-Fi coverage also became particularly serious for guests attempting to work remotely.

S2 provided the clearest account of cascading technical failure. The employee described a high-occupancy situation in which loss of internet connectivity prevented check-in, followed by a separate night-audit disruption caused by a malfunctioning system and an aging computer that could shut down unexpectedly.

“There were many guests and the internet went down, so I could not check them in. The system also failed during night audit ... and the computer sometimes shuts down by itself, so I have to start again.” (S2, translated from Taglish)

Not all fragility originated in hardware or connectivity. S3 described a PMS as easy to operate but also easy to misuse because actions could proceed quickly without sufficient verification. The participant recounted assigning the correct physical room while failing to update the corresponding system state, producing an operational discrepancy. S4 likewise mentioned settlement errors caused by incorrect input.

Ease of use therefore had an ambivalent quality. Fast interaction reduced routine effort, but speed could also lower the friction that prompts a user to stop and verify.

“It is easy to use, but it is also easy to make a mistake. You keep clicking and may not notice that something is already wrong.” (S3, translated from Taglish)

A different vulnerability involved authority. S3 described system states that frontline staff could not change once a manager-controlled setting had been applied. Such controls may protect consistency or security, but they can also constrain immediate service recovery. S7 described booking conflicts involving third-party vouchers and payment status. Across these accounts, reliability was not simply a property of software uptime; it depended on the joint functioning of network access, hardware, interface design, data entry, payment flows, and organizational permissions.

This creates an efficiency-fragility paradox. The system becomes valuable because employees rely on it. The same reliance increases the operational consequence of failure.

Theme 3: Digital capability is produced through uneven learning ecologies

Employees learned hotel technologies through markedly different arrangements. S4 reported structured vendor-led instruction when the POS was acquired and continuing access to IT support. S3 described departmental meetings held every one or two months in which employees refreshed knowledge and shared newly discovered functions or problems. S5 described step-by-step instruction from a manager or supervisor, while S6 linked competence to prior college and practicum exposure.

At the other end of the continuum, S2 reported no formal training and described learning through observation and questions to a senior front-office colleague.

“There was no training here. I basically learned on my own by observing how the system was operated. If I did not know something, I asked the senior front-office agent.” (S2, translated from Taglish)

The contrast is analytically important because digital competence was not distributed by technology alone. It depended on whether the organization provided formal instruction, repeated opportunities to learn, knowledgeable peers, supervisory guidance, and technical support. M4 explicitly treated training as part of the cost of technology acquisition, while M2 valued systems that allowed users to schedule support or receive guidance when new functions were needed. These learning ecologies shape resilience. Routine competence allows an employee to complete the standard transaction; resilient competence includes recognizing that a room assignment is inconsistent, knowing what to do when a network fails, distinguishing a software problem from a user error, and knowing when and to whom an issue should be escalated. Training therefore functions as part of the hotel's recovery capacity rather than as a one-time implementation activity.

Theme 4: Resilience depends on calibrated digital hybridity

Participants did not consistently equate modernization with the elimination of manual work. M2 explicitly valued a manual backup when the system was unavailable and emphasized that system outcomes still depended on what employees encoded.

“When the system goes down, it is still better to have a manual backup ... it still depends on the person who encoded it. It is a combination of human intervention and the computer.” (M2, translated from Taglish)

M3 extended hybridity from service recovery to investment timing. The manager described a small and relatively young operation for which full system conversion remained expensive because of retainers, annual fees, and maintenance. Manual procedures were still manageable at the current transaction volume, so digitalization began incrementally with accounting software and could expand as the organization grew.

“We can start little by little with the system as the company grows. For now, manual work is still manageable because the transactions are not yet that large.” (M3, translated from Taglish)

M4 provided the contrasting boundary case. In a larger operation with more than 60 rooms and reservations arriving from multiple sources, manual management was seen as an inefficient use of time even though system acquisition and training were costly. The two managerial accounts suggest that appropriate digitalization is contingent on scale and coordination complexity rather than on a universal technology ideal. Calibrated digital hybridity synthesizes these patterns. The concept does not argue for keeping manual systems by default, nor does it romanticize human service. It proposes that hotels calibrate where digital automation should dominate, where human verification remains necessary, and where fallback procedures should exist. Calibration becomes more important as systems become more central to guest-facing operations.

DISCUSSION

Digitalization as operational embeddedness, not simply acceptance

The findings extend hospitality technology research by shifting the unit of attention from adoption intention to operational embeddedness. Acceptance models explain why employees may be willing to use a system (Guo et

al., 2023; Cimbaljević et al., 2024). The present interviews show what becomes visible after adoption: technology is woven into room status, payment, inventory, reporting, guest recognition, and service timing. At that point, the relevant outcome is not merely usage but the quality of the socio-technical configuration that supports usage.

This interpretation is consistent with Oikonomou et al. (2025), who find that hotel IT resources generate stronger organizational value when combined with human expertise. The qualitative evidence here adds process detail. Human expertise is not a generic complementary resource; it appears in checking entries, interpreting errors, learning new functions, escalating exceptions, and continuing service when routine technical pathways break.

The efficiency-fragility paradox

The second contribution is the efficiency-fragility paradox. Centralized systems reduce search time and coordinate work precisely because multiple tasks depend on them. That concentration increases exposure when connectivity, hardware, software, or user interaction fails. The paradox is therefore structural rather than accidental: the source of efficiency can also become a single point of operational vulnerability.

Hotel resilience research has linked e-readiness with operational resilience (Ghazi et al., 2024). The present findings suggest that e-readiness should include not only the capacity to adopt technology but the capacity to withstand its disruption. A useful technology assessment should therefore ask two questions: How much coordination burden does the system remove when it works? What happens to the guest journey when it does not? Evaluating only the first question risks creating brittle service.

Learning ecology as resilience infrastructure

The third contribution concerns learning. Training support has recognized benefits for hotel employees (Tavitiyaman et al., 2024), but the interviews indicate an additional mechanism: learning expands the hotel's fault-detection and recovery capacity. Employees who understand only routine steps may be competent users under stable conditions yet remain dependent on a supervisor when an exception occurs. Refresher sessions, vendor support, peer learning, and cross-training can distribute recovery knowledge more widely. This reframes training from an implementation cost to resilience infrastructure. The objective is not simply proficiency with menus and functions. It is the ability to notice a wrong system state, diagnose likely causes, apply a safe workaround, preserve the guest interaction, and escalate appropriately. The finding also explains why informal self-teaching is simultaneously adaptive and risky: it can build practical competence quickly, but it may produce uneven knowledge and undocumented workarounds.

Calibrated digital hybridity

The most distinctive interpretive contribution is calibrated digital hybridity. Recent hospitality scholarship increasingly treats digitalization as a socio-technical system in which technology and HR practices must be aligned (Radović et al., 2025). The present analysis sharpens that proposition by identifying five calibration conditions visible in the interviews: scale/transaction complexity, workforce capability, technical reliability, human discretion/fallback, and investment timing.

The concept differs from a simple 'high-tech/high-touch' prescription because it is not primarily about preserving interpersonal warmth. It is about operational architecture. A small property may rationally postpone an integrated system while transaction volume is manageable. A larger property with multiple reservation sources may require one. Both may need manual continuity for critical transactions, human verification for error-prone steps, and clear escalation paths when role permissions restrict frontline action. The desired state is not a fixed midpoint between manual and digital work; it is a context-dependent configuration.

Calibrated digital hybridity is offered as a provisional concept generated from a small destination-level dataset, not as a validated theory. Its value is heuristic: it specifies dimensions that future studies can operationalize

and test across different hotel classes, ownership structures, levels of technological maturity, and national infrastructure conditions.

Boundary cases and alternative interpretations

The interviews also contain cases that resist an overly negative narrative about technology. S1 and S5 described radio-based operational communication as adequate and did not report major technology problems. S6 similarly reported few difficulties and attributed familiarity partly to prior training during college or practicum. These accounts show that digital vulnerability was not universal and that some low-complexity tools can be reliable precisely because they fit the task. Conversely, the data do not support a claim that formal training alone guarantees resilience. Some formally trained employees still described user errors or system constraints. The broader pattern is one of fit: technology, learning, hardware, network quality, role authority, and operating scale must work together.

Managerial Implications

The findings translate into six practical principles for hotel operators.

- 1. Design for graceful degradation.** Critical processes such as check-in, room assignment, billing, payment, and guest requests should have documented minimum-service procedures for system or network failure. A fallback does not need to reproduce every digital feature; it needs to preserve safe continuity until normal service is restored.
- 2. Treat infrastructure reliability as part of service quality.** Software selection should be evaluated together with Wi-Fi coverage, workstation condition, device reliability, power continuity, integration quality, and vendor support. A capable application cannot compensate for an unstable technical environment.
- 3. Train for exceptions as well as routine transactions.** Initial orientation should be followed by refresher sessions and scenario practice for wrong room states, failed payments, booking conflicts, network loss, system freezes, incorrect entries, and escalation decisions.
- 4. Map decision rights.** Hotels should identify which system states frontline employees can change, which require managerial approval, and how urgent guest-facing exceptions are escalated. Controls that protect data should not unintentionally create avoidable service paralysis.
- 5. Stage automation according to operating complexity.** Investment should reflect transaction volume, number of reservation sources, departmental interdependence, workforce capability, and expected integration value. Incremental digitalization can be rational when complexity is low; integrated platforms become more valuable as coordination demands grow.
- 6. Audit dependencies, not only features.** Technology reviews should include a dependency map showing which guest-facing processes stop when each network, workstation, interface, or integration fails. The goal is to identify single points of failure before guests encounter them.

Table 4: Calibrated digital hybridity as a managerial diagnostic

Calibration dimension	Managerial diagnostic question	Risk when under-calibrated	Risk when over-calibrated
Scale and transaction complexity	Does the system reduce a coordination burden that is genuinely material at the current operating scale?	Manual overload, fragmented information, slow service	High fixed cost, unused functionality, unnecessary complexity
Workforce capability	Can enough employees operate, troubleshoot, verify, and recover	Dependence on a few experienced users;	System complexity exceeds actual



	common exceptions?	inconsistent recovery	competence
Technical reliability	Are connectivity, hardware, software, integrations, and vendor support reliable enough for critical tasks?	Frequent interruption; guest effort; work duplication	Excess dependence on a brittle technical chain
Human discretion and fallback	Can service continue or escalate safely when the system fails or blocks an action?	Service stoppage; delayed recovery	Weak controls; excessive manual duplication
Investment timing	Is the expected coordination value proportional to cost, maintenance, and organizational readiness?	Delayed modernization; manual inefficiency	Premature investment; low utilization; cost burden

Limitations And Future Research

Several limitations constrain interpretation. First, this is a secondary analysis of interviews collected for a broader mixed-method thesis. The original interview guide did not probe socio-technical resilience systematically, and interview depth was uneven. The analysis therefore does not claim saturation for the new research questions. Second, the sample comprises only 11 industry participants from one Philippine leisure destination; the findings support analytic rather than statistical transferability.

Third, two source transcripts contain inconsistencies in role or department labeling. These records were retained as operational staff rather than reconstructed from inference. Fourth, the analysis was conducted by the same researcher who collected the original data. Contextual familiarity is useful, but it can also preserve prior assumptions; the explicit analytic boundary and audit trail reduce but do not eliminate this risk. Fifth, hotel names were present in source records but intentionally removed from the current findings, limiting property-level comparison in order to reduce re-identification risk.

Future research can test calibrated digital hybridity in three ways. Comparative qualitative work can examine independent, chain, budget, boutique, and luxury properties to determine how ownership and scale change calibration decisions. Quantitative studies can operationalize the five dimensions proposed here and test their relationship with service continuity, employee confidence, service recovery, and guest effort. Longitudinal research can examine whether hotels move through different hybrid configurations as transaction volume, infrastructure reliability, and technology maturity change. A further extension should examine AI-mediated work, where discretion, explainability, override authority, and human fallback may become even more consequential.

CONCLUSION

The interviews suggest that hotel digitalization should be understood as a work-system configuration rather than as a technology inventory. Digital tools create value when they make information visible, reduce coordination time, preserve organizational memory, and allow employees to serve guests more efficiently. Yet the same tools generate dependencies on networks, hardware, user input, training, integration, and permissions.

The central managerial challenge is therefore not to maximize automation but to calibrate it. Calibrated digital hybridity describes an operating logic in which the depth of automation is matched to scale, workforce capability, technical reliability, investment timing, and the continued availability of human judgment and fallback capacity. In hospitality, resilience does not sit on the manual or digital side of a binary. It resides in how well the two are configured to keep service moving.

Ethics And Institutional Oversight

The data analyzed in this article were originally collected in 2024 as part of the author's master's thesis at Philippine Women's University. The Philippine Women's University Ethics Review Board subsequently

clarified in written correspondence that, under the institutional procedure in effect in 2024, the dean, panel of examiners, and/or adviser determined whether student research required referral for separate ethics review. The thesis proceeded through the university's academic thesis process without separate Ethics Review Board referral. All participants were adults who participated voluntarily after being informed of the study purpose, confidentiality, anonymity, and data-privacy provisions, and informed consent was obtained. The present study is a secondary analysis of de-identified existing interview data and involved no new recruitment, participant contact, intervention, or data collection. Hotel and participant names are not reproduced in the findings. This statement describes the documented institutional process and is not presented as retrospective ethics approval, exemption, or waiver.

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Conflict Of Interest

No conflict of interest exists.

Data Availability

The interview transcripts are not publicly deposited because contextual details may increase re-identification risk and the original participant information did not specify public transcript sharing. De-identified excerpts or analytic materials may be requested from the author subject to participant confidentiality and applicable institutional or journal requirements.

Prior Publication And Secondary-Analysis Transparency

The interview material originated in the author's 2024 master's thesis and contributed to a broader mixed-method article previously published in IJRISS (Bajado, 2025). The present manuscript is a distinct secondary qualitative analysis restricted to 11 hotel owners, managers, and employees. It excludes the quantitative dataset and guest interviews, asks new questions about operational embeddedness, breakdown, learning, discretion, and continuity, uses a socio-technical resilience lens, develops a new thematic structure, and advances the provisional concept of calibrated digital hybridity. The prior article is cited and the reuse of the interview material is disclosed explicitly to distinguish the present analysis from duplicate publication.

Ai-Assisted Tools Disclosure

OpenAI ChatGPT was used as an AI-assisted tool for language refinement, manuscript organization, and analysis-support tasks. It was not used to create, alter, or fabricate research data. The author reviewed the analyses, source materials, interpretations, citations, and final text and accepts full responsibility for the manuscript.

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Appendix A. Illustrative Coding Trail

This appendix shows how selected source meanings were moved from descriptive coding to interpretive themes. It is illustrative rather than exhaustive; the full quotation audit is retained separately.

Participant	Condensed source meaning	Initial code(s)	Interpretive move / final theme
M2	System provides fast reservation/room-status visibility; manual backup is valuable during downtime; outcomes depend on encoding.	information visibility; manual fallback; human input	Technology creates operational infrastructure but remains socio-technically dependent (Themes 1, 2, 4).
M3	Full conversion was delayed because of cost and low transaction volume; adoption	cost; scale fit; phased adoption	Digitalization is calibrated to operating complexity and



	began gradually with accounting.		investment timing (Theme 4).
M4	Systems reduce workload and retain returning-guest information; acquisition and training are costly.	workload reduction; organizational memory; training cost	Digital value combines technical memory with workforce capability (Themes 1, 3, 4).
S2	No formal training; learned from observation; internet, PMS, and old-computer failures disrupted check-in/night audit.	self-learning; network failure; software failure; hardware failure	Capability and fragility are jointly produced by learning and infrastructure (Themes 2, 3).
S3	PMS is easy to use but errors can pass unnoticed; refreshers help; permissions can restrict action.	interface-induced error; refresher training; constrained discretion	Ease, learning, and authority interact in operational resilience (Themes 2, 3, 4).
S4	POS speeds multiple F&B tasks; vendor training/IT support are available; input errors still occur.	time compression; formal support; human error	Formal support strengthens capability but does not remove human-error risk (Themes 1, 2, 3).