Article

A Framework for Total Productivity Management (TPMan) in a Resort Environment

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Abstract: The service environment, particularly the tourism sector, has become increasingly relevant in providing sustainable jobs across the globe. The resort environment consists of any combination of guest experience offerings such as accommodation, restaurants, events, and activities that operate mostly within one geographical environment. Furthermore, through an extensive literature review, it is found that the resort environment lacks practical quality improvement tools to enable continuous improvement (CI) within this remarkably complex and competitive space. This article aims to introduce a novel CI framework aimed at the resort environment to ensure a progressive competitive edge. This article illustrates a framework that builds a Total Productivity Management (TPMan) tool on these three dimensions as a foundation with an adapted quality methodology, which has been tried and tested within the manufacturing environment, providing eight pillars as CI components. The article illustrates the results by means of a case study where TPMan was applied over a period of 8 years within a local high-end resort in South Africa. The article concludes that TPMan is relevant to the resort environment as a practical CI tool.

Keywords: continuous improvement; resort environment; service dimensions; TPMan; guest experience

1. Introduction

Recent data show that the value of global tourism has reached US$10.3 trillion, with the local South African tourism contributing 6.4% (or R405.2 billion) to South Africa's growth in GDP, employing 1.5 million workers in 2019 [1,2]. The service sector, of which tourism is a part, supports 15–20% of employment within 85 countries, making it a significant contributor after financial services [3].

The substantial reliance on human intervention in providing a positive guest experience within the tourism and hospitality sector highlights the importance of developing tools to enable, support, and encourage continuous improvement (CI) [4,5]. continuous improvement is widely understood, as defined by Pioneers, Deming, and Masaaki, as the ongoing process of constantly and forever improving systems of production and service involving everyone in the company [6–10]. A key consideration for the tourism environment is an adequate focus on the quality and consistency by which customer service is delivered, maintained, measured, and improved upon. Several frameworks within the manufacturing environment are designed to aid quality improvement, specifically focusing on automation and reducing reliance on employees, and these can be used as a basis to improve the hospitality sector.

Hospitality and tourism, as a significant contributor to GDP, employ a substantial part of the workforce [11,12]. The manufacturing and retail industries drive automation and e-commerce, respectively which is one of the key distinctions from the luxury hotel and resort industry [5,13,14]. Within hospitality environments, personal service by humans is greatly responsible for the unique guest experience. It is evident that electronic devices are being programmed in such a way as to imitate the behaviour of humans. These devices

are open to big data such as internet environments to learn in such a way as to improve themselves over time and have been described as Artificial Intelligence (AI) [15]. There are various publications that introduce the idea of robots and AI to deliver an operational function or guest experience within specific environments. Some businesses have already been introduced to the evolved technology to render a front-of-house service [15–17]. This, however, does not suffice for all environments and target markets [18–20]. The tourism industry subsequently still calls for systems and tools that ensure the delivery of consistent and continuously improving quality services delivered by humans.

The customer evaluates guest experience as a perceived quality of service and value for money. Within the service industry, the customer expects a particular level of experience with the actual perceived experience being a challenge to measure accurately. This experience is based on feelings and emotions, which are difficult to scientifically benchmark. The complication, therefore, comes in the evaluation of the guest experience. Within the manufacturing environment, quality conformance can be established by accepted measurements and time studies. According to Rust and Oliver, there exist three dimensions of service quality: (1) Service Product, (2) Service Delivery and (3) Service Environment [21]. These dimensions provide guidance towards resolving the identified problem through the main objective of this research. In the service industry, an average population would have different perceived experiences from the same service, with the same service quality and within the same environment. Although a service standard audit necessitates good service delivery on some level, this does lie with the eye of the beholder. A diverse population would perceive service standards differently. This article will present a framework that has been developed for and employed in some international resorts, with the results presented.

1.1. Problem Statement and Main Objective

The identified problem is thus that in the service environment, specifically within hospitality, there exists a lack of a simple, systematic, and practical framework to encourage continuous improvement in environment, experience, and efficiency.

The challenge lies in the reliance on humans with unique personalities and opinions to perform in a consistent manner without removing or quenching personality, which is often responsible for the unique and warm service that AI and robots would fail to deliver. To find this balance, the industry needs a simple, systematic, practical, and transparent framework to improve, support, and sustain CI which is built on the above three dimensions as proposed by Rust and Oliver [21]. Furthermore, the environment would benefit from a framework that provides methods to integrate easily understandable and obtainable measurables (KPIs) at all staffing levels across all departments of a complex resort environment.

1.2. Research Questions

To achieve the main objective, the following research questions must be addressed:

RQ1. *Which quality methodologies are currently available within the service environment that suit a resort-type entity?*
RQ2. *Is there a need for a continuous improvement framework within the resort environment?*
RQ3. *Could a framework adapted from an established quality methodology employed in the manufacturing environment be transformed to suit the hospitality industry?*
RQ4. *How would a resort environment be defined and characterised?*
RQ5. *Against which requirements should this framework be verified to ensure a good fit?*
RQ6. *How would the framework be validated?*

The following sections provide a systematic approach to address the research questions in fulfilment of the main objective.

2. Methodology and Research Design

Employing the knowledge acquired by specific methods of observation and analysis from an existing reality defines design when new knowledge is generated to produce a

new reality [22]. Designing entails epistemological aspects regarding the nature of knowledge, ontological aspects regarding verification, validation, and methodological challenges relating to the acquisition of knowledge [22]. The research methodology employed is, therefore, qualitative in nature. The objective is to develop a framework that aims to validate productive management methods developed through key performance indicators (KPIs), specifically for the resort environment. Historically successful methodologies in manufacturing environments such as TPM, TQM, QFD, TPS, and quality assurance are key methodologies that employ KPIs towards CI. Although empirical data in Section 6 support this research, the research aims to utilise a triangulation method [23] by aiding the qualitative data with non-empirical evidence from conclusive research. Qualitative research methods are instrumental when investigating organisations and people, such as learning how people interpret their situation, goals, and work, which aligns with this research [22]. The qualitative research data have been gathered through seven devices as guided by Bryman and Bell, providing a qualitative mixed research methodology [24]:

1. Ethnography [25].
2. Grounded theory [26].
3. Epistemology and ontology [27,28].
4. Empirical research [29].
5. Conceptual research [29].
6. Phenomenological design [30].
7. Triangulation [29,31,32].

These methodologies are combined and applied as illustrated in Figure 1.
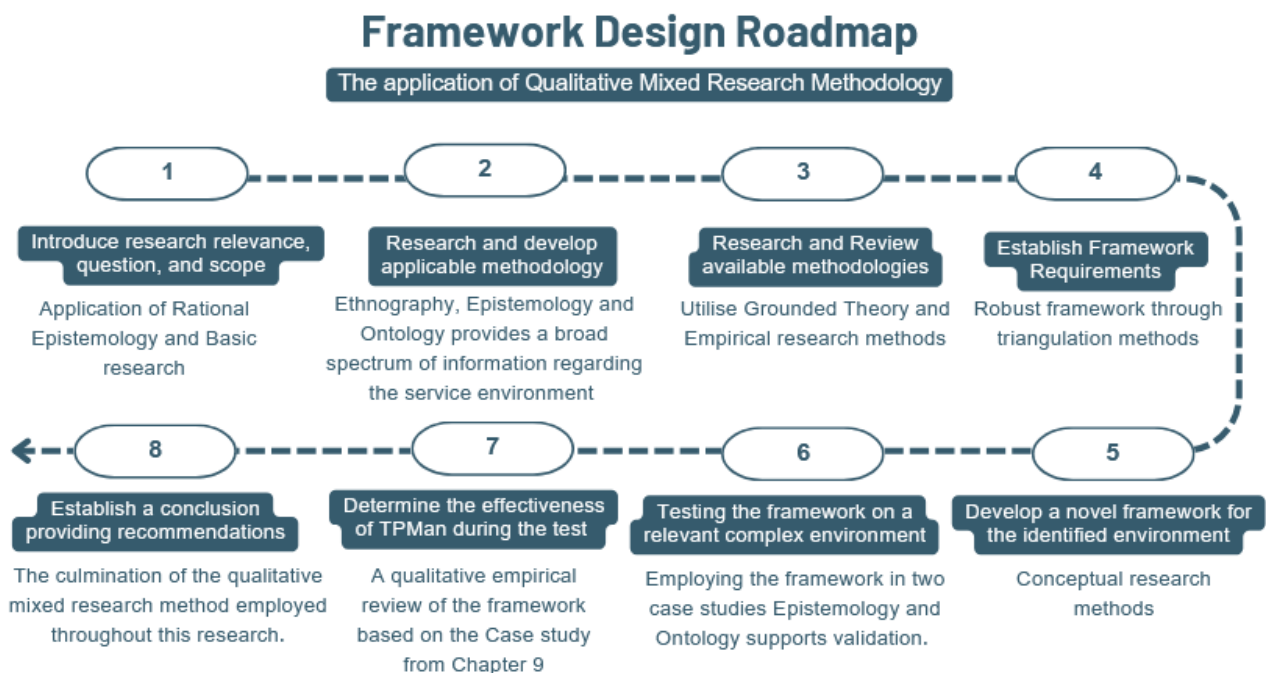
Figure 1. Framework design roadmap with applicable research methodologies.

3. Literature Review

The application of a qualitative mixed research methodology allows for the agility required to develop a framework equally agile in its application towards a new methodology answering the research questions in Section 1. The use of grounded theory, as formulated by Glaser and Strauss [33] in 1967, is mentioned for specific use in tourism as a study of sociology by Matteucci and Gnoth [34]. Grounded theory enables the development of new theories based on what is, and what is known, hence the relationship with ontology and epistemology [34].

There is an abundance of literature available regarding quality improvement systems and methods, particularly within the hospitality and tourism industry, with over 1054 members of the Travel and Tourism Research Association of Scientific Experts in Tourism [35]. These experts make considerable contributions towards service quality through several publications and research bodies. This shows the importance of service quality improvement within a competitive environment, with a focus on economic growth and sustainability for the industry. The research association also contributes to human resource management, safety and security, maintenance issues, training and education, and administration and management matters. A search of the significant databases on frameworks and systems within the resort environment for the period 2014 to 2024 renders 41 journal articles and publications on productivity management. Of these, 24 are unrelated papers, and 5 relate to human resource management and employee productivity. If the keyword "hospitality" is exchanged with" tourism", 22 papers are found, of which only 5 are related. There is an apparent lack of literature regarding productivity management within the hospitality and tourism industry, hence the need for further investigation towards a construct whereby customer service and employee effectiveness are evaluated, measured, and improved for the resort environment.

3.1. Learning from the Service Environment

Table 1 summarises the key CI methodologies evaluated that are employed in the service environment.

Table 1. CI methodologies deployed in the hospitality environment.

Description	Strength	Weakness
Grönroos developed the Service Quality Model in 1984. The perceived image of the company, which is driven by the technical and functional quality, influences the expected and perceived service [36].	Realistic and understandable model	Theoretical, with limited practical applications
The Gap Model was initiated by Parasuraman in 1985. A set of key discrepancies exist regarding organisational perceptions and the tasks associated with service delivery. These discrepancies or gaps are summarised into five elements [37].	Well-formulated with consistency through application across organisations	Addressing a gap could affect other gaps with unknown implications.
Parasuraman, Zeithaml, and Berry provided the SERVQUAL method, which is a 22-item instrument to establish customer perceptions of service quality [38].	Well-revised and thorough instrument	Complex and big data reliance
Haywood-Farmer was responsible for the attribute service quality model. An organisation succeeds in its service delivery quality if the customer preferences and expectations are met [39].	Focuses on the balance between professionalism, physical environment, and behavioural aspects	Service settings are diverse, rendering the model vague
The European Foundation for Quality Management provided the European Foundation for Quality Management Model. A self-assessment instrument for all levels of healthcare [40].	Well-established method to improve service and product quality	Data could be skewed, providing inaccurate results
Richard Spreng and Robert Mackoy provided the model of perceived service quality and satisfaction, which brings a good understanding of the relationship between perceived service quality and satisfaction [41].	Progressive adaptation of Oliver's model	Complex model and extensive measurements required
George Philip and Shirley-Ann Hazlett developed the PCP Attribute Model. This model identifies three service elements: Pivotal, Core, and Peripheral (PCP) [42].	Simplistic model to gain insight into service industries	Difficult to distinguish characteristics

Table 1. *Cont.*

Description	Strength	Weakness
Analytical Hierarchy process (AHP) developed by Thomas Saaty [43].	Practical and systematic	Cumbersome questionaries
LODGESERV is an extension of SERVQUAL specifically for lodges provided by Bonnie Knutson, Pete Stevens, Colleen Wullaert, Mark Patton, and Fumlto Yokoyama [44].	Specifically for hotels	26-item indices can be generic
Pete Stevens, Bonnie Knutson, and Mark Patton further developed DINESERV, which is also an extension of SERVQUAL specifically for restaurants [45].	Specialised for restaurants	System is rigid
The Quality Function Deployment (QFD) is an extended framework developed for manufacturing and was successfully implemented in hospitality by Miyoung Jeong and Haemoon Oh [46].	Provides an opportunity to remedy some of the most significant challenges	Can be confusing
Aytug Sozuer identified serious gaps between perceived and identified quality service by developing the European Foundation for Quality Management (EFQM) model applied in hospitality [47].	Allows for quality improvement	Management is self-evaluated and might be biased
Erwin Rauch, Andreas Damian, Philipp Holzner, and Dominik Matt synthesised the Lean Hospitality Model in 2016, which employs lean tools in hospitality [48].	Short- and long-term improvements	Localised to lean management only

3.2. Learning from Manufacturing

Before answering RQ3, a thorough study of the methodologies available to the manufacturing environment needs to be established. Although there are numerous papers and methods available, there is limited literature on practically applicable frameworks to improve quality standards in an integrated way, as exists in the manufacturing environment. The available models are unique to hotels, restaurants, or shops individually, yet none are found to accommodate the complexity of a resort. Although the resort includes hotels, restaurants, or shops, these methodologies, as summarised in the introduction do not satisfy an organisation where all of these offerings fall under one banner, with integrated human resources, operational departments, support services, and management structure. Since the manufacturing environment offers so many diverse CI methodologies, it would seem plausible that some of these methodologies could be applied to the hospitality environment. From an extensive review, the following methodologies from the manufacturing environment are highlighted and summarised in Table 2. The question then arises of whether any of these methodologies, which are tried and tested for manufacturing, would be applicable to the service environment.

Table 2. A summary of critical manufacturing CI methodologies.

Methodology	Description
5S	5S: Sort, Set in Order, Shine, Standardise and Sustain was developed by and formally introduced in Japan in the early 1960s by Osada and Hirano [49].
TPS	The Toyota Production System (TPS), also known as the Toyota Way, was developed in Japan by Taiichi Ohno and is an all-inclusive manufacturing system for quality assurance within manufacturing environments [50–52].
TPM	Seiichi Nakajima was dubbed the father of Total Productive Maintenance (TPM), which was designed for the manufacturing environment. The system is designed for the prevention of downtime by maintaining equipment on a strict maintenance schedule [53].

Table 2. *Cont.*

Methodology	Description
QFD	Dr Shigeru Mizuno and Dr Yoji Akao were the founders of Quality Function Deployment (QFD), which today serves both manufacturing and service industries as an integral quality improvement process [54].
Kaizen	The founder and father of Kaizen, Masaaki Imai, revolutionised many industries worldwide [7].
Zero-Defects	Philip Crosby developed the zero-defects concept, emphasising the importance of doing it right the first time [55,56].
PDCA	Deming developed the Plan, Do, Check, Act (PDCA) cycle and emphasised that management is responsible for 94% of quality problems [57–60].

From Table 2, there are well-established, tried, and tested methodologies that could suffice or at the least support a new framework for CI within the resort environment. Other methodologies investigated included Time Manager International (TMI) [61], Total Quality Management (TQM) [62], and Management By Walking About (MBWA) [63]. Determining whether existing methodologies for the service environment or methodologies aimed at the manufacturing environment qualify fully or partially towards CI will be discussed in the next section.

4. Building Blocks—Environment to Requirement

Although there are abundant papers and methods supporting CI in the hospitality environment, there seems to be limited literature on practically applicable frameworks to *improve* quality standards in an integrated way, such as are available in the manufacturing environment. This supports the research opportunity in developing a framework towards total productivity management that supports employees in short- and medium-term objectives through continuous improvement, designed for a multidimensional hospitality resort. This framework should lead to long-term improvements in profitability with a change in culture within the organisation through continuous improvement and team participation.

To develop a robust framework that satisfies the objective of this research, a clear understanding of the environment and subsequent requirements is established.

4.1. Understanding the Environment

The definition of "resort" has been widely discussed in various literature. Brian King discusses the interchangeable use of resort vs. destination; however, resort refers to "self-contained resorts" and "package holiday makers" within the context of visiting a resort environment that offers multiple services on one premises, often offered by one service provider under one brand. The research is applied to a resort environment that could include any of the following offerings. This definition satisfies RQ4:

- Lodging;
- Leisure activities;
- Shopping;
- Food services;
- Attractions;
- Travel and transportation.

According to Rust and Oliver [21], Service Quality comprises the three dimensions illustrated in Figure 2.

Service product refers to the added value the customer is interested in and would naturally be the pivotal dimension of the transaction. Service delivery relates to the method in which the service is actioned, and the service environment encompasses the where and how of the physical environment, which suitably affects and adds to the service product and service delivery. According to Rust and Oliver [21], these three aspects contribute synergistically as fundamental elements towards perceived service quality. During a

service delivery instance, a perfect service "product" delivered poorly or executed in an unfavourable or uncomfortable environment would be counteractive towards a holistic and positive customer experience. This dimensional model would, therefore, provide essential building blocks for the proposed framework.

The challenges presented to stakeholders regarding service quality and profitability in the hospitality industry are numerous. Moreover, the divergence of priorities depicted by this conundrum and the struggles this might cause within the inter-relationships of the stakeholders are apparent. According to Zhao [64], multinational hotel firms spend additional resources on maintaining healthy relationships between stakeholders, business partners and investors, employees, and customers [64].
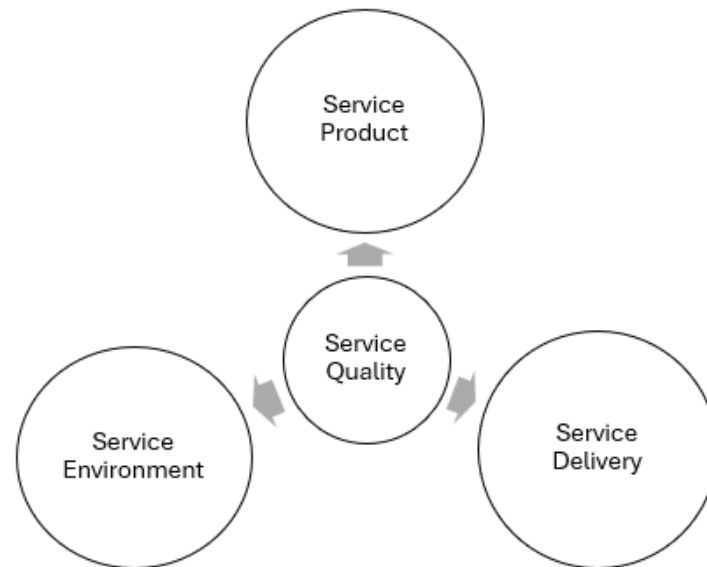

Figure 2. Illustration of the dimensions for service quality measurement adapted from [21,65].

4.2. Understanding the Requirements

Van Aken and Berends [22] provide guidance in the book "Problem Solving in Organisations" towards the designing of systems with particular emphasis on social systems within an organisation. Since the hospitality environment has a specific need for human actors to provide a service product, this design theory offers a good fit for finding solutions for the requirements listed. Actual design relies on perceived and validated needs, leading to the formulation of the problem analysis, which allows the formulation of design requirements. Van Aken and Berends [22] provide four categories of requirements:

1. Functional Requirements (FRs) constitute the core requirements demanded from the designed system.
2. User Requirements (URs) are the specific requirements that the user would expect from the system.
3. Boundary Conditions (BCs) are to be met unconditionally.
4. Design Restrictions (DRs) define the solution space the designed system should retain.

The requirements in Tables 3 and 4 ensure that the proposed framework can be verified in fulfilment of the main objective. These requirements are tested against current methodologies tabulated in Table 5 to understand their inadequacy. First, the requirements will be discussed with the appropriate motivation and reference.

4.2.1. Developing Functional Requirements (FRs)

Functional Requirements are the requirements that the system must be able to perform to satisfy the main objective, ensuring a framework is constructed that is resilient in a complex environment [66]. Table 3 provides a summary of the identified FR that the

framework would need to satisfy. Considering the literature regarding the applicable methodologies and the resort environment, 14 Functional Requirements are identified, addressing short-, medium-, and long-term challenges. These include aspects relating to relevant measurements of staff and system performance regarding the service environment, the service product, and service delivery. Moreover, the FRs need to address performance regarding efficiency and the experience of guests, employees, and service providers [67–73].

Table 3. Functional Requirements identified to be satisfied by an appropriate environment.

ID	Requirement Description	Requirement Motivation	Literature Reference
FR1	The framework should support the service environment to ensure a physical environment that supports a positive guest experience.	A workspace in the hospitality environment is an area where guests can be entertained. These areas could advertently form part of the service product.	[72,73]
FR2	The service product or offering should be improved by a systematic and focused process. These methods made available by the framework should sustain this process.	Continuous improvement is essential in a dynamic setting such as in the hospitality environment where service quality is a moving target.	[72,74]
FR3	The framework should allow for the quality of the service delivery to be measurable.	By employing the framework, this measurement will enable the business to set a benchmark, providing a method for staff to ensure continuous improvement by continuously assessing their position regarding this benchmark or historical data.	[73,75]
FR4	The framework should support small business units to operate independently to ensure accountability on a granular level.	Management would empower lower-level staff to be accountable for the financial position of the small business unit and its performance.	[71]
FR5	The framework should be flexible enough to accommodate the diversities within a multidimensional resort.	Due to the number of different functional departments, a flexible system would accommodate the differences between departments, ensuring a companywide consistent system.	[76,77]
FR6	The framework should provide a new platform for guests to articulate dissatisfaction without airing this on social media for the first time.	According to Capps and Cassidy [78], a risk for the company is a disgruntled or misunderstood patron to make their first point of contact via social media.	[69,78–80]
FR7	The framework should by design ensure a physical environment that supports a positive guest experience.	A workspace in the hospitality environment is an area where guests can be entertained. These areas could advertently form part of the service product.	[72,73]
FR8	The service product or offering should be improved in a methodical and focused method. Methods made available by the framework should sustain this process.	Continuous improvement is essential in a dynamic setting, such as in the hospitality environment where service quality is a moving target.	[72,74]
FR9	The framework should allow for the quality of the service delivery to be measurable. By employing the framework, this measurement will enable the business to set a benchmark, providing a method for staff to ensure continuous improvement by continuously assessing their position regarding this benchmark or historical data.	By employing the framework, this measurement will enable the business to set a benchmark, providing a method for staff to ensure continuous improvement by continuously assessing their position regarding this benchmark or historical data.	[73,75]
FR10	The framework should support small business units to operate independently to ensure accountability on a granular level.	Management would empower lower-level staff to be accountable for the financial position of the small business unit and its performance.	[71]
FR11	The framework should accommodate CI projects with both short- and long-term objectives.	The team should focus on short- and long-term improvements.	[48]
FR12	The framework should allow for CI in guest experience challenges as well as operational challenges.	Business operations need to be included in CI.	[81]

4.2.2. Developing User Requirements (URs) [67–73,82–88]

User Requirements are the requirements that the user would value from the system [22]. Table 4 provides a summary of the conceptual requirements identified by considering the appropriate literature on CI methodologies as well as the resort environment. A set of 14 URs has been extrapolated from the literature, against which the appropriate framework should be verified. These requirements include supporting staff with discipline in their workspace, supporting task performance and guest experience focus, allowing staff to make decisions through proper training, and encouraging uniformity across departments within the organisation [68,82–88].

Table 4. User Requirements identified to be satisfied by an appropriate framework.

ID	Requirement Description	Requirement Motivation	Literature Reference
UR1	Assist employees to focus on discipline in the physical workplace.	Employees should be allowed to be coached where the preciseness of tasks within the physical environment is imperative to a positive guest experience.	[82]
UR2	Propagate guest experience focus among staff.	Staff must always be aware that they are almost always on a stage when on duty and even when resting within possible view of guests.	[83]
UR3	Support task performance efficiency.	Employees need to make the best of their time while performing tasks. For example, the change-over of a hotel room happens quickly, where the new guest must feel as if they are the first person to ever step into that room.	[84]
UR4	The framework should allow for staff to make decisions on their own. If a guest has a need or complaint, staff should be equipped and empowered to take decisive action without consulting management	Staff should be equipped and empowered to take decisive action without consulting management if a guest has a need or complaint.	[71,85]
UR5	The framework should be viewed as a tool to assist management in introducing shared responsibility and encourage staff at all levels to participate in continuous improvement by taking responsibility autonomously.	Management should encourage staff from all levels to participate in continuous improvement by taking responsibility autonomously.	[85]
UR6	There is a need within a multidimensional entity to introduce uniformity across the functional departments.	Implementing a universal system that all employees understand and relate to uniformity could be accomplished.	[82]
UR7	Staff should be trained and educated for the company's specific needs to ensure a complete service offering.	This becomes challenging when staff work shifts as not all staff are available at regular hours.	[83]
UR8	Staff health and safety through training.	Staff should be trained in specific equipment and processes to ensure tasks are conducted safely and efficiently. This includes the ergonomic factors of the work environment.	[84]
UR9	The framework should support consistency regarding the service rendered and the manner in which the service is delivered.	Guests expect consistent service irrespective of the time of the day or night. Guests ordering midnight room service should receive the same level of service as the morning breakfast at the flagship restaurant.	[71,85]
UR10	The framework should encourage interdepartmental communication.	Resorts could operate in silos if interdepartmental communication is not encouraged.	[89]
UR11	The framework should support communication within the department, especially where shiftwork is scheduled.	Staff within the same department often miss each other for weeks on end due to shift scheduling.	[89]
UR12	The framework should allow the adoption of KPIs interchangeably.	Staff should understand KPI data, which are readily available from existing systems.	[40]
UR13	The framework provides an opportunity to remedy some of the most significant challenges.	The team should be able to prioritise challenges.	[46]
UR14	The framework should allow for self-evaluation, supporting autonomous management.	The interrelatedness between the team and the process should be included during productivity management.	[47]

Table 5. Adequacy of methodologies reviewed.

Description	UR Satisfied (14)	FR Satisfied (12)	Sum of Qualifying Characteristics	Adequacy of Methodology against Requirements
5S	5	7	12	46%
TPS	5	4	9	35%
TPM	6	6	12	46%
DMAIC	3	1	4	15%
The SERVQUAL method	4	6	10	38%
Performance-only model	2	4	6	23%
Attribute and overall effect models	4	3	7	27%
Model of perceived service quality and satisfaction	2	4	6	23%
LODGESERV	5	2	7	27%
DINESERV	6	3	9	35%

These requirements tabulated in Tables 3 and 4 satisfy RQ5.

5. Developing a Framework Built on Legacy

From the list of methodologies evaluated during the literature review, some have been omitted due to non-alliance to the requirements. The following table shows the results of the most appropriate methodologies from both the service and manufacturing environments. Table 5 illustrates the methodologies by comparing compliance against the identified requirements, which would in turn satisfy the main objective. The requirements that the methodologies comply with are summed under each type of requirement, either FR or UR, and then totalled. The total is presented in the last column as a percentage of compliance with the framework requirements. The highest-scoring methodologies are highlighted in green. None of the methodologies are adequate as they are presented in the literature and modifications are therefore necessary.

RQ1 is provided for in the 13 identified methodologies and frameworks, where it is evident that a gap exists for a practically applicable framework that enables quality improvement within the resort environment. This confirms the research opportunity, as set out in RQ2. The methodologies are reviewed and tabulated against the requirements summarised in Tables 3 and 4 and are presented in Table 5.

The methodologies that satisfy the highest number of requirements as summarised in Table 5 are 5S, TPM, and SERVQUAL. Although they are methodologies traditionally aimed at the manufacturing environment, 5S and SERVQUAL have been applied in the service environment and in some cases to the hospitality environment [90,91]. These methodologies that present good characteristics, however, fail the complex resort environment, as evidenced in Table 5, although the methodologies align with the three elements of service quality as described by Rust and Oliver [21].

TPM is a methodology that is widely used due to the effective way the system prevents breakdown and stoppage in the manufacturing environment [92]. The methodology is widely employed in complex organisations across departments within an organisation [93]. TPM is built on eight pillars, as summarised in Table 6:

Table 6. TPM pillars.

Pillar	Description
Autonomous Maintenance	Autonomous maintenance requires the operator to care for their equipment.
Planned Maintenance	Preventative maintenance is scheduled and planned.
Quality Integration	Adopting quality improvement systems.
Focused Improvements	Improve changeovers, reduce quality defects and prototyping.
Early Equipment Management	Ensure procurement of well-established brands with proper service level agreements.
Training and Education	TPM training should be provided to every employee.
Safety, Health, and Environment	Seiichi Nakajima's (2006) 12-step TPM development program provides a zero-accident and zero-pollution environment.
TPM in Administration	Continuous improvement in administration supports operations.

The 5S method supports the service environment dimension discussed in Section 3 and has been combined with TPM by Nakajima as early as 1988 in many manufacturing environments to produce a comprehensive CI tool within this environment whilst attending to tidiness and order in the workplace [21,92,94]. The second and third dimensions presented by Oliver and Rust [21] are satisfied by setting appropriate KPIs to measure the efficiency of staff and the experience of guests. TPM pillars are appropriate for the resort environment if the methodology is modified in such a way that the framework focuses on employees rather than equipment and manages employees rather than maintaining them. These modified pillars, as seen in Figure 3, are more appropriate for the service environment as pillars for the newly proposed framework, called "TPMan", and honour the foundation, underpinning the objective. Figure 3 presents the mapping of the existing validated methodology pillars to newly proposed framework pillars.
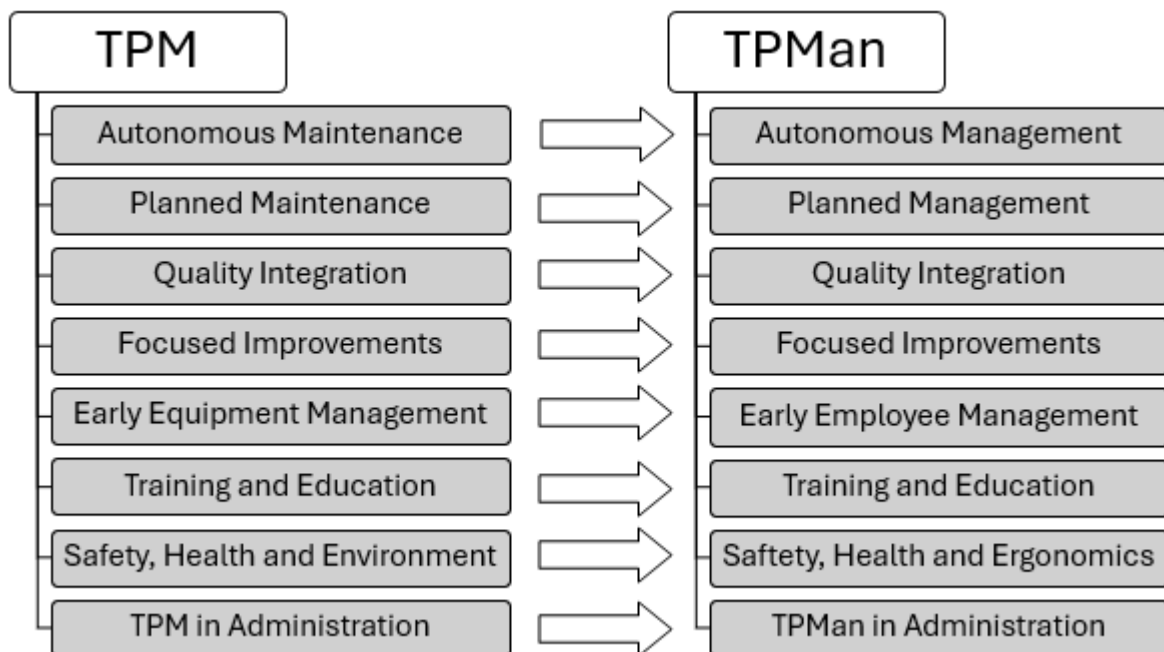

Figure 3. Mapping TPM to TPMan.

To construct a framework for the service environment, it would be appropriate to reinforce it on a foundation of the three service quality dimensions as presented by Rust and Oliver [21], illustrated in Figure 2. Table 7 provides the transformation of the three dimensions towards the new TPMan framework. These pillars and dimensions traverse the needs of a complex business, which could easily be developed in requirements whereby the framework should be verified.

Table 7. Transforming the three service quality dimensions to the new TPMan framework.

Rust and Oliver's Dimensions [21]	Description	TPMan Foundations
Service Environment	The environment forms part of the service offering towards the guest experience [95].	Environment Focus
Service Product	Encompasses the entire guest experience and the perceived value of money spent.	Experience Focus
Service Delivery	Relates to the efficiency of the service delivery.	Efficiency Focus

Furthermore, an adaptation of the TPM pillars, as discussed and illustrated in Figure 3, should be evaluated to provide robust pillars for the TPMan framework. The pillars should be individually comprehensive and applicable across all departments to ensure uniformity. The divergent nature of the pillars ensures that all aspects of the business are addressed, including (1) profitability, through evaluating costs; (2) driving continuous improvement on the three focus areas through staff participation; and (3) consistent and strong leadership by enabling management to focus on staff training, empowerment, and staff wellness.

These elements provide appropriate building blocks towards a new CI framework that is suitable for the resort environment.

Boundary Conditions (BCs) and Design Restrictions (DRs)

The boundary and design restrictions are introduced to ensure that the research remains within the scope of the proposed research questions (RQ1–RQ6)

These conditions include:

- BC1: This research is limited conceptually to a resort as defined in this article.
- BC2: A typical resort would be in one location, and the entities in BC1 fall within one management structure.
- BC3: Due to the complexity of the service industry regarding cultural differences across the world, the TPMan framework would need to be adapted to satisfy organisations in other demographic areas.
- DR1: Details of quality systems are restricted, and although many methodologies are considered, the details are not all recorded in this article.
- DR2: The TPM system is diverse, and certain conclusions are made outside of this document.

6. A New CI Framework: Total Productivity Management (TPMan)

The building blocks are combined to form a new CI framework built on the three foundations, as transformed in Table 7, and the eight pillars identified from TPM, which are modified and summarised in Table 8. These are illustrated as a unified framework in Figure 4.

Table 8. Summary of the TPMan pillars as adapted from Nakajima's TPM pillars [96].

Pillar	Description
Autonomous Management	Autonomous management calls for staff to self-evaluate and improve autonomously
Planned Management	Managing through documented procedures
Quality Integration	Adopting quality improvement systems
Focused Improvements	Providing an interactive action plan
Early Employee Management	Coaching before disciplining
Training and Education	Ensuring staff are trained for the job requirements
Safety, Health, and Ergonomics	Focus on the working environment so employees are supported in their work
TPMan in Administration	Continuous improvement in administration processes
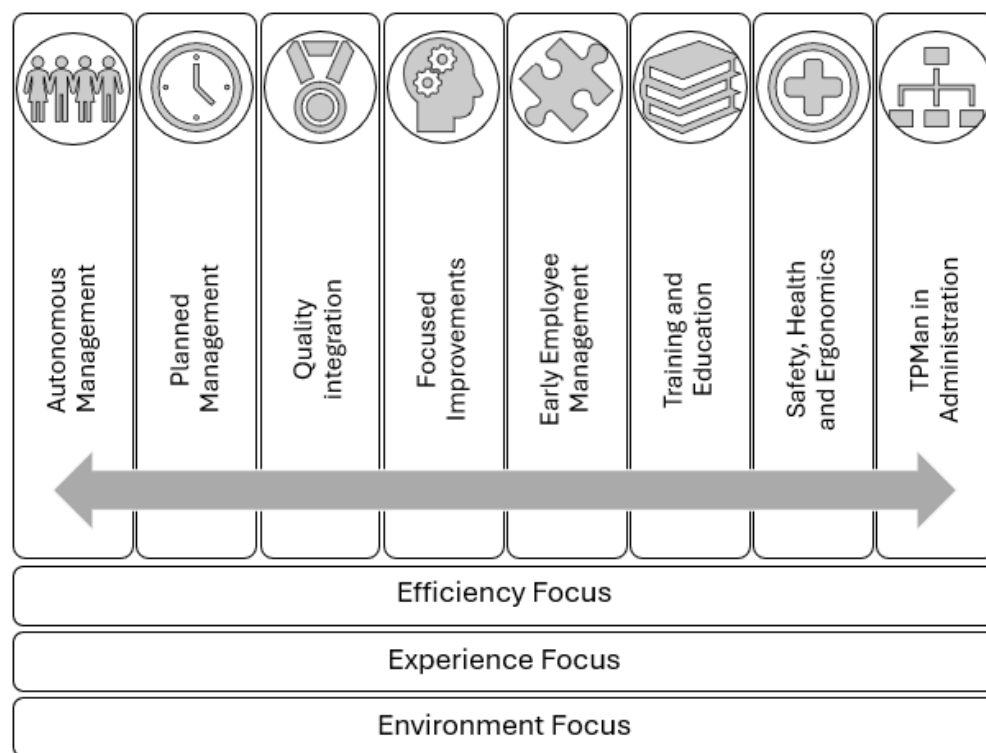
Figure 4. Introducing the new TPMan CI framework for the resort environment.

The adequacy of the framework is verified against how the requirements are satisfied as summarised in Tables 3 and 4. This is illustrated in Table 9, which shows that the TPMan framework satisfies all 14 URs and 12 FRs. The requirements, as supported by others throughout the literature, are combined to produce a comprehensive practical framework that would suffice as a CI tool for the resort environment to satisfy RQ3.

Table 9. Verification of TPMan against the requirements tabulated in Tables 3 and 4.

Description	UR Satisfied (14)	FR Satisfied (12)	Sum of Qualifying Characteristics	Adequacy against Requirements
TPMan	14	12	26	100%

6.1. Developing KPIs towards CI

KPIs are broadly categorised according to the three dimensions as proposed by Oliver and Rust [21]. These three dimensions underpin the three foundations whereby all identified KPIs are categorised.

Bauer [97] discusses the conundrum of developing and evaluating KPIs in hospitality due to seasonality. These KPIs, such as occupancy, revenue, and gate numbers, are indicative of global company performance. Moreover, this framework seeks to encourage CI on a departmental level, hence the KPIs should be developed and directed at staff on this level. Aligning with this research, the KPIs should be classified according to the three service dimensions as discussed and developed as the three foundations of the TPMan framework. Due to the nature of a continuous improvement methodology, it is implied that the KPIs are dynamic in either their goal or the KPI itself [98]. The manager in the department should continually assess where the teams' attention should be directed, aligning KPIs accordingly. The following is imperative to choosing KPIs for a department.

1. Is the KPI a good measure of some identified performance of the team?
2. Is the KPI measured and recorded effectively without introducing major new technology?
3. Do all staff understand the KPI and the unit in which it is measured?
4. Do staff in the department have the ability to affect the outcome of the KPI?

If the answer is no to any of these questions, the KPI is not appropriate on this level. Since departments in a resort environment are so diverse, each department team should develop their own KPIs that support their departmental goals [98]. KPI results are recorded by the dedicated TPMan champion on the appropriate form.

The KPIs are measured on a TPMan visual management board, which is visually displayed in each department for the benefit of the team. The elements on the board include KPIs that focus on environment with 5S, efficiency, and experience. The 5S results for the environmental dimension are illustrated in Figure 5.

5S Results

Department	
Current Month	
Champion	

5S_0001_VRM

Day Of the Month

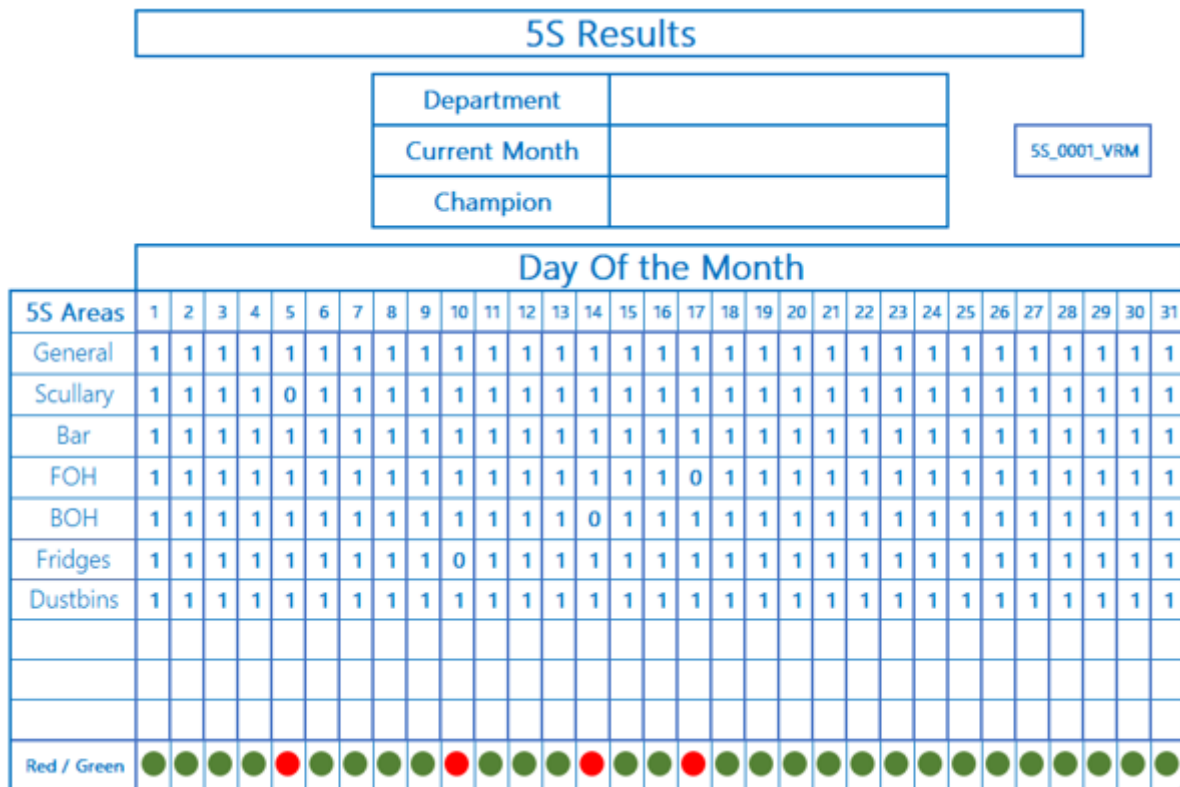| 5S Areas	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
General	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scullary	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FOH	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BOH	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Fridges	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dustbins	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red / Green	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Figure 5. Environment KPIs applying 5S.

The 5S areas are identified for the specific department and can be evaluated daily or weekly. The results are binary where the team either fails an area with a "0" due to noncompliance or passes with a "1" if all is in order. If there is a "0" for the day or chosen period, the team receives a red dot as illustrated in Figure 5 in the bottom row alerting the team to non-compliance, which could then be addressed. Alternatively, if all is in order, a green dot is allocated in the last row of the column that corresponds to the day of the month.

Efficiency suggests lean activities, which guide all employees to work economically with their time, equipment, and resources without objectifying costs. Figure 6 illustrates an example of how efficiency KPIs could be measured and tracked in a restaurant. These KPI examples in Figure 6 measure the number of times the kitchen runs out of a menu item. The second and third KPI's measure the average time it takes, in minutes, to serve food to the guest after the order was placed with a similar measure for beverages.

Restaurant												
Efficiency Focus												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Run outs												
Ave Time to deliver food												
Ave Time to deliver beverages												

Figure 6. Efficiency focus measurement.

Evaluating the guest experience within the hospitality industry considers the entire product offering. These include quality and value throughout the customer journey. Highlighting the customer journey throughout the organisation provides staff with an understanding of the pre- and post-guest experience outside their area and how they, in their respective departments, add value to this journey. Figure 7 provides an example of how experience KPIs are measured and tracked in a restaurant. These Experience KPIs are based on a survey presented to the guest during payment. The manager is able to ascertain the number of reviews received during the corresponding month, with an average rating on service and food as perceived by the guest. The survey also asks the guest if they would recommend the restaurant which is tallied on the form.

Restaurant												
Experience Focus												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Total Number Reviews												
Ave Service Review												
Ave Food Review												
Percentage Recommend												

Figure 7. Experience Focus KPIs in a restaurant.

Table 10 provides further examples of KPIs within departments of a resort for each foundation. The team aims to reach the set goal where the rule provides the benchmark that the team or manager decides on. This mark should be moved when being reached consistently [99].

Table 10. Examples of KPIs in the resort environment.

Department	Foundation	Description of Measurement	Goal	Rule
Administration and Finance	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Courier packages distributed	All packages were distributed to respective areas within one day	Max 5 packages not distributed on time
	Experience	Number of overdue payments to suppliers	All suppliers paid within negotiated terms	Max 5 overdue payments
Security	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	CCTV cameras offline	No camera offline for more than 12 h	Max 3 fails per month
	Experience	Number of security incidents on premises	Zero incidents	There were no incidents on the premises
Housekeeping	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Staff arriving late for a shift	All teams arrive on time	Max 5 late days for all staff
	Experience	Supervisor fails room after service	All rooms were serviced correctly the first time	Max 3 fails a month
Maintenance	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Number of reopened work orders after work complete	All work orders are completed correctly the first time	Max 5 reopened work orders per month.
	Experience	Number of overdue work orders	All work orders are completed within the specified time	Max 1% overdue work orders
Production Kitchen	5S Environment (5S)	Red dots on form Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Number of meals per day	800 pax	More than 500 pax
	Experience	Feedback from restaurant	Rating of 4.8	Min rating of 4.3
Drivers	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Number of vehicle incidents	No incidents or accidents	No incidents
	Experience	Guest feedback	5 positive reviews	At least 3 positive reviews
Garden and Workshops	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Number of guests on workshop or garden tour	Seasonal goals	Proportional growth in numbers
	Experience	Number of guests recommending workshops or garden tours	Have all guests recommend	95% of the number of guests
Hotel	5S Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Number of bicycles needing repair	All bicycles are ready for guests to use	Fewer than three bicycles in repair
	Experience	Number of complaints	Complaints to be avoided	Fewer than four complaints per month

Table 10. *Cont.*

Department	Foundation	Description of Measurement	Goal	Rule
Spa	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Staff sick days	All staff on duty when scheduled	Fewer than four sick days for the team during scheduled shifts
	Experience	Number of hotel guests not assisted	All hotel guests should be assisted	Fewer than three guests per month not assisted
Shop	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and 3 red months per year
	Efficiency	Run out of stock of items	Always be well-stocked	Max 5 runouts per week
	Experience	All areas will be ready for guests at 9:00	All areas are always ready	Fewer than three areas not prepared on time
Restaurants	Environment (5S)	Red dots on form in Figure 5	Have all areas pass inspection	Max 5 red dots per month and three red months per year
	Efficiency	The time taken to deliver food and beverages from the time of the order	Less than 8 (12) min for food and 5 (8) min for beverages out of season (in-season).	Less than 1% of late orders
	Experience	Number of recommendations	Guests will recommend the restaurant	97% of guests say yes

This framework has been validated by application within the identified environments, satisfying RQ6. This was achieved by implementing the framework in two resorts, the first being Babylonstoren in South Africa, and the second implementation was conducted in an international resort (The Newt) in the United Kingdom. TPMan was validated by measuring the success of adoption, the improvements made within the business, and the ability of the teams to make continuous improvements.

6.2. Case Study: Babylonstoren in South Africa

www.babylonstoren.com

This resort employs 770 staff within 28 departments, of which some are manufacturing departments showcasing products and services as guest experiences. These departments are divided between guest-facing departments and support service departments. The revenue centres are a hotel with 42 rooms, a spa, three restaurants, two farm shops, wine and olive tasting venues, cellars, a bakery, an online shop, and a function venue. Manufacturing processes, which include soap, wine, olives, olive oil, balsamic vinegar, fresh juice, cheese and dairy products, butchery and meat products, essential oils, a nut roastery, and water bottling plants, utilise mainly Babylonstoren's raw materials generated from farming operations. Babylonstoren provides three types of lodgings: a cottage type with a fully equipped kitchen, lounge, and one or two ensuite bedrooms; complete family compounds; and farmhouse rooms with a communal lounge, libraries, and bars. These arrangements offer saunas, salt rooms, vitality and hot pools, and outdoor games. The lodging is a high-luxury, 5-star environment with top-quality furnishings. The accommodation includes a gymnasium, a dam, canoes, bicycles, and a buffet breakfast in the flagship, world-renowned Babel restaurant.

Challenges in the resort prior to implementation of the CI framework include:

- A lack of communication due to departmental silos;
- Inconsistent use across departments of methodologies to measure performance;
- A lack of teamwork towards attaining KPI achievements;
- No framework to encourage CI;
- No framework to encourage efficiency, experience, and environmental focus;
- Generally untidy back-of-house areas.

TPMan was first employed as "The Babylonstoren Way" in 2018 across all departments simultaneously. Departments have made more than 7500 individual improvements across the three focus areas. The system was easily adopted by staff as the immediate effects of 5S ensure order and peace in the workplace. Ensuring the staff understand that performance measurement facilitates improved working conditions and team output creates a cooperative team where benchmarking their own performance is not threatening. This is vital for management to understand for the system to function and took the Babylonstoren team years to perfect. Once the penny dropped with staff that the system is not in place to identify poor performance or single out individuals, the team could adopt the system as a tool to facilitate CI. The system has thus been adopted within the environment, yielding positive results for a period of 5 years.

The KPI results from Babylonstoren, as illustrated in Figure 8, show an average increase in 2022 of 6% and 2023 of 12%. The total percentages in the last row for each year is red if below average for the enterprise and green if above average. This indicates comparative CI participation for each department in the resort. The framework accepts that if the system is used on an ongoing basis, KPIs are also improving in their individuality. This is monitored by management on an ongoing basis.

2021

	Weight	Soap Factory	Garden	Tunnels	Online JHB	Online Cape	Babel BOH	Babel FOH	Hotal Reception	Housekeeping	Functions	Spa	Ticket Office	Greenhouse	Production Kitchen	Cheesery	Butchery	Bakery	Farm Shop	Stores	Cellar	Bottleing Plant	Juicery	Tasting Venue	Drivers	Maintenance	Security	Workshop	Farm	Farm Managers	Farm Trectors	Farm Water
CI Actions	5	3	4	3	1	4	3	3	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	2	3	3	2	5	4
5S Red Dots	5	1	3	2	0	1	3	3	3	3	3	3	2	0	0	0	2	1	3	0	1	4	3	5	2	3	2	3	3	3	0	3
Training Done	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
KPI's	5	4	3	4	4	4	4	5	5	3	5	4	3	3	5	5	4	5	5	5	4	5	5	4	3	4	5	4	4	4	4	4
Total (%)	16	56	69	63	31	63	69	75	81	63	81	69	50	44	63	75	63	81	63	69	81	81	94	69	63	56	75	69	63	63	75	69

2022

	Weight	Soap Factory	Garden	Tunnels	Online JHB	Online Cape	Babel BOH	Babel FOH	Hotal Reception	Housekeeping	Functions	Spa	Ticket Office	Greenhouse	Production Kitchen	Cheesery	Butchery	Bakery	Farm Shop	Stores	Cellar	Bottleing Plant	Juicery	Tasting Venue	Drivers	Maintenance	Security	Workshop	Farm	Farm Managers	Farm Trectors	Farm Water
CI Actions	5	5	3	3	3	3	3	2	4	4	3	3	5	4	5	4	5	4	4	5	4	4	4	5	4	4	5	4	2	5	5	4
5S Red Dots	5	1	3	3	0	2	4	3	3	3	3	3	0	0	0	2	2	3	0	1	4	3	5	2	3	2	3	3	3	0	3	3
Training Done	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
KPI's	5	4	5	4	4	4	4	5	5	4	5	4	3	3	5	5	4	5	5	5	4	5	4	3	3	2	2	3	4	4	4	4
Total (%)	16	69	75	69	44	63	69	81	81	69	75	81	50	50	63	81	69	81	69	75	81	81	88	69	69	56	69	69	63	63	81	75

2023

	Weight	Soap Factory	Garden	Tunnels	Online JHB	Online Cape	Babel BOH	Babel FOH	Hotal Reception	Housekeeping	Functions	Spa	Ticket Office	Greenhouse	Production Kitchen	Cheesery	Butchery	Bakery	Farm Shop	Stores	Cellar	Bottleing Plant	Juicery	Tasting Venue	Drivers	Maintenance	Security	Workshop	Farm	Farm Managers	Farm Trectors	Farm Water
CI Actions	5	5	5	5	2	5	5	5	5	5	5	5	5	5	4	4	5	4	3	5	5	5	5	5	5	4	5	5	5	3	5	4
5S Red Dots	5	3	3	2	3	1	4	3	3	3	3	3	0	0	2	4	2	3	2	1	4	3	5	2	3	2	3	3	3	1	3	3
Training Done	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
KPI's	5	5	5	4	4	4	4	5	5	4	5	4	3	4	5	5	4	5	5	5	4	5	5	4	3	4	5	4	4	4	5	4
Total (%)	16	88	88	75	56	69	88	88	88	81	88	81	56	56	75	88	75	81	69	75	75	88	100	75	75	69	88	81	69	69	88	75

Year-on-year Improvement or Decline																															
2021–2022	22%	9%	10%	40%	0%	0%	8%	0%	10%	-8%	18%	0%	14%	0%	8%	10%	0%	10%	9%	0%	0%	-7%	0%	10%	0%	-8%	0%	0%	0%	8%	9%
2022–2023	27%	17%	9%	29%	10%	27%	8%	8%	18%	17%	0%	13%	13%	20%	8%	9%	0%	0%	0%	-8%	8%	14%	9%	9%	22%	27%	18%	10%	10%	8%	0%

Figure 8. Year-on-year KPI results for 2021–2023.

Improvements noted by management include:

- General awareness of tidiness in all areas.
- Companywide focus on CI, including guest experience, efficiency, and environment.
- Awareness of KPIs and drive to improve on benchmarks.

- Improved interdepartmental communication due to the universal CI framework.

The resort, being a complex environment, shows visible improvements that have been sustained over the past years. However, continual efforts need to be made by top management to encourage staff and middle management to persist in applying the CI methodology, as it requires consistent effort over and above normal operational tasks.

6.3. Case Study: The Newt in the United Kingdom

www.thenewtinsomerset.com

Over the past five years, The Newt has evolved into a world-class hospitality destination. The luxury resort is an ever-evolving experience-oriented destination. The estate offers extraordinary experiences, including accommodation, a spa, gardens, museums, manufacturing facilities, workshops, and tours. The staff complement, exceeding 660 employees, primarily consists of locals with exciting backgrounds and life experiences, adding to an exceptional, unique guest experience. The distinctive programs and activities accompany a well-designed Visitor Attraction (VA) offering to require visitors to purchase an annual visitor membership, which provides the member with a multitude of benefits, including unlimited repeat entries to The Newt for 12 months, access to Partner Gardens, seasonal workshops, event invitations, and discounts and promotions in the e-commerce shop.

TPMan was initially employed during 2022, dubbed "The Newt Way" across selective departments with implementation still ongoing. Management chose to employ the framework across departments consecutively and systematically as managers from the selected departments were well-positioned and ready. The various departments have contributed to over 1536 improvements to the operational efficiency, guest experience, and the physical environment. There was some initial resistance to change due to additional responsibilities on the part of the departmental champion and management. The teams appreciated the methodology's immediate positive effect as the initial focus was placed on quick wins with a gradual decline in enthusiasm as the improvement results became more subtle. The initial KPIs were confusing and arduous, with unrealistic goals. This was rectified on review of the measurables with notable effects regarding positive participation. High staff turnover within this environment hampers the uptake of the framework as new staff must be trained and momentum is lost. Business sustainability efforts should be continuous and evolutionary, propelled by management who are open-minded to change [100]. According to Padin [100], a Triple Bottom Line (TBL) approach to CI, whereby economic, social, and environmental elements are considered, would support verification efforts, specifically within a nomological framework [100]. The following challenges were noted during the initial period of implementation:

- Reluctance by staff towards the additional responsibilities with no additional reward;
- Departmental champions were rotated on a month-to-month basis;
- Too many KPIs set with strict goals;
- Element of fear of failure by staff and middle management;
- Framework was implemented as very rigid.

Figure 9 illustrates the KPI results for 2023 for the Botanical Rooms restaurant at The Newt. The results show the CI actions completed month to month during the year, along with other matrices such as food reviews. The red blocks indicate non-conformance to the goal set by the team. Green blocks indicate conformance to the set goal.

Noted improvements or changes include:

- A new champion is chosen every 3 months rather than monthly.
- Champion awards—mention in monthly all-team meetings like "wow awards".
- Extra tronc points or bonus scheme for the main champion if succeeding as a benefit.
- Monthly audits—sit down with the HOD/champion; 20-minute feedback from audit.
- Monthly audits—audit the board and system rather than the standards of the department.
- Do not get too caught up with counting the red dots. Management should be concerned if every month all dots are green throughout the month.

- If some departments are finding it too much and not progressing after some time, then it may be beneficial to remove some KPIs and focus on 5S.
- Team training for the new champions.
- Champions have refresher meetings every 2 weeks.
- Reminding the team that The Newt Way cannot be failed, removing the element of fear.
- The benchmark should be to improve upon the previous month.
- Focus on flexibility and teamwork.
- It is vital that the team has the freedom to adapt the framework to suit the organisation, culture, and individual department. Even management style should be accommodated.

Botanical Rooms															
Descriptions	Goal	Previous year	Ave YTD	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Total Number Reviews	More than 40, otherwise red	64	64	10	31	66	76	72	45	77	80	94	69	78	74
Ave Food Review	More than 4.5%, otherwise red	4.6	4.5	4.6	4.5	4.53	4.51	4.51	4.67	4.49	4.25	4.51	4.58	4.59	4.72
Number Recommend	More than 90%, otherwise red	94.9%	91.7	90.2	91.1	92.4	90.79	93	95.56	93.5	80.25	91.9	92.8	92.3	96
Wastage	Less than R2500, otherwise red	1516.09	1528.50	1250.00	1000.00	1200.00	1500.00	1000.00	2200.00	1000.00	1500.00	2167.00	1980.00	1880.00	1665.00
Overtime	Less than R10k, otherwise red	0	3	2	1	1	4	5	2	4	5	2	1	5	4
New Action Plans for the month	Information	8	8	8	6	8	9	9	10	8	12	3	11	10	6
Action Plan Complete	More than 3, otherwise red	6	6	2	5	6	4	8	7	6	6	4	6	7	6
5S Red Dots	Less than 6, otherwise red	3	3	2	3	1	2	3	3	3	9	3	1	2	6
Training attended	At least 1, otherwise red	1	1	1	1	1	1	0	1	0	1	1	1	1	1

Figure 9. KPI results for the Botanical Rooms restaurant.

7. Discussion

An in-depth review of the past literature provided the needs and environmental clarity that ensured a foundation for developing the User and Functional Requirements summarised in Section 4. Establishing the best-fit methodology for adaptation advanced the research towards an in-depth review of TPM, 5S, and SERVQUAL, laying the groundwork for developing the TPMan framework. The pillars of the TPM methodology discussed provide a good fit for developing a framework, where *equipment* and *maintenance* are synonymous with employees and management. It has been shown that consistently maintaining equipment is vital to quality product manufacturing and maximising profits [101,102]. Since employees are the focus of quality service delivery within the service industry, the reliance on employees forces the organisation to explore improvement systems that support and improve human actors [103,104]. Moreover, in complex service environments such as resort-type organisations, the interdependencies within the organisational departments illuminate the necessity for practical frameworks to assist the team in aligning vertical and horizontal efforts within the organisation [105]. From the lessons learnt while implementing the TPMan framework, it is evident that the framework is effective from the onset as staff immediately focus on improvements for service quality, guest experience, and the physical environment. Staff buy-in is dependent on many factors including the management style of the various departments [15]. This is evident from the varying results observed across departments. The implementation at Babylonstoren was carried out across all departments simultaneously. This led to some disruptions, with a slow start as the implementation team resources could not cope with the 25 functional departments at the time. The success of the framework has called for implementations at other resorts, with the next resort being The Newt. The implementation strategy was adapted to initially start rolling the framework out at only a few departments where managers could see the value of the framework. This gradual rollout process improved the uptake and overall success of the framework, as the initial departments had greater success serving as good examples to the subsequent departments. There has, however, been a reluctance by other departments to also adopt the

framework as it seemed to be optional to do so. Management had to step in and convince departmental managers to adopt the system and conform to the rest of the organisation.

8. Conclusions

With management buy-in, the possibility to motivate employees exists through the stepwise introduction of a comprehensible CI system that benefits the individual along with the enterprise. These benefits must be additional to monetary gain, especially where performance appraisal systems are already in place. Change creates a threat to most employees as the unknown is introduced [106]. If the transformation provides a transparent improvement towards fewer frustrations in the workplace, improved safety, and a fair performance-appraisal system, the employees who believe they deserve additional compensation for work well done will be motivated and highlighted. Such an employee would excel. Through the process of implementation, many lessons have been learnt, which are discussed in the case studies. Some elements to highlight include:

- Emphasis is placed on the importance of flexibility, which should be maintained in the framework to accommodate individual company and departmental needs [4].
- The framework should be conveyed as a tool to assist management and staff to improve on their own performance and that of the team [6].
- The team cannot fail the TPMan method unless they discontinue the use of it. Whilst the team is improving on benchmarked results and making continuous improvements by completing actions towards continuous improvements, the tool is serving its purpose [107].
- TPMan provides scope for continuous improvement in any domain of the business through the three dimensions, avoiding developing new programs within the business that do not form part of the TPMan methodology. Rather, find a way to incorporate the requirement to avoid confusing staff and distracting their attention from the chosen methodology.

8.1. Research Limitations and Opportunity for Future Work

As with any novel framework, there are some limitations that should be discussed. These limitations subsequently give rise to possible future work opportunities. Table 11 distinguishes between Boundary Conditions (BCs) and Design Restrictions (DRs), as provided by Van Aken et al. [22].

Table 11. Design limitations and relevant future work opportunities.

Restriction ID	Limitation Description	Motivation for Future Work
BC1	This research is limited conceptually to a multidimensional resort rather than other environments within the broader hospitality and tourism sector.	This research shows how the framework caters specifically for a complex multidimensional resort enterprise. This restriction could be lifted in future work to include other singular enterprises and general service environments.
BC2	The case studies were conducted in two resort environments with a particular configuration. There is no conclusive evidence that the framework would be equally effective for all configurations of resorts. This is a limiting factor to the framework.	The research has shown the applicability of the TPMan framework, specifically the case study presented, being a multidimensional hospitality environment. The analysis should be employed on other multidimensional resort-type enterprises. These enterprises could comprise different departmental configurations and management structures that should be considered in future.
BC3	A typical resort would be in one location or where these entities in BC2 are in proximity and fall under one management structure.	Many resort and hotel groups own and manage a diversified service offering, which is not included in this study. These enterprises commonly include multisite entities that could be nearby and fall within one culture. This could be further investigated.
BC4	Due to the complexity of the service industry regarding cultural differences across the world [108], the TPMan framework would need to be adapted to satisfy organisations in other demographic areas, specifically where the culture is different.	The results of the framework could be unpredictable if applied in diverse cultural environments internationally where the enterprise falls into various cultures and languages. This would pose a challenge and should be considered as future work.

Table 11. *Cont.*

Restriction ID	Limitation Description	Motivation for Future Work
DR1	Details of quality systems are listed during the literature review. The research assumes that there is literature available not considered in this research.	Although many methodologies are considered, the details are not all recorded in this project. Additional methodologies could be considered to enhance this framework.
DR2	Substantiations of TPM other than the review of TPM in this research.	The TPM system is diverse, and specific conclusions are made outside of this document. These assumptions could be considered as future work.
DR3	Simple enterprise structures such as hotels, entertainment, travel and transportation, and spa restaurants are not combined as a multidimensional resort-type enterprise.	Simple structures could benefit from this framework, although the framework focuses on complex multidimensional resorts. This could provide a foundational basis for future work.
DR4	Change management is a well-documented challenge in any staff-heavy environment [106]. This research does not address these challenges extensively.	The complexities of change management in resorts are not considered in this research and should be regarded as a future work opportunity.

The validation of a framework would lie in the outcomes it yields in the organisation [77]. Transparency regarding the motives for implementing and validating the framework should build stakeholders' confidence [109]. Measuring these outcomes provides authentication of the framework's success vis-à-vis the framework itself, given a period of benchmarking the results on which improvement is expected. The research aimed to design, implement, and validate a framework that supports employees through benchmarking performance, providing methods to measure and record such performance and improvements. The resulting framework suits the complex hospitality resort to improve the quality of service to guests by alleviating human resource challenges and consistently measuring the success of such enhancements through relevant key performance indicators (KPIs) throughout the enterprise.

8.2. Outcome and Contribution

TPMan is thus validated by the success of adoption in the two resorts, the improvements made within these businesses, and the execution of continuous improvement actions within the various departments, as illustrated in the case studies discussed.

The objective of developing a framework for productivity management designed for a multidimensional hospitality resort has been achieved, verified, and validated by this research. Resorts across the globe can enjoy the TPMan framework, which promotes CI regarding the quality of the guest experience the resort delivers, the efficiency with which the experience is being delivered, and the environment in which the experience is delivered.

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