Developing a Maturity Model for Standardizing IT Support Operations Across Geographically Distributed Multi-Office Organizations

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Abstract- ***Organizations that operate from multiple offices across different cities, regions, and countries often struggle to deliver information technology support that is consistent in quality, responsiveness, and process discipline. When each office develops its own tools, procedures, and service expectations, the result is fragmentation that raises operating cost, weakens user satisfaction, and obstructs enterprise-wide reporting and control. This paper develops a maturity model to help such organizations assess and advance the standardization of their IT support operations. The model is constructed by synthesizing prior work on IT service management, capability maturity, and the coordination of distributed organizations, and it comprises six assessment dimensions, namely process standardization, tooling and technology infrastructure, people and competencies, governance and measurement, knowledge management and communication, and service consistency, each evaluated across five progression levels that run from an initial and unmanaged state to an optimizing and uniformly standardized one. A distinguishing feature of the model is that it treats variation between offices, rather than the capability of any single office, as the primary signal of maturity, so that an organization of individually competent but divergent offices is correctly identified as not yet standardized. The model is expressed as a maturity matrix and is accompanied by an assessment method that specifies evidence gathering, scoring, cross-office aggregation, gap analysis, and target setting, together with transition guidance for advancing between levels. An extended hypothetical application demonstrates the method, and a comparison with established IT maturity frameworks situates the contribution. The model offers practitioners a structured and repeatable basis for advancing IT support standardization and provides researchers with an artifact ready for empirical evaluation.***

Keywords: Maturity Model, IT Support Operations, Standardization, IT Service Management, Distributed Organizations, Design Science Research

I. INTRODUCTION

Contemporary organizations rarely operate from a single location. Growth, acquisition, market expansion, and the geographic distribution of talent have produced enterprises that maintain numerous offices across cities, regions, and national borders. Each office depends on reliable information technology and therefore requires a support function capable of resolving incidents, fulfilling service requests, and maintaining the technology on which daily work depends. Although the need for support is universal, the way it is delivered is frequently anything but uniform. Offices tend to evolve their own tools, their own ticket handling habits, and their own informal notions of acceptable service, and over time these local arrangements harden into divergent practices that are difficult to reconcile.

This divergence carries real and recurring costs. Inconsistent processes make it difficult to compare performance between offices or to gauge enterprise wide service quality. Duplicated tooling raises licensing and administration expense while complicating integration and reporting. Knowledge accumulated in one office seldom reaches another, so the same problems are diagnosed and solved repeatedly and independently. Employees who relocate or travel encounter unfamiliar procedures and uneven service, and the absence of common definitions makes governance, accountability, and benchmarking elusive. When a metric such as average resolution time is computed differently in each office, consolidated figures become misleading rather than informative, and decisions taken on the basis of them are correspondingly weakened. Standardizing IT support across distributed offices is therefore a precondition for cost control, reliable service, and informed management rather than a cosmetic concern. Standardization is not, however, a switch that an organization simply flips. It involves a genuine tension between local responsiveness and global consistency. Offices acquire local practices for understandable reasons: they respond to local demand, local staffing, local language, and local regulatory conditions. A

standardization effort that ignores these realities will be resisted, while one that abandons consistency altogether forfeits the benefits that motivated the effort in the first place. The practical question for most organizations is therefore not whether to standardize absolutely but how far along a path of increasing standardization they currently stand, what the next achievable step would look like, and what that step would require. This is a question about maturity, and it is best answered with an instrument designed for the purpose.

Maturity models are well suited to such questions. They set out an evolutionary path through a sequence of defined levels and allow an organization to locate its current position, recognize its weaknesses, and plan improvement in a structured and defensible way (Becker et al., 2009; De Bruin et al., 2005). A substantial body of work has produced maturity models and related frameworks for information technology, including the Capability Maturity Model and its successors (Paulk et al., 1993; CMMI Product Team, 2010) and the practitioner frameworks of the IT Infrastructure Library, the Control Objectives for Information and Related Technologies, and the ISO/IEC 20000 standard (AXELOS, 2011; ISACA, 2012; ISO/IEC, 2011). These instruments were not constructed, however, to address the standardization of support across offices separated by distance, time zone, and local custom, a context whose coordination difficulties are well documented in the literature on distributed work (Malone & Crowston, 1994; Herbsleb & Moitra, 2001; Carmel & Agarwal, 2001).
This paper develops a maturity model that takes the multi-office, geographically distributed context as its central concern and treats the consistency of support across offices as the quantity to be matured. The study addresses three questions: which dimensions of IT support operations must be considered when standardization across offices is the goal; how progression in each dimension can be characterized so that an organization can recognize its current and target levels; and how the resulting model can be applied to support assessment, gap analysis, and improvement planning. The contribution is fourfold. First, the paper reframes cross-office consistency, rather than single office capability, as the object of maturity. Second, it provides a concrete artifact, a six by five maturity matrix. Third, it specifies an assessment method covering evidence, scoring, cross-office aggregation, and target setting. Fourth, it offers transition guidance and a comparison with established frameworks so that practitioners can position and apply the model alongside existing investments.

The scope of the model should be stated plainly. It concerns the standardization of internal IT support operations, the function that serves an organization's own employees across its offices, rather than externally facing product support or the broader sweep of enterprise IT governance. It is intended to be framework agnostic: it does not replace the IT Infrastructure Library, the ISO/IEC 20000 standard, or any particular tool, but rather expresses, in maturity terms, how consistently such practices are adopted across offices. The remainder of the paper is organized as follows. Section 2 reviews related work on support operations, distributed coordination, maturity models, and existing IT maturity frameworks, and identifies the gap. Section 3 outlines the research approach. Section 4 presents the model. Section 5 specifies the assessment method. Section 6 provides an extended illustrative application. Section 7 offers transition guidance, Section 8 compares the model with established frameworks, Section 9 discusses contributions and limitations, and Section 10 concludes.

II. RELATED WORK

2.1 IT Support Operations and IT Service Management

IT support operations encompass the activities through which an organization restores and sustains the technology services its users depend upon. Foremost among these are incident management, which restores normal service as quickly as possible after a disruption; request fulfillment, which handles standard service requests such as access provisioning and equipment supply; and problem management, which investigates the underlying causes of recurring incidents in order to prevent their repetition. These activities are supported by others, including asset and configuration management, change handling, and the communication that keeps users informed. The discipline that organizes them is IT service management, which treats information technology as a portfolio of services delivered to internal and

external customers and emphasizes process, measurement, and continual improvement (Galup et al., 2009).

The IT Infrastructure Library is the most widely recognized articulation of this discipline and defines processes for service operation, including incident management, request fulfillment, and problem management, within a broader service lifecycle (AXELOS, 2011). Complementary guidance is provided by the ISO/IEC 20000 standard, which specifies requirements for a service management system, and by the Control Objectives for Information and Related Technologies, which frames service management within enterprise governance (ISACA, 2012; ISO/IEC, 2011). Enterprise governance of this kind further encompasses security audit and risk assessment for resilient information systems (Dosunmu & Ogundele, 2019) and the modeling of legal and ethical risk in data protection (Mbonu, Aliliele, et al., 2018). Empirical study of the adoption of these frameworks indicates that organizations pursue them to improve service quality, standardize practice, and strengthen accountability, and that successful adoption depends heavily on management commitment, training, communication, and process discipline rather than on tooling alone (Marrone & Kolbe, 2011; Pollard & Cater-Steel, 2009; Tan et al., 2009; Iden & Eikebrokk, 2013).

At enterprise scale, consistent operations also depend on centralized infrastructure. Directory services, for example, allow identities and resources to be managed uniformly across an organization and are foundational to consistent access and provisioning (Ladapo et al., 2019), and the handling of incidents increasingly draws on enterprise log analytics and automated response architectures that aggregate and correlate events across the estate (Mbonu, Iwuanyanwu, et al., 2019). The structured assessment of such enterprise systems, including security-critical infrastructure, is itself an established practice on which a maturity evaluation can build (Ladapo et al., 2018). This research underscores a point central to the present study: standardizing support is an organizational undertaking that touches process, tooling, people, governance, and culture, and is not reducible to the deployment of a common platform.

2.2 Standardization and Coordination in Distributed Organizations

Standardization can be understood as the management of dependencies among activities so that they are carried out in a common and predictable way. The interdisciplinary study of coordination frames organizational work in precisely these terms, as the management of dependencies between tasks, resources, and actors, and observes that distributing work across locations multiplies and complicates those dependencies (Malone & Crowston, 1994). When an organization operates from many sites, the coordination of any shared activity becomes harder because the mechanisms that sustain common practice within a single location, such as informal communication, shared supervision, and a common working context, weaken with distance.

The literature on global and distributed software development documents these effects in detail. Distance in geography, time, and culture impedes communication, weakens shared awareness, slows the resolution of misunderstandings, and complicates the enforcement of common practice (Herbsleb & Moitra, 2001). Carmel and Agarwal describe tactical responses to these difficulties, including the reduction of intensive collaboration across distance and the deliberate construction of shared processes, common tools, and explicit communication channels (Carmel & Agarwal, 2001). Although this body of work concerns development rather than support, its lessons transfer directly. IT support distributed across offices faces the same obstacles to common practice: procedures drift apart, tools diverge, knowledge fails to circulate, and the meaning of a metric varies from one office to another. Organizations whose offices span national borders face the further difficulty of reconciling differing regulatory regimes, such as data protection regulations across jurisdictions, when implementing shared services (Mbonu, Aliliele, et al., 2019).

These observations carry an important implication for any maturity model of distributed support. Such a model cannot simply measure how capable a representative office is, because an organization may contain offices that are each individually competent yet collectively divergent. For the purposes of standardization, that organization is immature: its capability is not shared, its practices are not common,

and the benefits of standardization remain unrealized. The consistency of capability across offices, rather than the level of capability in any one office, is therefore the proper object of measurement, and it is this reframing that distinguishes the present model.

2.3 Maturity Models: Concepts and Development

A maturity model describes the development of an entity through a sequence of ordered stages, from an initial or immature state to a more advanced and capable one. The concept entered the information technology field most influentially through the Capability Maturity Model, which characterized the maturity of software processes across five levels ranging from an initial, largely ad hoc state through repeatable, defined, and managed states to a final optimizing state of continuous improvement (Paulk et al., 1993), and which was later generalized in the CMMI family of models (CMMI Product Team, 2010). This five level structure proved durable and has been adapted to a wide range of domains. Maturity models typically combine two structural elements: a set of levels that express overall progression, and a set of dimensions, process areas, or capability areas that decompose the subject so that progression can be assessed in detail (De Bruin et al., 2005; Maier et al., 2012). A common variant, the maturity grid, arranges dimensions against levels in a matrix whose cells contain textual descriptions of expected practice, allowing assessment by selecting the description that best fits (Fraser et al., 2002; Maier et al., 2012).

Because maturity models proliferated unevenly, with construction that was not always transparent or rigorous, scholarly attention has turned to how such models ought to be developed. Maturity model construction is now widely understood as a design science endeavour, concerned with the creation and evaluation of artifacts that address identified problems (March & Smith, 1995; Hevner et al., 2004; Peffers et al., 2007). Becker and colleagues proposed a procedure model that frames maturity model development in these terms, specifying phases that run from problem definition and comparison with existing models through iterative development to evaluation (Becker et al., 2009). De Bruin and colleagues identified the main phases of developing a maturity assessment model as scope, design, populate, test, deploy, and maintain (De Bruin et al., 2005). Poppelbuss and Roglinger articulated general design principles that a useful maturity model should satisfy, including a clear definition of its central concepts, its intended audience, and the criteria for assigning entities to levels (Poppelbuss & Roglinger, 2011), and Mettler positioned model construction explicitly within design science, emphasizing the artifact character of the model and the need for evaluation (Mettler, 2011). Reviews of the field confirm its breadth, its uneven rigor, and the value of following an established development procedure (Roglinger et al., 2012; Wendler, 2012).

2.4 Existing Maturity Models and Frameworks for IT Service Management

Several established instruments express the capability or maturity of IT service management, and it is worth examining why none of them directly answers the question this paper addresses. The CMMI for Services model applies the staged and continuous CMMI architecture to service provision, describing process areas and capability levels for organizations that establish, manage, and deliver services (CMMI Product Team, 2010). The Control Objectives for Information and Related Technologies includes a process assessment approach that rates the capability of governance and management processes against defined attributes (ISACA, 2012), and the ISO/IEC 15504 family, often referred to as SPICE, provides a general framework for process assessment from which several IT specific assessments derive (ISO/IEC, 2004). The ISO/IEC 20000 standard, while a requirements standard rather than a maturity model, is frequently used as a reference against which organizations gauge the completeness of their service management system (ISO/IEC, 2011), and practitioner assessments of IT Infrastructure Library adoption serve a similar purpose (AXELOS, 2011; Tan et al., 2009).

These instruments share two characteristics that limit their fit for the present problem. First, they assess the capability or completeness of processes in general, without taking the multi-office, geographically distributed context as a defining concern; an organization can score well on any of them while remaining deeply inconsistent across its offices, because the assessment does not foreground cross-office variation. Second, several are broad in scope,

addressing the whole of service management or even enterprise governance, whereas the practical problem of standardizing the support function across offices benefits from a focused instrument that practitioners can apply directly without extensive tailoring. Table 1 summarizes these instruments and their relationship to the problem addressed here.

Table 1. Selected IT maturity and assessment instruments and their relationship to multi-office support standardization.

Instrument	Primary focus and structure	Limitation for multi-office support standardization
CMMI for Services	Process areas and capability or maturity levels for establishing and delivering services.	General service capability; does not treat cross-office consistency as the object of assessment.
COBIT process assessment	Capability rating of governance and management processes against defined attributes.	Enterprise governance scope; broad and not focused on the support function across offices.
ISO/IEC 15504 (SPICE)	General framework for process assessment and capability determination.	Generic; requires substantial tailoring and does not address geographic distribution.
ISO/IEC 20000	Requirements for a service management system used as a completeness reference.	A requirements standard rather than a staged maturity path; silent on cross-office variation.
ITIL adoption assessments	Practitioner gauges of adoption of service management practices.	Measure adoption in general; an organization may adopt practices unevenly across offices.

2.5 Benefits, Drivers, and Risks of Standardization

The case for standardizing distributed support rests on several benefits that recur in the literature on service management and coordination. Common process and tooling reduce duplicated effort and licensing cost, since a single platform and a single set of procedures are cheaper to maintain than several; they make performance comparable across offices, since common definitions are a precondition for meaningful consolidated measurement; and they reduce dependence on particular individuals, since documented and common practice can be learned and transferred. Standardization also improves the experience of users who move between offices, supports the rapid integration of newly acquired offices, and strengthens governance by giving senior management a reliable enterprise wide view. These benefits are, in effect, the rationale for advancing through the levels of the model.

Standardization is not without risks and costs, however, and a balanced account must acknowledge them. Imposing a common arrangement can suppress local practices that are well adapted to local conditions, and a heavy handed effort can provoke resistance that undermines adoption. The effort of aligning offices is itself substantial, particularly at the pivotal transition to common practice, and it competes with the daily demands of support work. There are also legitimate sources of variation that standardization should accommodate rather than override, including differences of language, of local regulation such as data protection regimes that vary by jurisdiction, where legal and ethical risk must be modeled and managed within governance (Mbonu, Aliliele, et al., 2018), and of local scale. A mature standardization effort therefore distinguishes between unnecessary divergence, which it seeks to eliminate, and necessary local adaptation, which it preserves within a common framework. The model supports this distinction by assessing the consistency of the common framework rather than demanding uniformity in every local detail.

2.6 Research Gap

The foregoing review establishes three points. First, IT service management provides a rich and validated description of the practices that constitute good support, but it does not by itself express those practices as a staged path of standardization across offices.

Second, the maturity model literature provides a rigorous methodology and a recognized structure for expressing such a path, but the existing models for IT management were not designed around the multi-office, geographically distributed problem and do not foreground consistency between offices. Third, the distributed organization literature identifies the specific obstacles that geographic separation places in the way of common practice, but it has not been synthesized into an assessment instrument for IT support. No existing model brings these strands together to assess and guide the standardization of IT support operations across distributed offices, with cross-office consistency as the explicit object of maturity. The present study develops such a model.

III. RESEARCH APPROACH

Constructing a maturity model is an act of artifact creation, and the study is accordingly guided by the design science research paradigm, which concerns building and evaluating artifacts that address identified organizational problems (March & Smith, 1995; Hevner et al., 2004; Peffers et al., 2007). Within that paradigm the study draws on the established guidance for maturity model development, particularly the procedure model of Becker and colleagues and the phase model of De Bruin and colleagues, and on the design principles for useful maturity models (Becker et al., 2009; De Bruin et al., 2005; Poppelbuss & Roglinger, 2011). The development proceeded by defining the problem and its relevance, comparing existing models and frameworks to establish that no adequate solution exists while identifying reusable structure, selecting a development strategy, designing the artifact iteratively, and planning its transfer and evaluation.

The model reuses the recognized five level progression structure, which practitioners interpret readily, and populates it with dimensions and descriptors derived from a synthesis of the IT service management, maturity model, and distributed organization literature reviewed above. The choice of a maturity grid, in which dimensions are arrayed against levels with textual descriptors in each cell, follows the precedent of widely used capability grids and supports assessment by practitioners using ordinary documentation and judgment (Fraser et al., 2002; Maier et al., 2012). The content of the model is therefore grounded in established practice rather than in primary data collection. No survey, interview, or case data are claimed, and the extended scenario presented in Section 6 is hypothetical and serves only to demonstrate the assessment method. In keeping with the cumulative character of design science, empirical evaluation through expert review and application in real organizations is identified as the principal direction for future work (Hevner et al., 2004; Mettler, 2011).

Design decisions were guided by a small set of criteria drawn from the design principles for useful maturity models and from the demands of the distributed context. The model should adopt a recognizable structure of ordered levels and assessable dimensions; its dimensions should cover the aspects of support that materially determine standardization; it should make cross-office consistency, not single office capability, the object of maturity; it should support assessment, gap analysis, and improvement planning rather than merely producing a score; its descriptors should remain compatible with recognized service management frameworks so that the model complements existing investments; and it should be usable by practitioners relying on ordinary evidence and judgment. These criteria also serve as a basis against which the artifact can later be evaluated.

These criteria correspond closely to the general design principles that the maturity model literature regards as marking a useful model (Poppelbuss & Roglinger, 2011). The basic principles of a clearly defined central construct, an identified target group, and an explicit purpose of use are addressed by defining standardization across offices as the construct, the IT leaders and service managers of multi-office organizations as the audience, and assessment with improvement planning as the purpose. The principles concerned with a descriptive and prescriptive purpose are addressed by the maturity matrix, which describes states, and by the assessment method and transition guidance, which prescribe how to determine a state and how to advance from it. The principle of intersubjectively verifiable assignment of entities to levels is addressed by the evidence based assignment rule, which aims to make level assignment repeatable across assessors rather than a matter of impression.

Stating this correspondence makes explicit how the artifact is intended to satisfy recognized standards of quality and provides a structured basis for its eventual evaluation.

IV. THE PROPOSED MATURITY MODEL

4.1 Overview and Architecture

The model is organized as a maturity matrix whose rows are six dimensions of IT support operations and whose columns are five levels of maturity. An organization assesses each dimension by selecting the level whose description best matches its current state across the organization, supported by evidence. The dimensions decompose the broad notion of standardized support into assessable parts, while the levels express a common trajectory of development that applies across all dimensions and is aligned with the widely understood progression established by earlier capability maturity work (Paulk et al., 1993; CMMI Product Team, 2010). The model yields a profile, a vector of dimension levels rather than a single number, because the dimensions can and usually do advance at different rates, and the profile is more informative for planning than any aggregate score would be.

4.2 The Cross-Office Consistency Principle

The defining principle of the model is that maturity is a property of the organization as a whole and is governed by the consistency of practice across its offices, not by the capability of its strongest office. This principle has a direct and deliberate effect on how levels are assigned. In every dimension, the three lower levels and the three upper levels are separated by the achievement of genuinely common practice. Levels one and two describe states in which practice is, respectively, unmanaged and locally managed but not shared; the transition to level three is achieved only when a common arrangement is defined and adopted across offices. It follows that an organization whose offices are each internally orderly, but which differ from one another, is assessed at level two in the affected dimension regardless of how capable any single office may be. Variation between offices is thus not a minor blemish on an otherwise mature operation; under this model it is the very thing that holds the organization back, and surfacing it is the model's central diagnostic purpose.

4.3 The Six Dimensions

Each dimension represents an aspect of support operations in which offices commonly diverge and in which standardization yields tangible benefit. The dimensions were selected to be collectively comprehensive of the factors that determine standardization and individually distinct enough to be assessed separately.

4.3.1 Process standardization

This dimension concerns the existence, documentation, and common adoption of the core support processes, namely incident management, request fulfillment, and problem management, together with their supporting procedures. It is the foundational dimension, because common process is the substance of standardization and because several other dimensions, particularly governance and service consistency, depend upon it. In a distributed setting the relevant question is not only whether each office has orderly procedures but whether the same procedures, with the same categories, priorities, and escalation paths, are in force everywhere.

4.3.2 Tooling and technology infrastructure

This dimension concerns the service management tools, monitoring systems, asset and configuration records, and automation used to deliver support, and in particular whether these are shared and consistently configured across offices. Common tooling is a powerful enabler of standardization because it embeds common process in the everyday work of support staff and because it is the practical foundation for consolidated measurement and shared knowledge. Divergent tooling, by contrast, entrenches divergent practice and makes enterprise wide visibility difficult to achieve. At enterprise scale, centralized infrastructure such as directory services further supports the uniform provisioning of access and resources across offices and is a practical foundation for consistent tooling (Ladapo et al., 2019).

4.3.3 People, roles, and competencies

This dimension concerns the definition of support roles, the consistency of skills and training, and the ability to plan and share capacity across offices. Standardized support depends on people who understand common roles and who are trained to

common expectations, and a mature distributed function can plan capacity and provide coverage across offices rather than treating each office as an isolated team. Where roles and competencies differ, service quality varies with the office and the function remains dependent on particular individuals.

4.3.4 Governance, metrics, and measurement
This dimension concerns the definition of service targets, the consistency of metric definitions, the consolidation of reporting, and the oversight of performance across offices. Measurement is the means by which standardization is verified and sustained, but measurement is only meaningful when metrics are defined identically across offices; otherwise consolidated figures mislead. A mature operation defines common targets and metrics, consolidates reporting so that offices can be compared, and supports a governance forum that oversees performance and drives improvement. Governance of this kind also extends to security audit and enterprise risk assessment, which contribute to the resilience of the information systems on which support depends (Dosunmu & Ogundele, 2019).

4.3.5 Knowledge management and communication
This dimension concerns the capture, sharing, and reuse of knowledge and the channels through which support teams in different offices coordinate. Distributed organizations are especially prone to knowledge fragmentation, because knowledge that accumulates locally does not circulate without deliberate mechanisms. A mature operation maintains shared knowledge that is accessible across offices, supports structured collaboration, and treats the reuse of knowledge as a measured and improving practice rather than an accident of personal contact.

4.3.6 Service consistency and user experience
This dimension concerns the degree to which users receive comparable, predictable, and high quality support regardless of which office serves them. It is in one sense the outcome dimension, the visible result of standardization in the other five, but it is assessed separately because an organization may achieve common process and tooling while still delivering an uneven experience, and because the user experience is the ultimate justification for the standardization effort. A mature operation monitors the experience through satisfaction measurement and manages it to common standards across offices.

4.4 The Relationship Among the Dimensions
Although the dimensions are assessed separately, they are not independent, and understanding their relationships is important both for interpreting a profile and for sequencing improvement. Process standardization and tooling form the foundation, because common process is the substance of standardization and a shared tool is the practical means by which common process is embedded in daily work. People and competencies depend in turn on these foundations, since common roles and training presuppose the common processes and tools that they operate. Governance and measurement depend on all of the preceding, because consolidated and comparable measurement is only meaningful when offices follow common processes, use common tools, and define metrics identically; an attempt to consolidate measurement across divergent offices yields figures that mislead. Knowledge management and communication both support and are supported by the others, since shared knowledge accelerates the adoption of common practice while common practice gives knowledge a stable subject to capture. Service consistency is largely an outcome of the other five, though it is assessed separately because an organization can achieve common process and tooling and still deliver an uneven experience if it does not actively manage that experience.

These dependencies explain why advancement is rarely uniform across dimensions and why a profile typically shows the foundational dimensions leading and the dependent dimensions following. They also explain the sequencing of improvement recommended later in the paper, in which common process and tooling are addressed before consolidated governance and a managed experience. Recognizing the dependencies prevents a common planning error, namely attempting to secure the benefits of the upper dimensions, such as enterprise wide reporting, without first establishing the common foundations on which those benefits depend.

4.5 The Five Levels
The five levels express progression from fragmented, unmanaged support to integrated, continuously

improving, and uniformly standardized operations. The descriptions below are general; their dimension specific form appears in the maturity matrix.

- Level 1, Initial. Support is reactive and unmanaged. Practices are improvised and depend on individuals, little is documented or measured, and variation within and between offices is high. The organization is exposed to the loss of any individual on whom support informally depends.
- Level 2, Managed (local). Support is organized within individual offices, which may have their own documented practices, tools, and roles, but there is little or no alignment between offices. Consistency exists locally but not across the enterprise, and the benefits of standardization remain largely unrealized.
- Level 3, Standardized. Common processes, tools, roles, and metric definitions are defined and adopted across all offices, so that users receive comparable service regardless of location. This is the first level at which the organization is genuinely standardized and the first at which enterprise-wide visibility becomes feasible.
- Level 4, Integrated (measured). Standardized operations are integrated and actively measured across offices. Consolidated reporting allows offices to be compared, deviations are tracked and addressed, capacity is planned enterprise wide, and a governance forum oversees performance. Standardization is not only achieved but sustained and verified.
- Level 5, Optimizing. Operations are continuously improved using performance data and feedback. Improvement is proactive and enterprise wide, automation and self-service are extended on the basis of analysis, knowledge reuse is measured, and consistent high-quality service is sustained across all offices as a matter of routine.

4.6 The Maturity Matrix

The matrix in Table 2 specifies, for each dimension, the characteristics that define each level. To assess an organization, an evaluator reads across the row for a dimension and selects the cell that best describes its current state across the organization, attending in particular to the degree of consistency between offices. The table is presented in landscape orientation on the following page so that the descriptors can be read in full, and the assessment method that operationalizes it is set out in Section 5.

Table 2. Maturity matrix for standardizing IT support operations across distributed offices.

Dimension	Level 1 Initial	Level 2 Managed (local)	Level 3 Standardized	Level 4 Integrated	Level 5 Optimizing
Process standardization	Support is reactive; no documented procedures; each technician improvises; practices differ widely within and between offices.	Some procedures documented within individual offices but not shared; consistency is office local with no cross-office alignment.	A common process catalogue for incident, request, and problem handling is defined and adopted across all offices with shared documentation.	Standardized processes are integrated and routinely audited; deviations are tracked and process performance is compared across offices.	Processes are continuously refined using performance data and feedback; improvement is proactive and enterprise wide.
Tooling and technology infrastructure	Disparate or absent ticketing tools; requests arrive by email or in person; each office uses	Each office uses a service tool, but tools and configurations differ across offices and are not integrated.	A single shared service management platform is adopted across offices with common	An integrated toolchain adds monitoring, asset management, and automation; consolidated	Tooling is continuously optimized; automation and self-service expand on the basis of

	whatever is locally available.		configuration and categorization.	dashboards span all offices.	analytics; predictive capability is introduced.
People, roles, and competencies	Roles are undefined; support is provided by whoever is available; skills are uneven; the function depends heavily on individuals.	Local support roles are defined within offices; training is informal and specific to each office.	Common role definitions and competency expectations apply across offices, with standardized onboarding and training.	Capacity is planned across offices with cross-office coverage; skills are assessed against a defined competency framework.	Competency is continuously developed; talent is shared flexibly across offices; career pathways are aligned enterprise wide.
Governance, metrics, and measurement	No service targets; performance is not measured; there is no accountability structure.	Some metrics are tracked locally but definitions differ between offices; there are no shared targets.	Common service level targets and metric definitions are established across offices with regular reporting.	Measurement is consolidated into comparable cross-office reporting; service levels are actively managed and a governance forum oversees performance.	Metrics drive continuous improvement; offices are benchmarked against one another; governance anticipates demand and risk.
Knowledge management and communication	Knowledge resides in individuals; there is no shared documentation; offices rarely communicate.	Some local knowledge bases exist; sharing is limited to within an office; cross-office communication is ad hoc.	A shared knowledge base is accessible across offices and defined channels connect support teams in different offices.	Knowledge is actively curated and reused across offices; collaboration is structured and lessons learned are shared systematically.	Knowledge management is proactive and continuously improved; communities of practice span offices and reuse is measured.
Service consistency and user experience	Service quality depends on the office and the individual; the user experience is inconsistent and unpredictable.	Service is relatively consistent within an office but varies noticeably between offices.	Users receive comparable service regardless of office, with consistent intake channels and expectations.	Consistency is monitored through satisfaction measurement and the experience is managed to common standards across offices.	The user experience is continuously improved using feedback and analytics; consistent high quality service is sustained enterprise wide.

V. THE ASSESSMENT METHOD

The model is applied through a structured assessment that yields a profile of current maturity, a comparison with a desired target, and a prioritized improvement plan. This section specifies the method in five parts: the procedure, the gathering of evidence and the assignment of levels, the aggregation of office level results into an organizational profile, gap analysis and target setting, and the use of the results.

5.1 Assessment Procedure

The assessment proceeds through a defined sequence of steps that can be carried out by an internal team or with external facilitation.

1. Scope. Identify the offices and support functions to be assessed and the period under consideration, and appoint assessors with sufficient knowledge of each office.
2. Gather evidence. For each dimension, collect evidence from each office, including process documentation, tool inventories and configurations, role descriptions and training records, metric definitions and reports, knowledge resources, and user satisfaction data.
3. Assess each office. For every dimension, place each office at the level whose description in the maturity matrix best matches its state, recording the evidence relied upon.
4. Aggregate. Determine the organizational level for each dimension using the cross-office aggregation rule described below, and assemble the dimension levels into an organizational profile.
5. Set targets and analyze gaps. Select a target level for each dimension and identify the gap between current and target as the basis for planning.
6. Plan and schedule improvement. Define improvement actions, sequence them according to dependencies, and assign ownership and timing.
7. Reassess periodically. Repeat the assessment at intervals to track progress and to keep the profile current as the organization changes.

5.2 Evidence and the Assignment of Levels

Levels are assigned on the basis of evidence rather than impression. For each dimension and office, the assessor selects the highest level whose description is fully supported by the available evidence; a level is not awarded on the strength of intention or partial implementation. Evidence is of three broad kinds: documentary evidence, such as a published process catalogue or a tool configuration standard; observational evidence, such as the actual categories and priorities in use in the live tool; and outcome evidence, such as consolidated reports or satisfaction results. Where evidence is mixed, the assessor records the office at the highest level fully met and notes the partial achievement of the next level, which is useful for planning. Treating the levels as cumulative, so that each presupposes the achievement of those below it, keeps assessment disciplined and comparable. The structured assessment of enterprise systems, including security-critical infrastructure, is an established practice from which this evidence-based discipline draws (Ladapo et al., 2018).

5.3 Aggregating Across Offices

The aggregation of office level results into an organizational level is where the cross-office consistency principle takes practical effect, and it is the step that distinguishes this method from a conventional capability assessment. The governing rule is that the organizational level for a dimension is the level of common, shared practice across offices, not the level of the most capable office. In particular, the organization can be placed at level three or above in a dimension only when a common arrangement is genuinely in force across all offices in scope. Where offices differ materially, the dimension is held at level two, however capable individual offices may be, because divergence is precisely the condition that level two describes and that standardization is meant to overcome.

It is useful to record, alongside the organizational level, the distribution of office level results and a simple measure of their dispersion, such as the range between the highest and lowest office. This dispersion is itself a diagnostic quantity: a dimension in which offices span several levels signals a larger standardization gap and a greater coordination effort than one in which offices cluster closely, even when both are held at level two by the aggregation rule. Recording dispersion therefore preserves information that a single level would otherwise discard and helps in prioritizing effort.

5.4 Gap Analysis and Target Setting

A target level is selected for each dimension in light of the organization's strategy, its constraints, and the cost

of advancement. Targets need not be uniform: an organization may reasonably aim for level four in process standardization and governance, where the benefits of consolidation are greatest, while accepting level three in others. The gap between current and target levels, considered together with the dispersion across offices, defines the work to be done. Because the dimensions are interdependent, gap analysis should respect their dependencies: gains in governance and service consistency are difficult to secure without prior gains in process standardization and tooling, since consolidated measurement and a common experience presuppose common process and common tools.

5.5 Using the Results

The organizational profile, the office level distributions, and the gap analysis together form a concise and comparable summary of standardization that supports several uses. It gives senior management an evidence-based view of where the support function stands and what advancement would require, supporting investment decisions. It gives the support leadership a shared language for discussing improvement with offices that may be attached to their local practices. And, when repeated over time, it provides a measure of progress that is meaningful precisely because it is anchored in common definitions. The profile is most useful when it is communicated as a profile, preserving the differences between dimensions, rather than collapsed into a single figure that obscures them.

5.6 Reliability and Optional Weighting

Because levels are assigned by judgment against textual descriptors, the reliability of the assessment deserves attention. Three practices improve it. The first is the disciplined use of evidence, so that a level is awarded only where the corresponding indicators are demonstrably met rather than asserted. The second is the involvement of more than one assessor, ideally including knowledge of each office, so that assignments can be discussed and reconciled where they differ; a divergence between assessors is itself informative and usually points to ambiguous evidence that should be resolved. The third is the retention of a brief record of the evidence behind each assignment, which makes the assessment auditable and allows later reassessments to be compared on a consistent basis.

The model deliberately produces a profile rather than a single composite score, because collapsing the dimensions into one number discards the information that makes the profile useful for planning. Where an organization nonetheless wishes to summarize its position, for example for high level reporting, it may apply weights to the dimensions to reflect their importance in its context and compute a weighted indication, while continuing to use the full profile for actual planning. Any such weighting should be made explicit and applied consistently over time so that successive assessments remain comparable. Weighting is offered here as an option rather than a recommendation, since the unweighted profile is sufficient for the model's primary purpose and avoids the loss of information that any single figure entails.

VI. ILLUSTRATIVE APPLICATION

To demonstrate the method, this section works through a hypothetical organization. The scenario is illustrative only and is not drawn from empirical data; it is constructed to show how the method is applied and how it surfaces standardization gaps, not to provide evidence of the model's validity.

6.1 The Scenario

Consider a professional services firm, here called the example organization, with three offices located in different countries, referred to as offices A, B, and C. The firm has grown partly by acquisition, and the three offices retain much of their inherited practice. Office A, the original headquarters, is the largest and most developed: it uses a recognized service management tool, maintains documented procedures, and reports on a handful of metrics. Office B, acquired more recently, uses a different tool and has its own documented but distinct procedures. Office C, the smallest, handles support informally, with requests arriving by email and by personal approach and with little documentation. Each office resolves incidents and fulfills requests for its own users with reasonable reliability, and users within each office are broadly satisfied; but the three offices differ markedly from one another in tools, procedures, metrics, and knowledge sharing.

6.2 Assessment by Dimension

Applying the matrix to each office produces the office level results shown in Table 3. Office A is generally at level two and, in a few respects, approaches the practices associated with higher levels within its own boundaries, but its arrangements are not shared with B and C. Office B is at level two in most dimensions, with documented but distinct practice. Office C is largely at level one, its support being reactive and undocumented. Crucially, in no dimension is there a common arrangement across all three offices, and so, by the aggregation rule, the organization as a whole does not reach level three in any dimension.

Table 3. Illustrative office level assessment (hypothetical).

Dimension	Office A	Office B	Office C	Organization
Process standardization	2	2	1	2 (divergent)
Tooling and technology	2	2	1	2 (divergent)
People, roles, competencies	2	2	1	2 (divergent)
Governance and measurement	2	2	1	2 (divergent)
Knowledge and communication	2	1	1	2 (divergent)
Service consistency	2	2	1	2 (divergent)

The assessment yields an organizational profile that sits uniformly at level two, with a dispersion of one to two levels between offices in every dimension. The central insight the method surfaces is one that a conventional single site assessment would miss: although each office is individually competent, the organization is not standardized, because nothing is common across the three offices. The firm is, in effect, uniformly stuck at the local stage, and its dispersion shows that office C in particular lags the others and will require the most attention.

6.3 Gap Analysis and Roadmap

Suppose the firm sets a target of level three across all dimensions within an initial horizon, with level four in process standardization and governance to follow. The gap analysis, shown in Table 4, then identifies the actions required and an order that respects the dependencies among dimensions. Because common process and common tooling are foundational, they are addressed first; consolidated governance and a managed service experience follow once the foundations are in place.

Table 4. Illustrative gap analysis and phased roadmap (hypothetical).

Dimension	Current	Target	Indicative actions and sequence
Process standardization	2	3	Phase 1: agree a common process catalogue for incident, request, and problem handling; align categories, priorities, and escalation across A, B, and C.
Tooling and technology	2	3	Phase 1: select and adopt a single shared service management platform with common configuration; migrate offices B and C.
People, roles, competencies	2	3	Phase 2: define common roles and competency expectations; standardize onboarding and training across offices.
Knowledge and communication	2	3	Phase 2: establish a shared knowledge base and defined channels connecting the three support teams.
Governance and measurement	2	3	Phase 3: define common targets and metric definitions; consolidate reporting once the shared tool is in place.
Service consistency	2	3	Phase 3: align intake channels and expectations; begin satisfaction measurement to common standards.

The roadmap illustrates how the model translates an assessment into action. It does not prescribe a single correct path, since the appropriate targets and sequence depend on the organization's circumstances, but it shows how the dependencies among dimensions shape a sensible order of work and how the dispersion across offices, here concentrated in office C, indicates where effort should be focused.

6.4 Interpretation and Reassessment

Two features of the result deserve emphasis. The first is that the organizational profile sits at level two in every dimension not because any office is incapable but because nothing is yet common across the three offices; the model therefore directs attention to the right problem, which is alignment rather than local competence. A capability assessment applied to office A alone might have reported a flattering picture and obscured the enterprise-wide gap. The second is that the dispersion recorded alongside the level carries planning information that the level alone would lose: office C trails the others in every dimension, so an organization acting on this assessment would invest disproportionately in bringing C toward the practices of A and B as the common arrangements are defined, rather than treating the three offices as if they were equally placed.

A reassessment conducted after the first phases of the roadmap would be expected to show movement. Once a common process catalogue and a shared tool were genuinely adopted across all three offices, process standardization and tooling would reach level three, since a common arrangement would then be in force; and with those foundations established, the dependent dimensions of governance and service consistency could follow as consolidated measurement and a managed experience became feasible. Tracking the profile across successive assessments in this way turns the model into an instrument of progress rather than a one time diagnosis, and because the assessments rest on common definitions, the comparison between them is meaningful.

VII. TRANSITION GUIDANCE

Advancing through the levels follows recognizable patterns, and articulating them helps organizations plan realistic steps. The guidance below describes what each transition typically requires across the dimensions. It is general, since the detail depends on the dimension and the organization, but the shape of each transition is consistent.

7.1 From Initial to Managed (level one to level two)

The first transition is about establishing order within offices. It involves documenting procedures, adopting a tool to record and track work where none exists, defining who is responsible for support, and beginning to record basic information about volume and outcomes. At this stage the goal is not yet consistency across offices but the elimination of pure improvisation, so that each office has a managed, if local, way of working. Organizations whose smallest or newest offices sit at level one, as office C did in the illustration, will spend much of their early effort here.

7.2 From Managed to Standardized (level two to level three)

The second transition is the pivotal one, because it is where standardization actually occurs. It requires the offices to give up some of their local practice in favour of common arrangements: a common process catalogue, a shared tool with common configuration, common role definitions, common metric definitions, and shared knowledge. This transition is as much a matter of coordination and change management as of technical implementation, since it asks offices to align, and it is where the tension between local responsiveness and global consistency is most acute. Success typically depends on clear sponsorship, genuine involvement of the offices in designing the common arrangements, and attention to the local conditions, such as language and regulation, that legitimately vary.

7.3 From Standardized to Integrated (level three to level four)

The third transition builds management and measurement on top of the standardized foundation. With common process and tooling in place, the organization can consolidate reporting, compare offices on a like for like basis, track and address deviations, plan capacity across offices, and establish a governance forum that oversees performance. This transition turns standardization from an achievement into a managed and sustained condition, and it is

feasible only once the common foundations of level three exist, because consolidated measurement presupposes common definitions.

7.4 From Integrated to Optimizing (level four to level five)

The final transition is about making improvement continuous and proactive. The organization uses its consolidated data and user feedback to refine processes, extend automation and self-service where analysis shows benefit, including automated incident response architectures that correlate events across the estate (Mbonu, Iwuanyanwu, et al., 2019), measure and increase the reuse of knowledge, and benchmark offices against one another to spread good practice. At this level standardization is mature: it is not only achieved and sustained but continuously advanced, and consistent high quality service across offices is a matter of routine rather than effort.

7.5 Enablers and Barriers

Across all four transitions, certain enablers and barriers recur, and recognizing them helps an organization plan realistically. Table 5 summarizes the typical focus of each transition together with the enablers that tend to support it and the barriers that tend to impede it. The pivotal second transition, to common practice, is generally the most demanding, because it asks offices to align and so engages the tension between local responsiveness and global consistency most directly.

Table 5. Typical focus, enablers, and barriers for each transition.

Transition	Typical focus	Enablers	Barriers
1 to 2	Establishing managed practice within each office.	Basic documentation, adoption of a tracking tool, defined responsibility.	Reliance on individuals, low priority for documentation, limited time.
2 to 3	Adopting common practice across offices.	Clear sponsorship, office involvement in design, change management.	Attachment to local practice, coordination cost, legitimate local variation.
3 to 4	Integrating and measuring across offices.	Shared tooling, common metric definitions, a governance forum.	Inconsistent data, weak ownership of measurement, reporting effort.
4 to 5	Continuous, proactive improvement.	Consolidated data, feedback channels, analytics, benchmarking.	Complacency once standardized, scarce analytical capacity.

VIII. COMPARISON WITH ESTABLISHED FRAMEWORKS

It is useful to state precisely how the model relates to the established frameworks reviewed earlier, both to position the contribution and to reassure practitioners that the model complements rather than displaces their existing investments. The frameworks differ in scope and purpose, and the present model occupies a niche that they leave open.

The CMMI for Services model and the process assessment approaches associated with the Control Objectives for Information and Related Technologies and with the ISO/IEC 15504 family assess the capability of processes in general (CMMI Product Team, 2010; ISACA, 2012; ISO/IEC, 2004). They are powerful and broad, but their breadth is also their limitation for the present purpose: they do not foreground the consistency of practice across offices, and an organization can rate well on them while remaining inconsistent across its locations. The ISO/IEC 20000 standard and assessments of IT Infrastructure Library adoption describe what good service management comprises and how fully it has been adopted (ISO/IEC, 2011; AXELOS, 2011; Tan et al., 2009), but adoption can be uneven across offices in a way these instruments do not specifically capture. The present model is narrower and more focused: it takes the support function as its subject, the multi-office context as its setting, and cross-office consistency as the property it measures. It is designed to be used alongside the broader frameworks,

expressing in maturity terms how consistently their practices are adopted across an organization's offices, and its descriptors are deliberately compatible with them so that the two can be applied together.

Table 6. Attributes of established frameworks and the proposed model.

Framework	Subject	Scope	Treats cross-office consistency	Primary use
CMMI for Services	Service processes	Broad	No	Capability appraisal
COBIT assessment	Governance and management	Enterprise	No	Governance rating
ISO/IEC 15504 (SPICE)	Processes generally	Generic	No	Process assessment
ISO/IEC 20000	Service management system	Broad	No	Conformance reference
ITIL adoption gauges	Service management practice	Broad	No	Adoption gauge
Proposed model	IT support function	Focused	Yes	Standardization assessment

IX. DISCUSSION

9.1 Theoretical Contributions

The principal theoretical contribution of this work is the extension of maturity model thinking to the specific and underserved problem of standardizing IT support across geographically distributed offices, with cross-office consistency rather than single office capability as the explicit object of maturity. This reframing draws on the coordination perspective, in which distributing work multiplies the dependencies that standardization must manage (Malone & Crowston, 1994), and it has a concrete effect on assessment: an organization of individually competent yet divergent offices is correctly judged immature with respect to standardization, a judgment that conventional assessment would miss. The model also contributes a concrete artifact, the six by five maturity matrix together with its assessment method, that operationalizes this reframing and that other researchers can examine, apply, and refine.

9.2 Practical Implications

For practice, the model gives the IT leaders of multi-office organizations a structured instrument for understanding where their support function stands, communicating that position to stakeholders, and planning improvement in a sequenced and defensible way. The aggregation rule and the recording of dispersion give them a vocabulary for a problem they often sense but struggle to articulate, namely that competent offices can nonetheless add up to an unstandardized organization. Because the descriptors align with recognized service management practice, the model complements rather than competes with existing investments in frameworks such as the IT Infrastructure Library and the ISO/IEC 20000 standard (AXELOS, 2011; ISO/IEC, 2011), and the transition guidance lowers the effort required to put it to use.

9.3 Limitations

Several limitations should be acknowledged. The model has been developed from the literature and from established practice but has not yet been subjected to empirical evaluation, so its dimensions, levels, and descriptors represent a reasoned design rather than a tested instrument. The six dimensions, although chosen to cover the salient aspects of support standardization, may require refinement or extension for particular industries or regulatory contexts. The five level progression, inherited from established maturity model structure, imposes a largely linear view of development that may not capture every organization's path, and the aggregation rule, while deliberately strict in its treatment of cross-office

variation, simplifies a distribution of office results into a single organizational level, which is why the recording of dispersion is recommended alongside it. Finally, the illustrative application is hypothetical and is intended only to demonstrate the method, not to provide evidence of validity.

9.4 Future Work

These limitations define a clear agenda for future research. The most important next step is empirical evaluation, beginning with expert review by experienced service managers to refine the dimensions, descriptors, and instrument, and proceeding to application in real multi-office organizations to assess the model's usefulness, usability, and accuracy, consistent with the design science principle that an artifact must be tested against the problem it was built to solve (Hevner et al., 2004; Mettler, 2011). Further work could develop weighting and scoring refinements, examine how the model performs across organizations of different sizes and sectors, study the relationship between higher maturity and outcomes such as cost, service quality, and user satisfaction, and investigate how the transition between levels is best managed in practice given the coordination challenges that distribution imposes.

9.5 Boundary Conditions and Generalizability

The model is intended for organizations that deliver internal IT support from more than one office and that have reason to value consistency across those offices. Its usefulness is greatest where offices are numerous, where they have grown apart through acquisition or independent evolution, and where the costs of fragmentation are material. It is correspondingly less pertinent to organizations that operate from a single site, for which cross-office consistency is not at issue, and to those that have deliberately chosen a federated model in which offices are meant to differ. Within its intended domain the model is general, since its dimensions and levels are expressed without dependence on any particular industry, tool, or framework, but this generality also means that the descriptors will benefit from tailoring to local terminology and to sector specific requirements, such as the regulatory obligations that bear on support in some industries and the data protection regimes that differ across the jurisdictions in which offices operate (Mbonu, Aliliele, et al., 2019). The principle at the heart of the model, that consistency across units rather than the capability of any single unit is the proper object of maturity where standardization is the goal, is moreover not confined to IT support; it may extend to other shared functions delivered across distributed offices, a possibility that future work could explore.

X. CONCLUSION

Organizations that deliver IT support from many offices spread across different locations frequently find that support drifts into divergent local practices, with consequences for cost, service quality, and governance. Standardizing support across such offices is a staged capability rather than a single decision, and assessing and advancing it calls for a purpose-built instrument. This paper has developed such a model, comprising six dimensions and five levels expressed as a maturity matrix, together with an assessment method that specifies evidence, scoring, cross-office aggregation, gap analysis, and target setting, and transition guidance for advancing between levels. The defining feature of the model is its treatment of consistency between offices, rather than the capability of any single office, as the quantity to be matured, so that an organization of uniformly competent but divergent offices is recognized as not yet standardized. An extended hypothetical application has shown how the method surfaces this condition and translates it into a sequenced improvement plan, and a comparison with established frameworks has situated the contribution as a focused complement to broader instruments. By placing the multi-office, geographically distributed context at the center of attention, the model fills a gap that general purpose maturity models and service management frameworks leave open, offering practitioners a repeatable means of advancing standardization and providing researchers with an artifact ready for empirical evaluation.

REFERENCES

[1] AXELOS. (2011). *ITIL Service Operation*. The Stationery Office.

[2] Becker, J., Knackstedt, R., & Poppelreuss, J. (2009). Developing maturity models for IT management: A procedure model and its application. *Business and Information Systems Engineering*, 1(3), 213–222.

[3] Carmel, E., & Agarwal, R. (2001). Tactical approaches for alleviating distance in global software development. *IEEE Software*, 18(2), 22–29.

[4] CMMI Product Team. (2010). *CMMI for Services, Version 1.3* (Technical Report CMU/SEI-2010-TR-034). Software Engineering Institute, Carnegie Mellon University.

[5] De Bruin, T., Rosemann, M., Freeze, R., & Kaulkarni, U. (2005). Understanding the main phases of developing a maturity assessment model. *Proceedings of the 16th Australasian Conference on Information Systems (ACIS)*, Sydney, Australia.

[6] Dosunmu, A. A., & Ogundele, [initials]. (2019). Security audit and enterprise risk assessment frameworks for resilient information systems. *[Journal title, volume(issue), pages to be confirmed]*.

[7] Fraser, P., Moultrie, J., & Gregory, M. (2002). The use of maturity models and grids as a tool in assessing product development capability. *Proceedings of the IEEE International Engineering Management Conference*, 244–249.

[8] Galup, S. D., Dattero, R., Quan, J. J., & Conger, S. (2009). An overview of IT service management. *Communications of the ACM*, 52(5), 124–127.

[9] Herbsleb, J. D., & Moitra, D. (2001). Global software development. *IEEE Software*, 18(2), 16–20.

[10] Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 28(1), 75–105.

[11] Iden, J., & Eikebrokk, T. R. (2013). Implementing IT service management: A systematic literature review. *International Journal of Information Management*, 33(3), 512–523.

[12] ISACA. (2012). *COBIT 5: A Business Framework for the Governance and Management of Enterprise IT*. ISACA.

[13] ISO/IEC. (2004). *ISO/IEC 15504 Information Technology, Process Assessment*. International Organization for Standardization.

[14] ISO/IEC. (2011). *ISO/IEC 20000-1:2011 Information Technology, Service Management, Part 1: Service Management System Requirements*. International Organization for Standardization.

[15] Ladapo, O. O., Dosunmu, A. A., Jooda, D., & Abolaji, T. O. (2018). Offline assessment of security-critical systems (Microsoft Active Directory). *[Journal title, volume(issue), pages to be confirmed]*.

[16] Ladapo, O. O., Jooda, D., Dosunmu, A. A., & Abolaji, T. O. (2019). Implementation of Active Directory for efficient management of enterprise networks. *[Journal title, volume(issue), pages to be confirmed]*.

[17] Maier, A. M., Moultrie, J., & Clarkson, P. J. (2012). Assessing organizational capabilities: Reviewing and guiding the development of maturity grids. *IEEE Transactions on Engineering Management*, 59(1), 138–159.

[18] Malone, T. W., & Crowston, K. (1994). The interdisciplinary study of coordination. *ACM Computing Surveys*, 26(1), 87–119.

[19] March, S. T., & Smith, G. F. (1995). Design and natural science research on information technology. *Decision Support Systems*, 15(4), 251–266.

[20] Marrone, M., & Kolbe, L. M. (2011). Impact of IT service management frameworks on the IT organization. *Business and Information Systems Engineering*, 3(1), 5–18.

[21] Mbonu, I. S., Aliliele, C., Iwuanyanwu, U., & Oluoha, [initial]. (2018). Legal and ethical risk modeling in enterprise data protection governance. *[Journal title, volume(issue), pages to be confirmed]*.

[22] Mbonu, I. S., Aliliele, C., Uzoka, E., & Oluoha, [initial]. (2019). Comparative data protection regulations and secure cloud implementation across jurisdictions. *[Journal title, volume(issue), pages to be confirmed]*.

[23] Mbonu, I. S., Iwuanyanwu, U., Uzoka, E., & Oluoha, [initial]. (2019). Enterprise log analytics and automated incident response architectures (SIEM). *[Journal title, volume(issue), pages to be confirmed]*.

[24] Mettler, T. (2011). Maturity assessment models: A design science research approach. *International Journal of Society Systems Science*, 3(1/2), 81–98.

[25] Paulk, M. C., Curtis, B., Chrissis, M. B., & Weber, C. V. (1993). Capability maturity model, version 1.1. *IEEE Software*, 10(4), 18–27.

[26] Peffers, K., Tuunanen, T., Rothenberg, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of Management Information Systems*, 24(3), 45–77.

[27] Pollard, C., & Cater-Steel, A. (2009). Justifications, strategies, and critical success factors in successful ITIL implementations in U.S. and Australian companies: An exploratory study. *Information Systems Management*, 26(2), 164–175.

[28] Roglinger, M., Poppelbuss, J., & Becker, J. (2012). Maturity models in business process management. *Business Process Management Journal*, 18(2), 328–346.

[29] Tan, W. G., Cater-Steel, A., & Toleman, M. (2009). Implementing IT service management: A case study focussing on critical success factors. *Journal of Computer Information Systems*, 50(2), 1–12.

[30] Wendler, R. (2012). The maturity of maturity model research: A systematic mapping study. *Information and Software Technology*, 54(12), 1317–1339.