CHAPTER 7

A Real Time Analysis of Project Management Methodologies in Different Sectors

Lay Shah, Lawanya Makde**, Vini Gupta*** and Avinash Bagul****

ABSTRACT

In today's competitive project management environment, it is crucial to study the project management methodologies (PMM's) tailored to suit the project environment for different industries. To assess each PMM's practical applicability, information was gathered through an online survey of project managers from different industries. By comparing PMM's such as PMBOK, Agile-SCRUM, Lean Construction, ISO 21500, and hybrid approach across different industries, the best methodology applicable for the specific industry was identified. Such analysis can help provide more flexibility and control to the project managers working in varied environments. The findings reveal that the hybrid method is the most flexible and successful in diverse environment projects through integration of the merits of the conventional and agile practices. With the help of these insights project managers can choose project management methods tailored to suit specific work environment resulting in better resource usage, management of risk proactively and take decision based on facts, enhancing the project delivery and overall organizational performance.

Keywords: Project Management Methodologies (PMM), Agile-SCRUM, Hybrid Approach, Comparative Analysis.

1.0 Introduction

The art of Project Management (PM) has a history dating back to pre-history as demonstrated by works of wonders of engineering like the Great Pyramid of Giza and the Great Wall of China.

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According to the records of past, these activities employed the initial management forms like certain existing hierarchies of oversight and stratified workers that were the forerunners of the asset allocation in contemporary times. Nevertheless, the origin of PM as a scientific field of study is said to be the invention of Gantt chart by Henry Gantt in 1917, a tool that contributed to the development of formal planning. During mid-20th century there were sophisticated military projects during systemization stage such as the Polaris project by the U.S Navy. Systemization stage called for strict quantitative mechanisms like the Critical Path Method (CPM), Program Evaluation Review Technique (PERT) and Work Breakdown Structure (WBS) and lined PM as a separate discipline. These practices were later enumerated in professional organizations like the Project Management Institute (PMI) and the International Project Management Association (IPMA). In 1987, Project Management Body of Knowledge (PMBOK) Guide was published, and together with ISO standards (10006 and 21500), this gave the industry an international, process centric outline.

The inflexibility of the traditional plan-focused models was made even more evident as complexities of various projects especially in the IT and infrastructure sectors increased. This required a paradigm shift on Agile methodologies- Scrum and Extreme Programming (XP)- which focuses on the iterative development, collaboration with stakeholders and high adaptability. Therefore, modern organizations are moving towards embracing hybrid structures, which combine the structural governing force provided by PMBOK with the dynamism of Agile to meet the dynamic needs. At the same time, project monitoring and control has been revolutionized by the digital revolution. The cooperation of real-time analytics and interactive dashboards has facilitated the use of data to monitor. Notwithstanding these developments, successful implementation still poses a challenge and is usually marred by the inconsistency in the data, cost of acquisition, as well as a failure to align the company strategy with operational measurements.

2.0 Literature Review

2.1 Characteristics of Project Life Cycles

Table 1: Characteristics of Four Categories of Life Cycle

Approach	Requirements	Activities	Delivery	Goal
Predictive	Fixed	Performed once for the entire project	Single delivery	Manage cost
Iterative	Dynamic	Repeated until correct	Single delivery	Correctness of solution
Incremental	Dynamic	Performed once for a given increment	Frequent smaller deliveries	Speed
Agile	Dynamic	Repeated until correct	Frequent small deliveries	Customer value via frequent deliveries and feedback

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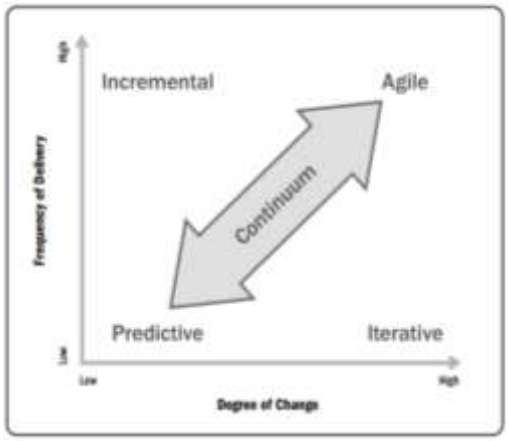
Figure 1: The Continuum of Life Cycles



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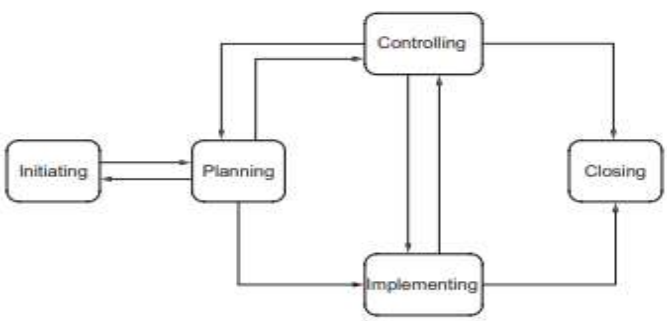
2.2 Guideline on Project Management, ISO 21500: 2012

ISO 21500 has knowledge areas rather than subjects used in place of those of PMBOK and fewer processes, 39, replacing the 49 processes, but is functionally equivalent. The standard is not prescriptive but is descriptive, which allows flexibility in its implementation. (Binder et al., 2014)

Figure 2: Process Groups Interactions



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2.3 PMBOK Guide – 6th Edition

The 6th version recognizes five process groups, ten knowledge areas, and 49 processes. The processes are characterized by the inputs, tools, and techniques, as well as outputs. It is most appropriate in large and complex projects and regulation-driven projects. (Čabarkapa, 2019).

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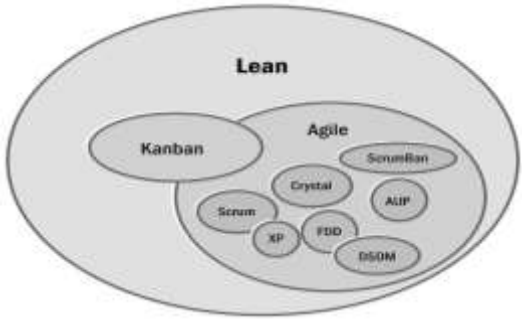
2.4 Agile approaches

Figure 3: Agile is a Blanket Term for Many Approaches



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Agile is a set of frameworks and practices in line with the Agile Manifesto. Agile falls in the field of the Lean philosophy and focuses more on working solutions rather than documentation. (Binder, et al., 2014)

Table 2: Overview of Agile and Lean Methodologies

Method	Description
Scrum	Most popular Agile method; uses fixed-length sprints, roles (Scrum Master, Product Owner), and ceremonies (Daily Standups, Reviews).
XP (Extreme Programming)	Focuses on technical excellence with practices like test-first, pair programming, continuous integration.
Crystal	Emphasizes people over processes and tailor's practices to project size and criticality.
FDD (Feature-Driven Development)	Model-driven, iterative method focused on building and designing features.
DSDM (Dynamic Systems Development Method)	Emphasizes full project lifecycle and active user involvement.
AUP (Agile Unified Process)	A simplified version of Rational Unified Process tailored to Agile values.
Scrum-Ban	Hybrid of Scrum and Kanban, combining iterative planning with continuous flow.
Kanban	Although shown slightly outside core Agile, it's a Lean method emphasizing visual workflow, limiting WIP (Work in Progress), and improving flow. Often used with Agile for visual project tracking.

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2.5 Lean project management

Lean project management maximizes the value and reduction of waste via continuous improvement. Ballard and Howell visualize projects as transient production systems, which are sustained by stable systems. Koskela states that development of production systems and their design need to be a subject of project management. (Ballard and Howell, 2002)

2.6 Scrum methodology

Scrum is an Agile model which is built on iterative and incremental development suited for dynamic requirements. Scrum has short sprints, role definitions (Product Owner, Scrum Master, Development Team), and formal events to facilitate empirical control of the process and constant improvement. (Sachdeva, 2016)

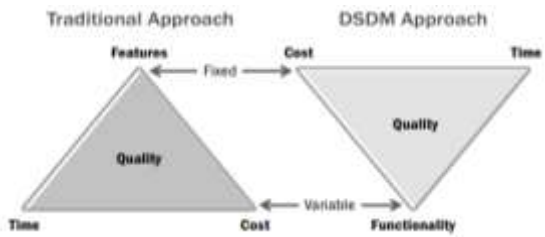
2.7 Extreme Programming (XP)

Extreme programing (XP) is based on the short development cycles and practices like the pair programming, test-first development, continuous integration and refactoring. XP encourages customer collaboration, shared code ownership, and a sustainable rate of work, which is effective in producing the high-quality software development with fluctuating demands. (Yasvi and Maleeha, 2019)

2.8 Dynamic Systems Development Method (DSDM)

DSDM is an organized Agile model that focuses on constrained delivery. Time, cost, and quality are fixed at an early stage whereas the scope is changed by prioritization. (Zafar et al., 2018)

Figure 4: DSDM Approach to Constraint-Driven Agility



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3.0 Research Methodology

Currently landscape of PM within the infrastructure and real estate sectors is defined by the demand for both control and adaptability increasing. Traditional methodologies such

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as the Waterfall model or PRINCE2 have been the traditional foundation for construction projects in the past because of their focus on planning in sequence and strict regulatory compliance. The inherent limitations of these static frameworks in engineering projects are because of integrating technological framework and volatile market conditions. Conversely, Agile methodologies, while proving to be extremely effective in software development settings with emergent requirements, are often inadequate for providing the necessary structural governance for managing a large-scale capital project. This difference calls for "Hybrid" approach comprising of predictive structured control and adaptive agility.

Object of this research is to measure the appropriate PM methodology in different industrial sectors, using quantitative approach this research examines the common project management practices by a structured survey and gather information related to dimensions of agility, compliance, control and rigidity. To validate the hypothesis that hybrid method provides best fit for multifaceted challenges this research check for the methodology suitability.

3.1 Research philosophy and design

The positivist philosophy that the social phenomena such as project management maturity and efficacy of methodologies can be objectively measured by the technique of systematic observation and statistical analysis. This epistemological stance allows us to submit testable hypotheses regarding the links between the project characteristics such as, stability of the requirements, interaction with the different stakeholders and the method adequacy. The research initially accurately describes the present state of the project management practices in the sample population, segmented response based on industries to illustrate the sector specific trends. It then explores how different dimensions of project management like "Organizational Agility" and "Fixed Requirements" interlink and load onto latent factors that signify theoretical methodologies. This two-pronged approach describes what is happening and explains the preferences that are behind the choice of certain methodologies.

3.2 Population and sampling

The target population includes project management personnel, engineers and people working in project management who are actively involved in project execution in various sectors. The sampling frame was stratified to ensure representation from high impact industries (Construction and Infrastructure, Information Technology (IT), Banking and Finance, Manufacturing, Healthcare, and Research and Development (R&D).

The final data set contains valid responses from N=66 participants. Although this is a modest sample size, strict statistical validation methods, such as the Kaiser-Meyer-Olkin

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(KMO) index of sampling adequacy and Bartlett's Test of Sphericity, were used to find that the data is adequate for multivariate analysis. The respondents represented a mix of roles ranging from site engineer to portfolio manager and therefore offered a broad perspective on project management practices. The segmentation of the industries enables a comparative analysis, making it possible to separate sector-specific constraints (e.g. regulatory compliance in banking, or physical constraints in construction) and universal tendencies towards hybridization.

3.3 Instrumentation and response coding

The primary data collection comprising of 35 core questions (Q1-Q35) designed to understand dynamic environment from the various project management methodologies. Items were measured using a five-point Likert scale, numerically coded as follows:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

The survey design partitions these 35 items into seven different sections (Sections A through G), which address a different dimension for the execution of a project. These dimensions form the independent variables for the analysis and are critical for the calculation of "Dimension Scores" which form the basis of the Methodology Orientation Matrix.

3.4 The methodology orientation matrix

A key part of this research is to compute the dimension scores to specific PM methodologies. This matrix helps to interpret the results of a survey and identify the best methodology to use for a particular respondent or industry group.

Table 3: Methodology Orientation Matrix

Dimension Pattern	**Indicates Suitability For**
High Score A + High Score B + High Score E	**Waterfall** (Predictive, Sequential, Rigid)
High Score C + High Score D + High Score F	**Agile** (Adaptive, Iterative, Customer-Centric)
High Score E + High Score G (specifically Q31, Q34)	**Six Sigma** (Process Control, Quality Focus)
High Score F + Q33	**Lean** (Efficiency, Waste Reduction)
Mixed High Scores Across Sections A - F	**Hybrid** (Balanced, Adaptive-Structured)

Source: Created by authors

The central thesis of this research is based on the definition "Hybrid": a pattern of mixed high scores on opposite dimensions (i.e. high documentation and high agility). This pattern suggest that governance requires Waterfall along with the Agile in contemporary projects rather than either of the approach in isolation.

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3.5 Methodology index scores

Index Scores gives the quantitative suitability resulting from an average of weighted score to each methodology. These indices make it possible to directly compare methodologies within each of the industry sectors on a numerical basis.

Agile Suitability Index: Calculated as the average of scores from Innovation (Q8, Q9), Organizational Agility (Q11, Q12, Q14, Q15), Customer Interaction (Q16-Q20), and Flexibility (Q26-Q30).

Interpretation: Index 4.0 = Highly Suitable; 3.0 - 3.9 = Moderately Suitable; < 3.0 = Low Suitability.

Waterfall / PRINCE2 Suitability Index: Calculated using Fixed Requirements (Q1-Q5), Sequential Processes (Q6, Q7, Q10), Risk (Q21-Q25), and Q31.

Lean / Six Sigma Suitability Index: Calculated using specific waste-reduction and quality-control items (e.g., Q28, Q29, Q33 for Lean; Q22, Q24, Q25, Q34 for Six Sigma).

4.0 Data Analysis

4.1 Overview of the data set

The analysis was conducted on a dataset of 66 respondents (Analysis N = 66). The dataset comprises 35 ordinal variables (VAR00001 through VAR00035) corresponding to the survey items. Preliminary data screening confirmed the integrity of the dataset, with no missing values reported for the variables included in the factor analysis. This sample size, while compact, is statistically sufficient for exploratory factor analysis given the strength of the correlations observed.

4.2 Data plan and analysis

The analysis of the data goes through four rigorous stages with the help of the software called as the Statistical Package for Social Analysis (SPSS): The computation of means and the standard deviations for all the 35 variables in order to get to know the central tendencies of the respondents. This procedure helps to recognize the most prevalent practice. Subsequently, the suitability of the data for multivariate analysis is checked by the KMO measure of sampling adequacy and bartlett's test of sphericity. Principal Axis Factoring (PAF) using Varimax rotation is then used to determine the latent structures in the data. This step is very important for construct validity, to ensure that the items that are supposed to measure "Agility" load onto one statistical factor (that is, separate from "Structure").

Finally, the data are aggregated by industry to compare the Methodology Index Scores (Agile vs. Waterfall vs. Hybrid) and triangulate these findings with the qualitative literature." This framework suggest that conclusion drawn regarding the Hybrid approach are

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not only theoretical but backed up with evidence linking survey data with statistical factors and eventually with standards of industries.

4.3 Descriptive statistical analysis

The descriptive statistics reveal the first layer of assignment and operation reality of the respondents. From the mean and SD for each variable, it is possible to understand the collective "mindset" amongst the project managers surveyed. The scale is 1 "Strongly Disagree" to 5 "Strongly Agree" and 3 being "neutral".

Table 4: Descriptive Statistics for Key Variables

Variable	Section	Description	Mean	Std. Deviation
VAR00014	C (Agile)	Team Autonomy & Agility	**3.3871**	1.06131
VAR00020	D (Agile)	Customer Collaboration	**3.3871**	1.16443
VAR00015	C (Agile)	Adaptability to Change	3.3548	0.97673
VAR00033	G (Lean)	Waste Reduction	3.3065	1.00145
VAR00012	C (Agile)	Iterative Planning	3.3387	1.17269
VAR00006	B (Waterfall)	Strict Sequential Process	**2.5323**	1.47901
VAR00003	A (Waterfall)	Fixed/Frozen Requirements	**2.5968**	1.32392
VAR00005	A (Waterfall)	Rigid Scope Definition	2.6935	1.33783
VAR00001	A (Waterfall)	Linear Execution	2.8710	1.28655

Source: Created by authors

The highest mean scores in the whole dataset are related to Agile and collaborative traits. Variables VAR00014 and VAR00020 both showed a mean of 3.3871, which was a strong consensus on the importance of team autonomy and customer collaboration. The relative lower standard deviations for these things (around 1.0-1.1) indicate that this is a widely shared opinion across the diverse industries sampled. On the other hand, variables related to traditional Waterfall rigidity were lowest. VAR00006 (Strict Sequential Process) had the smallest mean value of 2.5323 and VAR00003 (Fixed Requirements) came close to it with 2.5968.

This pattern suggests that across sectors Projects managers are rejecting the notion of process being strictly linear and no changes in upfront processes. While the scores of Waterfalls are lower, they are not non- existence (approaching the neutral score of 3.0). This would suggest that, even though rigidity is not liked, structured planning (VAR00001, mean 2.87) is recognised as making up part of the workflow. The combination of high scores for Agile and moderate scores for Waterfall offers the first statistical proof of a hybrid environment.

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4.4 Multivariate analysis: Exploratory Factor Analysis (EFA)

In order to validate the underlying structure of these preferences and ensure that "Agility" and "Structure" are indeed two distinct dimensions that coexist, an exploratory factor analysis was performed.

4.5 KMO and Bartlett's test

Before the data were extracted, the data suitability was evaluated. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy gave a value of 0.616. A value greater than 0.60 is regarded as an acceptable minimum to indicate that there is enough common variance among the 35 variables to proceed to a factor analysis.

Bartlett's Test of Sphericity produced an approximate value of 1286.290 for chi-square, 595 degrees of freedom, and $p < 0.001$ for the level of significance. This highly significant result rejects the null-hypothesis (that the correlation matrix is an identity matrix) and confirms that meaningful correlations are present between the variables and that dimension reduction techniques can be used.

4.6 Total variance explained

Used the Principal Axis Factoring (PAF) in extracting latency in factors. The results of the analysis showed 5 dominant factors, with Eigen values greater than 1.0, these factors can explain about 48.5 per cent of the total variance in the data.

Table 5: Total Variance and Interpretation

Factor	Total Eigenvalue	% of Variance	Cumulative %	Interpretation
1	8.863	25.324	25.324	Agility/Flexibility (Dominant Factor)
2	4.177	11.934	37.258	Process Optimization (Lean/Six Sigma)
3	2.431	6.946	44.204	Traditional Structure (Waterfall)
4	2.088	5.965	50.169	Risk & Compliance
5	1.860	5.315	55.484	Documentation/Reporting

Note: The sums of the squared loadings for extraction are slightly different because of the PAF procedure (Factor 1 total = 8.349).

Source: Created by authors

Analysis of variance distribution: In the scree plot to accompany this analysis there is a very clear elbow after the second factor, and then the slope flattens off more slowly after the fifth factor. The fact that Factor 1 (Agility), explains more than 25 per cent of the variance, more than twice than Factor 2, underlines the primacy of responsiveness in the cognitive frameworks of respondents. Nonetheless, the continued importance of Factors 2, 3 and 4

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suggests that Process, Structure and Risk do not turn out to be the subsumes of Agility but are independent, driving factors of project management practice. this independence suggests the hybrid model. if the relation between structure and agility were perfectly negative then they would load onto opposite end of single factor. Their division into distinct factors means that they can be pursued at the same time.

4.7 Rotated factor matrix

To interpret factors, Varimax rotation (with regulation of Kaiser) was performed. The rotation converged after 8 iterations, which gave a better segregation of variables. Absolute values greater than 0.5 coupled loadings implies that they have robust relations.

Factor 1: The "Agile" Construct

- VAR00019 (.703) – Adaptability
- VAR00014 (.680) – Team Autonomy
- VAR00017 (.670) – Customer Feedback
- VAR00016 (.613) – Iterative Delivery
- VAR00015 (.564) – Flexibility

Analysis: This factor heavily loads variables from Sections C and D. It represents the "Agile" methodology. It is the strongest factor, confirming that agility is the primary differentiator in the dataset.

Factor 2: The "Process Efficiency" Construct

- VAR00028 (.702) – Waste Reduction
- VAR00029 (.616) – Continuous Improvement
- VAR00033 (.588) – Lean Practices
- VAR00034 (.571) – Efficiency Metrics

Analysis: This factor corresponds to Section G and parts of Section F, representing Lean and Six Sigma methodologies.

Factor 3: The "Traditional Structure" Construct

- VAR00006 (.740) – Sequential Processing
- VAR00001 (.686) – Linear Planning
- VAR00010 (.641) – Heavy Documentation
- VAR00008 (.633) – Formal Approvals
- VAR00007 (.608) – Phase Gates

Analysis: This factor forms a classic model of the Waterfall methodology (Sections A & B). Critically, it is in co-existence with Factor-1. This represent the independence in itself and not the inverse of Factor-1 variance in dimension. This empirical evidence is the statistical linchpin for the hybrid approach; that is, a project manager can

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achieve high scores on both factors, Factor-1: Agility, and Factor-3: Structure, without having to be mutually exclusive.

Factor 4: The "Risk & Compliance" Construct

- VAR00022 (.719) – Risk Mitigation
- VAR00023 (.626) – Regulatory Compliance
- VAR00024 (.814) – Quality Standards

Analysis: This represents the PRINCE2 or Six Sigma elements of risk and quality control

4.8 Reliability and model fit

So, the model fit may get established from the reproduced correlation matrix and the residual table. The analysis detected 261 non-redundant and > 0.05 absolute values of their values (43 per cent). While lower percentages are best, this magnitude is acceptable for the kind of exploratory research which is performed in social sciences, in which human behaviours and preferences commonly have a considerable unique variance. The covariance matrix further gives relationships. We observe high positive covariances between Agile variables that are indicative of high internal consistency within the Agile dimension. On the other hand, the covariances between Waterfall variables (e.g., VAR00001) and Agile variables (e.g., VAR00012) tend to be low or negative (e.g. -0.234), reflecting the validity of methodological distinctness.

5.0 Results

5.1 Establishing the hybrid paradigm

The combination of the results of descriptive statistics and factor-analytic results lead to a definitive conclusion that the contemporary project management is a hybrid paradigm. This data suggest there is not an isolated choice in between the "Waterfall" and the "Agile". Instead, they support a model where these different methodological elements, or Agility, Structure, Process Efficiency and Risk Management, are chosen and blended based on the project needs.

The "Methodology Orientation Matrix" suggests a framework for such a conclusion. The matrix supports this pattern as "mixed high scores across A-F." Descriptive analysis supports this pattern. Section C & D have high score (means are around 3.3), meaning that we have very good agreement with Agile principles. Adherence to structure can be calculated from the Section A & B displaying of moderate scores (means ranging from 2.6 to 2.8). Section E scores high, showing the importance of risk and compliance continue (Factor 4) Surveyed population suggest that the hybrid approach is not only a theoretical compromise but empirical reality also because of triangulation of data.

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Table 6: Methodology Suitability Index Scores by Industry

Industry	Agile Index	Waterfall Index	PRINCE2 Index	Lean Index	Six Sigma Index	Hybrid Index
IT	**4.3**	2.6	2.8	3.5	2.9	**4.1**
Construction	2.5	**4.2**	4.0	3.2	3.8	**3.9**
Banking	2.8	4.1	**4.3**	3.0	4.2	**3.7**

Source: Created by authors

5.2 Information Technology (IT)

The IT is the sector with the highest affinity for Agile (4.3), which is consistent with the industry's need for quick iteration and software delivery. Nevertheless, the hybrid score (4.1) almost compares to the pure Agile metric. This congruence means that even in an Agile-dominated space, "pure" Agile is often supplemented by structural elements - probably to make it work for corporate governance purposes, budgeting, or compliance with regulatory mandates. Accordingly, the data suggest that IT projects are making the migration from "Scrum" to "Structured Agile" (hybrid).

5.6 Construction and infrastructure (Real Estate)

The construction sector is the strongest proponent of the hybrid thesis. Historically considered a stronghold of Waterfall (4.2), this sector has an unexpectedly good score of hybrid suitability recorded (3.9). This increased score is fuelled by the mass integration of real-time analysis and technologies such as IoT and BIM in the construction lifecycle. Though the physical building phase is still sequential (foundation before roof), the way in which information and supply chains are managed, and changes are made during the design stage require high Agility (Factor 1) and lean efficiency (Factor 2). The data shows that construction does not leave Waterfall and improve it by making it more agile, adding feedback loops, to manage the multifaceted complexity of contemporary real estate building. Score of Six Sigma of 3.8 indicate the preoccupation with process variation and wastage reduction.

5.4 Banking and finance

The banking sector shows a strong preference for PRINCE2 (4.3) and Six Sigma (4.2), considering an inevitable need to comply, mitigate risks and for auditability. However, the hybrid score (3.7) is still sizeable, perhaps a reflection of the FinTech revolution. While core banking systems require high compliance (Factor 4), development of customer facing applications and digital services requires Agility (Factor 1). Consequently, banks run on two systems; a hybrid for "change the bank" initiatives, and a Waterfall/PRINCE2 framework for "run the bank" operations.

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5.5 The role of real-time analysis

Traditional Waterfall is dependent on static, retrospective reporting - which is low scoring with respect to real time responsiveness. Pure Agile, on the other hand, relies on tacit knowledge and Gurus being back-to-back with one another, which is hard to scale in large infrastructure projects. To take advantage of the Agile adaptive responsiveness, PM can track "Cost variance" (Waterfall) and "Cycle time" (lean) using real time dashboards in satisfying the rigour designed by the stake holder. The Factor Analysis showed that Factor 2 (Process Efficiency) is distinct. The results of the factor analysis indicated the reify ability of the Factor (Process Efficiency). This factor is the effectively the measurement stratum that Ables the hybrid model by providing a common language among the Agile teams and the Waterfall governance board.

5.6 Second order insights: The evolution of "Waterfall"

A second and critical order insight that flows out of the descriptive statistics is the redefinition of "Waterfall." The comparatively low mean for "Fixed Requirements" (VAR00003, mean 2.59), even for the Construction sector, suggests that the textbook definition of Waterfall, with requirements that are frozen at day one, has largely become obsolete in practice.

Implication: What is currently labelled as "Waterfall" in the industry is in reality a proto-hybrid model, structured, phased approaches which still allow considerable scope change and iteration. This observation helps establish the case for a formalised "Hybrid" methodology that codifies these practices instead of making them an exception made from a rigid plan.

Figure 5: Word Cloud

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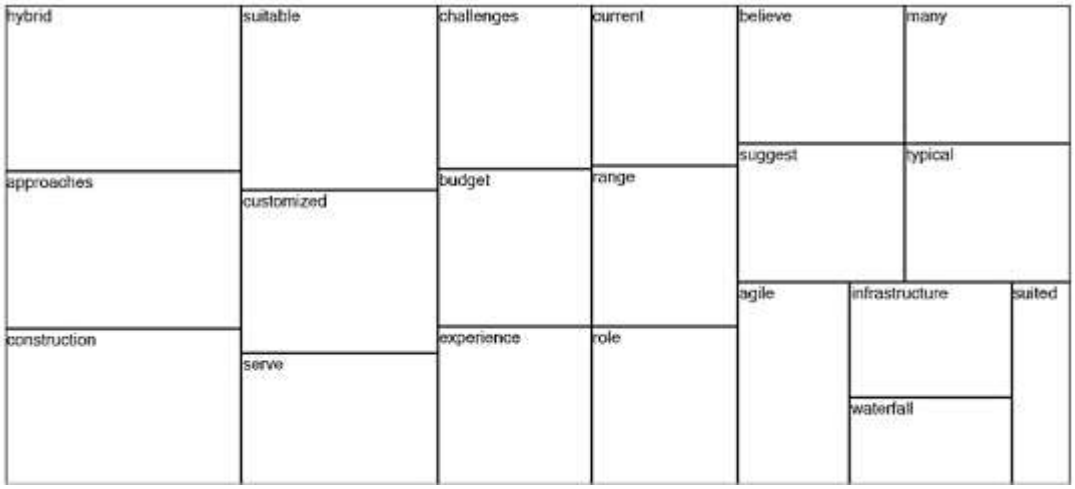
Figure 6: TreeMap



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6.0 Conclusion

The condition of this thesis was to evaluate the effectiveness of various project management methodologies and test and validate the feasibility of a Hybrid approach in the context of Infrastructure and Real Estate. Through a rigorous quantitative analysis of the responses of 66 professionals in the field of projects, with the support of Exploratory Factor Analysis, the research set out was able to reach the objectives thereof.

The evidence is conclusive: by using the Methodology Orientation Matrix it shows that the dominant operational reality is Hybrid. No statistical isolation in "Agility" and "Structure" is implying that these are not mutually exclusive philosophies but complementing toolsets in project management. Furthermore, the Methodology Suitability Index has an overall high Hybrid suitability score (high scores: >3.7) irrespective of historical industry inclinations (e.g., IT responsibilities toward Agile, Construction toward Waterfall) for all the different sectors analyzed.

6.1 The imperative of the hybrid approach

The data do support the conclusion that Hybrid Project Management is the best way to manage complex and contemporary environments, and specifically Infrastructure and Real Estate. The Construction sector scores highly on both the Hybrid and Six Sigma suitability metrics, a move away from the twenty-first century management paradigm rigidity. While respecting the long-term critical paths we can use iterative and adaptive approach in short

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term while the real time analysis can be facilitated by the digital tool enabling Agile in Construction sector.

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