

Development and Validation of the TEAM Intelligence Framework for Enhancing Project Execution: Evidence from a Survey Study in Bahrain

Dr. Yousif Alameen*

Trainer, Bahrain Society of Engineers, Kingdom of Bahrain

Abstract

This study builds on prior work on the SMART++ project idea creation framework [1], which focused on generating well-defined and structured project ideas prior to execution. In contrast, the present study shifts attention to the planning and execution phases, examining how project outcomes can be enhanced through TEAM intelligence-enabled environments.

The increasing complexity of modern project environments, particularly with the growing use of AI-influenced tools, has created a need for execution models that emphasize team effectiveness and digitally integrated capabilities. While existing research has focused primarily on structured approaches to project design, limited attention has been given to the team capabilities required for effective execution.

To address this gap, this paper introduces the TEAM Intelligence Framework, which conceptualizes project execution through four complementary domains: Teamwork, Emotional, Analytical, and Management Intelligence. The study also proposes the TEAM Balance Principle, asserting that effective execution depends on the balanced integration of these domains.

To empirically evaluate the framework, a survey was conducted with 47 professionals in Bahrain. The results show consistently high levels of agreement across all constructs (mean scores ranging from 3.70 to 4.13 on a 5-point Likert scale), indicating strong support for the framework.

The findings provide robust preliminary evidence that balanced human-centered capabilities significantly enhance project execution, supporting the practical applicability of the TEAM Intelligence Framework.

Introduction

Artificial Intelligence (AI) is reshaping how projects are executed across sectors by enhancing data processing, predictive analytics, and decision-making efficiency. However, AI does not replace human intelligence; instead, it amplifies the need for structured collaboration between human capabilities and intelligent systems.

Traditional project management frameworks [2] focus heavily on planning and process control, while recent approaches such as SMART++ [1] address structured project definition. Despite these advancements, project failure often occurs at the execution stage, not at the planning stage.

This highlights a critical gap:

A well-designed project does not guarantee success unless it is executed by a capable and well-balanced team. To address this gap, this study proposes the TEAM Intelligence Framework, which shifts the focus to team capability structures, particularly in AI-enabled environments.

Literature Review

Human Intelligence and Future Skills in AI-Driven Environments

Human intelligence encompasses cognitive, social, and emotional capabilities such as critical thinking, creativity, communication, and ethical reasoning. These competencies are increasingly recognized as essential in modern workplaces shaped by rapid technological advancement.

The OECD [3] highlights that future-ready professionals must combine technical expertise with adaptability, collaboration, and problem-solving skills. Similarly, frameworks on 21st-century skills emphasize that human-centered competencies are critical for navigating complex and uncertain environments.

In project-based contexts, these capabilities enable teams to interpret ambiguity, manage interpersonal dynamics, and make context-sensitive decisions. Despite advances in automation, such human abilities remain irreplaceable, particularly in areas requiring judgment and ethical consideration [4].

In summary, Human intelligence includes cognitive, emotional, and social competencies such as communication, creativity, and ethical reasoning. These are essential in complex, AI-driven environments [3].



Artificial Intelligence and Analytical Capability

Artificial Intelligence has transformed decision-making by enabling advanced data processing, pattern recognition, and predictive analytics. AI systems can analyze large datasets efficiently, supporting evidence-based decision-making in project environments.

Applications of AI in projects include risk forecasting, performance tracking, and resource optimization. However, AI systems lack contextual understanding and ethical reasoning, limiting their ability to operate independently in complex social environments [4].

Therefore, AI must be complemented by human oversight to ensure that outputs are accurate, fair, and contextually appropriate. This reinforces the idea that AI enhances—but does not replace—human intelligence.

In summary, AI systems excel in data analysis, pattern recognition, and predictive modeling. However, they lack contextual awareness and ethical judgment, requiring human oversight [4].

Human-AI Collaborative Intelligence

The concept of collaborative intelligence emphasizes that optimal performance is achieved when humans and AI systems work together [5].

In such collaborations:

- a) AI contributes computational power and analytical accuracy
- b) Humans provide contextual awareness, ethical judgment, and creativity

Research shows that human-AI collaboration leads to improved decision quality and innovation compared to either humans or machines operating alone.

However, effective collaboration requires more than technological access. It depends on team capabilities such as communication, trust, and the ability to interpret AI-generated insights. This highlights the need for a broader capability framework beyond analytical intelligence alone.

In summary, Collaborative intelligence integrates human and AI strengths. Humans provide judgment and context, while AI enhances analytical depth and scalability [5].

Team-Based Project Execution and Performance

Project success is strongly influenced by team effectiveness. High-performing teams demonstrate coordination, communication, shared understanding, and adaptability [6,7].

Traditional project management frameworks, such as PMBOK [2] and systems approaches [8], emphasize planning, scheduling, and control. While these are essential, they often underrepresent the human and relational aspects of execution.

Empirical studies indicate that many project failures result not from poor planning, but from:

Communication breakdowns

- a) Weak coordination
- b) Ineffective leadership
- c) Poor stakeholder engagement

This suggests that execution success depends on integrated team capabilities, rather than processes alone.

In summary, High-performing teams demonstrate coordination, communication, and adaptability [6]. However, existing models rarely define execution in terms of integrated intelligence domains, particularly in AI-supported environments.

Emotional Intelligence in Project Environments

Emotional Intelligence (EI) plays a crucial role in team performance and leadership effectiveness. EI includes self-awareness, empathy, emotional regulation, and interpersonal skills.

High levels of EI contribute to improved communication, conflict resolution, and stakeholder engagement. In team-based environments, EI supports trust-building and collaboration, which are essential for successful execution.

In AI-enabled environments, emotional intelligence becomes even more critical, as AI systems cannot replicate human empathy or social understanding [3]. Thus, EI remains a key differentiator in team performance.

Management Intelligence and Execution Control

Management Intelligence refers to the structured ability to plan, organize, and control project activities. It includes competencies such as goal setting, resource allocation, risk management, and performance monitoring.

Project management standards such as PMBOK [2] provide comprehensive guidelines for these functions. However, these frameworks often assume that teams already possess the necessary capabilities to execute effectively.

In practice, management intelligence must operate alongside teamwork, emotional, and analytical capabilities to ensure successful outcomes. Without this integration, even well-planned projects may fail during execution.

Research Gap and Contribution

Existing literature has extensively explored:

- a) Human intelligence and future skills [3]
- b) AI capabilities and limitations [4]
- c) Human-AI collaboration [5]
- d) Team performance and project management [2,6]

However, there is a clear gap in the literature:

Limited frameworks integrate human and AI capabilities into a unified execution model. Few models conceptualize project execution in terms of multiple intelligence domains. The concept of balance across capabilities remains underexplored.

Most existing approaches focus either on:

- a) Technical/analytical capabilities, or
- b) Human/social dynamics

but rarely combine both within a structured framework for execution.

Link to This Study

To address this gap, this study proposes the TEAM Intelligence Framework, which integrates:

- a) Teamwork Intelligence
- b) Emotional Intelligence
- c) Analytical Intelligence
- d) Management Intelligence

within a unified model guided by the TEAM Balance Principle, emphasizing that effective project execution depends on the balanced development of all four domains.



Methodology

Research Design

This study adopts a conceptual–empirical approach, combining framework development with survey-based validation.

Participants

A total of 47 professionals engaged in project-based work in the Kingdom of Bahrain participated in the study. The sample represents individuals with practical experience in team-based project execution across educational and organizational contexts.

Instrument

A structured questionnaire using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) was used to assess perceptions of:

- Framework effectiveness
- Integration of TEAM dimensions
- Validity of the TEAM Balance Principle

Hypotheses

- H1: TEAM Intelligence improves project execution
- H2: All four dimensions are equally important
- H3: Weakness in one dimension negatively affects performance
- H4: TEAM Intelligence enhances project outcomes

The TEAM Intelligence Framework

The TEAM framework defines project execution through four domains:

- T – Teamwork Intelligence: Collaboration, coordination, shared problem-solving
- E – Emotional Intelligence: Communication, empathy, stakeholder awareness
- A – Analytical Intelligence: Data-driven thinking and AI utilization
- M – Management Intelligence: Planning, resource allocation, risk control

TEAM Balance Principle

Effective execution requires balance across all four domains. Weakness in any one area constrains overall team performance.

Results

Descriptive Statistics (n = 47)

The survey results (Figure 1), indicate a consistently high level of agreement across all measured constructs, supporting the validity of the TEAM Intelligence framework.

Construct	Mean Score
TEAM improves project execution	4.00
Integration of TEAM dimensions	4.13
Equal importance of dimensions	3.96
Weakness negatively affects performance	3.70
Analytical/AI improves decision-making	4.02
Intention to use TEAM in future	4.06

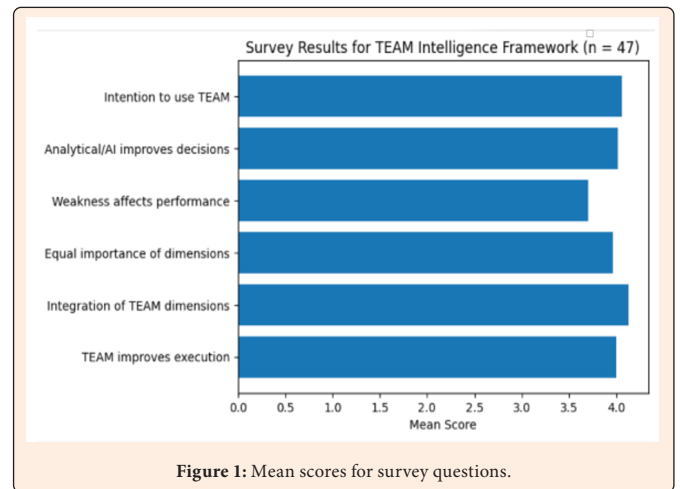


Figure 1: Mean scores for survey questions.

Key Findings

The findings reveal several important insights:

- The highest level of agreement (M = 4.13) confirms that project success is strongly linked to the integration of teamwork, emotional, analytical, and management capabilities, reinforcing the multidimensional nature of the framework.
- Strong agreement that TEAM improves execution (M = 4.00) demonstrates its practical effectiveness.
- The role of analytical thinking and AI tools is clearly supported (M = 4.02), highlighting the importance of integrating technology into team decision-making.
- The relatively high score for future intention (M = 4.06) indicates strong acceptance and applicability in real-world contexts.
- Agreement that all dimensions are equally important (M = 3.96) supports the structural validity of the framework.
- The slightly lower (but still positive) score for the weakness effect (M = 3.70) suggests that while participants recognize the importance of balance, this concept may require further emphasis in training and application.

Hypotheses Evaluation

All proposed hypotheses are supported:

- H1: TEAM Intelligence improves project execution → Supported (M = 4.00)
- H2: All four dimensions are equally important → Supported (M = 3.96)
- H3: Weakness in one dimension negatively affects performance → Supported (M = 3.70)
- H4: TEAM Intelligence enhances project outcomes → Supported (overall consistency across measures)

Discussion

The findings provide stronger empirical support for the TEAM Intelligence framework compared to earlier pilot results, reinforcing its validity as a model for project execution in AI-enabled environments.

The results confirm that:

- Project execution is multidimensional, requiring the integration of human and analytical capabilities rather than reliance on a single competency.

- b) AI contributes significantly to decision-making; however, its effectiveness depends on human interpretation, collaboration, and management structures.
- c) Emotional and teamwork dimensions remain essential, even in highly digital or AI-supported environments.

These findings align with the concept of collaborative intelligence [5], emphasizing that optimal outcomes emerge from the interaction between human and machine capabilities.

Importantly, the results provide empirical support for the TEAM Balance Principle, suggesting that imbalance across intelligence domains may constrain team performance. The slightly lower agreement on this aspect indicates that while the principle is recognized, it may not yet be fully internalized in practice [9-11].

Conclusion

This study introduced and empirically evaluated the TEAM Intelligence Framework shown in Figure 2, as a model for enhancing project execution in AI-enabled environments.

The findings confirm that:

- a) TEAM Intelligence positively influences execution
- b) All four domains are important and interdependent
- c) Balanced capability development is essential

The study contributes by shifting the focus from project design to execution capability, offering a practical model for modern, AI-supported teams.

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