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Synchronizing Strategy and Execution: PI Planning and Dependency Management in SAFe and PMI Frameworks by Serhii Chekhla

Serhii Chekhla [1]*

[1] *State University of Economics and Technology (Ukraine). Bachelor's Degree in International Economic Relations. Power Platform Architect at Quantum World Technologies Inc.*

*** *Corresponding Author,*** e-mail: serhiichekhla@gmail.com

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ABSTRACT

The article examines contemporary approaches to aligning strategic and operational management in scaled Agile environments through the use of Program Increment (PI) Planning. The role of PI Planning is substantiated as a key mechanism for coordinating business objectives, resources, and cross-team dependencies within the Scaled Agile Framework (SAFe) and the standards of the Project Management Institute (PMI). It is demonstrated that effective implementation of PI Planning enhances transparency, alignment across teams, and overall control of program execution. The study analyzes the value cascading model "Objectives → Features → Backlog", which ensures traceability from strategic goals to team-level execution. Particular attention is given to dependency management between teams as a critical success factor in PI Planning. In addition, key performance metrics are identified, including Throughput, Predictability Index, Flow Efficiency, Dependency Lead Time, and Return on Investment (ROI). The paper also explores the role of digital tools in supporting planning, execution, and performance monitoring processes. Specifically, the capabilities of the Microsoft ecosystem (LEO PPM, Azure DevOps, Planner, Power BI, Power Automate) are considered in the context of digitalizing PI Planning activities. It is shown that the integration of analytics and automation tools enables the creation of a closed-loop management cycle "Plan – Execute – Measure", which supports informed decision-making, organizational adaptability, and increased business value. The practical significance of the research lies in its applicability for improving portfolio management maturity, enhancing cross-team collaboration, and implementing benefits management approaches in organizations adopting scaled Agile practices.

KEYWORDS

PI Planning, SAFe, PMI, Agile Release Train, portfolio management, dependency management, digital transformation, Azure DevOps, Power BI, Power Automate.

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Синхронізація стратегії та виконання: PI-планування та управління залежностями у фреймворках SAFe та PMI Сергія Чехли

Сергій Чехла [1 *]

[1] *Державний університет економіки і технологій (Україна). Бакалавр з міжнародних економічних відносин. Архітектор енергетичної платформи, Quantum World Technologies Inc.*

* ***Автор-кореспондент,*** e-mail: serhiichekhla@gmail.com

СТАТТЯ

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АНОТАЦІЯ

У статті розглядаються сучасні підходи до узгодження стратегічного та операційного управління в масштабованих Agile-середовищах за допомогою планування програмних приростів (PI). Обґрунтовується роль планування PI як ключового механізму координації бізнес-цілей, ресурсів та міжкомандних залежностей у рамках Scaled Agile Framework (SAFe) та стандартів Інституту управління проєктами (PMI). Продемонстровано, що ефективне впровадження планування PI підвищує прозорість, узгодженість між командами та загальний контроль виконання програми. У дослідженні аналізується каскадна модель цінностей «Цілі → Функції → Журнал», яка забезпечує відстеження від стратегічних цілей до виконання на рівні команди. Особлива увага приділяється управлінню залежностями між командами як критичному фактору успіху в плануванні PI. Крім того, визначено ключові показники ефективності, включаючи пропускну здатність, індекс передбачуваності, ефективність потоку, час виконання залежностей та рентабельність інвестицій (ROI). У статті також досліджується роль цифрових інструментів у підтримці процесів планування, виконання та моніторингу ефективності. Зокрема, можливості екосистеми Microsoft (LEO PPM, Azure DevOps, Planner, Power BI, Power Automate) розглядаються в контексті цифровізації діяльності з планування PI. Показано, що інтеграція інструментів аналітики та автоматизації дозволяє створити замкнутий цикл управління «Планування – Виконання – Вимірювання», який підтримує прийняття обґрунтованих рішень, організаційну адаптивність та підвищення бізнес-цінності. Практичне значення дослідження полягає в його застосовності для підвищення зрілості управління портфелем, покращення міжкомандної співпраці та впровадження підходів до управління перевагами в організаціях, що застосовують масштабовані Agile-практики.

КЛЮЧОВІ СЛОВА

Планування PI, SAFe, PMI, Agile Release Train, управління портфелем, управління залежностями, цифрова трансформація, Azure DevOps, Power BI, Power Automate.

1. Introduction

In large-scale Agile environments, multiple teams simultaneously contribute to the achievement of shared strategic objectives [12]. Under such conditions, effective coordination becomes a critical success factor, as it determines not only what is delivered but also how interdependencies between teams are identified and managed.

Despite the widespread adoption of Agile practices, organizations continue to face significant challenges in aligning strategic intent with operational execution [4, p. 95]. This issue, commonly referred to as the execution gap, arises from the lack of mechanisms to ensure synchronization across teams, transparency into progress, and consistency in decision-making across levels of management.

Within the Scaled Agile Framework (SAFe), Program Increment (PI) Planning serves as a key coordination mechanism that aligns business and technology teams over a defined planning horizon [12]. PI Planning provides a structured environment in which teams collectively define objectives, identify dependencies, and coordinate delivery activities.

From a portfolio management perspective, PI Planning can be seen as a practical tool for translating strategic objectives into coordinated actions [14]. As noted in the PMI Standard for Portfolio Management, portfolios serve to convert strategic goals into a set of aligned investments and measurable outcomes [14]. In this context, PI Planning operationalizes this principle by linking high-level objectives with executable work items at the team level.

The PMI Agile Practice Guide further emphasizes that, in scaled Agile environments, value is created through alignment, transparency, and continuous feedback rather than centralized control [11]. PI Planning supports this approach by enabling decentralized decision-making while maintaining a shared understanding of priorities, risks, and expected outcomes.

However, despite the growing adoption of PI Planning, the integration of this mechanism with portfolio management approaches and digital tools that support end-to-end traceability and coordination remains insufficiently explored. This creates a need for further research into methods and instruments that enhance the effectiveness of PI Planning in complex organizational environments [12; 14].

2. Literature Review

The challenge of aligning strategic management with operational execution has been extensively discussed in modern academic and professional literature on project and portfolio management. A significant contribution to this area has been made by the Project Management Institute (PMI), particularly through *The Standard for Portfolio Management* and the *Agile Practice Guide*, which emphasize the importance of aligning strategic objectives, investments, and measurable outcomes [11; 14].

Within the Scaled Agile Framework (SAFe), Program Increment (PI) Planning is considered a key coordination mechanism that enables synchronization of multiple teams within an Agile Release Train. Existing studies highlight the role of PI Planning in facilitating cross-team collaboration, managing dependencies, and establishing shared program-level objectives. Special attention is given to the cadence-based nature of PI cycles, which supports continuous alignment and iterative planning [2; 12].

At the same time, the concept of value cascading from strategy to execution is actively explored in both PMI and SAFe approaches. This concept is reflected in the structured transformation of strategic initiatives into program-level and team-level work items, enabling traceability from high-level objectives to specific deliverables. Such an approach supports evaluating how individual tasks contribute to overall business value [11; 13; 14].

Another important research direction concerns dependency management in large-scale Agile environments. It has been established that the identification, visualization, and coordination of inter-team dependencies are critical factors influencing the successful delivery of program increments and the achievement of planned outcomes [12; 13].

However, despite significant advances in methodological approaches to PI Planning and portfolio management, the integration of these approaches with modern digital tools that enable end-to-end traceability, process automation, and data-driven decision-making remains underexplored. This creates

a need for further research that combines methodological frameworks with technological solutions to enhance management effectiveness in scaled Agile environments [5; 7; 8; 12; 14].

3. Problem Statement

The purpose of this article is to investigate Program Increment (PI) Planning as a mechanism for aligning strategic and operational management in scaled Agile environments, and to substantiate approaches to managing cross-team dependencies, ensuring execution transparency, and evaluating business value within the SAFe and PMI frameworks [12; 14].

Despite the availability of established approaches to portfolio and program management, including PMI standards and the Scaled Agile Framework (SAFe), organizations often apply these methodologies in isolation or in a fragmented manner. This leads to inconsistencies in governance, prioritization, dependency management, and performance measurement across different levels of management. As a result, the linkage between strategic objectives and execution outcomes remains insufficiently structured [13; 14].

At the same time, the rapid development of digital transformation and Agile practices introduces additional complexity. Organizations are required to maintain strategic focus while ensuring flexibility, rapid decision-making, and continuous adaptation. However, the absence of unified mechanisms that integrate methodological frameworks with operational practices and digital tools limits the effectiveness of PI Planning as a coordination instrument [1; 13].

In this context, the article aims to systematize the role of PI Planning within the broader portfolio management system and to identify key principles that ensure the connection between strategy, execution, and value realization. The study is based on the comparative analysis of SAFe and PMI approaches, as well as the generalization of practical experience in implementing scaled Agile environments [12–14].

The research focuses on the following aspects:

1) the conceptual role of PI Planning in linking strategic and operational levels of management;
2) the mechanisms of cascading strategic objectives into executable work items;
3) approaches to managing inter-team dependencies in large-scale Agile environments;
4) the role of digital tools in supporting planning, execution, and performance measurement;
5) key metrics used to evaluate the effectiveness and value of PI cycles.

The results of the study contribute to the development of a more integrated approach to PI Planning, combining methodological foundations with practical implementation mechanisms, and can be applied to improve portfolio management maturity and coordination efficiency in complex organizational environments.

4. Methods and Materials

The methodological foundation of the study is based on a system-structural approach and a comparative analysis of strategic and operational management alignment concepts within the Scaled Agile Framework (SAFe) and Project Management Institute (PMI) standards. The information base comprises official methodology guides from development institutes, peer-reviewed scientific publications on value cascading, and technical documentation of Microsoft digital tools (Azure DevOps, Power BI, Power Automate, LEO PPM). Using logical modeling and deductive analysis, the study systematizes the end-to-end traceability model "Objectives → Features → Backlog", substantiates mechanisms for cross-team dependency management, and categorizes key performance metrics of program increments (Predictability Index, Flow Efficiency, etc.). The applied aspect of the research relies on business process instrumental modeling to construct an automated "Plan – Execute – Measure" management cycle.

5. Results and Discussion

5.1. PI Planning as a Coordination Mechanism

Program Increment (PI) Planning in SAFe 6.0 is defined as a cadence-based synchronization mechanism that connects business strategy, portfolio epics, and Agile Release Trains (ARTs). It provides

a structured environment for aligning teams around shared objectives and coordinating delivery activities [12].

The PI Planning process includes defining business objectives, identifying dependencies, balancing team capacity, and validating plans through a confidence assessment. As a result, organizations obtain a single, transparent roadmap reflecting coordinated commitments across all participating teams [12].

From a portfolio management perspective, this mechanism corresponds to the program level, ensuring alignment of resources and dependencies across multiple projects [13; 14].

5.2. Value cascading model

A key mechanism for linking strategy and execution is the cascading of objectives into actionable work items. This approach is supported by both PMI and SAFe frameworks.

This logic can be represented as in Table 1.

Table 1. Objectives → Features → Backlog Model

Level	Artifact	Example	Purpose
Strategic Objectives	Portfolio Epics / PI Objectives	"Improve Customer Onboarding Experience"	Defines *why* — the business value
Features / Capabilities	Program Backlog Items	"Automated Customer Profile Creation"	Describes *what* to build
Stories / Tasks	Team Backlog Items	"Develop API for registration data"	Defines *how* it will be implemented

Source: Developed by the author.

This model ensures traceability from enterprise-level goals to team-level execution and supports evaluation of business value contribution [11; 13; 14].

5.3. Digital tools supporting PI Planning

Modern digital tools play a critical role in enabling PI Planning by providing data synchronization, process automation, and performance monitoring capabilities [9; 14].

Table 2. PI Planning in MS Ecosystem

Function	Recommended Tool	Key Capability
Strategic Objectives / Portfolio	LEO PPM (Power Platform custom app)	Portfolio structure, roadmaps, custom Gantt Chart
Program Features / Epics	Azure DevOps Boards	Feature backlog, dependencies, iteration planning
Team Backlog / Kanban	Planner Premium	Quick visual boards, checklists, lightweight task tracking
Roadmaps / Timeline	LEO PPM (Power Platform custom app)	Visual roadmaps, cross-project timelines
Analytics & Flow Metrics	Power BI	Dashboards for throughput, predictability, flow efficiency
Automation / Sync	Power Automate	Integration between Planner, DevOps, Dataverse
Data Repository	Dataverse	Unified data model for Objectives–Features–Stories

Source: Developed by the author.

Through this combination, organizations can conduct PI Planning digitally, synchronizing data across systems without leaving the Microsoft ecosystem [5–8].

5.4. PI as the Bridge Between Strategy and Execution

From a portfolio management perspective, PI Planning serves as a mechanism that connects strategic intent with coordinated delivery at the program and team levels. The PMI Standard for Portfolio Management emphasizes the role of portfolios in maintaining alignment through continuous review and reprioritization, while SAFe complements this approach through a regular PI cadence that supports adaptation and learning [12–14].

Together, these approaches form a closed strategic feedback loop [13; 14]:

Strategy → Portfolio → Program → Teams → Outcomes → Benefits → Feedback → Strategy

This structure ensures that each execution cycle contributes measurable business value rather than only completed output.

Table 3. PI Planning Layers

Layer	Scope	Key Output
Strategic Portfolio	Vision → Investment Themes	Funded Epics & Objectives
Program / ART	PI Objectives→ Features	Program Board, Capacity Plan
Team Execution	Features → Stories → Tasks	Iteration Goals, Velocity Reports

Source: Developed by the author.

When synchronized through Microsoft tools — LEO PPM, Azure DevOps, Planner Premium, and Power BI — this creates a seamless digital thread from vision to value [5–8].

5.5. Comparison of tools for PI Planning

5.5.1. Planner Premium – Convenience with Limitations

Planner Premium (formerly Project for the Web) is ideal for small or mid-sized groups needing quick visual coordination.

It offers integrated Kanban boards, task assignments, checklists, and due dates within the Microsoft ecosystem.

However, its simplicity brings limitations [6]:

- No support for hierarchical data (Epic–Feature–Story);
- Limited customization — no additional fields or automations;
- Restricted API access for advanced integrations.
- No portfolio-level dependency view or cross-team Gantt chart.

In PI Planning contexts, Planner Premium is best suited for team-level execution, not enterprise-level coordination [6].

5.5.2. LEO PPM – Flexibility and Enterprise Scale

LEO PPM, built entirely on the Microsoft Power Platform, enables a fully configurable PI-planning architecture.

It combines the governance of PMI standards with the agility of SAFe planning cycles.

Key advantages of such platforms include configurable data models for Objectives–Features–Stories relationships, integrated visualizations such as Gantt charts and Program Boards, API-level integration with Azure DevOps, extensibility through low-code development, and deeper analytics through Power BI and Power Automate [5; 7; 8].

Advanced portfolio management platforms such as LEO PPM are better suited to organizations that require a configurable architecture, portfolio-level visibility, and deeper analytical capabilities.

5.6. Architecture of PI Planning in SAFe

In SAFe 6.0 – PI Planning, a Program Increment (PI) represents a fixed planning and execution window (typically 8–12 weeks) during which multiple Agile Teams align to common business objectives.

PI Planning synchronizes all workstreams inside an Agile Release Train (ART) through a structured cadence [2; 12].

Each PI cycle typically includes team breakouts, during which teams define features and stories, estimate capacity, and identify risks, followed by Program Board alignment and confidence voting to validate the overall plan [12].

In PMI terms (PMI Portfolio Management Standard), this corresponds to the program level — the tactical bridge linking portfolio strategy with team execution [14].

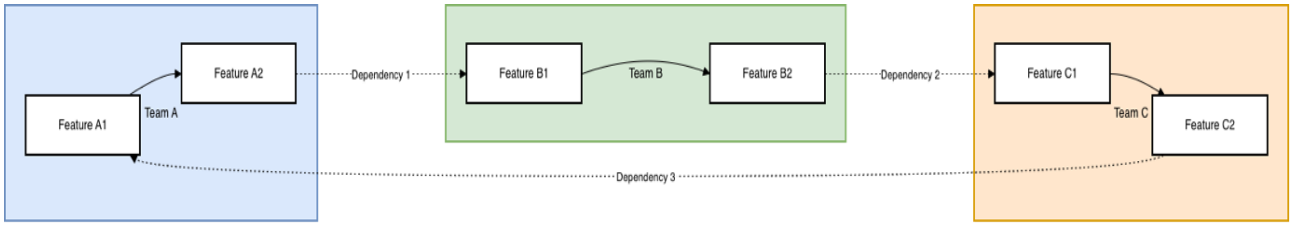

Figure 1. Program Board showing cross-team dependencies within a PI cycle

Source: Developed by the author.

The Objectives → Features → Backlog Model in Azure DevOps.
The PMI Agile Practice Guide describes a value cascade from strategy to execution [5; 11].
In Azure DevOps Boards, this is implemented as in Table 4.

Table 4. Azure DevOps Value Cascade

Level	Artifact	Example	Purpose
Strategic Objective	Epic / Objective	"Enhance customer onboarding experience"	Defines *why* — business value
Feature / Capability	Program Backlog Item	"Automate profile creation"	Describes *what* to build
Story / Task	Team Backlog Item	"Create API for registration data"	Describes *how* to implement

Source: Developed by the author.

DevOps captures traceability, effort, and status; Power BI visualizes velocity, throughput, and predictability across iterations [5; 8].

Table 5. PI Planning Template inside Microsoft Ecosystem

Phase	Description	Microsoft Tool
1 Preparation	Define PI Objectives, draft Features	LEO PPM / Project for the web
2 Planning Session	Team breakouts, Program Board, risk review	Azure DevOps / Planner Premium
3 Tracking & Inspect	Burn-up charts, flow metrics, predictability dashboards	Power BI / Power Automate

Source: Developed by the author.

All artifacts are stored in Dataverse, ensuring a single source of truth and traceability from strategy to delivery [5; 7; 8].

5.7. Dependency management and visualization

Dependency management is one of the most critical elements of PI Planning, since unresolved inter-team dependencies directly affect delivery predictability and timing. In large-scale Agile environments, timely identification and visualization of such dependencies improve coordination and reduce execution risk [12; 13].

Figure 2 illustrates a dependency matrix that can reveal critical relationships between teams and identify potential bottlenecks at an early stage.

The use of analytical tools for dependency visualization enables organizations to move from reactive issue resolution to proactive delivery coordination. Dependencies pose the most significant delivery risk in PI. Mapping them in Power BI reveals bottlenecks early [8].

5.8. Metrics and value management

Essential quantitative views include information from Table 6.

Power BI consolidates this data into dashboards such as Velocity vs Plan, Predictability Gauge, and Dependency Heatmap, which are automatically updated via the Power BI service, which connects to the different data sources [8].

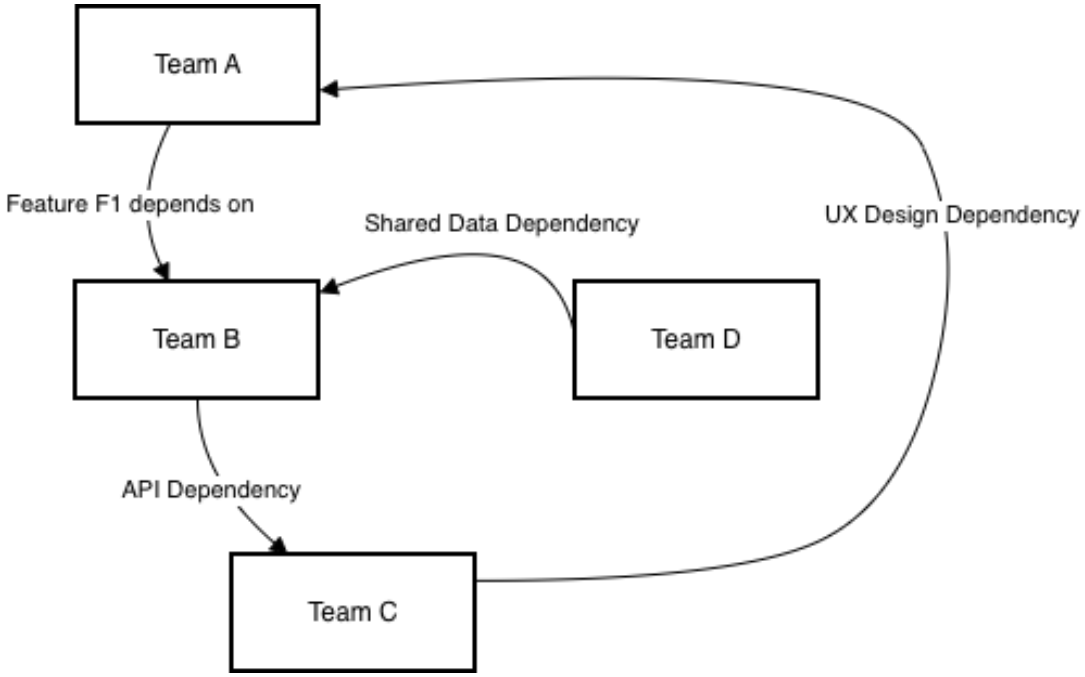

Figure 2. Dependency Matrix showing inter-team relationships

Source: Developed by the author.

Table 6. Metrics and Tools

Metric	Definition	Tool
Throughput	Completed story points per iteration	Azure DevOps/Jira
Predictability Index	Actual / Planned value	LEO PPM Roadmap
Flow Efficiency	Active Time / Lead Time	Dataverse + Power BI
Dependency Lead Time	Time from identification to resolution	Dataverse + Power BI

Source: Developed by the author.

Automation mechanisms play a critical role in maintaining data consistency and enabling continuous information flow across systems involved in PI Planning. Integration processes can synchronize data between delivery platforms, portfolio management systems, and analytical tools, ensuring that planning artifacts, execution status, and performance indicators remain aligned [7].

Such integrations support bidirectional data exchange between execution tools (e.g., Azure DevOps or Jira) and centralized data repositories, enabling automated updates to analytical dashboards. As a result, organizations can establish a continuous digital feedback loop connecting planning, execution, and performance evaluation [5; 7].

Automation connects every layer of the ecosystem [5; 7; 8]:

- *Jira/AzDevOps → Dataverse* – mirror tasks into LEO PPM backlog.
- *Dataverse → Jira/AzDevOps* – sync status, efforts, custom fields.
- *Dataverse → Power BI* – feed real-time reporting.

This removes manual data handling and creates a closed digital loop of "Plan → Execute → Measure".

5.9. Value measurement in PI cycles

In modern Agile organizations, performance is increasingly evaluated not only by delivery speed, but by the value realized from delivered outcomes. Within SAFe 6.0, value flow is considered a primary indicator of enterprise effectiveness, requiring alignment across strategy, portfolio, program, and team levels. Similarly, the PMI Benefits Realization Management approach defines value as a life-cycle process that includes benefit identification, tracking during execution, and validation after delivery [1; 4].

Program Increment (PI) Planning provides the operational cadence for this value realization cycle. Each PI produces measurable outcomes that are evaluated during Inspect & Adapt events, enabling organizations to continuously align execution results with strategic intent [4; 12].

Table 7 presents a comparative view of benefits realization approaches in PMI and SAFe frameworks.

Table 7. Approaches to Benefits Realization: PMI and SAFe

Dimension	PMI Benefits Realization	SAFe Lean Portfolio Management
Purpose	Ensure promised benefits are achieved and sustained	Continuously evaluate delivered value and adjust portfolio
Pre-Execution Phase	Benefit Identification and Mapping	Strategic Themes and Epic Hypotheses
Execution Phase	Benefit Tracking and Measurement	PI Objectives and PI Metrics
Post-Execution Phase	Benefit Sustainment Review	Inspect & Adapt Workshop
Responsible Roles	Portfolio Manager / Business Owner	LPM Team / RTE / Product Managers

Source: Developed by the author.

Both approaches emphasize that success should be measured in terms of realized benefits rather than completed output [1; 4; 13].

A key component of value-oriented management in PI cycles is the use of quantitative performance metrics. The most commonly applied metrics include throughput, predictability index, flow efficiency, dependency lead time, and return on investment (ROI) [4; 13].

Throughput reflects the volume of completed work within a PI, while the predictability index measures the ratio between planned and delivered outcomes. Flow efficiency evaluates the proportion of active work time relative to total lead time, providing insight into process bottlenecks. Dependency lead time captures the duration required to resolve inter-team dependencies, and ROI measures the relationship between achieved benefits and associated costs [3, p. 120].

These metrics can be calculated using data from delivery and portfolio management systems and serve as a foundation for data-driven decision-making [4; 8].

The application of analytical tools further enhances value measurement. Business intelligence platforms, such as Power BI, enable visualization of performance indicators through dashboards that track throughput trends, predictability, dependency patterns, and value realization. These dashboards support continuous monitoring and enable timely management interventions [8].

Automation technologies also play an important role in ensuring data consistency and reducing manual effort. Integration flows can synchronize data between execution systems and analytical platforms, creating a continuous information loop across planning, execution, and reporting layers [7].

Digital platforms can act as a centralized value realization layer by integrating data from multiple sources and providing a unified view of performance and benefits. In practice, solutions built on low-code platforms (e.g., Microsoft Power Platform, including LEO PPM) enable the aggregation of portfolio data, the monitoring of key indicators, and the automation of reporting processes [4; 7; 8].

Table 8 illustrates a unified value dashboard structure that integrates multiple data sources.

Table 8. Single Value Dashboard Structure

Data Type	Source	Metric
Story Points / Features	Azure DevOps/Jira	Throughput
Planned vs Actual Work	LEO PPM Roadmap	Predictability Index
Cycle Time / Wait Time	DevOps + Power BI	Flow Efficiency
Dependency Events	Dataverse	Dependency Lead Time
Benefit Values	LEO PPM Benefits Module	ROI

Source: Developed by the author.

Such integration enables a closed feedback loop linking strategy, execution, value realization, and organizational learning [4; 13].

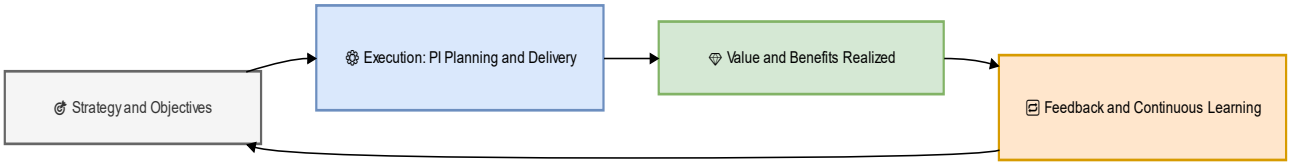

Figure 3. The Value Flow Loop – a continuous cycle of Strategy → Execution → Value → Feedback

Source: Developed by the author.

For practical monitoring, key performance indicators may also be structured by data source and review cadence, as shown in Table 9.

Table 9. KPI Review Structure

KPI	Formula	Primary Source	Review Cadence
Throughput	Σ Completed Items / PI	Jira/Azure DevOps	Weekly
Predictability	Actual / Planned × 100 %	LEO PPM Roadmap	Bi-weekly
Flow Efficiency	Active Time / Lead Time	Power BI	Weekly
Dependency Lead Time	Resolved – Identified	Dataverse / BI	Real time
ROI	(Benefits – Costs)/Costs × 100 %	LEO PPM Benefits	Quarterly

Source: Developed by the author.

6. Conclusions

The study demonstrates that PI Planning serves as an effective mechanism for aligning strategic objectives with operational execution in scaled Agile environments. The integration of SAFe coordination practices and PMI governance principles enables organizations to manage dependencies, improve transparency, and enhance decision-making.

The findings confirm that digital tools significantly increase the effectiveness of PI Planning by supporting traceability, automation, and analytical insights. The use of metrics such as throughput, predictability, flow efficiency, and ROI allows organizations to shift from activity-based to value-based management.

The findings also highlight the importance of unified portfolio-level metrics, continuous benefits tracking, and automated data synchronization as conditions for improving management maturity in scaled Agile environments.

Future research should focus on applying predictive analytics and artificial intelligence to improve planning accuracy, risk management, and value forecasting in complex project environments.

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