

## Beyond Silo Targets for Interdependent KPI Goal Setting: Empirical Evidence of Conflicting-Metric Practice, Barriers, and Organizational Archetypes

P. Rodríguez<sup>1,3,\*</sup>, J. Rodrigo<sup>1,4</sup>, F.X. Martínez<sup>1,5</sup>, J.A. Rappold<sup>2,6</sup>

### ARTICLE INFO

#### Special Issue:

11<sup>th</sup> International Conference on Maritime Transport;  
May 27-29, 2026.  
Barcelona School of Nautical Studies (FNB-UPC), Spain

#### Article history:

Received 27 May 2026;  
in revised from 28 May 2026;  
accepted 01 Jun 2026.

#### Keywords:

Supply chain performance management; Key performance indicators; Goal setting; Operational trade-offs; Conflicting objectives; SCOR model; Trade-off awareness gap; Functional silos.

© SEECMAR | All rights reserved

### ABSTRACT

Business Performance Management (BPM) systems treat key performance indicators (KPIs) as independent objectives despite well-documented operational interdependencies between lead times, cost, inventory investment, and customer service level. These trade-offs are routinely ignored during goal setting, resulting in misaligned incentives, functional silos, jointly unattainable targets, and degraded system-wide performance.

A cross-sectional mixed-method survey of 64 supply chain professionals reveals a prevalent trade-off awareness gap: while 51.6% of respondents pursue simultaneous improvement across efficiency, inventory, and customer delivery performance, only 12.5% explicitly model the trade-offs between them—a 39.1-percentage-point disconnect. A structural setter–owner mismatch exists in 89.1% of organizations, with capacity utilization cited by only 9.4% of respondents as an input to delivery goals. Inferential tests confirm that integration and trade-off awareness are positively associated with performance and negatively associated with dysfunction. Principal component analysis and Ward’s hierarchical clustering identify three organizational archetypes: Silo-Driven (56.3%), Aspirational (15.6%), and Trade-Off Aware (28.1%).

Thematic analysis of open-ended responses points to four practitioner-identified remedies: better integrated planning, analytical feasibility-checking tools, executive education, and shared KPI ownership. The paper concludes that the core problem is not awareness that trade-offs exist, but the absence of analytical structures and decision support systems to enforce joint KPI attainment

### 1. Introduction.

The management of organizational performance through structured measurement systems has evolved substantially over time, from early financial accounting standards through Management by Objectives (Drucker, 1954), and contemporary frameworks such as Objectives and Key Results (OKR) and the Balanced Scorecard (Kaplan & Norton, 1992). In supply chain management, the Supply Chain Operations Reference (SCOR) model, now in its fourteenth iteration as the SCOR Digital Standard (ASCM, 2022), has become the globally accepted standard to structure performance measurements across the following pillars: reliability, responsiveness, agility, cost, asset management, environmental, and social.

<sup>1</sup>Universitat Politècnica de Catalunya. Pla de Palau 18, 08003 Barcelona, Spain. Department of Nautical Science and Engineering.

<sup>2</sup>Rollins College, 1000 Holt Ave, Winter Park, FL 32789, USA. School of Business.

<sup>3</sup>PhD Candidate. Tel.: (+1) 608-770-7289. E-Mail: [Pedro.rodriguez.gomez@upc.edu](mailto:Pedro.rodriguez.gomez@upc.edu).

<sup>4</sup>Professor of Maritime and Marine Engineering. Tel.: (+34) 934015755. E-Mail: [jaime.rodrigo@upc.edu](mailto:jaime.rodrigo@upc.edu).

<sup>5</sup>Professor of Maritime and Marine Engineering. Tel.: (+34) 934017942. E-Mail: [francesc.xavier.martinez@upc.edu](mailto:francesc.xavier.martinez@upc.edu).

<sup>6</sup>Professor of Business. Tel.: (+1) 608-467-0188. E-Mail: [jrapold@rollins.edu](mailto:jrapold@rollins.edu).

\*Corresponding author: P. Rodríguez. Tel.: (+1) 6087707289. E-Mail: [pedro.rodriguez.gomez@upc.edu](mailto:pedro.rodriguez.gomez@upc.edu).

Broadly accepted and utilized, all these frameworks are limited by having commonly defined KPIs managed as if they were independent. In reality, many supply chain KPIs are structurally interdependent and often in direct conflict. The trade-off between lead time and inventory investment (Little, 1961), between capacity utilization and cycle time (Kingman, 1961), and between fill rate and safety stock (Eppen & Martin, 1988) are mathematical properties of supply chain systems. When goal-setting processes ignore these interdependencies, the objectives may be jointly unattainable, creating organizational problems: optimization of silo KPIs at the expense of others, cross-functional blame instead of collaboration, and degeneration into a recurring cycle of shifting priorities, finger-pointing, and unproductive justifications when targets are invariably missed.

The practical consequences were well documented by Locke et al. (1994), who demonstrated that conflicts between individual and organizational goals deteriorate performance when they motivate incompatible actions. Franke and Foerstl (2020) found that goal conflict in cross-functional sourcing teams directly undermines performance outcomes. Chopra and Meindl (2016) state that effective and efficient operational management hinges on balancing trade-offs across facilities, inventory, transportation, information, sourcing, and pricing, although they provide no structured methodology for translating this fact into operational KPI goal-setting in practice.

This research addresses a specific research gap in supply chain performance management, goal-setting theory, and operations research, which is the absence of a structured framework for incorporating known operational trade-offs into the development of jointly attainable KPI goals. This paper establishes and measures the problem empirically. These are the research questions addressed here:

- RQ1: What is the current state of academic research on supply chain KPI goal setting, particularly for interdependent or conflicting metrics?
- RQ2: How do organizations currently set goals for key supply chain KPIs related to customer service, speed, and asset efficiency?
- RQ3: To what extent are trade-offs between these KPIs explicitly considered in practice, and what barriers prevent their consideration when they are not?

This paper employs a systematic literature review (RQ1) followed by a cross-sectional mixed-method survey of 64 supply chain professionals (RQ2, RQ3); the survey pairs closed-ended quantitative items with an open-ended question (Q35) analyzed thematically. The paper is organized as follows. Section 2 reviews the literature and synthesizes the research gap (RQ1). Section 3 presents the empirical methodology. Section 4 reports the empirical findings (RQ2, RQ3), including the thematic analysis of the recommended actions from practitioners. Section 5 discusses the implications of those findings. Section 6 identifies research extensions and next steps. Section 7 presents the study's conclusions.

## 2. Literature Review.

### 2.1. Evolution of Business Performance Management systems.

The measurement of business performance goes as far back as 3500 BC in Mesopotamia with rough accounting records for transactions, inventory and debts. Double-entry bookkeeping (Pacioli, 1494) established the foundation for modern financial management. The Industrial Revolution sparked the demand for more sophisticated efficiency measures, culminating in Taylor's (1914) scientific management and the subsequent development of managerial accounting and standard costing. Drucker's (1954) *Management by Objectives* introduced collaborative goal formulation between management and employees, emphasizing measurable objectives and regular performance reviews. The second half of the twentieth century brought Total Quality Management (Deming, 1982) and Lean manufacturing (Womack et al., 1990), expanding the performance lens from financial metrics to customer satisfaction, process improvement, and waste elimination. The SMART framework (Doran, 1981) and OKR methodology developed at Intel Corporation provide complementary tools for translating strategic objectives into specific, measurable targets.

The Balanced Scorecard (BSC) (Kaplan & Norton, 1992) integrated financial and non-financial measures across four perspectives: financial, customer, internal processes, and learning and growth. The BSC has become the standard across industries (Kaplan, 2009). Despite these continuous improvements, a persistent gap remains. These frameworks excel at structuring what to measure and how to express targets but lack guidance on handling conflicts between interdependent metrics, particularly when the metrics are owned by different functions with misaligned incentive structures.

### 2.2. Goal-Setting Theory and the Impact of Goal Conflict.

The psychological foundations of goal setting were established by Locke (1968), and have evolved over decades (Locke & Latham, 2002), demonstrating that specific, challenging, and clear objectives lead to higher performance than unclear or easy goals. The High Performance Cycle (Latham et al., 2002) concludes that commitment and frequent feedback create a positive cycle of achievement.

On the other hand, these same foundations document the detrimental effects of goal conflict. When specific, difficult goals assigned to one manager conflict with another's, performance deteriorates (Locke et al., 1994; Slocum et al., 2002).

Cheng et al. (2007) found that perceived conflict among multiple performance goals reduces performance. Blech and Funke (2010) demonstrated that induced goal conflicts undermine complex problem-solving. Franke and Foerstl (2020) extended these findings to cross-functional supply chain teams, showing that goal conflict directly undermines team performance.

These findings have direct implications for supply chain KPI management: when organizations set aggressive, simultaneous targets for on-time delivery, cost efficiency, and inventory reduction, without analyzing their joint feasibility, they systematically create the structural conditions for goal conflict and or-

ganizational dysfunction. The mechanism is not just psychological or motivational; it is mathematical.

### 2.3. Supply Chain Trade-Offs: Operational Foundations.

The interdependencies between supply chain performance metrics can be found in seminal operations research works. Three foundational models for SCOR KPIs related to on time delivery, efficiency and inventory investment are mathematically coupled:

#### Little's Law (Little, 1961)

The average inventory in a system ( $L$ ) equals its throughput rate ( $\lambda$ ) times the average time in the system ( $W$ ):  $L = \lambda W$ . For example, when a company decides to source material from a supplier with a longer replenishment lead time, inventory must increase proportionally to maintain the same service level. Setting an inventory reduction target simultaneously without adjusting cycle time is a mathematically infeasible objective.

#### Kingman's Formula (Kingman, 1961)

Cycle time (CT) through a productive resource is proportional to variability, capacity utilization, and process time.

$CT = VUT$ , where  $V = \frac{1}{2}(C_a^2 + C_e^2)$  is the combined variability factor composed of the squared coefficient of variation of inter-arrival times ( $C_a^2$ ) and service times ( $C_e^2$ ),  $U$  is capacity utilization, and  $T$  is the mean expected process time. Cycle time is a convex function of utilization, accelerating sharply as utilization approaches 100%. Simultaneously targeting high utilization and short cycle times creates increasingly incompatible objectives. Moreover, supplier quality and delivery performance directly inflate  $C_a^2$  and  $C_e^2$  through rework and arrival variability, extending cycle time beyond what the utilization target alone would predict.

#### Stochastic Safety Stock (Eppen & Martin, 1988; Log-normal Extension)

Material availability (or service level) and inventory investment are jointly related to demand uncertainty over the replenishment lead time. For continuous, high-volume demand, the normal approximation of Eppen and Martin (1988) is adequate. However, for high-mix low-volume manufacturers where many SKUs exhibit sporadic demand, characterized by a high proportion of zero-demand periods, the normal approach underestimates safety stock requirements by assigning probability to (impossible) negative demand and underweighting the right tail where stockouts occur. An appropriate model assumes a Bernoulli arrival process with probability  $p$ , and the size of non-zero demand model following a lognormal distribution with parameters  $(\mu_{\ln}, \sigma_{\ln})$ .

These three relationships establish that delivery, efficiency, and inventory KPIs are a matter of mathematics rather than management or leadership style and cannot be set independently without risking joint infeasibility. The empirical question this paper addresses is whether and how practitioners integrate this fact into their goal setting processes.

Muckstadt et al. (2001) provide practical evidence of the interdependence between service performance and inventory.

In a case study of a manufacturer seeking to improve delivery reliability while reducing inventory, the incorporation of finite-capacity considerations into planning enabled substantial improvements in on-time delivery and reductions in finished-goods inventory. Although the authors do not explicitly invoke queueing theory, the results are consistent with the relationships predicted by Little's Law and Kingman's Formula, whereby capacity utilization and flow variability jointly influence lead times, work-in-process inventory, and delivery performance.

### 2.4. Supply Chain Strategy and Trade-Off Management.

Fisher (1997) argued that supply chains must align with product characteristics. Companies require efficiency-driven strategies for functional, commodity-type products and responsive strategies for innovative ones.

Roh et al. (2014) found that responsive strategies improve customer satisfaction but increase operating costs, while efficient strategies lower costs but increase vulnerability to demand uncertainty. Therefore, companies that pursue efficiency and responsive strategies simultaneously for the same value stream do so at their own peril.

Chopra and Meindl (2016) proposed that effective supply chain management hinges on balancing trade-offs across six key drivers: facilities, inventory, transportation, information, sourcing, and pricing. They also introduced the efficiency frontier concept at the strategic level.

Del Pozo et al. (2026) introduce the EASIER model, an integrated supply chain strategy framework organizing six strategic competences: efficiency, agility, sustainability, integration, digital enablement, and resilience. The framework is distinctive in two respects directly relevant to the present study. First, it explicitly acknowledges that trade-offs are inherent in supply chain strategy. Through a capped allocation mechanism, managers are required to prioritize among competing competences rather than treating all supply chain objectives as equally important. Second, EASIER links strategic prioritization with performance management by encouraging the selection of KPIs aligned with the competences most critical to the firm's business strategy.

The primary objective of the EASIER framework is to support strategic diagnosis, prioritization, and alignment between supply chain capabilities and business objectives.

The subsequent challenge of translating the output of all these models into quantitatively feasible and jointly attainable KPI targets remains outside the scope of their frameworks and represents the focus of the present study.

### 2.5. The SCOR Model and Its Limitations.

The SCOR model (ASCM, 2022) provides standardized definitions for all the key supply chain processes: Plan, Source, Transform, Order, Fulfill, Return, and Orchestrate. It also includes 149 performance metrics across six attributes: Reliability, Responsiveness, Cost, Asset Management Efficiency, Agility, and Sustainability. Selected level-1 and level-2 KPIs directly relevant to this research include RL.1.1 (Perfect Order Fulfillment), RS.2.1–2.3 (Source, Make, and Deliver Cycle Times),

CO.2.3–2.4 (Cost to Make, Cost to Deliver), and AM.2.2 (Inventory Days of Supply).

SCOR's maturity model (stages 1–5) recommends increasing cross-functional integration at higher stages, yet provides no guidance, mechanisms, or models for multi-objective trade-off optimization to balance metrics that are inherently interdependent. The benchmarking approach treats each metric independently, as if achieving top-quartile performance simultaneously on reliability, cost, and asset efficiency were merely a matter of executive alignment and better process execution. Furthermore, SCOR provides static point targets rather than performance ranges or scenario-based goal-setting tools. The absence of joint feasibility assessment represents a significant limitation for practitioners' ability to execute.

## 2.6. Research Gap Synthesis (RQ1).

The literature reveals mature, well-developed understanding of trade-offs in isolation (operations research), the behavioral consequences of goal conflict (psychology), and strategic alignment imperatives (management). However, no existing work provides a structured, operational methodology for incorporating known mathematical trade-offs into KPI goal-setting practice. Table 1 summarizes how this research bridges these streams; the diagnostic contributions reported in this paper are the empirical foundation on which prescriptive solutions can be built.

Table 1: Research streams, gaps, and contributions of the research program.

| Stream                     | Provides                                                                  | Lacks                                                                     | Contribution of this research                                                                       |
|----------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <i>Operations Research</i> | Mathematical trade-off models (Little, Kingman, Eppen & Martin)           | Goal-setting translation; distributional guidance for intermittent demand | Grounds KPI targets in OR relationships                                                             |
| <i>Goal-Setting Theory</i> | Motivational principles; empirical evidence of goal conflict consequences | Domain-specific frameworks for supply chain KPI conflict                  | Applies goal conflict theory to SC KPIs; links behavioral dysfunction to mathematical infeasibility |
| <i>SC Strategy</i>         | Alignment frameworks; efficiency frontier at strategic level              | Operational translation into annual KPI targets                           | Operationalizes trade-off awareness into annual planning                                            |
| <i>SCOR / BPM</i>          | Standardized metrics; process and practice maturity model                 | Trade-off integration; joint feasibility assessment                       | Adds joint feasibility analysis and shared ownership to SCOR KPI goal setting                       |

Source: Authors.

This synthesis answers RQ1: the academic literature establishes both that supply chain KPIs are interdependent and that goal conflict degrades performance, but it offers no operational method for setting jointly attainable KPI targets. Whether practice has independently developed such methods, or instead exhibits the dysfunctions the theory predicts, is an empirical question, addressed in Sections 3 and 4.

## 3. Methodology.

### 3.1. Research Design Overview.

This study employs a mixed-methods research design following a sequential explanatory strategy (Creswell & Plano Clark, 2017). It addresses RQ1–RQ3 through a systematic literature review and a mixed-method empirical survey. Table 2 maps

the three research questions of this paper to methods and data sources.

Table 2: Research questions mapped into the methodology and data sources.

| RQ | Focus                                                                  | Method                                               | Data Sources                                                            |
|----|------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------|
| 1  | State of academic research on interdependent SC KPI goal setting       | Systematic literature review                         | Google Scholar, Scopus, Web of Science; SCOR Digital Standard v14       |
| 2  | Current goal-setting practices for OTD, efficiency, and inventory KPIs | Mixed-method cross-sectional survey (n=64)           | Online questionnaire Q1–Q35 (closed-ended items and the open-ended Q35) |
| 3  | Extent of trade-off consideration; barriers to integration             | Quantitative survey items + thematic analysis of Q35 | Survey Q28–Q34 (quantitative); Q35 open-ended responses (qualitative)   |

Source: Authors.

### 3.2. Systematic Literature Review (RQ1).

The literature review follows a structured search protocol across Google Scholar, Scopus, and Web of Science. Search terms combine: 'supply chain performance management,' 'key performance indicators,' 'goal setting,' 'conflicting goals,' 'metric trade-offs,' 'SCOR model,' 'balanced scorecard AND supply chain conflicts,' and 'safety stock vs service level'.

Secondary searches use backward and forward citation tracking from seminal works. Included articles are peer-reviewed and address supply chain performance measurement, KPI goal setting, goal conflict, multi-objective decision-making, or production, distribution and inventory modeling. Sources are organized into four thematic streams: (a) BPM systems and goal-setting theory; (b) supply chain performance frameworks and SCOR; (c) operations research models of trade-offs; and (d) empirical psychological studies of goal conflict and behavior. The synthesis is reported in Section 2.

### 3.3. Mixed-Method Empirical Survey (RQ2, RQ3).

#### 3.3.1. Survey instrument and research design.

The survey employs a cross-sectional design combining a 35-item structured online questionnaire with one open-ended question, collecting data from supply chain professionals across multiple industries at a single point in time. The combination of closed-ended quantitative items and the open-ended Q35 makes it a mixed-method survey. It covers six sections:

1. Job and company background (Q1–Q8);
2. On-time delivery goal setting (Q9–Q13);
3. Efficiency goal setting (Q14–Q19);
4. Inventory goal setting (Q20–Q25);
5. KPI management, priorities, and trade-off practices (Q26–Q32);

and (6) Barriers and improvement suggestions (Q33–Q35).

Question types include single-select dropdowns, five-point Likert scales, check-all-that-apply items, ranking matrices, and one open-ended question (Q35). The instrument was refined through pilot testing with five supply chain professionals.

### 3.3.2. Target population and sampling.

The target population consists of supply chain professionals at the manager, junior and senior executive levels with direct visibility (as well as accountability and/or responsibility) into the KPI goal setting approach and the company's performance management and reward systems.

Sampling combines purposive and snowball approaches by recruitment through the researcher's professional network. A minimum of 60 respondents were targeted, with industry representation across industrial and process manufacturing, distribution and warehousing, transportation, and retail, with no single industry exceeding 40% of total respondents. A minimum of 15% at VP/Director level or above ensures strategic-level perspectives.

The survey yielded 64 respondents that met the criteria, with industrial manufacturing the largest single end market at 43.8%. Respondents were recruited individually through direct professional contacts, and, to the researcher's knowledge, each respondent represents a unique organization, which satisfies the independence assumption of all inferential tests reported in Section 4.

### 3.3.3. Quantitative and qualitative analytical strategy.

The quantitative analysis proceeds in four sequential stages from description, diagnosis, inference, to synthesis. Each stage addresses a question that maps onto the empirical research questions and onto the operations-research relationships established in Section 2.

Stage 1. Descriptive characterization of current goal-setting practice (RQ2). Before any relationship can be tested, the prevailing practice must be documented. RQ2 asks how organizations actually set goals, so Stage 1 profiles four things:

1. Who sets versus who is held accountable for each KPI domain (Q9–Q11 for OTD, Q15–Q17 for efficiency, Q21–Q23 for inventory).
2. The criteria that drive goal setting (for example, the Q11 inputs).
3. The degree of cross-functional integration in goal setting (Q12, Q18, Q24).
4. The maturity of the goal-setting process relative to other processes (Q26).

The purpose is to establish the empirical baseline, that is, the "set as if independent" pattern that the operations-research synthesis predicts should produce conflict against which every subsequent stage is interpreted.

Stage 2. Trade-off awareness gap and barrier analysis (RQ3). RQ3 asks to what extent trade-offs are explicitly considered and what prevents their consideration. Stage 2 isolates the central diagnostic of the paper: the distance between the ambition to

improve several interdependent KPIs simultaneously and the analytical practice of explicitly modeling the trade-offs among them. This gap indicates that organizations commit to multi-KPI improvement without verifying that the combination of targets is jointly feasible. Stage 2 then ranks the perceived barriers to locate the cause of the gap, distinguishing organizational and analytical constraints from informational ones.

Stage 3. Inferential hypothesis testing. Stages 1 and 2 describe patterns but cannot establish that those patterns carry the consequences the literature predicts. Stage 3 converts the qualitative logic of the literature review (RQ1) into four pre-specified hypotheses and tests each on the survey data, so that the diagnosis is grounded in inference. Each hypothesis probes one link in the causal chain the paper argues for. All tests are non-parametric:

- Spearman rank correlations for the ordinal Likert and composite measures (H1–H3)
- Chi-square tests of independence for the categorical setter/owner data (H4)

H1 (integration → performance). Tests on whether the degree of cross-functional integration in goal setting (Q12, Q18, Q24) is positively associated with self-reported KPI performance. The literature holds that integrated goal setting is what renders interdependent targets jointly attainable; if so, more integrated organizations should report better performance. H1 establishes that the practice described under RQ2 is consequential, not simply prevalent.

H2 (trade-off modeling → reduced dysfunction). Tests on whether organizations that explicitly model trade-offs (Q29) exhibit fewer of the five dysfunctional behaviors (Q31). This is the direct behavioral test of the core RQ3 claim that the modeling deficit is costly: if modeling protects against dysfunction, the modeling deficit documented in Stage 2 carries measurable behavioral costs. A negative correlation is predicted.

H3 (process maturity → performance). Tests on whether the maturity of the goal-setting process (the seven items in Q26) is positively associated with performance. H3 separates organizational capability (maturity) from the specific integrative behavior tested in H1, confirming that the capability dimension independently tracks outcomes.

H4 (setter–owner non-independence). Chi-square tests of the setter-owner contingency tables in each of the three domains analyze whether the function that sets a goal is statistically independent of the function held accountable for it. The setter-owner mismatch documented descriptively in Stage 1 could in principle be random. The test on H4 establishes that it is a systematic disconnect that makes it an organizational precondition for goal conflict and the central theme for a governance-driven remedy.

The study found no theoretically motivated reason to expect organization size or industry effects on the specific goal-setting behaviors under study, so demographic controls are not included in the inferential analysis, though future work with larger samples may explore these boundary conditions.

Stage 4 — Exploratory multivariate analysis: data reduction and organizational typology. Stages 1 to 3 examine the variables one or two at a time. Stage 4 is centered in two synthesis questions complementary to the univariate/bivariate analysis:

(i) whether the distinct behaviors this study measures reflect a smaller number of underlying organizational qualities, addressed by Principal Component Analysis (PCA)

(ii) whether the 64 organizations fall into a few recurring, internally coherent types of goal-setting practice, addressed by Ward's hierarchical clustering.

Together these convert the variable-level findings of RQ2 and RQ3 into organization-level structure, which is what makes the diagnosis actionable, since different organizational types call for different interventions.

Both analyses draw on the same pool of seven goal-setting variables, each standardized to mean zero and unit variance so that differences in scale do not dominate the component loadings or the inter-organization distances. The seven variables span goal-setting practice, organizational context, and their behavioral and performance outcomes:

1. Average KPI integration across the three KPI domains (composite of Q12, Q18, Q24), capturing cross-functional cooperation in goal setting (goal-setting practice).
2. Explicit trade-off modeling (Q29), the direct measure of whether interdependencies are analytically addressed (goal-setting practice, and the central RQ3 variable).
3. Multi-KPI ambition (Q28), the breadth of simultaneous improvement targets (goal-setting practice).
4. Leadership joint consideration (Q32), executive engagement in cross-KPI trade-off decisions (organizational context).
5. Dysfunction count (sum of five Q31 behaviors), the behavioral consequences of goal-setting practice (behavioral outcome).
6. Average goal-setting process maturity, composite of seven Q26 items, organizational capability (organizational context).
7. Average self-reported KPI performance across the three domains, composite of Q8, Q14, and Q20 (performance outcome).

The two techniques deliberately use different subsets of this pool, because they serve different analytical purposes. The PCA is run on all seven variables. Because the PCA is exploratory, no variable is excluded a priori. Running the full set allows the decomposition to reveal whether any variable stands apart from the dominant dimension; multi-KPI ambition in fact loads primarily on a secondary axis (Section 4.4), indicating that aspiration varies independently of analytical sophistication

The clustering is run on six of the seven variables, excluding multi-KPI ambition (Q28). Its purpose is to partition organizations into the most clearly separated, internally homogeneous types, and for that, multi-KPI goal ambition is uninformative for that purpose. Conceptually, ambition is an intent variable (how much an organization aspires to improve)

rather than a measure of goal-setting sophistication or its consequences; because nearly every organization reports high ambition (sample mean 3.52 on the five-point scale), it does little to distinguish one organization from another. Empirically, ambition is the most weakly correlated of the seven variables and, as the PCA confirms, loads on a separate axis from the dimension on which organizations meaningfully differ. Retaining it in the distance calculation would therefore inject variance on which organizations are essentially alike, blurring the boundaries between clusters without improving separation. Restricting the clustering to the six discriminating variables — integration, trade-off modeling, leadership joint consideration, dysfunction, goal-setting maturity, and performance — sharpens the archetypes, which are validated by Kruskal–Wallis tests on those same six variables (Section 4.5).

#### 4. Empirical Findings.

The final analytic sample comprises 64 supply chain professionals drawn from manufacturing, process, and retail end markets (industrial manufacturing 43.8%, process manufacturing 20.3%, other manufacturing 20.3%, retail 15.6%). The sample is highly senior: 54.7% hold VP or Director titles, 23.4% are CEO, C-Suite, or EVP, 17.2% are Managers or Supervisors, and 4.7% are Individual Contributors. This means that 78.1% are at VP level or above and 95.3% are at manager level or above.

Organization size is bimodal: 32.8% have between 500 and 2,500 employees and 32.8% have more than 5,000 employees, while the smaller bands of fewer than 500 and of 2,500 to 5,000 employees each account for 17.2%.

79.7% of respondents report more than 20 years of experience, with a further 17.2% reporting 10 to 20 years, satisfying the design requirement for strategic-level visibility into KPI goal setting. Table 3 presents the full sample profile.

Table 3: Sample profile (n = 64). 78.1% of respondents are at VP level or above; 95.3% at manager level or above.

| Characteristic      | Category                  | n  | %     |
|---------------------|---------------------------|----|-------|
| Job level           | VP / Director             | 35 | 54.7% |
|                     | CEO / C-Suite / EVP       | 15 | 23.4% |
|                     | Manager / Supervisor      | 11 | 17.2% |
|                     | Individual Contributor    | 3  | 4.7%  |
| Industry            | Industrial manufacturing  | 28 | 43.8% |
|                     | Other manufacturing       | 13 | 20.3% |
|                     | Process manufacturing     | 13 | 20.3% |
|                     | Retail                    | 10 | 15.6% |
| Organization size   | Less than 500 employees   | 11 | 17.2% |
|                     | 500–2,500 employees       | 21 | 32.8% |
|                     | 2,500–5,000 employees     | 11 | 17.2% |
|                     | More than 5,000 employees | 21 | 32.8% |
| Years of experience | More than 20 years        | 51 | 79.7% |
|                     | 10 to 20 years            | 11 | 17.2% |
|                     | 5 to 10 years             | 2  | 3.1%  |

Source: Authors.

All inferential tests use non-parametric methods appropriate for ordinal data. This section reports the observed results and every case where a directional prediction was pre-registered in the research design, the observed direction is noted explicitly.

#### 4.1. Descriptive Findings: Current Goal-Setting Practices (RQ2).

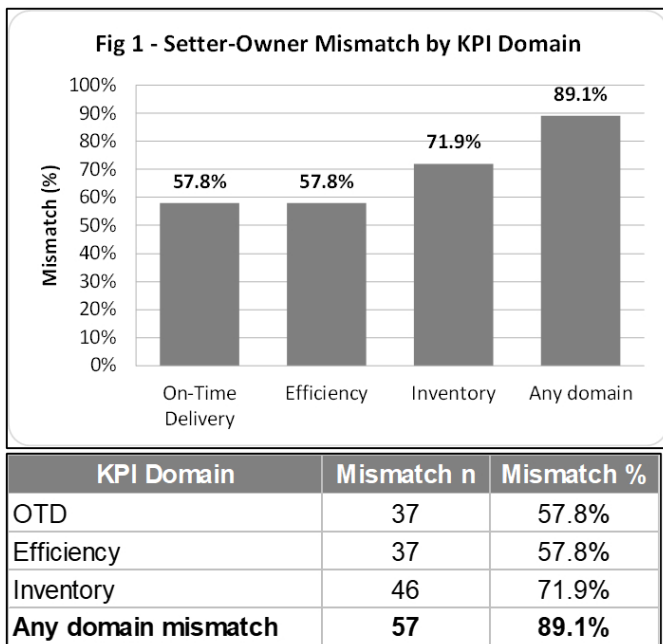
The goal-setting ownership analysis (Q9–Q11 for OTD, Q15–Q17 for Efficiency, Q21–Q23 for Inventory) reveals a pervasive setter–owner mismatch: 89.1% of respondents report at least one KPI domain in which the function that sets the goal differs from the function held accountable for performance against it. The mismatch is present in 57.8% of the cases for OTD as well as for efficiency and is most acute for inventory at 71.9%. Table 4 summarizes the mismatch by domain, and Figure 1 displays it.

Table 4: Setter–owner mismatch summary by KPI domain (n = 64).

| KPI domain       | Setter–owner mismatch | Dominant setter         | Dominant accountable function |
|------------------|-----------------------|-------------------------|-------------------------------|
| On-Time Delivery | 57.8%                 | GM / Finance (34 of 64) | Supply Chain / Operations     |
| Efficiency       | 57.8%                 | GM / Finance (38 of 64) | Manufacturing / Operations    |
| Inventory        | 71.9%                 | GM / Finance (42 of 64) | Supply Chain (57 of 64)       |
| Any domain       | 89.1%                 | —                       | —                             |

Source: Authors.

Figure 1: Setter–Owner Mismatch by KPI Domain.

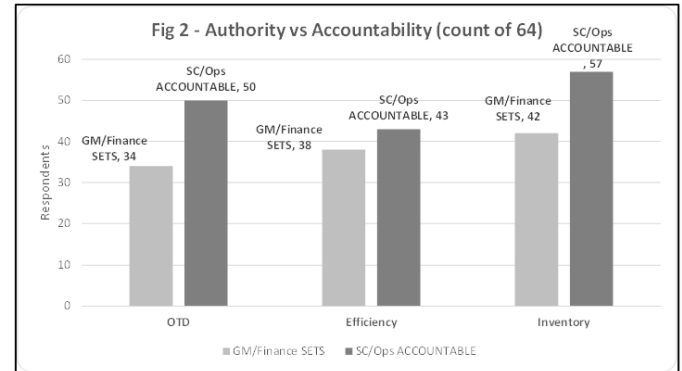


Source: Authors.

The dominant pattern is consistent across all three domains: General Management or Finance sets the target while Supply Chain or Manufacturing/Operations bears accountability. For inventory specifically, General Management or Finance dominates goal setting (42 respondents) while Supply Chain bears accountability (57 respondents). This disconnect between authority and accountability, visualized in Figure 2, is consistent with the goal-conflict mechanisms described in prior literature.

Goal-setting inputs are dominated by aspirational and externally referenced criteria rather than operational interdepen-

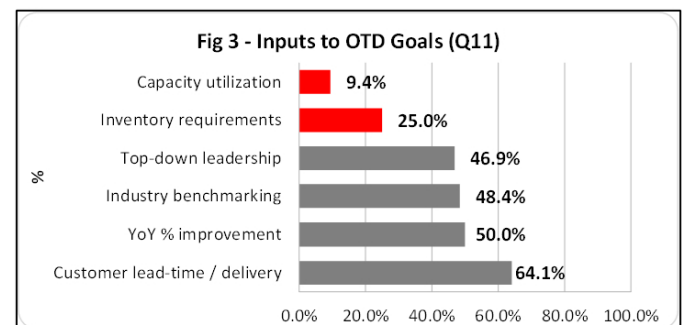
Figure 2: Authority vs. Accountability (who sets vs. who owns). Authority–accountability disconnect. Across all three KPI domains, General Management or Finance predominantly sets the goal while Supply Chain or Operations is held accountable for it.



Source: Authors.

dent drivers. For OTD goals (Q11), the most frequently cited input is customer lead-time or delivery requirements (64.1%), followed by year-over-year percentage improvement (50.0%), industry benchmarking (48.4%), and top-down leadership directives (46.9%). Only 9.4% of respondents cite capacity utilization as an input to OTD goals, despite Kingman's formula establishing that capacity utilization is a primary mathematical driver of cycle time and therefore of delivery performance. Only 25.0% cite inventory requirements as an OTD input, despite the mathematical linkage between safety stock and fill rate. Figure 3 shows that the inputs most directly related to joint feasibility are cited less frequently than aspirational or externally referenced inputs.

Figure 3: Inputs to On-Time Delivery Goals (Q11) Inputs considered when setting On-Time Delivery goals (Q11, check-all-that-apply). Aspiration-based and externally referenced criteria dominate; capacity utilization (the primary cycle-time driver in Kingman's formula) is cited by only 9.4% of respondents.



Source: Authors.

These results suggest that goal-setting inputs often do not explicitly incorporate the operational trade-offs that influence joint KPI feasibility.

KPI integration scores are low across all three domains. On

the five-point integration scales, the observed means are 2.89 for OTD goals (Q12), 2.70 for efficiency goals (Q18), and 2.78 for inventory goals (Q24)—each below the scale midpoint of integrated practice, with 35.9% of respondents rating OTD integration at 1 or 2 and over 40% doing so for efficiency and inventory. The process-maturity ratings (Q26, coded Infancy = 1 to Excellent = 4) place the goal-setting process near the bottom of the seven processes evaluated, with a mean of 2.17 (Basic). Table 5 reports the full maturity ranking, and Figure 4 displays both the integration means and the maturity ranking together.

Table 5: SCOR process-maturity ratings (Q26), ordered most to least mature.

| SCOR process                       | Mean maturity (1-4) | Rank (of 7)      |
|------------------------------------|---------------------|------------------|
| Sourcing                           | 2.45                | 1 (most mature)  |
| Annual operating plan development  | 2.38                | 2                |
| Production management & scheduling | 2.19                | 3                |
| Goal-setting process               | 2.17                | 4                |
| Demand planning                    | 2.16                | 5                |
| Sales & operations planning        | 2.14                | 6                |
| Inventory planning & optimization  | 1.95                | 7 (least mature) |

Source: Authors.

The only processes rated lower than goal setting are inventory planning and optimization (1.95) and sales and operations planning (2.14); demand planning (2.16) and production management (2.19) are essentially tied with goal setting, while sourcing (2.45) and annual operating plan development (2.38) are the most mature.

The clustering of planning, S&OP, and goal-setting processes near the bottom of the maturity ranking suggests that integrative cross-functional processes remain less developed than other supply-chain processes.

#### 4.2. Trade-Off Awareness and Barriers (RQ3).

The central empirical finding of this research is the trade-off awareness gap: the disconnect between multi-KPI goal attainment ambition (Q28) and explicit trade-off modeling (Q29).

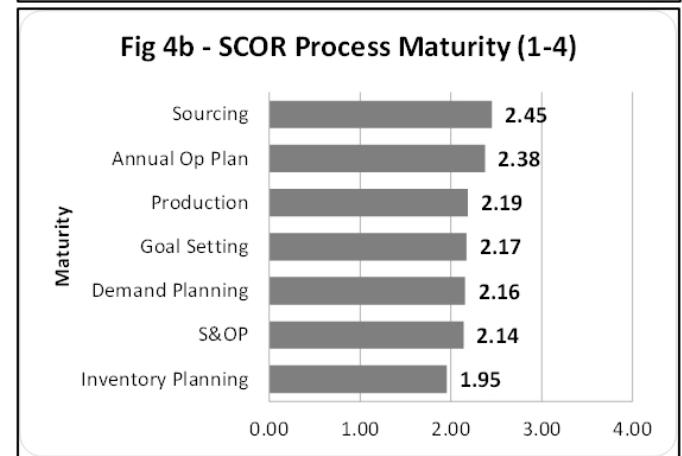
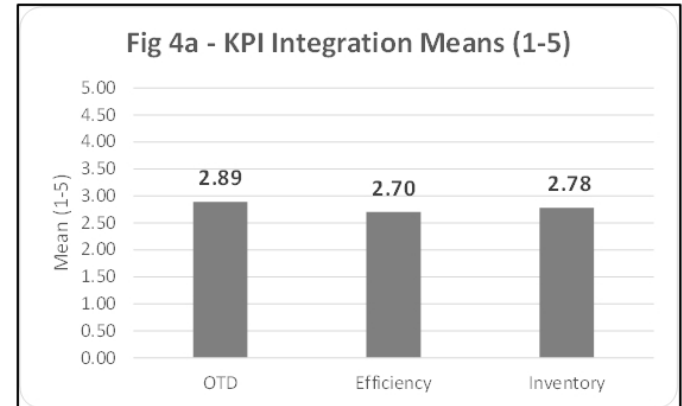
While 51.6% of respondents agree or strongly agree that their company's goals include simultaneous improvement in efficiency, inventory, and customer delivery, only 12.5% agree or strongly agree that their company explicitly models the trade-offs between these KPIs.

The resulting gap of 39.1 percentage points between ambition and analytical practice is shown in Figure 5.

Figure 6 cross-tabulates ambition (Q28) against modeling (Q29). 28 of 64 respondents (43.8%) simultaneously pursue multi-KPI improvement targets and report no explicit trade-off modeling, while only 5 respondents combine high ambition with explicit modeling. The mean trade-off-modeling rating across the full sample is only 2.23 on the five-point scale, against a multi-KPI ambition mean of 3.52.

Five dysfunctional organizational behaviors (Q31) are prevalent. Explicit acknowledgment that trade-offs are not consid-

ered in goal setting is the most common (62.5%), followed by priority shifting between OTD, efficiency, and inventory targets (57.8%), finger-pointing between functions (50.0%), sandbagging or goal manipulation (46.9%), and silo creation and protection (43.8%). Respondents endorse an average of 2.61 of the five behaviors, indicating that these dysfunctions co-occur rather than appear in isolation. Figure 7 ranks the five behaviors.



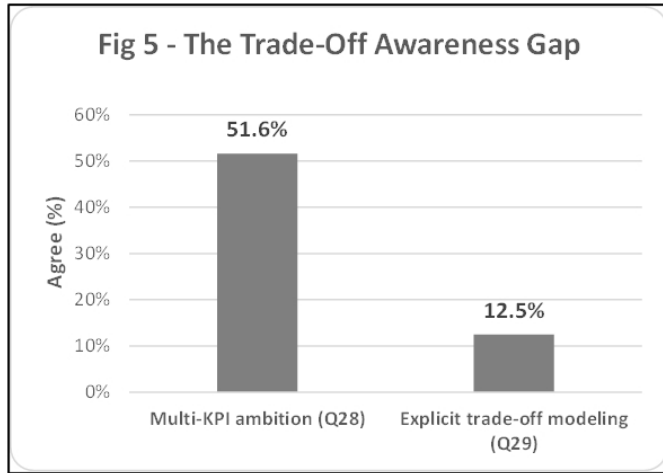
Source: Authors.

ered in goal setting is the most common (62.5%), followed by priority shifting between OTD, efficiency, and inventory targets (57.8%), finger-pointing between functions (50.0%), sandbagging or goal manipulation (46.9%), and silo creation and protection (43.8%). Respondents endorse an average of 2.61 of the five behaviors, indicating that these dysfunctions co-occur rather than appear in isolation. Figure 7 ranks the five behaviors.

Co-occurrence analysis confirms a tightly linked cluster: the five behaviors overlap with one another at Jaccard values ranging from 0.26 to 0.48. The strongest pairwise overlap is between finger-pointing and sandbagging (B2–B4, 0.48), consistent with the hypothesis that agents facing unattainable targets respond by both blaming other functions and buffering their own targets.

The next strongest overlaps involve silo creation with finger-pointing (B2–B3, 0.40), silo creation with trade-off ignorance (B3–B5, 0.42), and both priority shifting and sandbagging with trade-off ignorance (B1–B5 and B4–B5, 0.40 each). Table 6 reports the pairwise co-occurrence (Jaccard) matrix. The pattern

Figure 5: The Trade-Off Awareness Gap. A gap of 39.1 percentage points separates the share of organizations pursuing multi-KPI improvement (51.6%) from the share that explicitly models the trade-offs between those KPIs (12.5%). The largest cell (28 respondents, 43.8%) combines high multi KPI ambition with no explicit trade-off modeling, a condition that may contribute to the establishment of jointly difficult-to-attain targets.



Source: Authors.

Figure 6: Q28 x Q29 KPI ambition vs. Modeling.

|                        | Models: NO<br>(Q29<4) | Models: YES<br>(Q29>=4) |
|------------------------|-----------------------|-------------------------|
| High ambition (Q28>=4) | 28                    | 5                       |
| Low ambition (Q28<4)   | 28                    | 3                       |

Source: Authors.

is consistent with a reinforcing sequence of behaviors in which jointly unattainable goals produce constant priority shifts and cross functional blame, which results in defensive silo behavior.

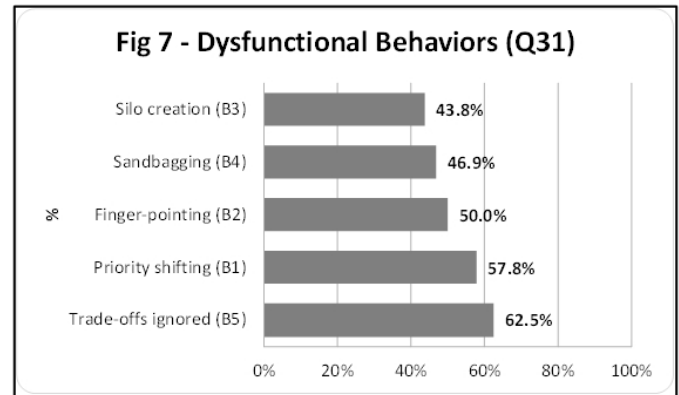
Barrier analysis (Q33) ranks the obstacles to trade-off consideration as:

1. functional silo behavior (64.1%)
2. lack of executive understanding of trade-offs (62.5%)
3. lack of effective tools and models (57.8%)
4. misaligned incentives between functions (54.7%)
5. data availability and cleanliness (29.7%)

The relatively low ranking of data availability suggests that respondents perceive organizational and analytical factors as more important barriers than data access.

The evidence regarding use of tools to facilitate trade-off aware goal setting reinforces this interpretation. Among respondents who identify any tool for trade-off analysis (Q30),

Figure 7: Dysfunctional Behaviors (Q31).



Source: Authors.

Table 6: Pairwise behavior co-occurrence (Jaccard overlap). The strongest pair is finger-pointing with sandbagging (0.48).

| Jaccard overlap   | B1 Priority shift | B2 Finger-point | B3 Silo | B4 Sandbag | B5 Ignored |
|-------------------|-------------------|-----------------|---------|------------|------------|
| B1 Priority shift | —                 | 0.35            | 0.30    | 0.40       | 0.40       |
| B2 Finger-point   | 0.35              | —               | 0.40    | 0.48       | 0.38       |
| B3 Silo           | 0.30              | 0.40            | —       | 0.26       | 0.42       |
| B4 Sandbag        | 0.40              | 0.48            | 0.26    | —          | 0.30       |
| B5 Ignored        | 0.40              | 0.38            | 0.42    | 0.30       | —          |

Source: Authors.

MS Excel or similar is by far the most common (61.7% of responses), with dedicated decision-support, advanced planning tools, or optimization software cited in only 12.8% of responses. As Figure 9 shows, counting respondents who report Excel only or no tool at all, 71.9% of the sample lacks any purpose-built capability for trade-off analysis, suggesting that tool availability may contribute alongside knowledge-related barriers.

#### 4.3. Inferential Hypotheses Analysis.

Four hypotheses were tested inferentially; Table 7 summarizes the test statistics, effect sizes, and outcomes, and Figure 10 displays the effect sizes.

H1 (integration → performance). Composite integration is strongly and positively correlated with composite performance ( $r_s = 0.66$ ,  $p < 0.001$ ), supporting H1.

H2 (trade-off modeling → reduced dysfunction). Explicit trade-off modeling is negatively correlated with the count of dysfunctional behaviors ( $r_s = -0.38$ ,  $p = 0.002$ ), supporting H2.

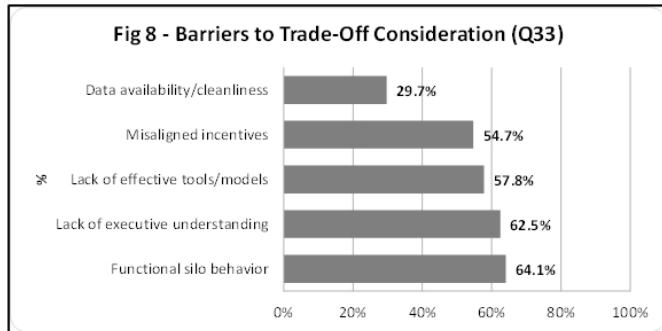
H3 (process maturity → performance). Goal-setting maturity is positively correlated with performance ( $r_s = 0.47$ ,  $p < 0.001$ ), a moderate-to-strong effect, supporting H3.

H4 – H4 (setter-owner non-independence). Chi-square tests of the setter-owner contingency tables reject independence in all three KPI domains (OTD  $\chi^2 = 16.97$ ,  $p = 0.009$ ; efficiency  $\chi^2 = 25.74$ ,  $p < 0.001$ ; inventory  $\chi^2 = 40.19$ ,  $p < 0.001$ ).

#### 4.4. Principal Component Analysis (PCA).

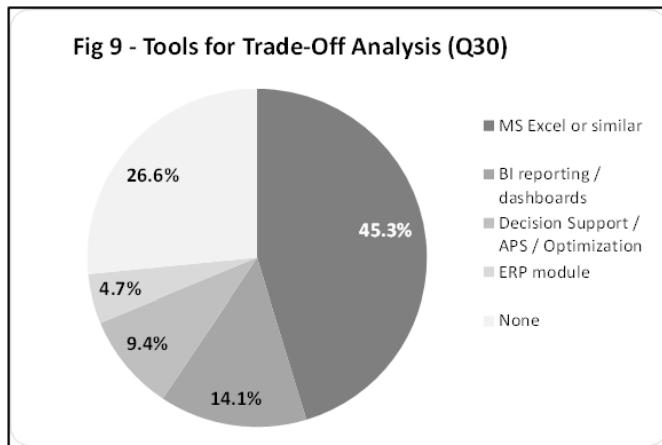
To uncover whether the seven goal-setting variables measured in this study (integration, trade-off modeling, multi-KPI

Figure 8: Barriers to Trade-Off Consideration (Q33). Functional silos, weak executive understanding, and the absence of effective tools dominate, while data availability ranks last, indicating an organizational and analytical problem rather than a data availability one.



Source: Authors.

Figure 9: Tools for Trade-Off Analysis (Q30).



Source: Authors.

ambition, leadership joint consideration, dysfunction, goal-setting maturity, and performance) reflect a smaller number of underlying organizational qualities, an exploratory PCA was conducted on the standardized scores. In doing so the PCA poses no new research question, instead it synthesizes RQ2 and RQ3, testing whether the goal-setting practices documented under RQ2 and the trade-off-awareness measures of RQ3 are facets of a single underlying organizational quality.

Consistent with the analytical strategy set out in Section 3.3.3, the PCA uses the full seven-variable pool, whereas the clustering in Section 4.5 uses six of these variables; the rationale for the difference is given in Section 3.3.3.

The analysis identified two meaningful components, each explaining more variance than any single original variable, per the Kaiser eigenvalue > 1.0 criterion, which together account for 60.6% of the total variation across the seven measures.

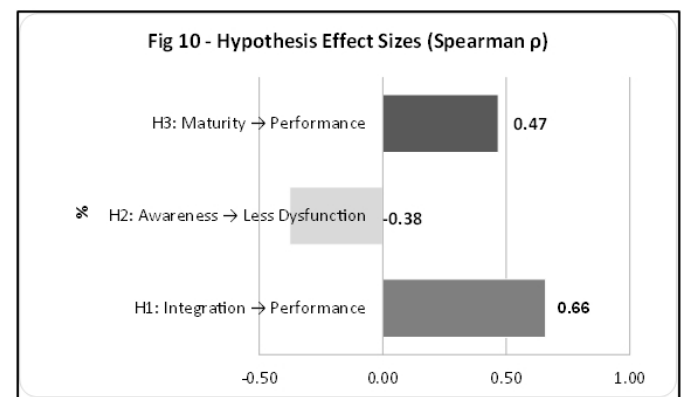
The first and dominant component (eigenvalue 3.23, capturing 45.4% of variance) shows positive loadings between 0.37 and 0.44 for five of the seven variables (integration, trade-off modeling, leadership joint consideration, goal-setting maturity,

Table 7: Inferential hypothesis tests with statistics, effect sizes, and outcomes (n = 64). Integration and maturity are positively associated with performance; trade-off awareness is negatively associated with dysfunction. Setter and accountable functions are non-independent in all three domains. All are statistically significant.

| Hypothesis                       | Test            | Statistic              | Effect size   | p       | Outcome   |
|----------------------------------|-----------------|------------------------|---------------|---------|-----------|
| H1: Integration ↔ performance    | Spearman $\rho$ | $\rho = 0.66$          | large         | < 0.001 | Supported |
| H2: Awareness ↔ less dysfunction | Spearman $\rho$ | $\rho = -0.38$         | medium        | 0.002   | Supported |
| H3: Maturity ↔ performance       | Spearman $\rho$ | $\rho = 0.47$          | medium-strong | < 0.001 | Supported |
| H4: Setter × owner dependence    | Chi-square      | $\chi^2 = 16.97-40.19$ | —             | ≤ 0.009 | Supported |

Source: Authors.

Figure 10: Hypothesis Effect Sizes. Effect sizes for H1–H3 (Spearman  $\rho$ ). Integration (H1) and maturity (H3) are positively associated with performance; trade-off awareness (H2) is associated with less dysfunction.



Source: Authors.

and performance), with dysfunction loading negatively (-0.37). This component is interpreted as a general Goal-Setting Sophistication dimension: Higher PC1 scores are associated with higher integration, trade-off modeling, leadership involvement, and performance.

The second component (eigenvalue 1.08, 15.2% of variance) captures a different and smaller pattern: it contrasts multi-KPI ambition and raw performance against trade-off modeling and leadership involvement, identifying an Ambition–Capability Gap dimension, organizations that set ambitious targets and report decent performance but lack the analytical methods and leadership engagement to sustain them. Tables 8 and 9 display the eigenvalues for all PCs and the loadings for PC1 and PC2.

#### 4.5. Organizational Archetypes: Ward's hierarchical cluster analysis.

To determine whether the 64 observations cluster into distinct types of goal-setting practice, Ward's hierarchical cluster analysis was applied to six standardized variables, that is, the

Table 8: PCA Eigenvalues.

| Component | Eigenvalue | Variance % | Cumulative % |
|-----------|------------|------------|--------------|
| PC1       | 3.228      | 45.4%      | 45.4%        |
| PC2       | 1.080      | 15.2%      | 60.6%        |
| PC3       | 0.913      | 12.8%      | 73.4%        |
| PC4       | 0.624      | 8.8%       | 82.2%        |
| PC5       | 0.561      | 7.9%       | 90.1%        |
| PC6       | 0.400      | 5.6%       | 95.7%        |
| PC7       | 0.306      | 4.3%       | 100.0%       |

Source: Authors.

six discriminating variables identified in Section 3.3.3 (integration, trade-off modeling, leadership joint consideration, dysfunction, goal-setting maturity, and performance); multi-KPI ambition is excluded for the reasons given there. Like the PCA, the clustering addresses RQ2 and RQ3 jointly at the level of the organization rather than the variable.

### The three resulting archetypes are:

**Silo-Driven** (56.3% of the sample,  $n = 36$ ), characterized by the lowest trade-off modeling and goal-setting maturity, the highest dysfunction, and the lowest performance, the most commonly observed profile within the sample.

**Aspirational** (15.6%,  $n = 10$ ), exhibiting the highest level of explicit trade-off modeling in the sample but still elevated dysfunction and only middling performance, organizations that recognize the problem but have not yet built the organizational structures to solve it.

**Trade-Off Aware** (28.1%,  $n = 18$ ), displaying the highest integration and leadership engagement, high trade-off modeling, the lowest dysfunction, and the highest performance, the most mature profile, evidence that higher levels of trade-off awareness and integration are achievable.

To confirm these clusters reflect real organizational differences rather than artifacts of the algorithm, Kruskal–Wallis tests were run on all six clustering variables; all six variables differed significantly across clusters (all  $p < 0.001$ ).

Table 10 profiles the three archetypes and Figure 12 displays them. The archetypes suggest that organizations differ their readiness to adopt trade-off-aware goal-setting practices.

### 4.6. Practitioner-Identified Remedies (Q35 Thematic Analysis).

The single open-ended question (Q35) asked respondents to describe additional ways to improve trade-off integration into the KPI goal-setting process. Of the 64 respondents, 40 provided substantive answers (the remainder left the field blank or wrote non-substantive replies such as “nothing further” or “already covered”).

Table 9: PC1, PC2 Loadings. Two components with eigenvalue  $> 1$ . and explain 60.6% of the variance. “Goal-Setting Sophistication”, that is, integration, trade-off modeling, leadership joint consideration, maturity, and performance load positively while dysfunction loads negatively.

| Variable           | PC1   | PC2   |
|--------------------|-------|-------|
| Integration        | 0.44  | 0.15  |
| Trade-off model    | 0.41  | -0.37 |
| Multi-KPI ambition | 0.22  | 0.54  |
| Leadership joint   | 0.37  | -0.51 |
| Dysfunction        | -0.37 | -0.34 |
| GS maturity        | 0.39  | -0.25 |
| Performance        | 0.41  | 0.32  |

Source: Authors.

Table 10: Organizational archetypes-Ward’s hierarchical cluster analysis (relative profiles;  $n = 64$ ).

| Archetype       | Share               | Integration | Trade-off modeling | Goal-setting maturity | Dysfunction | Performance |
|-----------------|---------------------|-------------|--------------------|-----------------------|-------------|-------------|
| Silo-Driven     | 56.3%<br>( $n=36$ ) | Low         | Lowest             | Lowest                | Highest     | Lowest      |
| Aspirational    | 15.6%<br>( $n=10$ ) | Moderate    | Moderate           | Moderate              | High        | Moderate    |
| Trade-Off Aware | 28.1%<br>( $n=18$ ) | Highest     | Highest            | Highest               | Lowest      | Highest     |

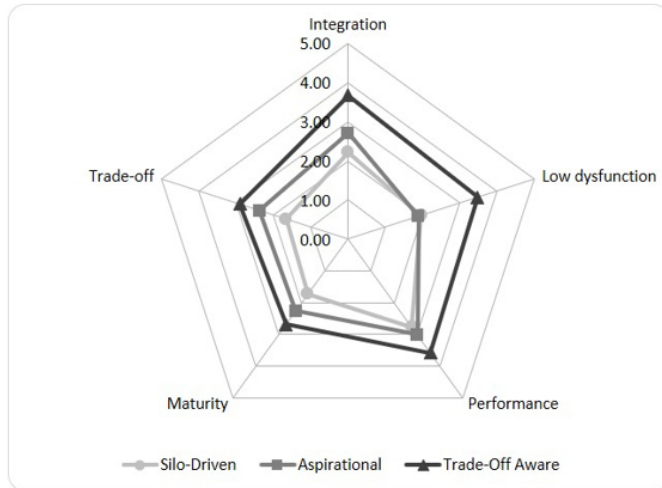
Source: Authors.

A single-researcher thematic analysis of these 40 responses produced four recurring themes; Table 11 reports their frequencies, with the complete coded responses provided in the accompanying data-analysis workbook. Practitioners’ unprompted suggestions cluster almost entirely on analytical, governance, and educational remedies, mirroring the quantitative barrier ranking of Section 4.2.

Substantively, the thematic analysis serves two research questions at once: it corroborates RQ3 by reproducing the barrier structure in practitioners’ own words, and it points to a potential research extension by identifying three buckets of remedies: analytical, educational, and governance.

Largest theme, alignment and integrated planning (42.5%), reflects calls for holistic, cross-functionally aligned goal setting and for the integrated planning forums (S&OP/IBP) in which trade-offs can be surfaced — for example, “metric interaction should be discussed monthly in an S&OP process we do not have,” and the recurring observation that the “lack of linkage between sales and operations continues to be the biggest single challenge.”

Figure 11: Organizational Archetype Profiles (radar). The three organizational archetypes from Ward’s hierarchical clustering. Trade-Off Aware organizations (28.1%,  $n = 18$ ) score highest on integration, maturity, and performance while exhibiting the least dysfunction; Silo-Driven organizations (56.3%,  $n = 36$ ) show the inverse profile. The existence of the Trade-Off Aware cluster suggests that organizations can develop practices associated with higher trade-off awareness and performance.



Source: Authors.

Table 11: Themes in practitioner-identified remedies. Q35 open-ended responses, single-coder thematic analysis).

| Theme                           | Substantive responses | % of substantive (n=40) |
|---------------------------------|-----------------------|-------------------------|
| Alignment & integrated planning | 17                    | 42.5%                   |
| Tools & feasibility-checking    | 10                    | 25.0%                   |
| Executive education & awareness | 7                     | 17.5%                   |
| Governance & shared ownership   | 6                     | 15.0%                   |

Source: Authors.

The second theme, tools and feasibility-checking (25.0%), maps directly onto the kind of analytical decision-support tool recommended in Section 6; respondents asked for scenario planning and simulation, for “mandatory checks for KPI feasibility,” and, in several cases, for precisely that kind of model: “a simple Excel model showing how inventory and fill rate move together would be a massive step up from where we are now,” and “3–4 well-defined scenarios and let senior leadership pick.”

The third theme, executive education and awareness (17.5%), captures the need to build leadership understanding of KPI interdependencies, voiced as “build awareness of dependencies between KPIs in the leadership team,” “educate VP and up, translating ops stuff into dollars,” and the blunt “most do not even know.”

The fourth theme, governance and shared ownership (15.0%), calls for assigned accountability and aligned incentives across functions: “shared bonuses across functions — nothing else will change behavior,” “someone needs to own the connections between KPIs,” and “ownership assigned to the goals so they

can be cascaded down.”

Several responses also reframed the core problem in plainly diagnostic terms — “stop behaving as if KPIs are independent” and “face reality and stop acting like all KPIs’ goals can be hit independently”, aligning closely with the quantitative findings reported earlier. The qualitative findings are broadly consistent with the quantitative results: practitioners do not lack awareness that trade-offs exist; they lack the analytical tools, governance structures, and executive understanding to act on that awareness. These themes provide a useful starting point for future research and practical development.

## 5. Discussion.

This study sought to understand how organizations set goals for interdependent supply chain KPIs and the extent to which trade-offs are considered during that process. The findings indicate that while practitioners frequently pursue simultaneous improvements in delivery performance, efficiency, and inventory outcomes, formal mechanisms for evaluating the feasibility of those objectives remain limited.

Regarding RQ2, the results suggest that goal setting is often driven by organizational aspirations rather than by explicit consideration of the operational relationships linking key performance measures. Across all three KPI domains examined, responsibility for setting targets was frequently separated from responsibility for achieving them. General Management and Finance functions commonly established goals, while Supply Chain and Operations functions were accountable for execution. This pattern does not necessarily imply ineffective management practices; however, it may reduce the extent to which operational constraints and trade-offs are incorporated into the goal-setting process.

The analysis of goal-setting inputs reinforces this interpretation. Respondents reported that customer requirements, benchmarking, year-over-year improvement expectations, and leadership directives are commonly used when establishing targets. By contrast, variables directly connected to operational feasibility (such as capacity utilization and inventory requirements) were cited less frequently. Given the mathematical relationships documented in the operations research literature, this finding suggests that organizations may not consistently integrate known system constraints into target-setting decisions.

The results associated with RQ3 point to a related challenge. While a majority of respondents reported pursuing simultaneous improvement across multiple KPI dimensions, relatively few indicated that their organizations explicitly model the trade-offs among those measures. The resulting difference between ambition and analytical practice represents one of the most notable findings of the study. Respondents did not identify data availability as the primary obstacle. Instead, functional silos, limited executive understanding of KPI interdependencies, and the absence of suitable analytical tools emerged as the most frequently cited barriers.

This distinction has practical implications. If organizations already possess much of the data required to evaluate KPI in-

teractions, then improvements may depend less on data collection efforts and more on the development of analytical capabilities and governance processes that support cross-functional decision making. The prominence of organizational and behavioral barriers suggests that the challenge extends beyond technical optimization and into the broader domain of management practice.

The inferential analyses provide additional support for this interpretation. Higher levels of KPI integration and trade-off awareness were associated with stronger performance outcomes and lower levels of dysfunctional behavior. Similarly, more mature goal-setting processes were associated with higher reported performance. Although the cross-sectional design does not permit causal conclusions, the consistency of these relationships suggests that organizations emphasizing integration and trade-off awareness may be better positioned to manage competing performance objectives.

The archetypes identified through Ward's hierarchical clustering further illustrate this variation. The largest group, labeled Silo-Driven, exhibited relatively low levels of integration, trade-off modeling, and process maturity, together with higher levels of dysfunctional behavior. A second group, The Aspirational archetype, displayed evidence of awareness and intent but more limited organizational capability. The third grouping, Trade-Off Aware, combined higher integration, stronger leadership involvement, substantial use of trade-off modeling, and superior performance outcomes. These archetypes should not be interpreted as fixed organizational categories; rather, they represent recurring patterns observed within the sample. Their existence suggests that organizations differ substantially in how they approach interdependent KPI management and may require different improvement pathways.

The qualitative findings align closely with the quantitative results. Respondents frequently emphasized the need for cross-functional planning, analytical decision-support tools, executive education, and clearer governance structures. These themes emerged without prompting and closely mirror the barriers identified through the survey analysis. This convergence across methods strengthens confidence in the overall interpretation of the findings.

The results suggest that the challenge of supply chain KPI goal setting is not simply one of selecting ambitious targets. Rather, it involves developing organizational processes capable of evaluating the feasibility of multiple objectives simultaneously. The findings indicate that many organizations recognize the importance of improving several KPIs at once, but fewer possess the analytical and governance mechanisms required to systematically manage the trade-offs involved.

## 6. Research Extensions and Next Steps.

The findings of this study identify several opportunities for future research and practical development. While the results provide evidence that organizations frequently pursue goals for interdependent supply chain KPIs without explicitly evaluating the trade-offs among them, the study was designed primarily

to characterize current practice rather than to test specific interventions. As a result, several questions remain open.

One area for future work involves the development and evaluation of decision-support approaches that make KPI interdependencies more visible during the goal-setting process. Respondents consistently identified limited analytical capability and insufficient trade-off modeling as barriers to effective goal setting. In addition, many practitioners expressed interest in tools that could evaluate the feasibility of proposed targets before they are formally adopted. Given that most organizations in the sample reported relying primarily on spreadsheets or basic reporting tools, future research may benefit from emphasizing accessibility and practical implementation rather than sophisticated optimization methods alone.

A second area concerns governance and organizational design. The findings suggest that responsibility for establishing goals and responsibility for achieving them are frequently distributed across different functions. Future studies could examine alternative governance mechanisms intended to improve coordination among functions that share responsibility for interdependent KPIs. Examples may include shared accountability structures, cross-functional target-setting processes, formal trade-off review procedures, or incentive systems designed to encourage joint optimization rather than local performance improvement.

The results also suggest a role for leadership development and executive education. Respondents frequently cited limited understanding of KPI interdependencies as a barrier to more integrated decision making. Future research could explore whether structured educational interventions improve trade-off awareness and influence goal-setting behavior. Such work may be particularly relevant because the challenge identified in this study appears to involve not only analytical methods but also managerial interpretation and organizational decision making.

The organizational archetypes identified through the cluster analysis provide another avenue for investigation. The existence of distinct profiles suggests that organizations may differ substantially in their readiness to adopt trade-off-aware goal-setting practices. Future research could examine whether interventions should be tailored to organizational maturity levels and whether different adoption pathways are associated with different implementation outcomes.

Several methodological extensions would also strengthen the evidence base. First, replication with a larger sample would improve statistical power and allow more robust validation of the factor structure and organizational archetypes identified in this study. Second, longitudinal research designs could examine whether changes in goal-setting practices lead to subsequent changes in performance, helping to clarify causal relationships that cannot be established through a cross-sectional survey. Third, industry-specific studies may reveal contextual differences in how organizations perceive and manage KPI trade-offs. Such research may be particularly valuable in environments characterized by high variability, long lead times, or substantial operational uncertainty.

Finally, the findings point toward the potential value of a Design Science Research approach focused on developing and

evaluating practical artifacts that support trade-off-aware goal setting. Such artifacts could combine analytical models, governance mechanisms, and implementation guidelines into an integrated framework intended to help organizations establish goals that are both ambitious and operationally feasible. Evaluating the effectiveness of such artifacts in real organizational settings represents a logical next step in extending the work presented here.

These research opportunities suggest that future work should move beyond documenting the existence of KPI trade-offs and toward understanding how organizations can incorporate those relationships into routine managerial decision making. The results of this study provide an empirical foundation for that effort while highlighting several directions in which both theory and practice can be advanced.

## 7. Conclusions.

This study examined how organizations set goals for interdependent supply chain performance measures and the extent to which trade-offs are considered during that process. Drawing on a systematic review of the relevant literature and survey data from 64 supply chain professionals, the research addressed three questions: whether key supply chain KPIs are mathematically interdependent, how organizations currently establish goals for those KPIs, and what factors influence the consideration of trade-offs during goal setting.

The literature review indicates that widely used supply chain measures, including delivery performance, efficiency, and inventory - related metrics, are connected through well - established operations research relationships. Despite these relationships, the survey results suggest that organizations frequently establish goals for multiple KPIs without formally evaluating their interactions. While respondents commonly reported pursuing simultaneous improvements across several performance dimensions, relatively few reported the use of explicit trade-off modeling or structured feasibility assessment.

The findings also indicate that organizational and managerial factors may play a larger role than data availability in limiting trade-off-aware goal setting. Functional silos, limited executive understanding of KPI interdependencies, and the absence of suitable analytical tools emerged as the most frequently cited barriers. In addition, the results suggest that organizations exhibiting greater integration, higher levels of trade-off awareness, and more mature goal-setting processes tend to report stronger performance outcomes and lower levels of dysfunctional behavior.

The cluster analysis further identified meaningful variation among organizations. Three recurring organizational profiles were observed, ranging from relatively siloed and low - integration environments to organizations characterized by higher levels of coordination, trade-off awareness, and process maturity. Although these findings do not establish causal relationships, they suggest that organizations differ substantially in how they manage competing performance objectives and may require different approaches to improvement.

Several contributions emerge from this research. First, the study provides empirical evidence regarding current goal-setting practices for interdependent supply chain KPIs. Second, it introduces and measures the gap between multi-KPI performance ambition and explicit trade-off consideration. Third, it identifies organizational, analytical, and governance-related factors that may influence the ability of firms to manage KPI interdependencies effectively.

More broadly, the findings suggest that the challenge of supply chain goal setting extends beyond the selection of performance targets themselves. Organizations must also determine how multiple objectives interact and whether proposed targets can be pursued simultaneously within existing operational constraints. Future research can build on these findings by developing and evaluating methods, tools, and governance approaches that support more informed trade-off-aware decision making.

Taken together, the results contribute to a growing body of research examining the relationship between performance measurement, organizational decision making, and supply chain effectiveness. They also provide a foundation for future work aimed at improving the alignment between strategic performance objectives and operational realities.

## References

- ASCM. (2022). SCOR Digital Standard (Version 14.0). Association for Supply Chain Management.
- Blech, C., & Funke, J. (2010). You cannot have your cake and eat it, too: How induced goal conflicts affect complex problem solving. *The Open Psychology Journal*, 3, 42–53.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Cheng, M. M., Luckett, P. F., & Mahama, H. (2007). Effect of perceived conflict among multiple performance goals and goal difficulty on task performance. *Accounting & Finance*, 47(2), 221–242.
- Chopra, S., & Meindl, P. (2016). *Supply chain management: Strategy, planning, and operation* (6th ed.). Pearson Education.
- Crabtree, A. D., & DeBusk, G. K. (2008). The effects of adopting the balanced scorecard on shareholder returns. *Advances in Accounting*, 24(1), 8–15.
- Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). SAGE.
- del Pozo, V., de Larrucea, J. R., & Rappold, J. A. (2026). A holistic supply chain framework to drive strategic alignment: The EASIER model. *Operations and Supply Chain Management: An International Journal*, 19(2), 350–362.
- Deming, W. E. (1982). *Quality, productivity, and competitive position*. MIT Center for Advanced Engineering.
- Doran, G. T. (1981). There's a S.M.A.R.T. way to write management's goals and objectives. *Management Review*, 70(11), 35–36.
- Downes, P. E., et al. (2021). To collaborate or not? The moderating effects of team conflict on performance-prove goal orientation, collaboration, and team performance. *Journal of Occupational and Organizational Psychology*, 94(3), 568–590.

- Drucker, P. F. (1954). *The practice of management*. Harper & Row.
- Eppen, G. D., & Martin, R. K. (1988). Determining safety stock in the presence of stochastic lead time and demand. *Management Science*, 34(11), 1380–1390.
- Fisher, M. L. (1997). What is the right supply chain for your product? *Harvard Business Review*, 75(2), 105–116.
- Franke, H., & Foerstl, K. (2020). Goals, conflict, politics, and performance of cross-functional sourcing teams. *Journal of Business Logistics*, 41(1), 6–30.
- Gkizani, A. M., & Galanakis, M. (2022). Goal setting theory in contemporary businesses: A systematic review. *Psychology*, 13(3), 420–426.
- Kaplan, R. S. (2009). Conceptual foundations of the balanced scorecard. *Handbooks of Management Accounting Research*, 3, 1253–1269.
- Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard — Measures that drive performance. *Harvard Business Review*, 70(1), 71–79.
- Kingman, J. F. C. (1961). The single server queue in heavy traffic. *Mathematical Proceedings of the Cambridge Philosophical Society*, 57(4), 902–904.
- Latham, G. P., Locke, E. A., & Fassina, N. E. (2002). The high performance cycle: Standing the test of time. In *Psychological management of individual performance* (pp. 201–228).
- Lee, H. L. (2002). Aligning supply chain strategies with product uncertainties. *California Management Review*, 44(3), 105–119.
- Lillis, A. M. (2002). Managing multiple dimensions of manufacturing performance—An exploratory study. *Accounting, Organizations and Society*, 27(6), 497–529.
- Little, J. D. C. (1961). A proof for the queuing formula:  $L = \lambda W$ . *Operations Research*, 9(3), 383–387.
- Locke, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, 3(2), 157–189.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705–717.
- Locke, E. A., et al. (1994). The effects of intra-individual goal conflict on performance. *Journal of Management*, 20(1), 67–91.
- Makowski, M. (2009). Management of attainable tradeoffs between conflicting goals. *Journal of Computers*, 4(10), 1033–1042.
- Mayer, P., et al. (2017). Productivity vs security: Mitigating conflicting goals in organizations. *Information & Computer Security*, 25(2), 137–151.
- Mundfrom, D. J., Shaw, D. G., & Ke, T. L. (2005). Minimum sample size recommendations for conducting factor analyses. *International Journal of Testing*, 5(2), 159–168.
- Pacioli, L. (1494). *Summa de arithmetica, geometria, proportioni et proportionalita*. Venice.
- Roh, J., Hong, P., & Min, H. (2014). Implementation of a responsive supply chain strategy in global complexity. *International Journal of Production Economics*, 147, 198–210.
- Slocum, J. W., Cron, W. L., & Brown, S. P. (2002). The effect of goal conflict on performance. *Journal of Leadership & Organizational Studies*, 9(1), 77–89.
- Taylor, F. W. (1914). *The principles of scientific management*. Harper.
- Womack, J., Jones, D., & Roos, D. (1990). *The machine that changed the world*. Rawson Associates.
- Wood, R., Bandura, A., & Bailey, T. (1990). Mechanisms governing organizational performance in complex decision-making environments. *Organization Behavior and Human Decision Processes*, 46(2), 181–201.