

Structured Decision-Making as a Leadership Competency in Manufacturing Technology Investment

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Abstract

Deciding on investment technology in the manufacturing sector is difficult to do properly. Most of the time, decision options are visible enough to leadership; what makes it harder is getting people with different functional backgrounds and different definitions of success to evaluate those options against the same criteria. This study was conducted at PT J, one of the largest footwear manufacturers in Indonesia, specifically during the calendaring process of rubber outsole production. Material waste is one of the business issues that occurred, where a partial automation pilot had been running for over a year without closing the maximum targeted percentage gap. There is no structured decision framework for choosing the best solution, even though three proposed solutions are available. To provide a structured evaluation of the decision process, this study starts with a Kepner-Tregoe Problem Analysis to define the actual problem before considering alternative solutions. Value-Focused Thinking ensures every function criterion of success is collected and can be generated for possible alternative solutions. To select the best solution, the Analytical Hierarchy Process converted that definition of success into a set of weighted criteria and ranked the best alternative by prioritization assessment. A critical task for the QC Manager was to be alert for any defects. Thickness measurement data was essential for the Production Manager before making any improvements. The Automation Engineer Manager defined a project as a success if the system was reliable, rather than compromising dependability. The plant manager was always asking about what might happen from each of the options for the next investment. These four framings were acquired by putting them into the same evaluation frame at the same time. The only thing that made the most sense was the set of criteria weights. The 18.3% combined weight for cost was second to quality at 30.9%. This systematized process did not change these managers' thinking. It, in fact, found the first opportunity to see how they really think.

Keywords: Managerial Decision Making, Leadership Competency, Technology Adoption, Analytical Hierarchy Process, Bounded Rationality, Organizational Values

1. Introduction

1.1 The Managerial Decision-Making Challenge in Technology Investment

Started as an automation project initiative, PT J had been testing a pilot system on its calendaring production line since early 2025, but after operating for over a year, this project has not closed the performance gap. The original target for this material waste is below 5%;

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however, by the time this research began, the waste performance was still stuck at 11.53%. Three strategic alternatives were proposed, but to evaluate them systematically, the organization needs a structured framework to properly decide on the solution and accommodate the different priorities each function brought to the discussion.

Most of the employees in the automation department are technical experts. With my management background in this environment, the focus was not on which technology option was most capable, but rather on the decision-making process itself. Different functions and roles have their own perspectives, as people are experienced with the available data resources, but without a structured framework, it is hard to bring them under a common set of evaluation criteria. Besides the technical specifications of any particular sensor or control system, the gap is worth considering. As a future leader who will face investment decisions or any similar multicriteria decision-making like this one, motivates this study to understand what a difficult process for making them actually looks like in practice.

1.2 Research Objectives

Three questions were constructed to guide this research. First, what explains the persistent waste gap given that a partial automation system is already in place? Second, how can the managers with different definitions of success be translated into decision criteria. Which available alternative is the most suitable for those criteria, based on a systematic comparison evaluation process? The goal of this study is not only to answer these questions for PT J, but also to establish the process of answering them in a systematic way, which is valuable beyond the specific investment decision itself. Build this kind of systematic reasoning that differentiates leaders who generate good decisions, because the same decision dynamic, competing priorities, no collective framework shows up in many manufacturing sectors.

2. Literature Review

2.1 Bounded Rationality and the Limits of Managerial Judgement

[Simon \(1955\)](#) claimed that managers tend to settle for decisions that seem feasible given the time and data available, rather than actually optimize. Automation engineer is the closest to quality issue concern, but engineers tend to frame problems as technical problems. That framing is not incorrect, but unfinished. The performance gap and an operator skill gap require a different approach, without a systematic process that forces all scopes written simultaneously, the natural tendency is to reach for the solution that only fit the dominant expertise in the area. A systematic framework does not always cure it, but it makes the blind spots visible earlier in the process before a solution is determined.

[Mintzberg \(1973\)](#) examined on what management textbooks say about what manager, opposed to what actually they do, and is relevant in here for a different reason. Manager are reactive on what gets their attention based on the report made from their staff, and how a problem gets framed depend on who is reported to them. For example, at PT J a quality gap framed by a QC team as a measurement system failure. At the same time automation engineer judgement looks this issue as a technology problem. Both framing contain fact, but neither contains the whole picture. When applied the solution, the solution ends up come from the framing that shows first rather than balanced reading of the evidence.

[Pittenger et al. \(2023\)](#) extended this study into the data age: they showed that satisficing behaviours still occur when data is plentiful, as data quality and utility are inconsistent

constraints on decision making. Their empirical survey also confirmed that time constraints continue to result in shortcuts in judgment, per Simon's original observation.

The two tendencies complement each other. Satisficing means working from an incomplete representation. When in a urgency situation, that picture is smaller (reactive framing). The pilot automation system had been building up data on the dashboard for more than a year at PT J. Production tracked throughput. The Defect rates were monitored by Quality Control. The Automation team conducted an uptime monitoring. All readings were correct, and no reading was adequate. The decision about what to do next was being made from three partial views of the same situation, and the organization had no mechanism for bringing those views into the same room at the same time. That is what Simon and Mintzberg between them predict, and it is also what this study set out to address.

2.2 Stakeholder Diversity and the Politics of Organizational Decision-Making

[Freeman \(2010\)](#) pointed out that any decision affecting multiple functions will be judged differently by each of them, and that these differences will not go away even if they pretend otherwise. At PT J, four department had direct stakes in the outcome. Production had to live with the problem on the floor every shift. Quality Control owned the performance numbers and needed honest confidence that the chosen solution would actually change them. The Automation department had the technical knowledge to assess feasibility, but also the tendency to see problems as opportunities for automation. Top management controlled the budget and was accountable for the investment's returns over the following years. None of these groups had the full picture. Each had legitimate reasons to push in different directions.

What happens when that kind of disagreement does not get visibly resolved? [Eisenhardt & Zbaracki \(1992\)](#) showed that the problem will not go away; it just goes hidden. Recommendations from each function will start with its Key Performance Indicators (KPI). The report was arranged to stand its ground in each department, not to expose the root cause of the problem. Top management needs to decide between competing narratives rather than evaluate options with mutual criteria. At PT J, this is a real risk. A structured decision framework solved this issue, not by perfectly eliminating the disagreement, but by giving every function the opportunity to clearly state their proposed target, which is a requirement for any outcome to get support from the organization, not just formal approval.

[Reynolds et al. \(2006\)](#) provided evidence of this in their empirical research, which found that stakeholder salience and resource divisibility systematically limit managers' ability to balance competing interests. Their results indicate that in the absence of structured processes, the function that is most powerful or has the most convincing argument decides the outcome of the decisions. The structured decision framework is designed to manage risk, not to take away the potential for disagreement, but to provide an 'evaluation space' for each function to clearly articulate what it needs before it commits to any option.

If there is no way to make an explicit statement about the point of each function, the decision is typically made by the function with the greatest authority or the function that argues the strongest. There was a very real possibility at PT J. The Automation department was the most technically expert. The budget was under the top management's control. Defect data were contained within the Quality Control. The Production team embraced the process day to day. Each of these groups has some information that the others do not have, although the one group with the most clear-cut mandate usually sets the frame for the others and the others shape their

concerns around it in an unstructured discussion. The outcome need not be bad. It is a choice about organizational hierarchy, rather than organizational knowledge, and that is not the same thing.

2.3 Structured Decision-Making as a Leadership Competency

[Drucker \(1967\)](#) argued that the difference between an effective leader and an ordinary experienced leader lies not in the quality of their instincts but in the quality of their decision-making procedures. Fast thinking is appropriate in common circumstances when one knows the pattern. Making an investment decision is not a commonplace occurrence. Expertise and seniority of the people involved at PT J were not lacking. The automation engineers were used to with their systems. The managers had considerable experience. The problem was that there was no process to which everyone put their assumptions on the table before making a decision on direction, but rather after. The lesson is that this sort of procedural discipline has been taught. It is not something you are either born with or do not have. It can be developed intentionally and thus be a competence of leadership rather than just a personality trait.

[Keeney \(1992\)](#) noted another issue. Most decision-making processes begin by listing options and then move backward to support the option the organization has been inclined to choose. But although someone had to choose what to include, the list itself is never questioned. In technology contexts, this often results in failure: organizations embrace a technology because it exists and look for a problem to address, rather than beginning with the problem and specifying the tech that would be appropriate to address it. The PT J situation had this dynamic. The partial automation system was already installed. The natural framing was to evaluate how far to extend it. VFT also adds a different question about what the organization actually needs to achieve, extending the existing system, the best route to that, or just the most visible one?

[Gonçalves et al. \(2024\)](#) used VFT in conjunction with ISM in manufacturing-inclusive expert panels and found that a value-first process always yielded value-based decision initiatives that were not uncovered through alternative-focused deliberation. Since the resulting solutions are more defensible and more supportive of the organization, their research supports Keeney's initial premise that it is better to begin with values than with options.

[Pfeffer & Sutton \(2006\)](#) argued that most organizations make decisions by copying what worked before or following what everyone else seems to be doing. Not because the people involved are careless, but because careful analysis takes time that operational pressure rarely protects. At PT J, this dynamic was visible. The pilot automation had been running for over a year. The waste rate had not decreased below 11.53%. Discussion about what the next action plan was constrained by the same deadline pressure that had influenced every previous decision-making in the organization. Evidence-based management does not rely on data, it involves thinking carefully about evidence before deciding on a course of action.

There are three phases where KT, VFT, and AHP slow the decision-making process at different stages for diverse reasons. KT ensures the judgment is not influenced by the first person to reach the manager. VFT ensures that the solution is not only from the technologies already available off the shelf. AHP prevents the final decision from being the voice of the loudest man in the meeting. Together, they generate outcomes that informal discussions usually fail to achieve, such as decisions that can be easily understood by any managers with divergent points of view, as if they were formulated through a process that they could each have completed on their own.

2.4 Kepner-Tregoe Problem Analysis

[Kepner & Tregoe \(2013\)](#) developed a structured framework for problem analysis comprising four steps: Situation Appraisal, Problem Analysis, Decision Analysis, and Potential Problem Analysis. In manufacturing contexts, in particular, the IS/IS NOT component of the Problem Analysis step is useful because it distinguishes between the location and time of a problem and the absence of a problem, and differentiates problems verified as root causes from organizational assumptions. This kind of disciplined specification will avoid the common issue of selecting a solution that directly addresses a symptom rather than a root cause.

Structured root cause analysis has been shown to be useful in operational contexts through empirical evidence. [Jayswal et al. \(2011\)](#) demonstrated that a structured root cause methodology could be used to address sustainability issues in chemical manufacturing processes and found that the risk of misdiagnosis was lower when dealing with sustainability issues under time pressure, with clear cause specification frameworks. In another large-scale industrial study, [Ma et al. \(2021\)](#) demonstrated that no matter how sophisticated the analysis, reliable diagnostic output still requires a structured human problem specification as a precondition. The results confirm KT's fundamental argument that the definition of the problem should precede the selection of a solution.

2.5 Analytical Hierarchy Process as a Tool for Organizational Judgment

Saaty's (1980) Analytical Hierarchy Process is important here because of its problem-solving capabilities. Four managers with different functional perspectives and different definitions of success do not necessarily lead to better decisions. The situation becomes more complex. In AHP, this is done by making pairwise comparisons, which do not involve general assessment, but require detailed judgment to be made individually. It verifies the consistency of this judgment and combines it. An individual who prioritizes quality over cost and cost over timeline is likely to fail the consistency test because they place equal value on both quality and timeline. The paradox is not resolved, but acknowledged.

[Forman & Peniwati \(1998\)](#) aggregated multiple judgments from SMEs using the geometric mean; all judgments have equal mathematical weight unless the group determines, based on the criteria weighting, that one function's concern should be given higher weight. This finding reflects a significant organizational attribute. The most senior person, who is the most persistent or has the best presentation report, usually establishes the frame. AHP could be used to preserve each manager's integrity within the organization and remain part of the decision-making process as we demonstrated here.

There is a considerable body of empirical literature on the application of AHP to manufacturing technology selection. In the high-functionality textile sector, [Coronado Mondragon et al. \(2021\)](#) selected technologies and suppliers using AHP and Fuzzy AHP, and the results indicated that multi-expert evaluations were dominated by supply chain and organizational criteria over technical criteria. In their study, [Sonar et al. \(2021\)](#) used AHP to analyze the factors influencing the implementation of additive manufacturing, and the findings showed that, despite differences in individual judgments within each expert group, the priority ranking obtained through the structured pairwise comparison remains stable. In addition, [Sivalingam & Subramaniam \(2024\)](#) validated the robustness of criteria weighting using pairwise comparisons in operational manufacturing decision contexts and used AHP-TOPSIS to select collaborative robots for assembly environments.

The five theoretical streams discussed above are used collectively to provide the basis for analyzing this study. The bounded rationality phenomenon has been observed when the management team at PT J lacks information on production or technical matters and still operates without a complete problem framing. The diversity of stakeholders explains why four functions in the same organization had different and legitimate notions of success. Structured decision-making as a leadership competency provides a procedural rationale for a sequential approach. The KT Problem Analysis operationalizes that logic at the diagnostic stage, ensuring everyone works on the right problem before considering a solution. The AHP then converts these conflicting values from the diverse stakeholders into a single defensible rank order.

3. Research Method

3.1 Research Design

Calendaring process at PT J is one of the crucial production line for outsole production. Consistency of Rubber Sheet Thickness directly affect the production output for the next process. By early 2026, the gap between current performance and the target stands at over 6 percentage points for the year, even if the automation system is functioning well. This case worth to be examining for that persistence. Decision-making for the next action plan is made directly, without a reconstruction process. The decision makers were accessible. Non-formal information previously used creates ambiguity rather than settlement; it creates an obvious before-and-after structure that retrospective study cannot reconstruct.

3.2 Respondent Selection and Profile

Eight Subject Matter Experts (SMEs) were selected because they cover all the key aspects of this specific problem. The production manager (SME1) understands the operational realities they face every day, shift patterns, and the practical issues that are often ignored in formal reports. Quality control (SME2) has a specific, clear picture of where the thickness standard does not consistently comply. Three shift supervisors and a senior mixing operator make contributions that the manager cannot, as they manually measure the rubber sheet every 30 to 45 seconds, switch between manual and automatic modes, and understand the limitations of the system's precision in real time. SME3, automation engineer with ten year experience in the field, can evaluate clearly about technical feasibility without a long process of vendor evaluation. SME4, Top Management controlled the investment decision-making. The analysis needs a full picture of every stakeholder area involved, but no single one of them had it completely.

3.3 Conceptual Framework

This analysis was conducted with three steps that were designed to complement each other, not as a parallel run process. In phase 1, [Kepner & Tregoe \(2013\)](#) IS/IS NOT Problem Analysis was implemented on 14 months of production data, combined with a structured interview by 8 SMEs, with explicit goals of separating the verifier root cause from the organizational assumption of the waste gap problem. Phase 2, used Value-Focused Thinking through cross-functional focus group sessions to determine the verified causes into a hierarchy of objective criteria and convert from those objective criteria into three strategic alternatives. Phase 3 distributed AHP questioner to four senior SMEs, aggregate their pairwise comparison with geometric means and process the result with SuperDecision 3.2.0 software. Critically, six evaluation criteria generated from what SMEs expressed in Phase 2, not from the researcher judgment.

In order to strengthen credibility, a probable root cause conclusion from KT is only accepted if it is verified by at least two independent SME sources and aligns with production data, not only from the interview results alone. Every AHP comparison matrix results in a consistency ratio below 0.10, which confirms rational judgment between the four managers internally. If the state of individual response diverged significantly from the geometric mean, those pairwise comparison results will be reconsidered before finalizing.

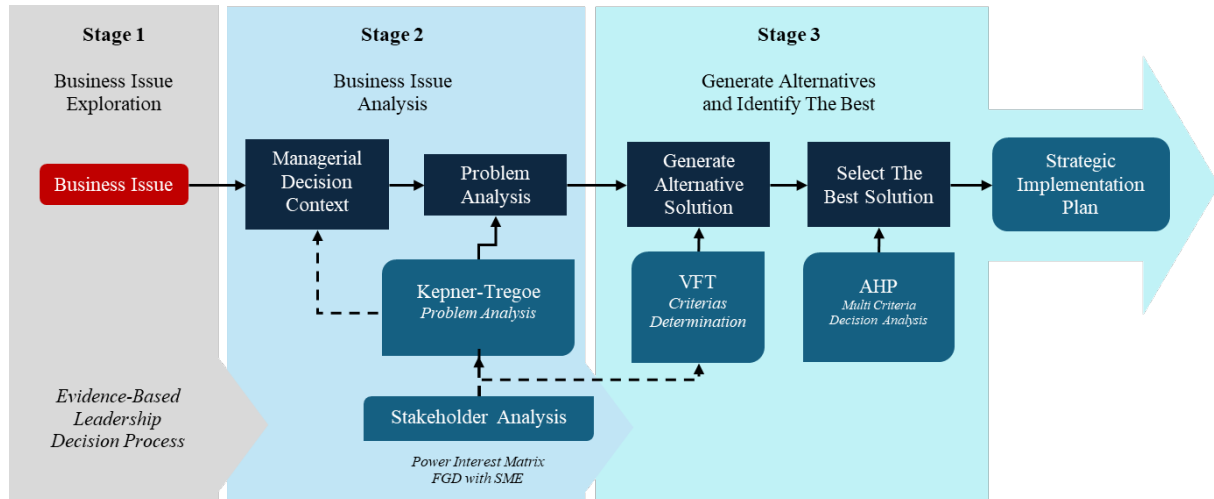


Figure 1. Research Conceptual Framework

Analytical hierarchy process decision applied in this study is illustrated in Figure 2, which explain how overall goal decompose into six evaluation criteria and three alternatives for systematic pairwise comparison.

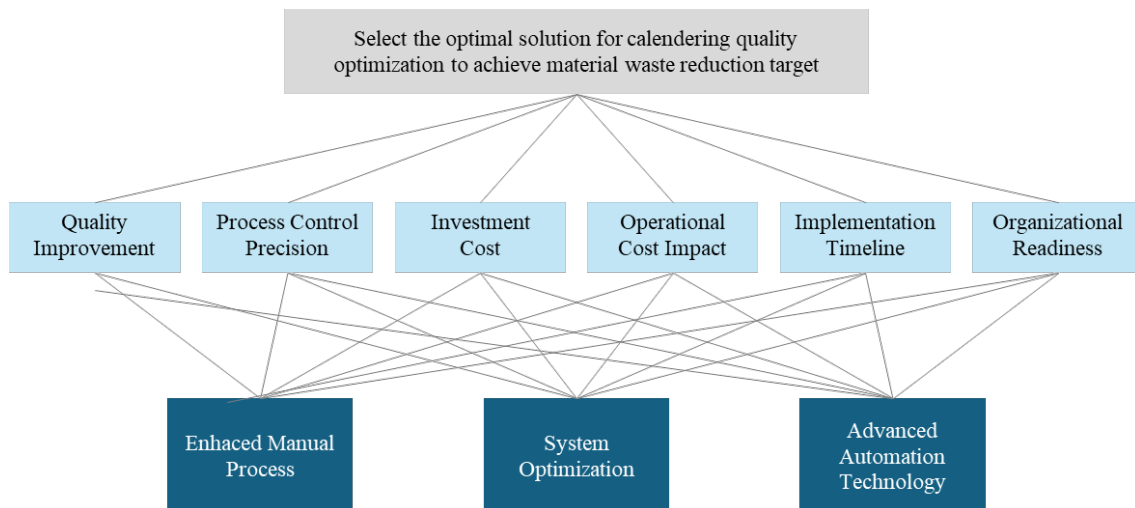


Figure 2. AHP Decision Hierarchy

4. Findings and Discussions

Three different things were revealed after the three stages of analysis were completed. The finding adjusted the organizational assumption about what kind of problem this actually was. Value-Focused Thinking made every function that actually cares more visible. A defensible answer was produced by quantifying those criteria values with the Analytical Hierarchy Process.

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4.1 What Manager Actually Solves: The Problem Analysis Phase

Before the Kepner-Tregoe analysis was conducted, the waste problem was dominantly interpreted as a human performance issue that needed to be more disciplined by SOP, or to adopt more advanced technology. The IS/IS NOT analysis revealed a more complicated result. The pilot automation system was not malfunctioning, and it was doing exactly as planned. The limitation was come from the design of the pilot device.

Verification process generates three most likely causes. The real-time monitoring system gap was the first cause; the system ran at 60.2% overall availability without thickness tracking on every shift, leaving the important data needed to distinguish normal process variation from a developing problem unavailable to operators and supervisors. The second root cause was operator dependency. The 83% auto 17% manual usage ratio is evidence that the system's effectiveness varies depending on who is running the process, because operators engage to compensate for their own precision limits. Shift 1 averaged roughly 10 to 12% defect rates while Shift 3 ran at 15 to 18%, a gap that could not be explained by equipment differences. The third root cause connected directly to the second: manual measurement took 30 to 45 seconds, during which the process continued producing output. SME8, the senior operator, put it plainly by the time you finish measuring, the sheets that were going to be wrong already are. Table 1 summarizes the full IS/IS NOT analysis across all four dimensions.

Table 1. Kepner-Tregoe IS/IS NOT Analysis, Calendering Waste Rate, PT J

Dimension	IS (Present)	IS NOT (Absent)	Distinction Features	Probable Root Cause
WHAT (Object)	Waste 11.53% at calendering stage, exceeding target of less than 5%	Throughput problem (41.67 sheets/batch already exceeds 40-sheet target)	Quality consistency problem, not capacity	Insufficient process control precision for consistent specification achievement
WHAT (Deviation)	Quality achievement 78% with mode dependency: auto (83%) vs manual (17%)	Total equipment failure or mechanical breakdown	Process control variation, not equipment malfunction	Operator-dependent control effectiveness and manual measurement limits
WHERE	Calendering mixing stage across all three production lines	Upstream compounding or downstream cutting and assembly stages	Problem concentrated in the calendering control loop	Lack of real-time monitoring and automated adjustment capability
WHEN	Persistent across all shifts since January 2025; stable at 11 to 12% post-pilot with no improvement trend	Before pilot automation (manual baseline was 13.49%)	Partial improvement achieved but fundamental gap remains	Current system at capability ceiling; further improvement requires architectural change

Source: Structured interviews with 8 SMEs and production monitoring dashboard

4.2 What Managers Discovered about Their Own Values: The VFT Phase

The VFT sessions confirmed what would be expected when four functions with different KPIs

sit in the same room. Each one had a legitimate definition of success, and each definition was slightly different. The QC Manager was clear that prevention is the only number that matters because everything downstream of a missed defect costs more. The Production Manager needed real-time data before anything else could work. The Automation Manager treated reliability as a precondition, not a trade-off.

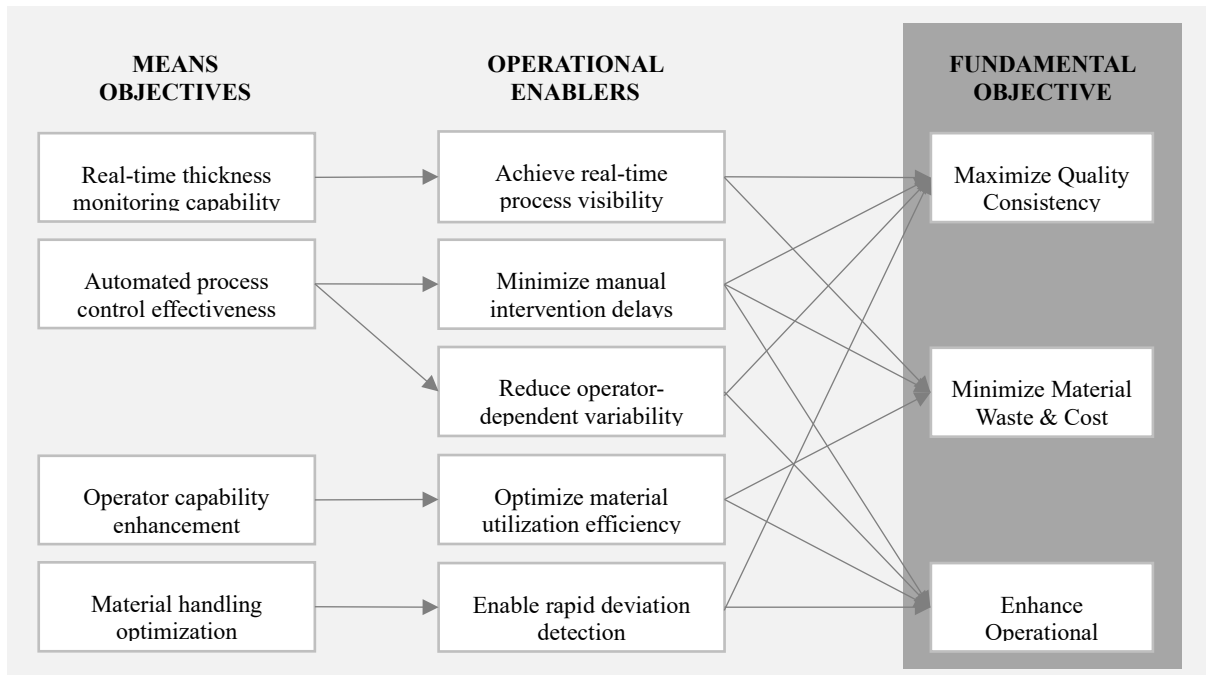


Figure 3. Means-Ends Network Diagram

VFT methodology begins by articulating what the stakeholders concern, then use that values as the generative tools for alternative development through means objectives. Means objectives can be initiated in combination as a consideration to generate alternative, given different levels of investment, technology capability, and implementation difficulty. Focus group discussion conducted to develop three alternative solutions, based on that situation and criteria at PT J.

Alternative 1 started with the assumption that the problem can be solved with only operational discipline without touching any hardware or tools improvement. Tighten SOP, structured operator training, and create a calibration schedule for the digital caliper to ensure consistency between shifts. This alternative option easy to implement, fully in operation control with lowest investment cost. KT problem analysis shows there is a gap in system architecture rather than operator performance make this option not the optimum solution. Instead of avoiding this fact, this alternative solution still worth as an opportunity to evaluate.

Alternative 2 take a different starting point, since PT J already implement the pilot of automation project that running since early of 2025. KT Problem analysis revealed monitoring gap issue due to lack of real time thickness measurement. Adding thickness laser sensor provide real-time measurement, while adjustment of roller gap still controlled by operated. Without replacement of dull system, this alternative can addressed structural issue. Hardware already installed before, so the investment amount will cost around Rp 100 million.

Alternative 3 is a full package of technical advancement, including MES integration, closed-loop servo actuation, predictive analytics, and automatic adjustment control without operator

intervention. The performance result was best projected compared with other options. So, the investment cost was estimated at three times the cost of the second alternative, and the project was expected to finish in 9 to 12 months. AHP result placed the second alternative not finding that advanced automation is overrated. It appeared that the most capable and appropriate technology at some point is not always the same, and its development is not always the same.

4.3 What the Collective Judgment Revealed: The AHP Phase

The output of the AHP provides a concrete number for every alternative comparison; this selection of the best alternative cannot be done solely through discussion. Potential quality improvement accounted for 30.9% of the total weight. Investment cost and operational in total achieve 18.3%. Process Control Precision, Implementation Schedule plan, and operational readiness have a similar 16.9% weight. In technical evaluations, schedule and readiness are often treated as secondary; they are handled during implementation and after technology adoption. A system that is not feasible to implement and sustain in a company will perform according to what the company can extract from it, not according to the design specification, giving the same weight to the control process precision, reflecting a different logic from that. Table 2 has the full weight distribution.

Table 2. Criteria Priority Weights Derived from Senior Manager Judgments

Criterion	Priority Weight	Percentage	Rank
C1: Quality Improvement Potential	0.3088	30.9%	1
C2: Process Control Precision	0.1695	16.9%	2
C5: Implementation Timeline	0.1695	16.9%	2
C6: Organizational Readiness	0.1695	16.9%	2
C3: Investment Cost	0.1022	10.2%	5
C4: Operational Cost Impact	0.0805	8.1%	6
CR = 0.011 (below 0.10, consistent)			

Source: SuperDecision 3.2.0 computation from aggregated SME questionnaire responses (April 2026)

Table 3 shows how each alternative performed locally across all six criteria.

Table 3. Local Priority of Alternatives Across All Criteria

Criterion	Weight	Alt 1 Manual	Alt 2 Syst. Opt.	Alt 3 Adv. Auto.	Winner	CR
C1: Quality Improvement Potential	30.9%	7.2%	27.9%	64.9%	Alt 3	0.062
C2: Process Control Precision	16.9%	7.5%	33.3%	59.2%	Alt 3	0.014
C3: Investment Cost	10.2%	60.0%	30.0%	10.0%	Alt 1	0.000
C4: Operational Cost Impact	8.1%	16.3%	54.0%	29.7%	Alt 2	0.009
C5: Implementation Timeline	16.9%	32.0%	55.8%	12.2%	Alt 2	0.018
C6: Organizational Readiness	16.9%	42.9%	42.9%	14.3%	Alt 1 & 2	0.000

Source: SuperDecision 3.2.0 (April 2026). All consistency ratios below 0.10.

Table 4. Final AHP Synthesis, Alternative Priority Ranking

Rank	Alternative	Overall	Normalized	Percentage	Gap
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Priority					
1	System Optimization (A2)	1.000	0.3840	38.4%	none
2	Advanced Automation (A3)	0.989	0.3798	38.0%	0.43%
3	Enhanced Manual (A1)	0.615	0.2362	23.6%	~14%

Source: SuperDecision 3.2.0 final synthesis (April 2026).

System optimization ended at 38.4%, Advanced automation at 38%. Four managers reasoning independently produce a 0.43 percentage point gap between the two top options. That is not a technical finding. It reflects a collective judgement that PT J has not yet built the deployment capacity and change management depth that A3 requires to deliver its potential. For the A2 ranking, SuperDecision's sensitivity analysis shows that the ranking is stable under various weight changes, which further strengthens the robustness of the collective judgment associated with the final priority scores. Figure 4 shows the stability of that gap across weight variations.

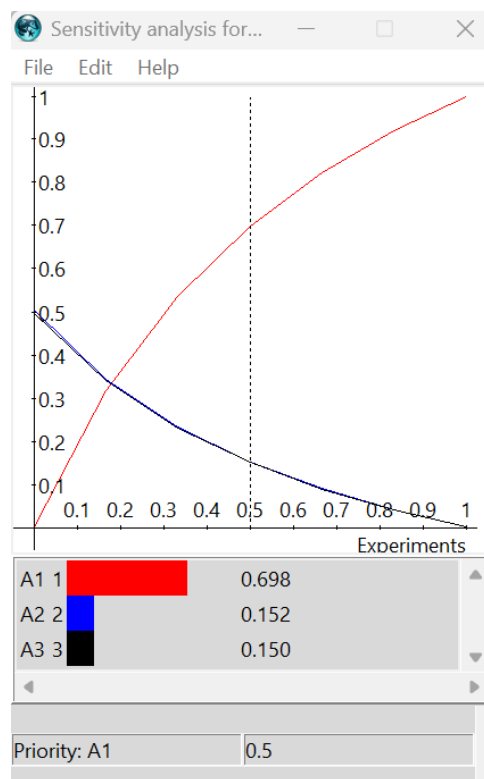


Figure 4. Sensitivity Analysis of Alternative Rankings Under Varying C1 Weight

Source: SuperDecision 3.2.0 Result

4.4 Managerial Implications: What the Process Revealed Beyond the Decision

Management and leaders at PT J are not the source of the issue. They have expertise, experience, available data, and proven technical skills. What is missing here is the sequential step-by-step procedure of the decision. The usual pattern before this study is to jump straight to a technical solution, because the automation engineers are very close to the problem and are focused on improving the production process. Deadline pressure often makes the decision process rush and tends to be skipped. KT pauses before running a diagnosis. VFT needs every stakeholder to describe what they want to achieve successfully before generating alternatives. AHP provided the final consideration in a clear ranking of priorities. At the specific point, each of this are the small intervention. Together, every decision was produced with logical reasoning that could be

traced back. This is a very different result compared to the decision that only reflects the most persuasive in the room.

Most real-world examples involve budget cost evaluations. Capital expenditure is the most visible number, so in the early discussion, the budget plan allocation usually overlooks the performance criteria. The manager does pairwise comparison for every criterion and alternative independently, they allocate quality performance weight four times from the cost weight. That structured process create opportunity for the preference as a shared position not only, personal professional view.

Organizational readiness level has a similar weight to implementation and process control precision at 16.9%. Most of the time, readiness is treated as an investment framework, a post-decision activity to manage during implementation after the technology has already been decided. This manager weighted it as a criterion selection. These things clearly imply that organizational readiness affects the alternative selection process, so readiness needs to be monitored and allocated resources during implementation with the same level of importance as the technical installation itself.

The nature in a fast-paced manufacturing environment requires immediate reaction to the problem after the expert gives a solution. The direct implication in this study as a practitioner with no technical background is to be concern about the structured step rather than method. At PT J, four managers see the same calendaring production line with a different situation. Production manager concern about their target and production output. QC Manager see this problem as a defect prevention gap. A decision that ignores one of those interpretations just to make it faster creates a worse result. Structured decision framework are not a substitute for engineering knowledge. The framework is a mechanism to make sure that knowledge is properly contextualized before taking a conclusion.

5. Conclusion

This study was designed to answer three questions. First question is what is the actual root cause of persistent waste gap at one process that run partial automation system. KT analysis answered that this is not operator skill issue or broken equipment, instead the system was not designed to give continuous measurement feedback required for achieve targeted precision level. The difference is important for decide investment to solve the right problem, not the familiar one. Second, how can the managers with different definition of success be translated to decision criteria. VFT Phase responded to this by explicitly stating what these definitions mean for the first time. Defect prevention concern from QC Manager, visibility concern from Production Manager, equipment reliability threshold from Automation Manager, and investment consideration from top management had existed in the organization without compared directly. Developing them did not create conflict. This created standard requirement for organization decision rather than just functional negotiation.

Third, which alternative is the most suitable for those criteria best based on systematic comparison evaluation process. AHP placed the second alternative of System Optimization at 38.4% with Advanced Automation close behind at 38.0%. The margin reflect not an indication of a preference for one technology over another, but rather a collective of managerial decision that organizational readiness is a selection criterion, not an afterthought.

This finding has important implication for human resource and leadership practice, because organizations tend to invest less in structured decision framework rather than the decision itself.

In general, managers are trained to analyze alternatives. But, the ability to state value before propose alternatives and accommodate conflicting functional priorities before committing to a major decision is rare to teach even if it is more important. Used across these three phases, this is not only a research tool but this ability can be replicated as a leadership practice.

Future research needs to validate quality pattern over cost across industry and culture, compare waste gap closure after system optimization, and compare the impact of system optimization on the subsequent decision once the structured decision process is followed. Most importantly, validate whether the application of the structured decision process affects how the same managers approach the next decision. The last question is the one that relates this study to broader effort to develop decision-making as an organizational competency.

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