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DEFEND ID AND THE INDONESIAN AIR FORCE BUILD SELF-RELIANCE THROUGH AN INTER-COMPANY COLLABORATION MODEL: TRANSFORMING HIERARCHICAL ASYMMETRY INTO COLLECTIVE CAPABILITY

Ian, Fuady[1]; Evi, Satispi[2]; Agus, Suradika[3]
[1,2,3]Doctoral Program in Public Administration, Faculty of Social and Political Sciences, Universitas Muhammadiyah Jakarta, Jakarta, Indonesia.

Abstract: Defense equipment self-reliance requires more than the capabilities of individual state-owned manufacturers. Within DEFEND ID, the Indonesian defense-industry holding, companies occupy unequal positions and possess different technological knowledge, resources, production infrastructures, and organizational authority. This study examines existing inter-company collaboration, identifies its enabling and constraining conditions, and reconstructs a hierarchical-asymmetry collaboration model to support Indonesian Air Force equipment self-reliance. The study adopts a qualitative phenomenological design using purposively selected stakeholders representing holding companies, the Air Force, the Ministry of Defence, national research institutions, and academia. Data from in-depth interviews, observation, and documents were interpreted through coding, data condensation, displays, and cross-source triangulation. Findings indicate that collaboration has progressed beyond isolated projects toward capability integration but remains constrained by uneven capacities, unclear roles, fragmented technology and production links, and insufficient alignment between user demand and industrial readiness. The reconstructed model treats asymmetry not as a deviation to eliminate but as a structural condition to orchestrate through differentiated responsibilities, facilitative leadership, knowledge exchange, resource pooling, a lead-integrator mechanism, tiered decisions, and multi-actor alignment. Its contribution is an empirically grounded mechanism for converting heterogeneous firm capacities into complementary collective capability; the study does not demonstrate that full defense equipment independence has already been achieved.

Keywords (English): Collaborative governance; defend id; hierarchical asymmetry; defense industry; inter-company collaboration; equipment self-reliance

INTRODUCTION

National defense capability is increasingly determined by technological mastery, industrial production, reliable maintenance, and access to strategic supply chains. For an archipelagic state such as Indonesia, air-domain requirements also depend on the ability to sustain complex systems throughout their life cycle.

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A procurement program may strengthen operational readiness without immediately creating an equivalent capacity to design, integrate, modify, or sustain equipment domestically. These are analytically distinct outcomes. (Bitzinger, 2009)

The establishment of DEFEND ID brought together a holding parent, PT Len Industri, and four member companies: PT Dirgantara Indonesia, PT Pindad, PT Dahana, and PT PAL Indonesia. Their capabilities are not interchangeable. Aerospace, electronics and command systems, manufacturing, energetic materials, and maritime engineering create opportunities for complementarities but also make coordination dependent on authority, trust, and common priorities. The source dissertation identifies power, resource, and knowledge disparities as recurring features of these relationships. (Provan & Kenis, 2008) (Navalino, 2022)

The underlying policy problem is not simply whether collaborating firms meet or whether a formal holding structure exists. A strategically useful collaboration must connect the Indonesian Air Force's requirements to feasible national research, production, integration, maintenance, and technology-development pathways. The dissertation describes a transition from project-based cooperation toward a more integrated ecosystem, while identifying continuing mismatches among institutional mandates, technical readiness, program continuity, and supply-chain arrangements. (Patil & Bhaduri, 2020)

Hierarchical asymmetry names this dual structure: a formal corporate hierarchy coexists with unequal capacities across firms. In an overly horizontal account, asymmetry can be read only as an obstacle to participation; in an exclusively hierarchical account, top-down direction may appear to solve coordination by itself. The present evidence suggests neither interpretation is adequate. Asymmetry becomes productive only if it is translated into differentiated and mutually accountable roles. An entity with stronger competence in a specific technology may serve as a lead integrator, but its authority must be paired with transparent interfaces, learning obligations, and support from complementary firms. (Ansell & Gash, 2007) (Vicente Oliva et al., 2019)

Research questions and contribution

The article develops three connected questions: (i) how does collaboration presently operate among DEFEND ID companies; (ii) which conditions enable or inhibit collaboration under hierarchical asymmetry; and (iii) what model can convert dispersed resources and knowledge into collective capabilities relevant to Air Force self-reliance? Unlike a descriptive inventory of inter-company programs, the resulting model specifies the sequence of structural conditions, governance mechanisms, integrative activities, and intended capability outcomes.

The contribution is bounded by the original qualitative evidence. The article reconstructs a collaboration mechanism grounded in stakeholder interpretations and organizational documents rather than estimating causal effects, technological maturity scores, or actual domestic-content

gains. Self-reliance is interpreted as a trajectory of strengthened design, production, integration, maintenance, adaptation, and sustained support rather than as a binary status. Findings are necessarily context-sensitive and should be tested in later comparative and outcome-oriented research.

Why a holding-level model is necessary

The ability of a single member company to complete a particular task does not establish that the holding can deliver an integrated defense capability. Military platforms require interoperable subsystems and coordinated interfaces among engineering, electronics, manufacturing, quality assurance, logistics, and research. The central design problem is therefore one of boundary-spanning coordination: corporate authority must be used to align diverse competencies, while users and policymakers must specify a realistic and durable demand signal. (Antai & Hellberg, 2024)

This perspective also addresses a practical tension within state-owned companies. Each firm must maintain commercial viability and investment discipline, while the holding is expected to advance national capability goals that may involve long technology-development horizons. Clear program mandates, shared roadmaps, and tiered escalation are therefore not administrative details; they are central conditions for deciding who commits resources, accepts technical risk, and benefits from cumulative learning. (Hellberg, 2023) (Republik Indonesia., 2012)

LITERATURE REVIEW

Collaborative governance provides the article's primary interpretive lens. Its familiar components—starting conditions, institutional design, facilitative leadership, collaborative processes, and outcomes—offer a way to trace how initial inequalities shape participation, trust, commitment, and joint action. The framework is particularly relevant where common objectives cannot be realized by any single organization. (Ansell & Gash, 2007) (Bartels & Turnbull, 2020)

An integrative account of collaborative governance additionally emphasizes principled engagement, shared motivation, and capacity for joint action. In a strategic holding, these components operate within legal and corporate decision rights. Collaboration must consequently be understood as a relation between participatory work and formal authorization rather than a replacement of one by the other. (Emerson et al., 2012) (Forrer et al., 2014)

Research on network governance differentiates governance structures and underscores the managerial requirements of multi-organization arrangements. In DEFEND ID, hierarchy defines the parent–member relationship, but cross-company expertise often follows a different distribution from formal authority. Firm-level specialization, interdependence, and accountability therefore need to be organized together. (Provan & Kenis, 2008)

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Table 1. Research streams, findings in the dissertation, and the specific article contribution.

Research stream	Established concern	Extension developed here
Collaborative governance	Starting conditions, rules, leadership, and shared action	Traces how asymmetric capacity changes each stage of collaboration
Network governance	Coordination and legitimacy across organizations	Connects holding authority to competence-based task allocation
Defense-industry integration	Supply chains, technology transfer, and strategic partnerships	Places integration and learning within a holding-level mechanism
Public-sector organization	Delegation, performance, and accountability	Combines tiered decisions with cross-company knowledge exchange

As established defense-industry research demonstrates, industrial capabilities depend on production networks, supply-chain resilience, and long-term technological competence. Yet identifying desirable cooperation is not equivalent to explaining how firms with unequal technical and organizational resources coordinate under a shared corporate hierarchy. This is the more precise gap addressed in the dissertation-derived model. (Antai & Hellberg, 2025) (Damanik et al., 2024) (Bojnec, 2013)

The framework further draws on public administration, New Public Management, principal–agent relations, and civil–military relations as complementary, not interchangeable, perspectives. Performance and resource discipline influence corporate choices; delegated authority structures decisions and information; and the military user's operational requirements shape the ultimate purpose of collaboration. These lenses sharpen the explanation without displacing collaborative governance as the primary analytical structure. (Hood, 1991) (Braun & Guston, 2003) (Rosenbloom et al., 2022)

RESEARCH METHODS

Qualitative design, setting, and participants

The dissertation uses a qualitative phenomenological approach to investigate the experiences, interpretations, and institutional practices of actors involved in DEFEND ID collaboration. This design is appropriate to a question about how unequal authority, competencies, and resources are experienced and managed. It does not test variable effects statistically. The principal setting comprises PT Len Industri as the holding parent and PT Dirgantara Indonesia, PT Pindad, PT Dahana, and PT PAL Indonesia as member companies.

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Purposive selection identified ten stakeholder positions chosen for their involvement in industrial management, defense planning, end-user requirements, research infrastructure, or expert assessment. Their inclusion supports triangulation across organizational locations; it does not constitute a probability sample from which population percentages could be inferred. The dissertation's informant matrix is condensed below without adding unreported interviews or participants.

Table 2. Informant positions and analytical contribution (adapted from dissertation Table 3.1).

Stakeholder position	**Perspective in the inquiry**
PT Len Industri — business/cooperation director	Holding strategy, synergy, role distribution, coordination
PT Dirgantara Indonesia — commercial/development director	Aerospace capability, technology and product development
PT Pindad — production director	Production capacity, resource and task integration
PT Dahana — operations director	Specialized capabilities and inter-firm operations
Indonesian Air Force — strategic advisor	Operational needs and self-reliance priorities
Indonesian Air Force — planning official	Capability planning and user–industry alignment
Ministry of Defence — defense-planning directorate	Policy, procurement priorities, capability development
Ministry of Defence — defense-potential directorate	Industry development and institutional cooperation
BRIN — research and innovation infrastructure deputy	Research integration and technological development
Academic/subject-matter expert	Independent theoretical and institutional interpretation

The evidence includes semi-structured in-depth interviews, observation, and documentation. It covers organizational practices and the ways participating actors evaluate present arrangements, incentives, technological constraints, and possible collaborative mechanisms. This range allows the article to compare what firms consider feasible with what the Air Force and public-sector actors regard as necessary.

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RESEARCH METHODS (CONTINUED)

Data processing, triangulation, and trustworthiness

The source dissertation reports data condensation, coding, thematic categorization, data displays, and conclusion verification, complemented by phenomenological interpretation of actors' experiences. The thematic scheme organizes evidence around starting conditions, institutional design, facilitative leadership, collaborative processes, and outcomes. Enabling and inhibiting factors are synthesized across these categories before model reconstruction. This is consistent with qualitative analysis built on iterative condensation, display, and verification. (Miles et al., 2014)

Credibility was pursued through comparison across informants, observation and documents, and member checking as described in the dissertation. Dependability relied on a traceable analytic procedure; confirmability required interpretations to remain grounded in empirical material; transferability was supported by the organizational context; and authenticity required divergent positions to be represented. These procedures strengthen transparency but should not be conflated with evidence of numerical representativeness or out-of-sample model validation.



Picture 1. Dissertation-based analytic sequence from field material to a reconstructed collaboration model.

Operational interpretation of hierarchical asymmetry

Power asymmetry refers to unequal decision influence and formal position; resource asymmetry concerns personnel, investment, facilities, and production access; knowledge asymmetry concerns specialized expertise, design experience, technological mastery, and information. The article treats each as a structural condition rather than assigning firms an unobserved score. Their implications are then traced through the experiences reported by informants and across the empirical matrices.

At the final synthesis stage, the study combines the existing collaboration profile with the evidence on supporters and constraints. The resulting model is assessed for logical coherence with those themes: whether each proposed mechanism addresses a documented obstacle, builds on a documented enabling condition, and leads to a capability that respondents identify as relevant to Indonesian Air Force self-reliance. This is an interpretive reconstruction, not a causal or quantitative impact evaluation.

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Boundaries of inference

No new interviews, audits, maturity measurements, or industrial performance data were generated for this article. Figures describing firm capabilities and program relationships are thematic diagrams derived from the dissertation. Only the Ministry of Defence budget chart reproduces a numerical series reported in the dissertation, and its source figures are attributed as reported rather than independently revalidated. Procurement quantities and delivery schedules are not treated as verified outcomes.

RESULTS AND DISCUSSION

Starting conditions: differences as the basis of collaboration

The existing condition is characterized by unequal organizational power, material resources, technical competencies, and knowledge within a common corporate group. These differences are visible in the contrast between aerospace platforms, electronic and control systems, manufacturing, energetic materials, and maritime engineering. Participants described such specialization as inevitable and potentially beneficial, while also emphasizing the risk of unclear responsibility, fragmented information, and uneven readiness.

The interviews further identify incentives for cooperation: commercial opportunities, defense priorities, Air Force requirements, capability building, and access to technology and research. Constraints include uncertainty in future program needs, differences in firms' investment horizons, production and technology gaps, and ambiguity about which company should lead a given activity. Past collaboration had often developed through particular projects, leaving relationships and corporate work cultures that predated the holding structure.

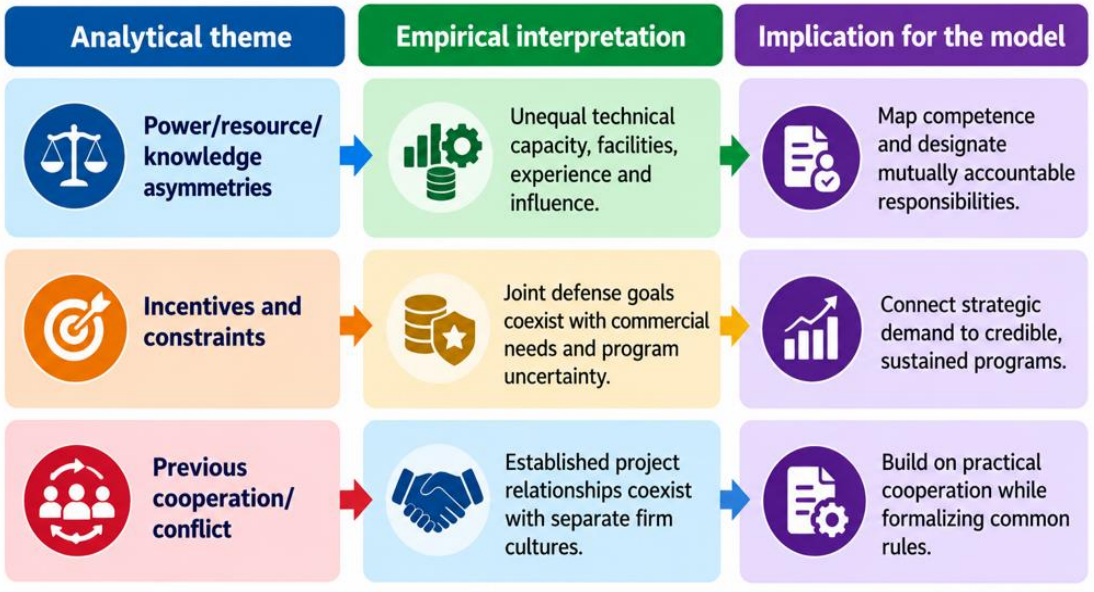


Figure 3. Starting-condition themes and their implications (source: dissertation Table 4.1).

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These findings lead to a crucial distinction between equality and complementarity. Equal organizational roles are neither feasible nor necessary where technologies and production infrastructures differ. Rather, an effective arrangement asks whether tasks and authority are allocated to the entity able to perform them, whether the contribution of supporting firms is protected, and whether weaker capabilities can be strengthened through the project. This reframes asymmetry as a problem of governance design. (Austin & Seitanidi, 2012)

From project cooperation to sustained capability development

Respondents reported movement toward a holding-based ecosystem, including communication and attempts at integration, but they did not depict an already complete collective capability. Progress remains uneven because agreements must be converted into deliverables, systems interfaces, joint research plans, and supply arrangements. Consequently, a successful memorandum or a formal organizational chart is at most an intermediate condition. The desired outcomes relate to technology mastery, production and integration capacity, maintenance support, and the ability to sustain operational requirements over time. (Suárez, 2011).

RESULTS AND DISCUSSION (CONTINUED)

Institutional design and facilitative leadership

The institutional-design findings emphasize inclusiveness, appropriate forum composition, explicit ground rules, and transparency about information needed to perform assigned work. Inclusiveness does not imply that every company participates identically in each technical program. It requires relevant contributions to be heard at a stage when design decisions, technical interfaces, and investment requirements can still be shaped. Forum membership must reflect the skills necessary for a specific issue and the authority needed to commit resources. (McInerney, 2015)

The holding is expected to establish a common direction, coordinate role allocation, support empowerment, and align technological development. Participants treated facilitative leadership as more than command through the ownership hierarchy. Its practical functions include mediating competing interests, ensuring that technical knowledge influences decisions, and promoting investments whose benefits may emerge at different times or in different member companies.



Figure 4. Institutional and leadership mechanisms (adapted from dissertation Tables 4.2–4.3).

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These elements also explain why a higher-level authority cannot replace local expertise. Technical decisions should be made by the appropriate competent entity within program parameters; conflicts about investment, responsibility, or inter-firm commitments should have specified escalation routes. Such a tiered system preserves the coordinating benefits of hierarchy without turning specialized knowledge into passive compliance. (Lapuente & Van de Walle, 2020)

The results are compatible with network-governance scholarship's attention to how structural arrangements affect collaboration, yet the distinct empirical contribution lies in the explicit coupling of holding orchestration with competence differentiation. In this case, the challenge is not simply choosing between centralization and decentralization. It is identifying which decision is appropriately centralized and which integration activity depends on dispersed knowledge. (Koliba et al., 2017).

RESULTS AND DISCUSSION (CONTINUED)

Collaborative processes: dialogue, trust, and shared commitments

The dissertation describes face-to-face dialogue as especially important for strategic programs, technical problems, systems integration, and technology development. Effective dialogue requires personnel with relevant technical competence and decision authority; without these conditions, meetings can produce agreement in principle but little implementation. Informants emphasized the need to translate discussions into action plans with responsibilities, schedules, targets, and implementation follow-up. (O'Leary, 2014)

Trust develops through demonstrated capabilities, timely disclosure of constraints, credible information, and repeated delivery on joint work. Formal structures help define obligations, but trust is tested during integration problems, delays, and technological uncertainties. The empirical evidence also connects commitment to resource allocation, research investment, willingness to exchange knowledge, persistence through setbacks, benefit sharing, and collective responsibility for program outcomes.

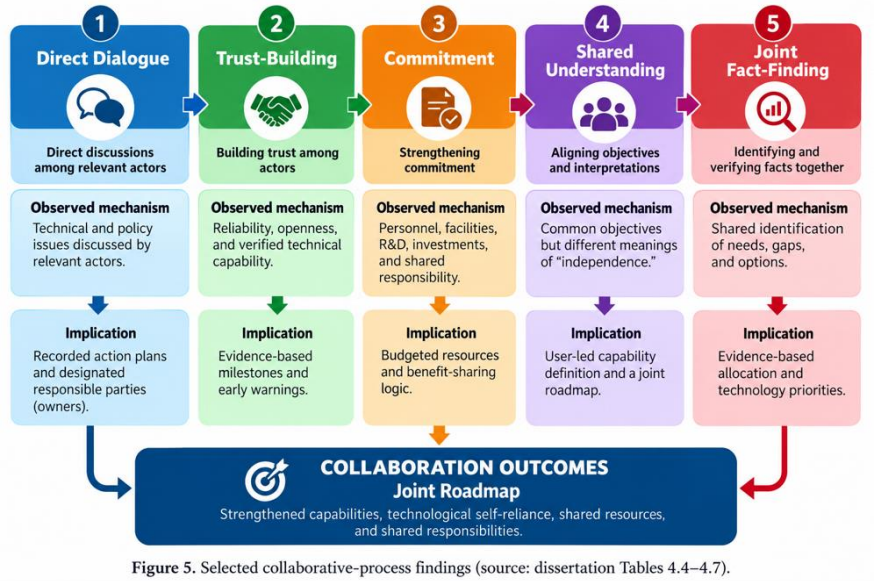


Figure 5. Selected collaborative-process findings (source: dissertation Tables 4.4–4.7).

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An important difference emerges between agreement on a national objective and agreement on operational meaning. Self-reliance can refer to domestic content, reduction of external dependence, local maintenance, modification capacity, or mastery of strategically critical technologies. Those interpretations need to be reconciled in a common roadmap. Otherwise, firms may report progress using incompatible milestones while the Air Force's operational needs remain unresolved.

Interpreting small wins cautiously

Smaller improvements—more open exchanges, more predictable coordination, clearer joint planning, or successful technical cooperation—provide credible signals that collaboration can progress. However, they are intermediate organizational outcomes. The study does not equate them with verified national self-reliance in complete air-defense systems. Strategic plans and joint fact-finding have value precisely because they can connect short-term cooperative actions to more demanding technological and industrial results.

RESULTS AND DISCUSSION (CONTINUED)

Observed outcomes and the policy-resource context

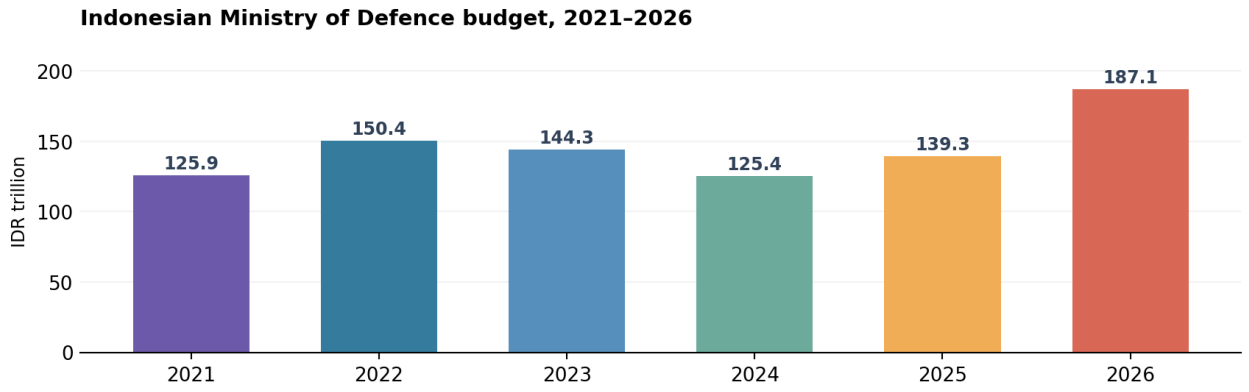
Across the cases discussed in the dissertation, participants recognized growing coordination and more explicit efforts to connect company competencies. However, the qualitative synthesis also highlights incomplete technology integration, production interfaces, supply chains, and user–industry alignment. The outcome is therefore better described as an ongoing transition toward collective capability than as completed equipment independence.

The resource context is relevant because national spending can finance platforms and facilities without automatically creating domestic design or integration mastery. Table 6 reproduces the Ministry of Defence budget series included in the dissertation. It is contextual data rather than a measured dependent variable and must not be interpreted as proof that collaboration caused the changes in funding.

Table 6. Ministry of Defence budget cited in the dissertation, 2021–2026 (IDR trillion).

Year	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Budget	125.9	150.4	144.3	125.4	139.3	187.1

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Picture 2. Defense budget series redrawn from the dissertation; original attribution: Ministry of Defence (2026).

The series fluctuates between 2021 and 2025 before reaching 187.1 trillion rupiah in 2026, according to the source manuscript. The dissertation separately states that its 2026 modernization program allocation is 84.48 trillion rupiah. Because these values are transcribed from the dissertation rather than independently rechecked against a current government dataset, their role here is descriptive. The article's principal evidence remains qualitative. (Kementerian Pertahanan Republik Indonesia., 2026)

The integration challenge extends beyond expenditure. Procurement from foreign suppliers can improve readiness and create technology-transfer opportunities, but it does not establish autonomous engineering or lifetime support without appropriately designed industrial participation. The source dissertation cites imported air platforms and associated domestic participation to illustrate this tension. The key criterion is therefore the conversion of procurement and joint projects into cumulative national capabilities, not the sheer value of budgets or contracts. (Sezal & Giumelli, 2022).

RESULTS AND DISCUSSION (CONTINUED)

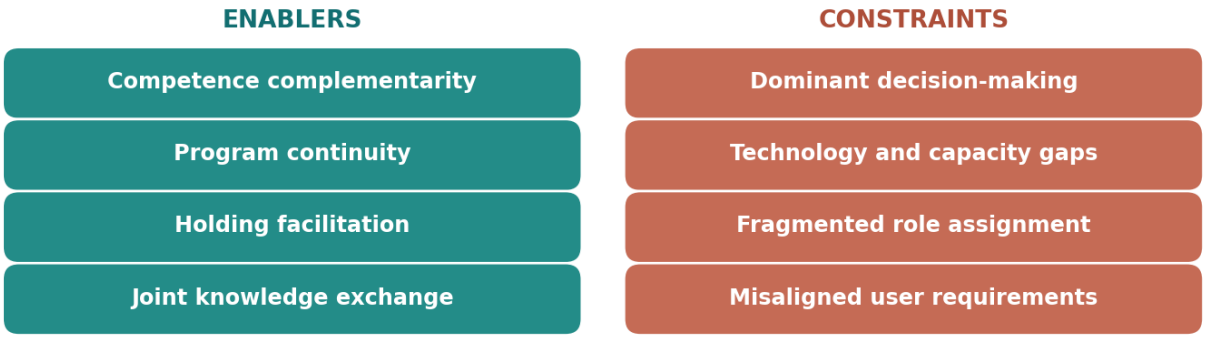
Enabling and inhibiting factors

The dissertation identifies eight enabling and eight inhibiting conditions. Several are opposing expressions of the same underlying feature. Complementary specialization can support integrated systems when competence is mapped and work is assigned coherently; the same differentiation can produce fragmentation when firms lack common interfaces or clarity about their roles. Greater authority can accelerate collective decisions but can also suppress expertise when exercised without facilitation and accountability.

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Table 7. Conditions that support or constrain inter-company collaboration (dissertation synthesis).

Enabling factors	**Inhibiting factors**
Holding leadership and orchestration	Potential dominance by more influential entities
Resource pooling across firms	Unequal capacity and insufficient resources
Joint technology and knowledge development	Technology gaps and limited information exchange
Complementary specialist competencies	Fragmented work packages and capabilities
Competence-based leads and supporting firms	Unclear divisions of responsibility
Air Force operational requirements as common direction	Mismatch between needs and industry readiness
Stable strategic programs for long-term investment	Uncertain requirements and development timelines
Collective integration and capability consolidation	Weak integration of technology, production and supply chains



Picture 3. Qualitative enabler–constraint map; labels represent themes, not numerical frequencies.

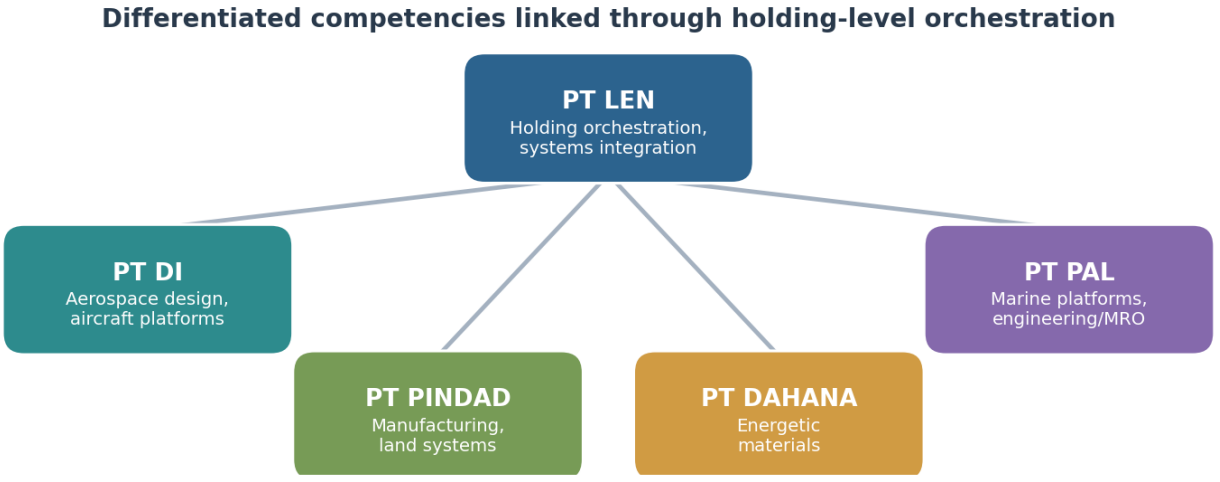
The practical significance is that these constraints are not solved by homogenizing every firm. Instead, programs need mechanisms that reveal actual technical capacity, give the best-equipped firm a clearly defined lead role, and provide other members with the interfaces, resources, and learning opportunities required for useful participation. Common technical documentation, joint fact-finding, and accountable decision routes can mitigate the risks of dominance and hidden capability gaps. (Emmanuel-Ebikake et al., 2014)

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RESULTS AND DISCUSSION (CONTINUED)

Organizational capabilities as complementary inputs

The five companies occupy distinct functional positions in the defense industrial ecosystem. The dissertation describes PT Len Industri as the holding parent with competence in electronics, command/control systems, and industrial orchestration; PT Dirgantara Indonesia as an aerospace design and manufacturing actor; PT Pindad as a manufacturer with specialized defense production capabilities; PT Dahana as a source of energetic-material expertise; and PT PAL Indonesia as an actor in maritime platforms and maintenance engineering. These descriptions are not rankings of company performance.



Picture 4. Functional differentiation within DEFEND ID, based on the dissertation's organizational profiles.

The relevance of maritime or land-focused companies to an Air Force-centered research question lies not in an assumption that every company manufactures aircraft components. It lies in possible contributions across shared competencies, subsystems, materials, integration, production discipline, research, and support capabilities, conditional on the needs of a particular program. For this reason, lead-integrator responsibility should be selected at the program level, rather than allocated automatically to a company for all platforms.

Lead integrator and tiered decision-making (Lane, 2013)

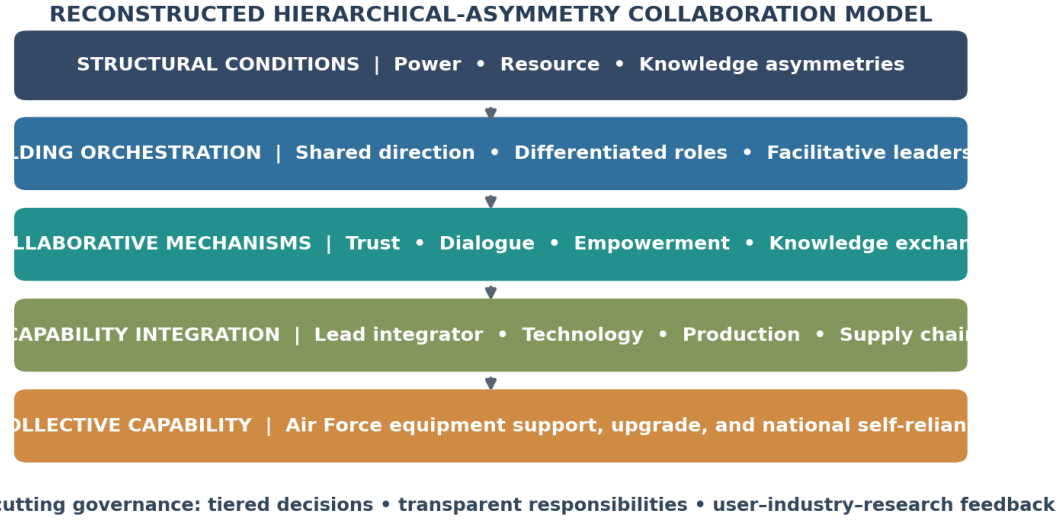
The lead-integrator mechanism occupies a central position in the proposed model. Production of individual components is insufficient if no actor assumes responsibility for interfaces, systems engineering, integration readiness, configuration control, and technical validation. The dissertation proposes linking competent lead organizations with specialized supporting firms while routing investment and inter-company conflicts through a tiered governance process. The model's intent is to make accountability and expertise mutually reinforcing.

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A holding-level coordinator must therefore act differently across program phases. During requirement definition, it aligns military user priorities and industrial capability assessments. During development and integration, it ensures technical leadership is coherent and participation rules are clear. During production and sustained support, it coordinates supply chains, modification pathways, learning, and assessment. The exact contractual and security arrangements remain to be specified in subsequent implementation work.

THE RECONSTRUCTED COLLABORATION MODEL

The dissertation's central result is a hierarchical-asymmetry-based collaboration model rather than a collection of isolated improvement suggestions. It starts with unequal power, resource access, and knowledge. Those differences are recognized explicitly, then managed through holding orchestration, competence-based institutional arrangements, facilitative leadership, collaborative mechanisms, and integrative industrial functions. Multi-actor coordination keeps the process oriented toward Indonesian Air Force requirements.



Picture 5. Hierarchical-asymmetry-based model reconstructed from the dissertation's final synthesis.

How the causal logic is represented

The diagram presents a conceptual sequence, not a statistically identified causal pathway. The holding defines shared direction and role differentiation; facilitative leadership and transparent forums permit firms to exchange relevant knowledge and commit resources; a designated integrator connects interdependent technologies, manufacturing, and supply-chain functions; and collective capability becomes the intended intermediate outcome toward self-reliance. This explicitly addresses the source's reported gaps in responsibility allocation, technology integration, and joint planning.

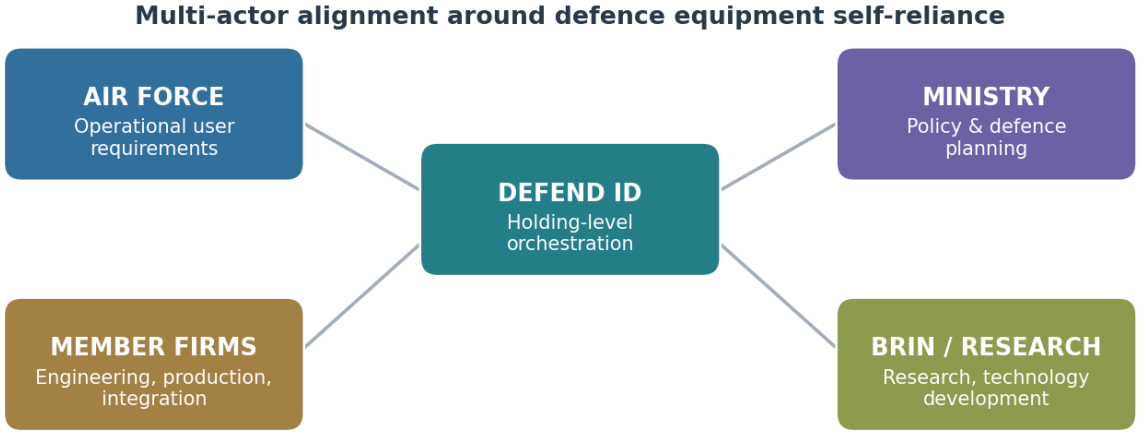
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Cross-cutting feedback is essential. User requirements and testing experience should refine program priorities; technical assessments should reveal where investment and empowerment are needed; and implementation obstacles should be escalated through decision tiers without losing specialist input. The central claim is that asymmetry can be governed into complementarity, not that hierarchy necessarily produces collaboration or that the resulting model has already been experimentally validated. (Meuleman, 2021)

DISCUSSION

Multi-actor integration and institutional alignment

The reconstructed model extends beyond relations among the five firms because defense equipment self-reliance is influenced by actors outside the holding. The Indonesian Air Force articulates operational and sustainment requirements; the Ministry of Defence provides policy and capability-planning direction; DEFEND ID coordinates industrial competencies; the member companies contribute technology, production, and support; and BRIN and associated research actors support development and knowledge renewal. Academic perspectives offer independent interpretive and evaluative input. (Dakhouche et al., 2024)



Picture 6. Multi-actor linkages inferred from the dissertation's model reconstruction.

The diagram should not be read as establishing equal statutory authority or a single centralized command across these actors. It indicates necessary coordination interfaces. A user-defined technology requirement must be connected to a credible industrial roadmap and resource commitments; a research priority must be connected to firms with appropriate development and integration responsibilities; and an industrial milestone must be judged against a meaningful operational capability, not merely a completed meeting or formal agreement. (Butcher & Gilchrist, 2016)

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Theoretical contribution and novelty

The study makes five connected conceptual advances: treating hierarchical asymmetry as a structural condition rather than an anomaly; assigning the holding an orchestration function; specifying competence-based role differentiation as a conversion of asymmetry into complementarity; relating power, resources, and knowledge to technology and production integration; and embedding the holding in a multi-actor ecosystem oriented toward the Air Force user. These elements are reconstructed within the dissertation context rather than claimed as globally unprecedented concepts.

This interpretation connects collaborative-governance perspectives to defense-industry capability building. It reframes the governance question from "how should organizations become equal partners?" to "how can unevenly positioned organizations contribute different competencies to a common capability?" That shift is analytically useful where formal hierarchy is unavoidable but specialist knowledge remains distributed. The resulting model complements existing work on inter-organizational arrangements and defense-sector technological competence. (Lee & Park, 2020) (Lubis et al., 2024)

CONCLUSION

The study concludes that inter-company collaboration inside DEFEND ID has evolved beyond predominantly project-specific cooperation, but the holding has not yet fully integrated its heterogeneous capacities into a consistently functioning collective capability for the Indonesian Air Force. The principal challenges are uneven power, resources, and knowledge; unclear work division; constrained information and technology exchange; and gaps among military requirements, industrial readiness, production systems, and supply chains.

The proposed model recognizes hierarchy and asymmetry rather than attempting to eliminate them. It places holding-level orchestration, differentiated roles, facilitative leadership, resource pooling, knowledge exchange, lead-integrator responsibility, tiered decisions, and multi-actor alignment in a coherent mechanism for building collective capability. In this account, power asymmetry is addressed by participatory but accountable orchestration; resource asymmetry by competence allocation and pooling; and knowledge asymmetry by joint development and knowledge transfer.

Managerial and policy implications

DEFEND ID should develop a competence-based responsibility map for strategic programs and specify program leads, systems integrators, participating companies, and decision rights. Air Force users and defense planners should express capability needs through sufficiently stable, prioritized roadmaps that allow firms to justify investment and develop practical partnerships with

national research institutions. Each program should establish verifiable technical milestones for design, integration, maintenance, and supply-chain development rather than relying solely on nominal participation or project announcements.

Institutional safeguards matter. Forums need genuine technical participation, controlled but adequate information exchange, escalation rules, transparent role assignments, and documented follow-up. Collaboration should also include capacity-building obligations where a stronger actor's leadership can raise the competence of supporting members. Tracking these mechanisms over multiple programs would allow policymakers to differentiate process improvements from actual gains in technological autonomy. (Soraya et al., 2023)

Limitations and future research

The evidence is qualitative and specific to the DEFEND ID setting. Informant accounts and document-based observations support thematic interpretation, but they do not establish causal magnitudes, comparative firm scores, or demonstrated self-reliance outcomes. The qualitative matrices should not be converted into invented percentage distributions. The dissertation's reported financial and procurement data are used solely as contextual information in this article. Future research could operationalize capability metrics, test integration outcomes across programs, compare other strategic holdings, and assess the effects of lead-integrator and knowledge-transfer mechanisms using mixed methods.

Research integrity and provenance

This English manuscript is adapted from the author's 2026 dissertation at Universitas Muhammadiyah Jakarta. Tables were condensed and diagrams redrawn from its reported empirical themes. No independent new fieldwork or additional numerical survey data are claimed. Source references and automatically updateable Word citation fields have been reconstructed from the dissertation bibliography; the original reference metadata should be verified before journal submission.

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