Projectizing the "Hospital for One": Implementing Glocal Healthcare Supply Chains via the GIDC Model [1]

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Abstract

The traditional, centralized capital expenditure (CapEx) healthcare project management model faces a compounding challenge: acute global supply chain vulnerabilities alongside a rising demand for hyper-personalized, patient-centric care. This paper introduces a project-delivery framework designed to transition healthcare systems toward Glocal Healthcare, a paradigm that leverages global data orchestration while deploying localized, highly resilient delivery assets.

Central to this transformation is the lifecycle project management of the "Hospital for One" concept, moving the project environment out of massive, centralized facilities and into a decentralized, data-driven patient ecosystem. To operationalize and measure this structural transition, this paper details the application of the Green Income Diversification Creativity (GIDC) model, demonstrating how sustainable Project Management Office (PMO) structures can utilize Green AI and localized production techniques to drive down Scope 3 emissions, diversify operational risk, and secure long-term economic viability in healthcare project portfolios.

1. Introduction: The Program Management Challenge in Centralized Healthcare

For decades, megaprojects in the healthcare sector have prioritized structural centralization. The traditional project blueprint dictated the construction of vast, energy-intensive hospital structures designed to manage large populations via a centralized, "Just-in-Time" (JIT) logistical framework. However, recent global disruptions, ranging from maritime chokepoint blockades in critical corridors to sudden geopolitical trade restrictions, have exposed the systemic fragility of centralized health procurement, demonstrating how geopolitical shocks trigger functional disruptions at key logistics nodes that cascade across international networks (Soman and Balasubramanian 2025). Geopolitical friction increasingly requires project managers to establish highly agile, temporary healthcare supply chains (HSCs) to sustain life-saving flows in politically volatile settings. Empirical evidence indicates that traditional physical protections, such as

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contractual backups or static inventory buffers, fall short when macro-level disruptions affect international manufacturing and logistics simultaneously; consequently, mitigating these vulnerabilities demands deep cross-border data collaboration, systemic agility, and a radical realignment of cross-national regulations to sustain operational delivery profiles (Duong *et al*. 2025).

When healthcare supply chains experience severe disruptions, the impacts are direct. In a projectized environment, a disruption is not merely a variance in a schedule; it is an immediate challenge to clinical delivery and patient safety (Kwon *et al*. 2016). As established by the International Supply Chain Education Alliance (ISCEA) in its Certified HealthCare Supply Chain Manager (CHSCM) body of knowledge, cost compression and regulatory rigidity often limit the adaptive capacity of traditional hospital procurement when faced with black-swan events (ISCEA, 2021).

To bridge the gap between structural vulnerability and personalized patient care, healthcare project managers may transition to Glocal Healthcare (Globally Connected, Locally Resilient). This approach shifts the project management focus away from massive physical construction toward the orchestration of the "Hospital for One", treating the individual patient's immediate environment as the ultimate project delivery site.

2. The Glocal Healthcare Project Framework: Scaled Architecture

Kerzner (2017) discusses the reality that modern complex programs can no longer survive on a single, rigid project velocity. He outlines how organizations must split their execution into a dual structure:

- The Slow/Predictive Velocity: Long-term, stable, and rigid planning used for high-level governance, strategic alignment, and global infrastructure procurement.
- The Fast/Adaptive Velocity: Rapid, iterative, and flexible execution lifecycles are deployed closer to the end-user or operational front lines to react to market or environmental changes.

Building on the work of Kerzner (2017), the implementation of a Glocal healthcare structure may represent a highly complex program management challenge. It splits the traditional project management baseline into a dual-velocity lifecycle (See Fig.1).

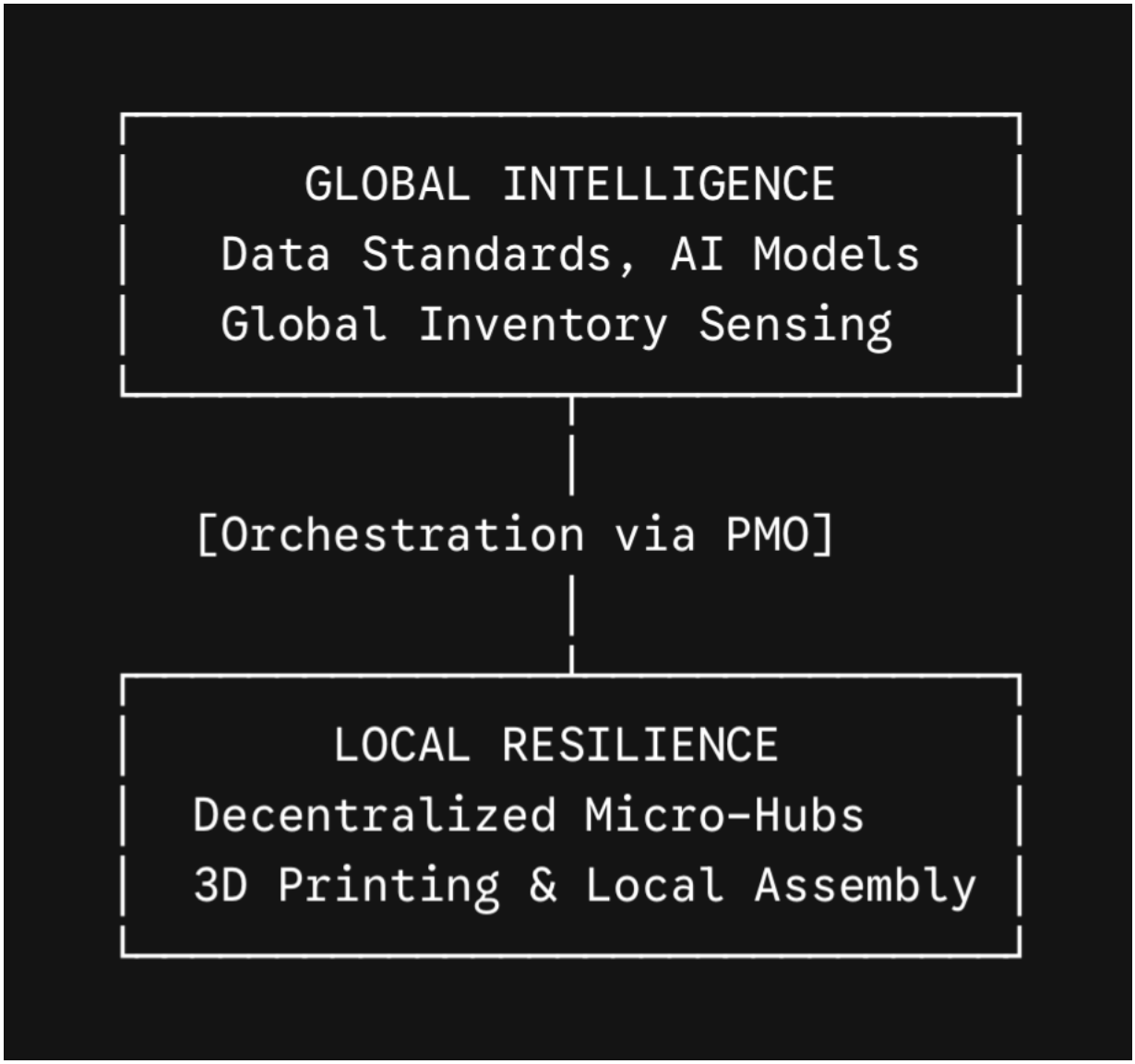

Figure 1: The Glocal Healthcare Project Framework

a) **Global Intelligence (The Informational Baseline)**: Utilizing international data standards (such as GS1 tracking codes) and predictive AI engines to serve as the unified information architecture (ISCEA, 2021). This allows the Project Management Office (PMO) to leverage the simulation principles of digital supply chain twins outlined by Ivanov (2020) to actively sense global demand patterns, manage third-party risk profiles, and proactively mitigate the ripple effect of supply shortfalls before they manifest in local project delivery. Ivanov (2020) stresses the significance of the Ripple Effect, showing how a single component shortage at an upstream node scales unpredictably and compromises the entire downstream network. Ivanov (2020) also demonstrates that to protect a network, managers must look past static

calculations and simulate the exact parameters of lead-time, speed of propagation, and the upstream and downstream disruption durations. So, in a projectized environment, the PMO uses these exact parameters to sense changes in global demand and map out visibility across the different tiers (e.g., Tier-1 and Tier-2 suppliers) of the portfolio. For a healthcare PMO, managing this ripple effect could be the equivalent of analyzing third-party supplier risk profiles to calculate how a bottleneck at an international active pharmaceutical ingredient (API) facility will directly delay local care delivery milestones.

b) **Local Resilience (The Execution Baseline)**: Transitioning physical production to regional micro-hubs. Instead of shipping finished items across vulnerable international logistics corridors, local projects leverage the decentralized, distributed manufacturing frameworks validated by Attaran (2020) during global medical supply crises. Essentially, CAD is the technology that turns data into physical reality, allowing healthcare Project Management Office (PMO) to replace physical cargo space with digital bandwidth. So, a local 3D printer or modular assembly hub can read this digital CAD file to understand the exact mathematical dimensions of the product, manufacturing the medical component instantly on-site. Thus, by pushing digital CAD designs directly to localized printing assets, healthcare networks can achieve on-site component assembly for critical medical hardware, providing a scalable blueprint that can be extended to advanced hyper-localized points of care, such as 3D-printed personalized pharmaceuticals.

By partitioning the project scope between global data intelligence and local infrastructure execution, healthcare program managers can achieve a hybrid advantage: a project network that learns globally but delivers autonomously within a secure radius of the patient.

3. Projectizing the "Hospital for One" Ecosystem

The "Hospital for One" is the structural culmination of decentralized project delivery. Rather than scheduling a patient to fit into a rigid hospital ward project space, the PMO treats the single patient's biology and residential perimeter as a custom, clinical-grade project ecosystem.

Managing this micro-project environment requires tailored adaptation across three foundational project performance domains outlined in the modern global standard (Project Management Institute, 2021): Scope, Risk, and Delivery.

a) Scope Management via Continuous Monitoring

The physical project boundary expands beyond traditional hospital walls by deploying the customizable, sensor-embedded wearables validated by Nasiri & Khosravani (2020). These 3D-

printed smart devices capture and transmit real-time physiological data streams directly from the patient's environment. For the PMO, this continuous data flow replaces static milestone tracking with an integrated, real-time baseline, shifting the project scope from a model of reactive treatment to the continuous integration and management of a highly dynamic clinical ecosystem.

b) Risk Management via Predictive Intervention

Traditional risk registers in healthcare projects focus on facility operational downtimes. Within the "Hospital for One" framework, the PMO adapts the high-performance computing models validated by Topol (2019), where predictive machine learning models function as automated analytical tools. By continuously evaluating real-time patient metrics and streaming biometrics to detect individual physiological deviations, these smart algorithms may trigger automated alerts for early preventive clinical interventions. In a projectized environment, this operationalizes risk mitigation, resolving health anomalies before an acute milestone failure (such as an emergency hospital admission) can manifest.

c) Integration Management via Decentralized Delivery

The delivery phase of medical supplies is local and direct. Rather than routing medications through multiple tiers of national distribution centres, local supply chains may route pharmaceuticals directly to the patient's doorstep. This relies on automated demand forecasting to eliminate over-ordering and drastically reduce the burden on physical hospital infrastructure (ISCEA, 2021).

4. Operationalizing Sustainable Value: The GIDC Model Integration

To improve the chances that the transition to a decentralized "Hospital for One" is economically viable, risk-mitigated, and environmentally sustainable, portfolio managers may anchor their execution in the Green Income Diversification Creativity (GIDC) model (Tawfik, 2025). Rather than viewing environmental sustainability as a static compliance requirement, the GIDC framework functions as a dynamic, four-stage cyclical flywheel (See Fig.2). Each pillar feeds into the next, continuously optimizing project lifecycles and may help in giving rise to localized manufacturing micro-hubs, innovative healthcare delivery channels, and green supply networks.

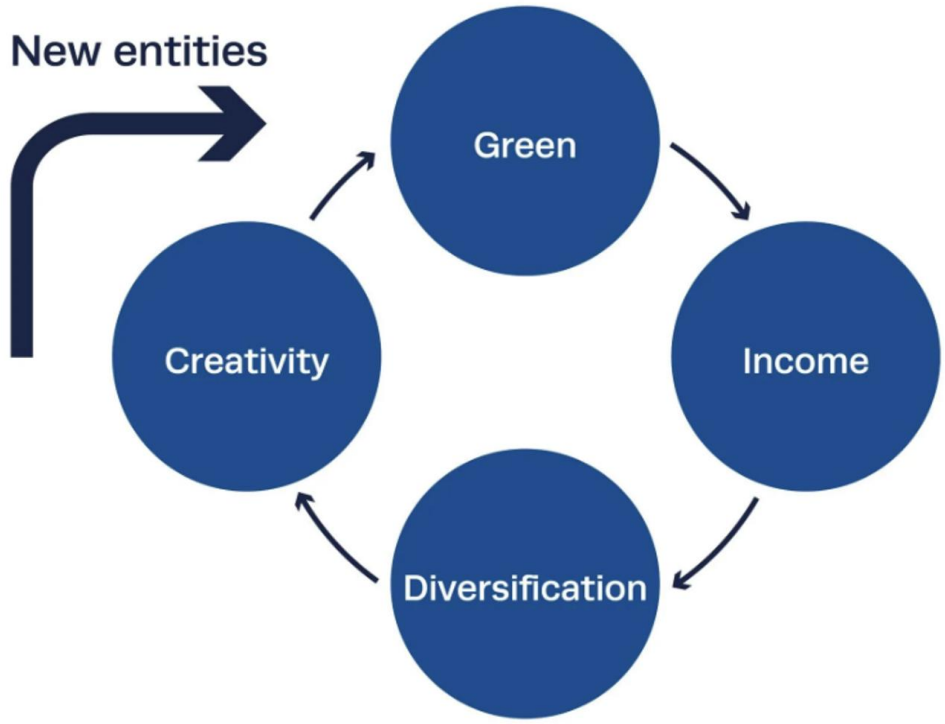

Figure 2: The GIDC Model four-stage cyclical flywheel (Tawfik, 2025)

Within a Glocal healthcare program, the four interconnected components of the GIDC flywheel function as the core strategic performance pillars:

I. Green: Minimizing Scope 3 Emissions and Environmental Footprint

A commitment to environmental sustainability. Traditional, centralized healthcare systems generate massive Scope 3 emissions through long-haul air freight and complex maritime shipping of medical items. By adapting the sustainable logistics compression frameworks established by Bai & Sarkis (2020), healthcare project managers may implement a Glocal infrastructure that actively shrinks transport distances. This operational change drives down the localized "miles-per-vial" carbon footprint metric, minimizing the necessity for expansive, energy-intensive central facilities and allowing PMOs to systematically meet strict Environmental, Social, and Governance (ESG) compliance guidelines.

II. Income: Securing Capital Streams and Economic Viability

Green transformations can only be sustained if they are financially viable. The Income pillar focuses on the economic performance of the project portfolio, ensuring that green initiatives

generate tangible cost savings or open alternative funding channels (such as ESG-linked capital investments and carbon credits). By reducing operational waste, cutting down on physical patient transit overheads, and optimizing resource consumption, the "Hospital for One" model may shift the capital expenses (CapEx) into highly predictable, optimized operational expenses (OpEx), securing long-term financial health for the organization.

III. Diversification: Geopolitical Risk Isolation and Supply Resilience

Stable income and operational continuity within complex clinical portfolios demand robust risk mitigation, particularly because a reliance on a singular manufacturing origin or an unstable geographical transit corridor may introduce severe structural vulnerabilities. To counteract these vulnerabilities, the Diversification pillar of the GIDC framework operationalizes supply chain resilience (SCRes), academically defined by Ponis and Koronis (2012) as *"the ability to proactively plan and design the Supply Chain network for anticipating unexpected disruptive (negative) events, respond adaptively to disruptions while maintaining control over structure and function and transcending to a post-event robust state."* By shifting execution away from vulnerable, linear global pipelines and transitioning toward a diversified, multi-hub regional supply network, a healthcare PMO may successfully isolate operational risks. Consequently, even if a critical global maritime chokepoint or international distribution node is compromised, the diversified local infrastructure maintains total control over its internal clinical structure and function, ensuring that the life-saving medical supply chain remains completely uninterrupted.

IV. Creativity: Driving Innovation via Green AI, Robotics, and Advanced Tech

The resilience gained through diversification may provide the stable environment needed to foster institutional Creativity. This pillar drives the adoption of innovative technological solutions, such as sustainable AI, predictive analytics, and automated robotics (Tawfik 2025). In a "Hospital for One" program, Green AI could be used to optimize the energy usage of remote diagnostic monitoring equipment, while localized manufacturing assets (such as 3D printers) may minimize overproduction and material waste. This directly prevents "expiry waste" where excess inventory is produced, shipped incorrectly, and ultimately destroyed at a high environmental cost (ISCEA 2021).

The Flywheel Effect:

As the Creativity pillar matures, it may help in producing technological breakthroughs that feed directly back into the Green pillar, restarting the cycle at a higher level of efficiency. This continuous momentum may ultimately yield specialized point-of-care clinics, automated home-ward setups, and hyper-local pharmaceutical assembly lines, permanently changing the baseline of modern healthcare project delivery.

5. Conclusion: A Call to Project Leadership in Global Healthcare

The future of healthcare infrastructure will not be defined by constructing larger, centralized facilities, but by designing smarter, more resilient networks. Transitioning to a Glocal healthcare model and managing the complex deployment of the "Hospital for One" requires project leaders to move past outdated project execution playbooks.

By grounding this transition in the structural principles of the GIDC model, project and supply chain professionals may build systems that reduce environmental impacts, protect inventories from global volatility, and deliver highly personalized, life-saving care directly to the patient's environment. The mandate for modern healthcare leadership is clear: build networks that are globally secure, locally resilient, and profoundly personal.

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Dr. Mohamed Tawfik is an expert in healthcare marketing, a researcher, and the creator of the Green Income Diversification Creativity (GIDC) model, a strategic framework designed for green transformation and environmental sustainability. A recognized professional voice and TV media analyst, Dr. Tawfik frequently provides expert commentary on pharmaceutical market trends and the geopolitical factors impacting global healthcare logistics.

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With over 20 years of expertise across the healthcare, pharmaceutical, and marketing sectors, Dr. Tawfik has held multiple senior leadership roles within the Kingdom of Saudi Arabia, and currently serves as the Marketing Director at DAWA NAJD Commercial Organization. His contributions to the international professional community include serving as a Healthcare Advisory Board Member for the International Supply Chain Education Alliance (ISCEA), the official Alumni Ambassador for the University of Liverpool Saudi Chapter, and an Advisory Board Member at the IASTEM Academy.

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