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NARRATIVE INQUIRY ON THE INNOVATION JOURNEY OF FOUNDERS OF BIOMEDICAL STARTUPS IN THE PHILIPPINES

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Acceptance Page

This thesis of **CHRISTINA QUIÑONES-MARQUEZ** titled: **"NARRATIVE INQUIRY ON THE INNOVATION JOURNEY OF FOUNDERS OF BIOMEDICAL STARTUPS IN THE PHILIPPINES"** is hereby accepted by the Faculty of Management and Development Studies, U.P. Open University, in partial fulfillment of the requirements for the degree **Masters of Research Development and Management.**

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Biographical Sketch

Dr. Christina Quiñones-Marquez is a registered physician, pediatrician, and dedicated public servant with nearly two decades of unwavering service to the children of Laguna.

Dr. Marquez completed her undergraduate studies of Bachelor of Science in Biology, major in Cell Biology at the University of the Philippines Los Baños. She obtained her Doctor of Medicine degree from Saint Louis College of Medicine in Baguio City, followed by a Post-Graduate Internship at the National Kidney and Transplant Institute. Her pediatric specialty training was done at both Laguna Provincial Hospital and Mary Mediatrix Medical Center.

Beyond clinical practice, Dr. Marquez has demonstrated extensive institutional leadership. She served as the youngest president of Laguna Medical Society, a component society of the Philippine Medical Association. At the frontline of public health management, she led the Laguna Medical Center COVID-19 Response Team from beginning to end. She was honored with the "*Natatanging Kawani*" award in 2021 by the Civil Service Commission and the Provincial Government of Laguna. Furthermore, she received the "*Bagong Bayani sa Gitna ng Pandemya*" award from the Integrated Bar of the Philippines (IBP), as well as the *"Excellence in Leadership Icasiano Award"* and the "*Most Outstanding Physician Award*" from the Philippine Medical Association.

Dr Marquez sees herself as an individual of faith and a devoted mother to her four sons. She firmly advocates that true legacy lies not in titles or organizational affiliations but in the integrity of one's character and commitment to service to others.

Dedication

In all humility and with a thankful heart, I want to give honor and praise to my Almighty God and Savior Jesus Christ for the strength, provisions, wisdom, perseverance, and faith that carried me through this academic journey. If not for His mercy and grace, I would not have reached this milestone.

I dedicate this body of work to my four sons, namely ***Gabriel***, ***Benjamin***, ***Zachary,*** and ***Jaren***. On the days I almost gave up, amidst the tears and the doubts, the four of you served as my motivation to take each step forward. This accomplishment is as much yours as it is mine.

I also dedicate this to all **Filipino biomedical and health technology innovators and startup founders** who courageously pursue solutions that address the Philippines' healthcare challenges. Despite all the obstacles, you remain anchored to the hope and dream that there is a brighter future ahead. May your narratives continue to inspire innovation, resilience, and meaningful change.

Finally, I dedicate this work to each resilient Filipino, "***the Juan in the arena,***" who dares to dream beyond the limitations, finds the courage to move forward when faced with uncertainty, and remembers to lift the welfare of others upon reaching success.

May this work stand as a testament that no dream is too ambitious, no obstacle too great and no journey too difficult, when faith gives us courage, purpose keeps us moving and compassion calls us to serve.

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Abstract

Researchers have studied institutional constraints in biomedical startups in the Philippines, but little is known about how founders experience and interpret the innovation journey from ideation to commercialization. This qualitative narrative inquiry examined eight purposively selected founders representing four technology categories. Guided by a constructivist-interpretivist paradigm, semi-structured interviews were re-storied into individual narrative profiles, member-checked, coded, and compared through cross-narrative synthesis. The accounts were organized through five non-linear thresholds: arrival; building and validation under constraint; regulatory qualification; procurement and adoption; and engagement with the systemic environment and founder identity.

Findings showed that entry was relational and problem-led. Entrepreneurial intention followed exposure to clinical or social need, while commitment to identifiable beneficiaries sustained action. Founders validated functioning technology through improvisation and resource combination. Regulatory qualification varies by product, venture, and institutional context. Founders sought new categories, proportionate regulatory requirements, predictable timelines, and improved digital process flows for registration, rather than deregulation. The greatest divergence occurred after product validation, when procurement, institutional acceptance, and market uptake either enabled movement or produced delay, redirection, withdrawal, and re-entry. Financing and adoption emerged as interconnected conditions. Resilience and narrative identity formed an adaptive architecture where founders interpreted disruption and reconfigured roles, resources, and strategies. Founders' proposals emphasized development support, regulation and adoption, venture funding during the pre-revenue

interval, simplified administrative processes, and human and institutional entrepreneurial capability.

The study concludes that the innovation journeys of biomedical startup founders in the Philippines were non-linear, with the challenge not in developing a viable product but in moving these innovations through regulatory qualification, institutional adoption, and sustained use. The study therefore provides a founder-centered understanding of how biomedical innovations advance, stall, or change direction on their path toward clinical use and public benefit.

Keywords: Biomedical Startups; Health Technology; Innovation Journey; Narrative Inquiry; Effectuation Logic; Entrepreneurial Resilience; Narrative Identity; Technology Adoption; Philippines; Low-And-Middle-Income Countries

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Chapter I

THE RESEARCH PROBLEM

Background of Study

The healthcare industry currently faces substantial challenges from a weakened health system. Evident threats highlighted by the recent COVID-19 pandemic, such as shortages of physicians and nurses, as well as other allied medical workers, and continuously increasing costs for health services (Kulakov et al., 2023; Meara et al., 2015), are realities faced especially in low-and middle- income countries (LMICs) such as the Philippines (Jiu et al., 2022). The need for cost-effective and innovative solutions is important. The United Nations' Sustainable Development Goals (SDG's) have identified health and innovation as interconnected pillars for sustainable development. SDG 3 (Good Health and Well-Being) ensures good health for all, and commits to addressing epidemics like AIDS, tuberculosis, and malaria, and achieving equitable health through universal healthcare. Specifically, **SDG 3.b** advocating research and development of medications, vaccines, and other medical devices that address the current burden of disease and other health delivery service issue support for the biomedical startup sector. In addition, biomedical startups aid in achieving **SDG 9** (Industry, Innovation and Infrastructure), which highlights the foundational roles of resilient infrastructures and technological innovation. **SDG 9.5** aims to enhance scientific research and upgrade the technological capabilities of the Philippine biomedical ecosystem. The intersection of these goals highlights that health issues, whether locally or globally, can be addressed by technology. It focuses on innovative scientific discoveries that can translate into accessible, affordable healthcare solutions. These technologies have

been built and fostered by founders who pushed for their concept to become reality, each having unique, compelling yet often obscured narratives on their innovation journey.

The Philippines continues to face challenges in its innovation ecosystem. The limited human resources in science, technology, and innovation, with fewer than 174 full-time scientists and researchers per million population (National Economic and Development Authority [NEDA], 2023), and gross expenditure on R&D at only 0.324% of GDP, significantly lower than the global average of 2.04% (NEDA, 2023). These systemic constraints are compounded by fragmented linkages among government, business, academe, and the R&D community (National Innovation Council, 2022).

Biomedical technology and devices transform traditional diagnostic and therapeutic methods to address the timely health concerns of the population (Haleem et al., 2023; Friebe, 2020). These technologies range from simple laboratory tests to novel robotic surgeries and digital health applications (Howitt et al., 2012). The recent pandemic accelerated the adoption of technologies such as virtual reality, artificial intelligence (AI), and sensors in healthcare systems (Friebe, 2020; Wehde, 2019). Using the context of Department of Science and Technology- Philippine Council for Health Research and Development (DOST- PCHRD), biomedical devices developed fall into the program on Biomedical Engineering for Health. It encompasses a wide array of products and services that range from biomaterials and sensors, photonics and optics, radiological and nuclear medicine technologies, novel regenerative medicine (cellular therapies, tissue engineering), applied human engineering (rehabilitative devices, mobility assisting devices, biomechanics), neuro engineering (brain-computer interfaces, neural prosthetics), surgical systems and

devices, implants (orthopedic implants, pacemakers), emergency medical devices, medical training aids (anatomical simulation systems, virtual and assisted realities) and capacity building tools (Perez et al., 2024).

In Singapore, an established leader in the health innovation industry, the national program leverages government investment, advocates international partnerships, and has a formidable private-sector engagement, further boosting the already thriving biomedical ecosystem (Lee & Vatvitsas, 2021; Pangarkar & Vanderberg, 2022). The successful efforts in biomedical innovation and entrepreneurship hand in hand were seen to improve public health outcomes and stimulate economic growth.

While in the Philippines, the number of biomedical startups has grown significantly, yet this potential is constrained by systemic barriers that impede startup success and commercialization. According to Teves et al. (2023), biomedical startups only consist of 5.2% of the country's total number of startups. The enactment of the Philippine Innovation Act (Republic Act 11293) in 2019 places the National Innovation Council at its helm in creating an integrated and collaborative national effort to boost innovation in the country. DOST-PCHRD, one of the agencies, has programs that aim to equip these innovative organizations to face the challenges of translating research into market-ready products.

In the context of Philippine biomedical startups, the founders and innovators have a challenging terrain to navigate, marked by limited funding access, talent shortages, regulatory complexities, and inadequate infrastructure. The Philippine Food and Drug Administration (FDA) regulates the development of therapeutics and biomedical products across multiple distinct phases, namely conception,

prototype development and preclinical testing, clinical validation and safety trials, economic and value assessment, and regulatory appraisal and market access (Perez et al., 2024), each stage demanding technical compliance as well as sustained commitment and emotional endurance from the founders.

Philippine startups have received less venture capital compared to other Southeast Asian countries like Singapore and Malaysia. Hence, Philippine biomedical startup founders employ bricolage strategies that creatively combine available resources to overcome barriers (Baker & Nelson, 2005; Fisher, 2012; Senyard, 2015). Moreover, existing systemic gaps include a decrease in qualified and managerial professionals due to the brain drain of talent to first-world employment opportunities, an underdeveloped digital infrastructure, and lengthy business and regulatory processes. Yet even with the existing obstacles, recent developments show a promising future for the Philippine biomedical ecosystem. There are new key biomedical startups that have secured financial backing, such as Lifetrack, HyBrain, and Cloud MD (TechCollective, 2025). University-based spin-offs like VISON technology from De La Salle University exemplify emerging technology push commercialization pathways that translate locally adaptive, cost- effective biomedical innovations that address the country's pressing healthcare needs.

Existing research on biomedical innovation in the Philippines provides valuable systemic insights. But there is a limited understanding of how these founders experience, interpret, and manage innovation, especially in the resource-constrained context. Using the narrative inquiry approach provides an interpretive lens, looking at the founders' origin stories unfolding, revealing how they construct meaning from their individual experiences of success and struggles within the broader perspectives

of institutional, sociopolitical, and cultural background (Castelo et al., 2023; Kyrkimtzis,2023; Perez et al., 2024).

Statement of the Problem

As mentioned, the Philippines has strengthened its biomedical ecosystem with an improved policy framework from the provisions of the Republic Act 11293, mandated agencies and proactive initiatives (PCHRD HeaRTNovation Hubs), and varied institutional support mechanisms designed to facilitate medical device development and commercialization (Teves et al., 2023; Perez et al., 2024). Despite research on structural interventions that document regulatory barriers, limited funding opportunities, and challenges in market accessibility, a significant gap remains. Current studies provide limited understanding of how biomedical startup founders in the Philippines experientially navigate, construct meaning from, and manage the multifaceted, complex innovation journey of product commercialization.

This gap is significant because each founder has unique tacit knowledge, adaptive strategies, and relational practices that remain undiscovered by formal innovation management frameworks. The lack of understanding of the real-world hurdles of these innovators creates a risk for responsible policymakers and agencies constructing misaligned support mechanisms. Furthermore, the absence of founder-based research studies limits the development of innovation management models specifically for LMICs, where the resource constraints demand unique forms of bricolage and improvisation (Wang, 2023; Hu et al., 2022).

Therefore, this study addressed the central research question: "**What are the narratives of biomedical startup founders in the Philippines, as they navigate their innovation journey from laboratory research to market commercialization of their product?"**

This central question was explored through the following specific research questions:

RQ1: What backgrounds, entry points, motivations, and formative experiences characterize biomedical startup founders who pursue innovation in the Philippines?

RQ2: What technical, regulatory, financial, and market-related challenges do biomedical startup founders encounter through their innovation journey, and what narrative patterns of adaptation, resilience, and identity reconstruction emerge from their experiences?

RQ3: What systemic gaps, support mechanisms, and ecosystem improvements do biomedical founders identify through their narratives as essential for advancing Philippine biomedical innovation?

Objectives of the Study

The study's general objective was to explore and understand how biomedical startup founders narrate and construct meaning from their innovation journey from ideation to product commercialization using the narrative inquiry approach.

Specifically, the study pursued the following intents to:

1) describe the backgrounds, entry points, formative experiences, opportunities, and motivations that shaped their pursuit of biomedical innovation in the country;

2) examine how founders retell or re-story their experiences of navigating technical, regulatory, financial, and market-related challenges throughout the innovation journey; and

3) synthesize the envisioned future of Philippine biomedical innovation from the founders' narratives, advocating systemic changes and support mechanisms to improve the current biomedical ecosystem.

Significance of the Study

This study added to and extended the current theoretical frameworks on innovation management by demonstrating narrative identity, dynamic capabilities, and meaning-making intersect biomedical innovation pathways. It provides empirical evidence for applying narrative inquiry to R&D management research, weighing in methodological diversity to a field dominated by quantitative assessment.

This study directly addressed policy priorities articulated in two foundational governance documents. The Philippine Development Plan 2023-2028 (NEDA, 2023) recognizes that advances in research and development, as well as technology and innovation, are critical for transforming production sectors. The said report identifies inadequate human resources in science, technology, and innovation, insufficient R&D expenditure, and unmaximized university-industry- government linkages as obstacles to the growth of research and development in the country. On the other hand, the

National Innovation Agenda 2032 (National Innovation Council, 2022) mentions health and wellbeing as one of the ten priority areas, emphasizing the need to translate scientific innovations into actual solutions.

By highlighting how the biomedical founders navigated these systemic barriers, this study aimed to provide qualitative evidence to complement the available quantitative studies and evaluations, offering concrete insights into what adaptive strategies, innovation practices, and meaning-making processes enable the founders to persist despite the constraints.

Scope and Limitations of the Study

Scope

The research participants were founders of biomedical startups in the country. (Teves et al., 2023). For purposes of this study, biomedical startups included ventures developing biomedical devices, diagnostics, therapeutics, and digital health technologies that address identified health needs and meet the study's criteria for successful innovation.

As this study focused on narrative inquiry, the study captured retrospective narratives of the innovation journey of founders' past experiences involving their biomedical product. The participant pool consists of founders or co- founders who have achieved demonstrable success indicators, as detailed in the methodology. These participants also needed to demonstrate sufficient temporal depth indicated by a minimum of three years of active involvement in the startup.

Limitations

The study acknowledged inherent limitations that shaped the findings and interpretation. The narratives were composed of personal interpretation and may be subject to selective recall, hindsight bias, and memory reconstruction. To lessen this limitation, triangulation with documentary evidence (such as awards, social media features and product pitches) was employed, alongside the provisions of follow-up interviews. Regarding the pool of participants, the study excluded founders from ventures that have been discontinued or are in early stages of development or have not achieved the specified success metrics.

Another limitation was the study's generalizability. Since the founders' narratives offer detailed stories of experience, it may only resonate with startups sharing the same LMIC contexts. Furthermore, the results will only present cross-sectional snapshots of the founders' journeys and not the entire journey and will not capture it entirely through direct observation of actual day-to-day decision-making, while future research endeavors may employ an ethnographic approach for longitudinal narratives and deeper insights.

Finally, the researcher's positionality and interpretive role significantly affected the study. The employment of reflexive journaling and peer debriefing will serve to mitigate interpretive bias.

Definition of Terms

Biomedical Device. This refers to any tool, device, or technology used for either prevention, diagnosis, or treatment of a specific health condition (Global Harmonization Taskforce, 2012).

Biomedical Startups. This refers to early-stage or growth-oriented ventures that invests on development of technology, products, procedure to provide healthcare solution to an existing health need (Mukherjee, 2021; Teves et al., 2023; Chakraborty et al., 2023; Kalinowska-Beszczyńska et al., 2024; Jarabe et al., 2025). These include the development of biomedical devices, diagnostics, therapeutics, and digital health technologies.

Biomedical Startup Founders. These are the individuals who initiated, co-founded, or led the development of a biomedical innovation venture. (Viitanen, J. 2016; Teves et al., 2023). For this study, the term “founder” was used to refer to eligible founders, co-founders, and principal innovation project leaders.

Innovation Journey. This refers to the complex, multi-stage process through which new ideas are conceptualized, developed, and implemented, often in the face of setbacks and iterative learning. This concept is foundational in innovation theory and characterized by non- linear progression where activities such as initiation, development, implementation, and termination or scaling occur in successive, overlapping, or cyclical phases (Van de Ven et al., 1999; Oeij et al., 2019).

Innovation Process. These are the sequence of activities, decisions, and transitions from initial research or ideation through prototype development, regulatory approval, clinical validation, and market entry (Hu et al., 2022).

Narrative Inquiry. This is a qualitative research methodology that explores how individuals make meaning from experiences through the construction and telling of personal stories (Creswell, 2014; Clandinin & Connelly, 2000; Jarabe et al., 2025).

Philippine Biomedical Innovation Ecosystem. This is the network of institutions, policies, funding mechanisms, regulatory bodies, academic entities, and support organizations that enable or constrain biomedical startups in the country (Teves et al., 2023; Viitanen, 2016; Perez et al., 2024).

Technology Readiness Level (TRL). This refers to a measuring system of product or technology maturity accepted globally (Mankins, 1995).

Chapter II

THEORETICAL BACKGROUND

Review of Literature

This section of the study shows the empirical studies that focus on the landscape of biomedical innovation in the Philippines, which in turn shape the experiences and decision-making of startup founders. This review of related literature examines the founder's mindset, innovation ecosystems, and various socio-cultural factors that affect the triumph or collapse of biomedical ventures in the country.

Biomedical Innovation in the Philippine Context

The Philippine healthcare system is burdened by overpopulation, limited health budget allocation, limited health care access, and heavy disease burden across all age groups (Shrime et al., 2015; Howitt et al., 2012; Jiu et al., 2022). Biomedical innovation startups aim to provide solutions to these challenges, providing cost-effective, locally adaptive answers to the national health agenda (Meara et al., 2015; Kulkov et al. al, 2023; Perez et al., 2024), as stated by the Department of Health. The context where these budding innovative ventures operate is shaped by systemic restrictions, stringent policy frameworks, and regional cultural differences; a stark contrast with high-income countries where most existing innovation literature exists.

The Philippine Innovation Act of 2019 and various programs by national agencies like DOST-PCHRD aimed to create a conducive environment for innovative ventures to increase, especially in healthcare. Unfortunately, this objective was not achieved as implementation and regulatory barriers persist, causing startups to fail to reach product commercialization (Perez et al., 2024). Culturally, the mission-driven

orientation that contrasts with scarcity, regulatory uncertainty, and market barriers often evident in their ventures mobilizes networks for support and sustains commitment (Vadil et 2023; Jarabe et al., 2025). The concept of entrepreneurial resiliency, or the capacity to persist despite resource scarcity, regulatory uncertainty, and market barriers, is often evident in the commercialization journey of startups in the country.

Existing studies on macro-level barriers (Teves et al., 2023), policy framework gaps (Perez et al.,2024; Hu et al., 2022), and success actors of entrepreneurship (Chakraborty et al., 2023; Mukherjee, 2021) describe the biomedical ecosystem landscape. Yet the experience of the founders of biomedical startups, how they construct identity as innovators, and how they sustain motivation through failures remain largely undocumented.

Biomedical Product R&D and Innovation Process

The product development and commercialization of biomedical technologies, from pharmaceuticals, diagnostics, medical devices, and digital health technologies, has a specific, complex pathway unique to the product being developed. This process involves multiple sequential and overlapping stages, each with distinct technical, regulatory, and financial requirements.

The Stage-Gate Model

The Stage-Gate Model was originally conceptualized by Robert Cooper (2008) and is described as a structured framework for managing innovation and product development projects, particularly in industries that demand strong regulatory compliance, technical expertise, and high-risk management, such as biomedical

technologies. This model is widely used by medical device companies and research technology-driven organizations to guide them from conception to product market launch.

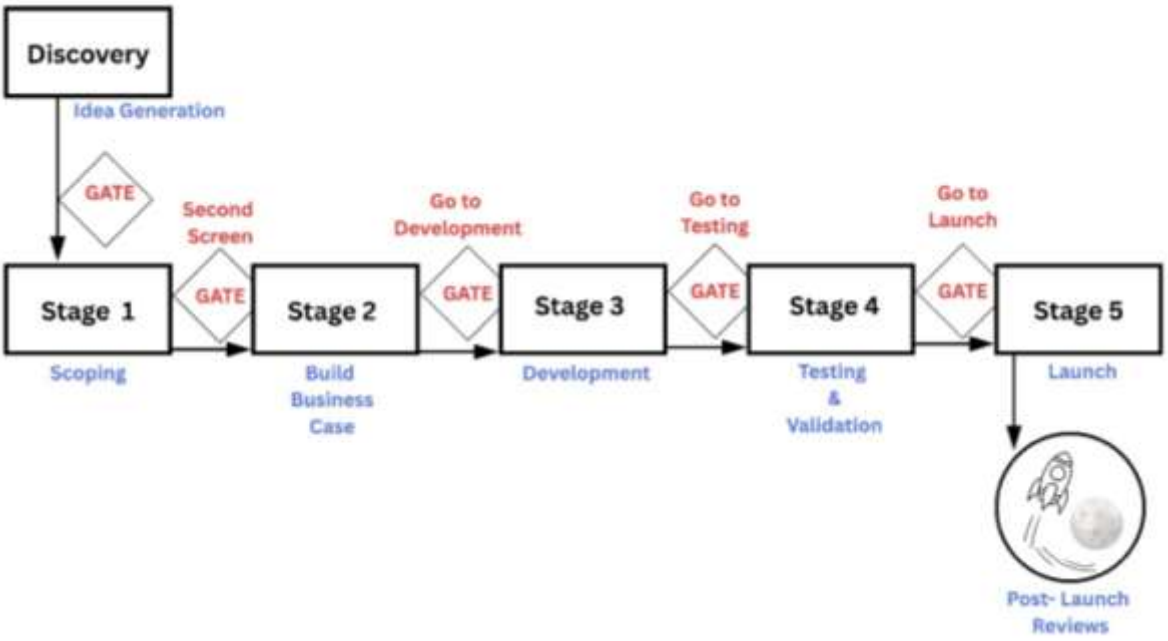
This model organizes innovation activities into a sequence of stages such as discovery, feasibility, analysis, business case development, design and development, design transfer, and product launch. Each stage has specific tasks and deliverables that aim to decrease the risk for the product. Between each stage is a “gate” where designated teams formally review progress, evaluate technical, regulatory, and commercial risks such that the founders can make calculated decisions on whether to advance, pause, or terminate an innovative endeavor (Pietzsch et al., 2009; Soenksen &Yazdi, 2017). Figure 2.1 shows the Stage-Gate Model (Cooper, 2008)

By building these review points or gates, the Stage-Gate Model ensures that only the most viable and compliant projects proceed, aligned with strict regulatory standards. The stages seen in the Stage-Gate model may vary per biomedical technology. It also shows cross-functional integration among engineering, clinical, regulatory, manufacturing, and marketing teams.

While the stage-gate framework of Cooper provides a robust general model of innovation projects, its application in the biomedical domain requires adaptation to the unique complexities of health technology product development. To address the specific complexities, Ijzerman and Steuten (2011) presented a tailored approach on the different stages in the background of the health assessment, formal horizon scanning, economic modelling and regulatory strategy into the innovation process. Their framework recognizes that successful biomedical product development relies on

evidence-based decision-making regarding both product design and market access (See Figure 2.2).

Figure 2.1. The Stage-Gate Model.



Note: Adapted from "Perspective: The Stage-Gate ® Idea-to-Launch Process-Update, What's New and NexGens Systems: by R.G. Cooper, 2008, Journal of Production Innovation Management, 25(3) p.214.

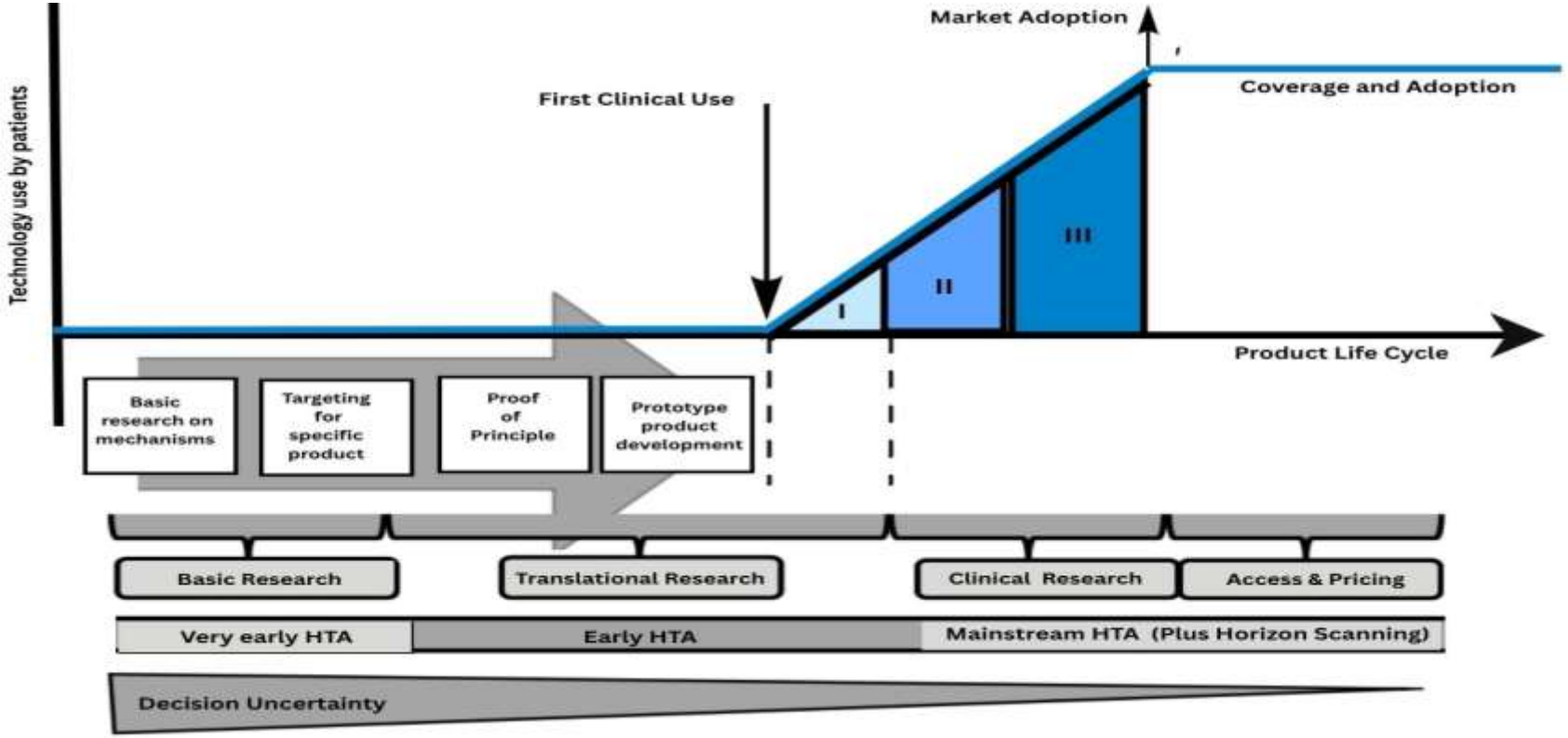
Development begins with the discovery and basic research phase, where researchers identify medical needs and explore disease pathology. It is also the stage where new compounds are generated and screened, or new devices and technologies are ideated. It consists of fundamental activities like target identification, whether it's identifying a new protein or choosing the right compound for a new drug. For medical device innovators, this is the stage they develop proof-of-concept prototypes to demonstrate technical feasibility. This stage is characterized by high uncertainty, extensive literature review and experimentation to establish scientific proof for further development (Morris, 2011; Kruachottikul, 2024). Figure 2.2 shows the flow chart of stages of medical product development.

This foundational work usually covers around 1 to 5 years depending on the complexity of technology. This usually coincides with TRL 1 through 3; where basic technology concepts are formulated (TRL1), possible applications of technology concepts (TRL 2), and initial proof of concept is demonstrated in laboratory models (TRL3).

This is then followed by preclinical development and animal studies phase. Biomedical innovations enter this phase where candidate drugs, biologics or devices undergo animal testing in laboratories to assess clinical safety, efficacy, biological activity and any potential toxicity prior to any human exposure (Feldman, 2015; Ineichen et al., 2024) This phase must fulfill requirements of with Good Laboratory Practice (GLP) guidelines to guarantee data integrity for regulatory submissions and approval for human clinical trials. Preclinical trials usually take another 1 to 3 years (Mahalmani et al., 2022; Singh & Seed, 2021).

Transitioning to the clinical phase, candidate products are tested in humans to demonstrate safety and efficacy. Clinical development progresses in three main stages. Phase I trials, consisting of 20 to 100 healthy volunteers, focus on initial dosing for new drug or vaccine development; this usually lasts 6 months to 1 year. Phase II trials expanded testing to a larger population to evaluate efficacy, optimal dosing, and any potential side effects in the target population. This lasts around 1 to 2 years and serves as a critical juncture where only 30 to 40% of interventions transition to the next phase. Phase III consists of the pivotal, large-scale comparative studies that generate evidence required for regulatory approval. It typically enrolls 3000 or more participants in multiple clinical sites. Clinical trials are rigorous and costly. They usually last 6 to 8 years for pharmaceuticals (Zhang, 2010; Singh, 2023) and medical devices, estimated

Figure 2.2. Flow Chart of Stages of Medical Product Development.



Note: Adapted Ijzerman, M. J., & Steuten, L. M. ,2011. Early assessment of medical technologies to inform product development and market access: a review of methods and applications. Applied health economics and health policy, 9(5), 331-347.

to last 3-5 years depending on the regulatory risk classification. For medical devices, this phase consists of prototype refinement or the movement from alpha and beta models to production-ready pilot devices, ensuring consistent quality and usability based on ongoing feedback and testing (USFDA, 2018).

Regulatory reviews follow, during which comprehensive data packages are submitted to authorities like the Philippine FDA. Approval is only granted after thorough evaluation of safety, effectiveness, and manufacturing processes. This has no definite amount of time frame, depending on the risk of the innovations, which could last from several months to years. Following approval, products move into commercialization. It involves market launch, scaling up production, and establishment of a distribution network. Startups or innovation companies are also required to conduct post-market surveillance, which is the systematic monitoring of safety and effectiveness in actual clinical scenarios. Reporting and monitoring for adverse events is also done during this stage. From the data gathered, the product will be improved accordingly.

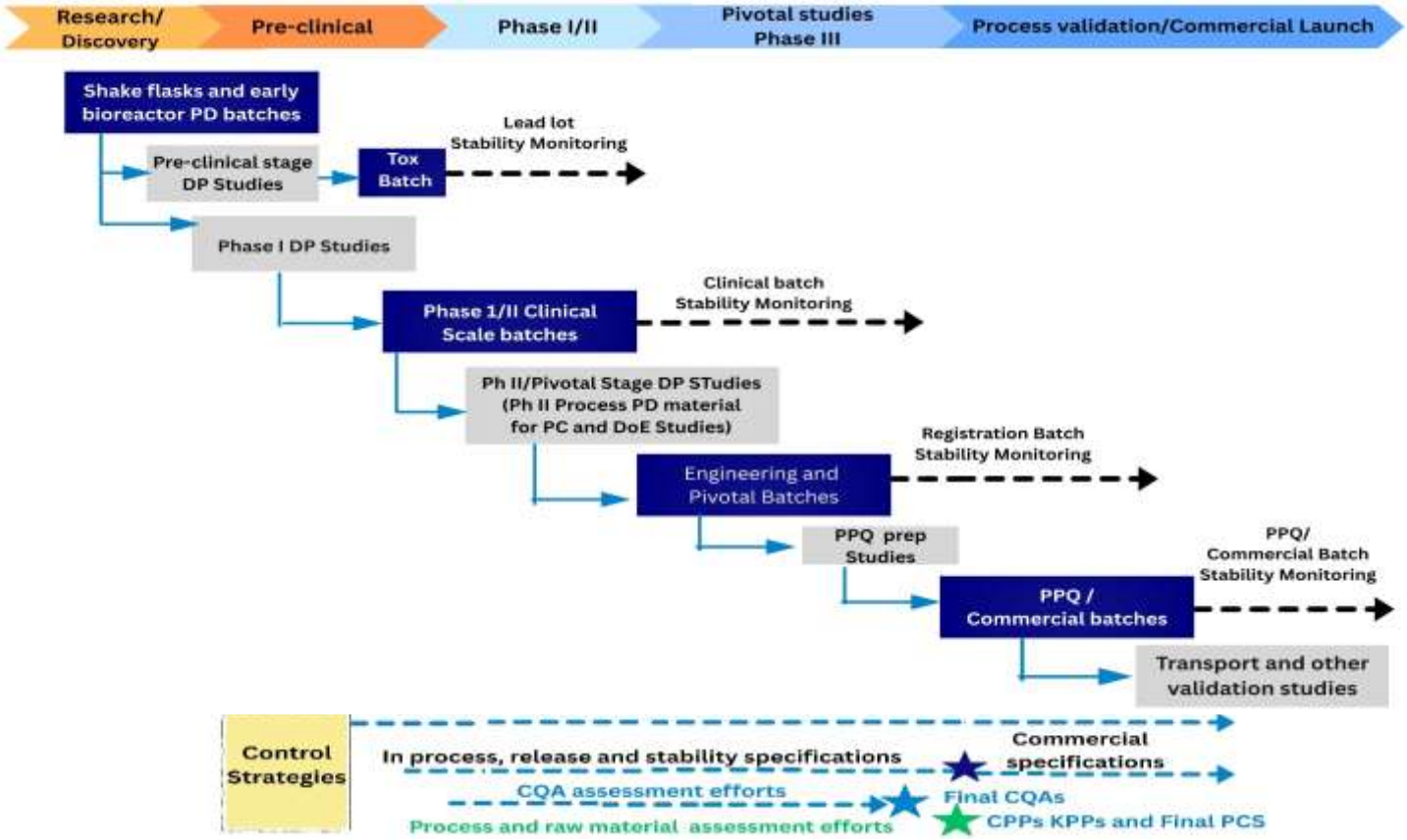
In a more recent model specifically for drug development, as seen in Figure 2.3, a comprehensive road map for drug development spanning from early research through commercial launch is organized into five major stages, namely a) Research/Discovery, b) Pre-clinical, c) Phase 1/II Clinical Trials, d) Phase III/Pivotal studies, and e) Process Validation/ Commercial launch. The entire timeline typically requires around 10-15 years, with development progressing through controlled stages of toxicology batches establishing initial safety profile, clinical batches supporting trial phases, and registration batches confirming commercial scale manufacturing capability. Quality assurance is integrated through lead lot stability monitoring

beginning as early as the preclinical phase and continuing throughout to ensure consistent product quality (Drug Development Process Map, n.d., USFDA, 2018).

The quality assurance framework operates through three parallel tracks as shown in the lower part of Figure 2.3, that spans the entire development lifecycle. The first track involves reference standard characterization and development of commercial specifications that define acceptable product quality attributes. The second track focuses on establishing and refining Critical Quality Attributes (CQAs) through systematic assessment efforts of physical, chemical, biological, and microbiological properties that have a direct impact on product safety and efficacy. The third track addresses Critical Process Parameters (CPPs) and Key Process Parameters (KPPs) identified via risk assessment methodologies, ultimately resulting to a Final Process Control Strategy that governs commercial manufacturing operations (Sampathkumar & Kerwin, 2023; Cimino & Braun, 2023). This model highlights the Quality by Design or QbD approach, whereby quality is built into the product as the initial part of development rather than in later stages.

This implies that by the time the product reaches marketability, it has undergone numerous extensive tests and improvements, ensuring a consistently safe, effective, and high-quality medication (Namjoshi et al., 2020). The comprehensive R&D and innovation process for biomedical products is a decade-long or longer journey characterized by sequential stages of escalating complexity, cost, and regulatory approval. The high attrition rate, with the overall though stages of clinical success of only 5 to 14%, underscores the inherently tedious and risky nature of a biomedical startup endeavor (Schweickart et al., 2023; Rajasimha, 2024).

Figure 2.3. Timeline and materials for biologics, drug product development, characterization, and qualification studies.



Note : Adapted from Sampathkumar &Kerwin, 2023 Roadmap for Drug Product Development and Manufacturing of Biologics. Journal of Pharmaceutical Sciences, 113(2), 314-331.

The process of translating biomedical innovation from concept to commercialized products is not uniform across technology types. Product development from ideation to market production are broadly recognized, the specific requirements, challenges, and duration of these stages can vary depending on the nature of the technology being developed (Hanney et al., 2015; Dirnagl et al., 2022). For example, a new molecular diagnostic, a mobile health app, a point-of-care rapid test, and gene therapy each follow distinct development and regulatory pathways, reflecting differences in complexity, risks, regulatory standards, and monitoring. Crucially, the translation time from idea to market launch is very distinct for each of the technologies developed. Some innovations, such as wellness apps, can be developed and released within months, with minimal regulatory barriers. On the other hand, a breakthrough medical device may require a decade or more before clinical use, with extensive testing for safety and efficacy even after product launch. To illustrate these differences, Table 2.1 synthesizes typical development timelines, cases, and examples across major classes of biomedical technology.

Translation time is fundamental to the innovation journey of biomedical founders. It defines the structure of an innovation story, influencing key process milestones, production successes, and setbacks. If translation time is lengthy, the founder's narrative may unfold in multiple stages, which necessitates more commitment and adaptability, resilience, persistence, and capacity to navigate through risk and uncertainty. Shorter translation times tend to result in founders' narratives focusing more on agility to users' needs and regulatory contexts. It also affects how founders construct meaning, perceive risk, and engage with different stakeholders in the biomedical startup ecosystem.

Table 2.1

Comparison of different developmental timelines of biomedical technologies and their examples

Technology Type	Typical Idea-to-Market time Approximation in years	Examples	Sample cases
Small/moderate risk medical devices	~ 3 – 7 years	Digital blood pressure monitors, thermometers, infusion pumps, needleless syringe	Agno, et al., 2024 Wong, 2005 Yang et al., 2015
Complex/ high risk or novel medical devices	~ 7 – 20 years	Implantable cardiac defibrillator, artificial heart valves, robotic surgery systems	Wang et al., 2010 Walsh III et al., 2014 Troccaz et al., 2019
In Vitro Diagnostics	~ 3 – 7 years	PCR Test kits, ELISA kits, Clinical chemistry Analyzer	Dill, et al., 2017; Rai, A. J. ,2007.
Companion Diagnostics (CDx)	~ 8 – 15 years	HER IHC or FISH HER2protein detection in breast cancer	Moelans et al., 2011
Point of Care	~ 3 – 8 years	Rapid Antigen Test Kits, Blood glucose monitoring device	Larkins &Thombare 2023
New small molecule drugs	~ 10 – 20 years	Statins, Imatinib, oral antivirals	Kanavos et al., 2007 Saxena, et al., 2009 .
Innovative biologic and gene or cell therapy	~ 12– 20 years	Monoclonal Antibodies CAR-T cells (genetically engineered T cells that recognize and kill cancer cells	Brown et al., 2021 Hameed et al., 2025, Liu et al.,2015
Regulated digital health SaMD (Software as a Medical Device	~ 3 years	Cardiac Rhythm monitoring apps, AI enabled image analysis software	Ullah et al., 2023 Samala et al., 2024

Theoretical Framework

Diffusion of Innovation Theory

Rogers' Diffusion of Innovation Theory, gained distinction in the examination of technologies and dissemination of innovations within communities. The theory defines innovation as any idea, technique, or technology perceived as unfamiliar or novel by individuals within an organization or a social system. On the other hand, it defines diffusion as a process by which information about a specific technology or innovation moves from one person to another over a period within a group or an enclosed social system (Rogers, 2003; Zhang et al., 2015).

The theory postulates four main determinants of innovation, namely (a) attributes of innovation, (b) characteristics of the adopters, (c) means of communication, and (d) the social system itself. Key players identified are categorized into five groups based on their attitudes toward innovation. These are the innovators, early adopters, early majority, late majority, and laggards.

The Diffusion of Innovation Theory (Rogers, 2003) has been used to study the adoption of different health technologies in various specialties. Greenhalgh et al. (2004) were able to identify factors influencing the spread of health innovations, including biomedical devices within clinical practices and health organizations.

Another study by Jiang et al. (2018) employed both network analysis and the Diffusion of Innovation Theory to trace the global impact and diffusion dynamics of new drugs in both the Chinese and U.S. Pharmaceutical sectors. Putteeraj et al. (2022) analyzed how health workers in Mauritius were able to adapt and accept

innovative electronic health solutions. The study confirms the significance of diffusion attributes and adopter categories for biomedical informatics products.

The Diffusion of Innovation Theory (Rogers, 2003) provides a theoretical lens on the mechanisms and factors that facilitate or hinder the spread and acceptance of an innovative health technology among physicians, hospitals, patients, and other key stakeholders. It is important to know that clinicians are often very careful about new technology. The theory will elucidate the market-level dynamics founders have to go through to achieve sustainable adoption of their innovation.

Narrative Identity Theory

The Narrative Identity Theory proposes that an individual creates their sense of self through the unique experiences an individual goes through. It highlights life experiences into compelling, coherent stories of successes and failures (McAdams, 2018; Clandinin & Connelly, 2000). It postulates that identity is not a fixed entity, but rather an evolving one. This theory showcases the dynamic and evolving processes that individuals go through, interpreting events and making meaning of the challenges they encounter. At the center of this approach, it focuses on the idea that an experience is always temporal and relational or always interpreted using the context of the locale and environment (Polkinghorne, 1996). This theory invokes how an individual can make sense of risk, failure, and opportunity. This study will use the theory to highlight the founders' narratives, recounting milestones and decision points as well as motivations, resilience, and value systems (Smith & Anderson, 2004).

The application of narrative identity theory in the Philippine biomedical innovation context reveals how these founders construct meaning from adversity, overcome resource constraints, and systemic barriers. This theory provides a conceptual bridge connecting individual experiences to broader aspects of meaning-making, identity transformation, and social construction. By examining the narratives of the biomedical founders, it captured the psychological and developmental dimensions of identity construction contextualized in the Philippine culture of resilience and community building.

Resiliency Theory

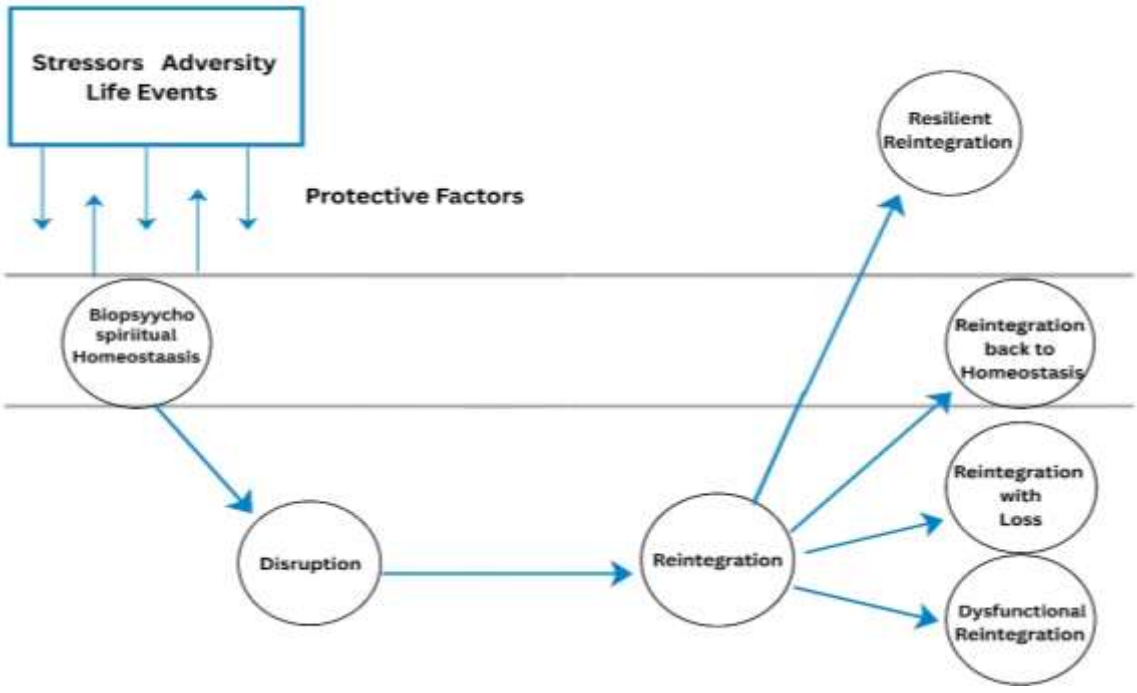
The Resiliency Theory has been recognized as fundamental for understanding the innovation journeys of scientists, as well as high-risk venture takers like biomedical startup founders. It proposes that resilience is one's capability to adapt, regain, and even prosper in the face of hardships, disruption, and failure.

The Metatheory of Resilience by Richardson (2002) mentions how resilience is viewed as a dynamic interaction between individuals and their environment. Richardson identifies "three waves of resilience" that illustrate how individuals respond to adversities as seen in Figure 2.4. The first wave identifies the protective factors that build resilience. This is followed by the second wave that focuses on the coping process and what is coined as the "biopsychospiritual homeostasis," or the point when an individual has wholly adapted or conformed physically, mentally, and spiritually to the stressors. Lastly, the third wave explores the internal motivations that an individual or an organization must activate resilience (Richardson, 2002).

The experiences of biomedical startup founders exemplify the interplay between stability and adaptability as mentioned in Richardson's resiliency theory. The founder's ability to demonstrate persistence, harness personal and organizational resources to survive setbacks or pivot from a point of failure, demonstrates what is described as "biopsychospiritual homeostasis" (Mberi, 2020; Conduah & Essiaw, 2022).

Placing resiliency theory as part of the narrative inquiry approach provided focus on the founders' stories as dynamic narrations of adaptations and learning, vital to the future visions of successful and flourishing biomedical startups in the country.

Figure 2.4. Richardson's Metatheory of Resilience and Resiliency.



Note: Adapted from Richardson, 2002 Richardson, G. E. (2002). The metatheory of resilience and resiliency. Journal of Clinical Psychology, 58(3), 307-321.

Innovation Process Approach

Biomedical startup founders employ diverse approaches to their innovation journey. The different philosophies reflect how innovations are conceived, developed, and commercialized. While some founders adopt structured methodologies as seen in academia and accelerator programs, others are reliant on emergent, intuitive, or context-driven strategies shaped by resource constraints and local realities. Understanding these varied approaches provides an important foundation for the analysis and interpretation of how founders narrate their innovation processes and their meaning-making of the entirety of their innovation journey.

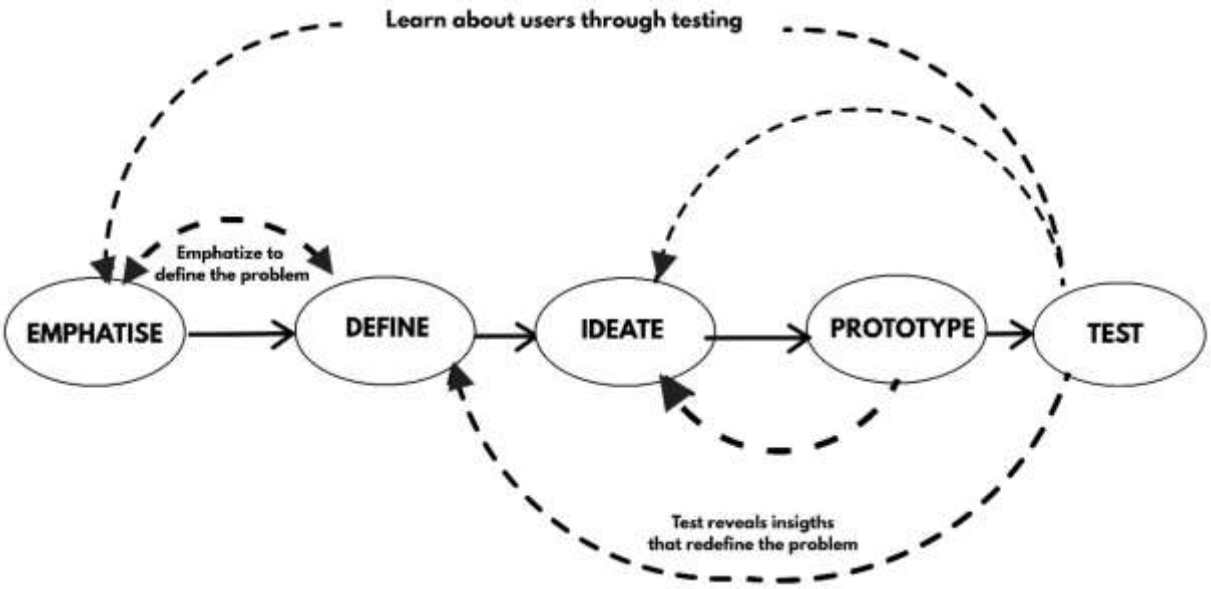
Design Thinking Methodology

Design thinking represents a human-centered, iterative approach to innovation. characterized by five non-linear phases, namely empathize, define, ideate, prototype, and test (Brown, 2008), as illustrated in Figure 2.5. First, the empathize phase consists of knowing and understanding the reality of the needs of its target users by doing interviews, direct observation, and ethnographic studies. This is then followed by the define phase, which integrates the research findings to frame the identified problem or need. This is done by identifying patterns, mapping needs, and constructing criteria for evaluating proposed solutions. Third, the ideate phase is when innovators come up with the idea and collaborate on a solution or a possible product to address the identified need. Then the prototype phase creates an initial physical version of the idea, such as mockups or a working model, for early testing with the intended users. The last is the test phase, where feedback is gathered from users to prove

assumptions, refine solutions, and generate additional insights for product adjustments.

This methodology emphasizes the importance of deep empathy with its target end-users, and in a biomedical context, it would be the patients and health care providers. Moreover, rapid prototyping and learning through risk-taking and experimentation hold greater importance than comprehensive upfront planning. Design thinking encourages founders to begin with patients' and clinicians' perceived needs rather than the available technological capacity. It pushes testing of assumptions early through low-fidelity prototypes and accepts failure as a learning mechanism by rapid application of identified flaws (De Leon & Tejero, 2022; Kiriyama et al., 2022).

Figure 2.5. The Design Thinking Methodology Framework.



Note: Adapted from Design Thinking: A Non- Linear Process by Interaction Design Foundation of Stanford.

Several Philippine biomedical startups have explicitly adopted design thinking principles, particularly those emerging from universities like Stanford Byers Asia and local accelerators to teach this framework (Altman et al., 2018; De Leon et al., 2024; Perez et al., 2024; Viitanen, 2016). However, design thinking is not universally adopted, and many founders develop innovations through alternative pathways that may be equally or more prevalent in resource-constrained Philippine contexts.

Technology-Push Approach

The technology-push model of innovation, or the “linear model proposes that scientific discoveries in research laboratories drive technological development and subsequent market applications. It conceptualizes that innovation flows unidirectionally from basic research to commercialization (Rothwell, 1994; Godin 2006). The dynamics of this model are prominent due to the unforeseen nature of scientific discovery and the long temporal lag between laboratory breakthroughs and clinical applications. It is dependent on the significance of university-based research in generating foundational technological knowledge. (Vea, 2014; Bannerman, 2020).

In the current literature, technology-push innovations often involve academic spin-offs where researchers recognize commercial potential in their scientific endeavors and establish opportunities that translate laboratory capabilities into marketable solutions, as seen in TTOs and IPR units present in the organization. Classic examples would be including conglomerates BioNTech’s mRNA vaccine platform developed by Johannes Gutenberg University over a decade prior to the COVID-19 pandemic, transformed academic immunology research into life-saving therapeutic (Albert, 2022). Another case is that of Oxford/Astra Zeneca COVID-19

vaccine, which uses viral vector technology primarily designed for malaria and influenza vaccines by the Jenner Institute and its spin-off Vaccitech (Bannerman, 2020).

Locally, technology-push pathways are increasingly evident but constrained by structural limitations in university -industry linkages and commercialization infrastructure. De La Salle University's first faculty-led biomedical engineering spin-off, VISON Technologies, was launched in 2024 (Aquino, 2024). These ventures illustrate that technology-push innovation in the Philippines predominantly originates from premier research universities where laboratory discoveries precede entrepreneurial intent. The founders with this background navigate a dual identity as researcher and innovator -entrepreneur (Teves et al., 2023; Kulkov et al., 2023).

The Philippine technology-push commercialization, like its Southeast Asian counterparts Singapore A*STAR and Biopolis or Taiwan's robust university-based technology transfer mechanisms, faces common struggles like weak university-industry links, limited venture capital for high-risk biomedical technologies, insufficient technology transfer capacities, prolonged regulatory approval timelines, and a decreasing number of technology experts due to brain drain phenomena (Luo et al ., 2025; Koh et al., 2005; Perez et al., 2024).

Yet despite this identified constraint, the technology-push model remains critically relevant for understanding the innovation journey of founders of biomedical startups in the country, especially those originating as academic researchers. It is essential for the narrative inquiry lens, as founders' stories reflect the challenges of translating laboratory discovery into regulatory-compliant and commercially sustainable biomedical innovations (Rothwell, 1994; Van de Ven et al., 1999).

Lean Startup Methodology

The Lean Startup Methodology, as popularized by Eric Ries (2011), is built on Steve Blank's (2013) customer development framework. It represents a paradigm shift from traditional entrepreneurial planning towards a more experimentation-driven concept; specifically, "build-measure-learn" cycles and data-driven pivot-or-persevere decisions (Ries, 2011; Blank, 2013).

Looking at the biomedical context, lean startup principles have been adapted to navigate identified constraints unique to the sector, such as strict regulatory requirements and clinical validation studies ensuring effectiveness, as well as safety and ethical considerations involved in trials with human subjects (Reis, 2011; Eisenmann et al., 2012). Despite these adaptations, the methodology still gained popularity through biomedical accelerators and incubators that teach lean principles like JLABS (Johnson & Johnson Innovation), Mass Challenge Health Tech, which coach founders to identify critical decision points (example clinical efficacy, physician adoption, reimbursement feasibility), design low-cost experiments, and pivot business models (Blank, 2013; Maurya, 2012).

In the country, lean startup adoption is increasingly visible among startups participating in local accelerators such as QBO Innovation, Ideaspace Foundation, DOST-PCHRD's Technology Enterprise for Innovation and Commercialization (TEKI) and HEArtNovation programs, which explicitly incorporate lean methodology training into their systems. (Teves et al., 2023; DOST- PCHRD, 2025).

The lean startup approach's relevance to narrative inquiry lies in its potential appearance in founders' narratives as both an explicit mental model influencing decision-making and an implicit pattern of experimental decision-making. These

innovators may narrate pivots as “failures” or “learning opportunities” depending on how much of the lean principles they have imbibed, treating setbacks as data sets of experimentation rather than outright defeat. The lean methodological frameworks shape meaning-making processes (Ries, 2011; Maurya, 2012).

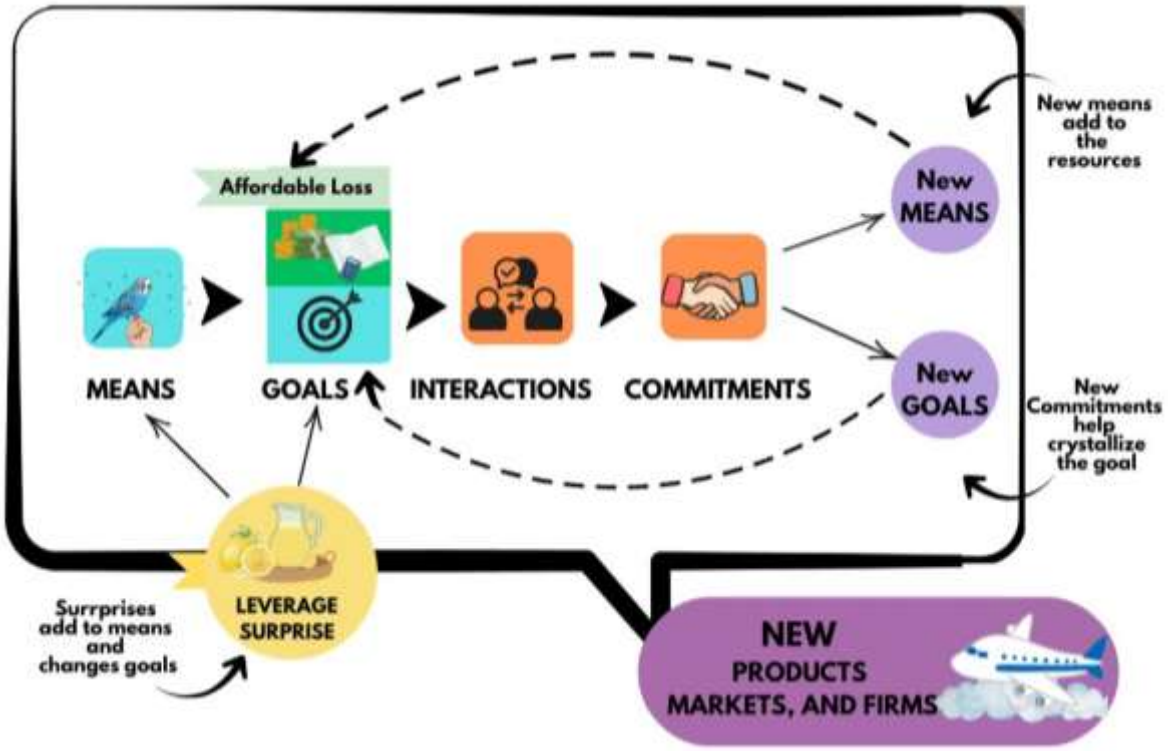
Effectuation Logic Theory

The Effectuation logic theory developed by Sarasvathy (2001) challenges rational goal-driven models of entrepreneurship by proposing that successful founders employ different logic from traditional causal reasoning. Effectuation postulates that causation starts with the readily available resources at the founder’s disposal: innovator uniqueness (traits, abilities, preferences), his mental and technical abilities (educational background, technical expertise, research background), and his associations (social and professional networks, and then envisions possible endpoints or outputs created with those resources (Sarasvathy; Sarasvathy & Dew, 2005). Effectuation is characterized by five core principles: (a) bird-in-hand principle (use what is available rather than wait for ideal conditions), (b) affordable loss (decision based on acceptable downside risk), (c) crazy quilt principle (building collaborative relations and partnerships to reduce uncertainty), (d) lemonade principle (leveraging contingencies and unexpected events as opportunities rather than obstacles), and (e) pilot-in-the-plane principle (considering outcome are controllable through action rather than predictable through analysis) as illustrated in Figure 2.6 (Sarasvathy, 2001; Fisher, 2012).

In biomedical innovation contexts, effectuation has been documented in studies of medical device development startup founders who leveraged clinical relationships

and institutional access from prior healthcare careers rather than conducting costly formal market research, or diagnostic startup innovators who assembled founding teams from existing academic collaborators before clarifying the final product (Read et al., 2009; Dew et al., 2009).

Figure 2.6. The Effectuation Logic Theory.



Note: Adapted from Wvandel, & Wvandel., 2019 https://creativebusinessmodels.com/2019/05/a-creative-entrepreneurial-process/

In the case of Moderna, the company-built mRNA platform partnerships with pharmaceutical companies before identifying specific therapeutic applications, exemplifying the crazy-quilt principle of co-creating markets with stakeholders (Fisher, 2012). Another example is the multiple cases of university spin-offs where founders began with laboratory technologies and available university resources (laboratory facilities, student assistantships, and institutional credibility) to explore commercial

possibilities rather than waiting on development of comprehensive marketing plans (Sarasvathy & Venkataraman, 2011).

Looking at the context of Philippine biomedical startups, effectuation logic may be particularly prevalent due to the resource constraints and institutional voids that make rational planning difficult. Founders usually need to engage in bricolage, the creative recombination of available resources to overcome barriers (Baker & Nelson, 2005; Senyard, 2015) as part of their adaptive strategies. In addition, Filipinos have been inculcated with the virtue of “bayanihan” (collaborative community effort) that aligns with effectuation’s emphasis on partnership building and collaborative co-creation (Medina-Molina, 2019). The previously identified constraints present in the Philippine biomedical ecosystem- limited network access beyond immediate circles, a risk-averse clinical culture of physicians, unreliable regulatory timelines, and unpredictable financial opportunities complicate the pilot-in-the-plane principle of controllability, pushing the innovative founders to balance effectuation principles and causal logic based on the context encountered through their innovative journey(Teves et al., 2023; Perez et al.,2024)

The Effectuation theory’s relevance for narrative inquiry lies in its explanatory power on the founders’ construction of their identities and the basis of their decisions upon retrospectively narrating their journey. In their narratives, effectuation logic may be implied with language such as “I started with what I had” rather than “I identified a market gap” (Sarasvathy, 2001; Garud et al., 2014). The understanding of effectuation provides analytical sensitivity for recognizing when founders’ narratives describe adaptive improvisation and that highlights the innovators’ logic in their decision-making

for industry-specific constraints (Baker & Nelson, 2005; Senyard, 2015; Kulkov et al., 2023).

This study does not presume that founders follow a specific innovation approach. Instead, narrative inquiry will reveal how founders describe, interpret, and make sense of their innovation processes, whether explicitly referencing formal methodologies, describing emergent, intuitive, or context-driven strategies, or even blending multiple approaches at different phases of their innovation journey. Understanding this diversity of possible approaches provides analytical sensitivity during narrative interpretation, allowing recognition of possible specific models or a unique blend of multiple approaches the founders used in their origin stories.

The Innovation Journey Framework in the following section provides a more temporally oriented lens that aligns with narrative inquiry's emphasis on progression, setbacks, and learning cycles that the founder has undergone.

Innovation Journey

The Innovation Journey framework is a concept developed by Andrew Van de Ven et al. (1999) that looks at innovation also as a non- linear dynamic journey characterized by three major periods. These periods are (a) Initiation, (b) Development, and (c) Implementation/Termination (Oeij et al., 2019). Van de Ven (2024) stresses this assertion: "you can't control the innovation journey, but you can learn to maneuver it". It favors an enablement-oriented approach over a traditional control-oriented one.

The Initiation period is characterized by a prolonged initial ideation process where there are multiple coincidental events, environmental observations, and gradual convergences of ideas, talents, and opportunities. There could be specific significant turning points, such as funding opportunities, competitive threats, or technological breakthroughs that can catapult formal innovation initiatives and mobilize resources. Organizational cultures that value experimentation and risk, provide resources for exploration, and enable the innovation journey (Van de Ven et al., 1999; Coyne & Van de Ven, 2024).

This is followed by the Development period, characterized by multiple parallel activities, setbacks and correction of mistakes, high personnel turnover, and continuously shifting success criteria. During this stage, there are also several stakeholders assuming leadership roles, whether it's the founder, the sponsor, critics, or even institutional collaborators. This period exhibits cyclical patterns of divergent and convergent behavior, which involves exploiting chosen directions, learning by testing and collaborating with existing networks. Studies show that the innovation journey cycles repeatedly between these modes to enabling conditions (resource investment, restructuring, innovative team members) and constraining conditions (rigid health technology assessment guidelines) (Van de Ven et al., 1999; Coyne & Van de Ven, 2024).

The Implementation/ Termination period involves two prongs. The first path would be successful in implementing the innovation with existing systems or "generative imitation". The second path would involve termination or ceasing the process due to resource exhaustion or environmental opposition. (Van de Ven et al., 1999; Coyne & Van de Ven, 2024). Terminated innovations are considered new

knowledge and as important as successful ones. It presents knowledge on what does not work in a specific product development (Chiaroni et al., 2011).

The Innovation Journey provides perspectives for managing innovations. It points out that the development process is fundamentally a collective achievement through networks and ecosystems. It also asserts that setbacks and mistakes are inevitable sources of learning.

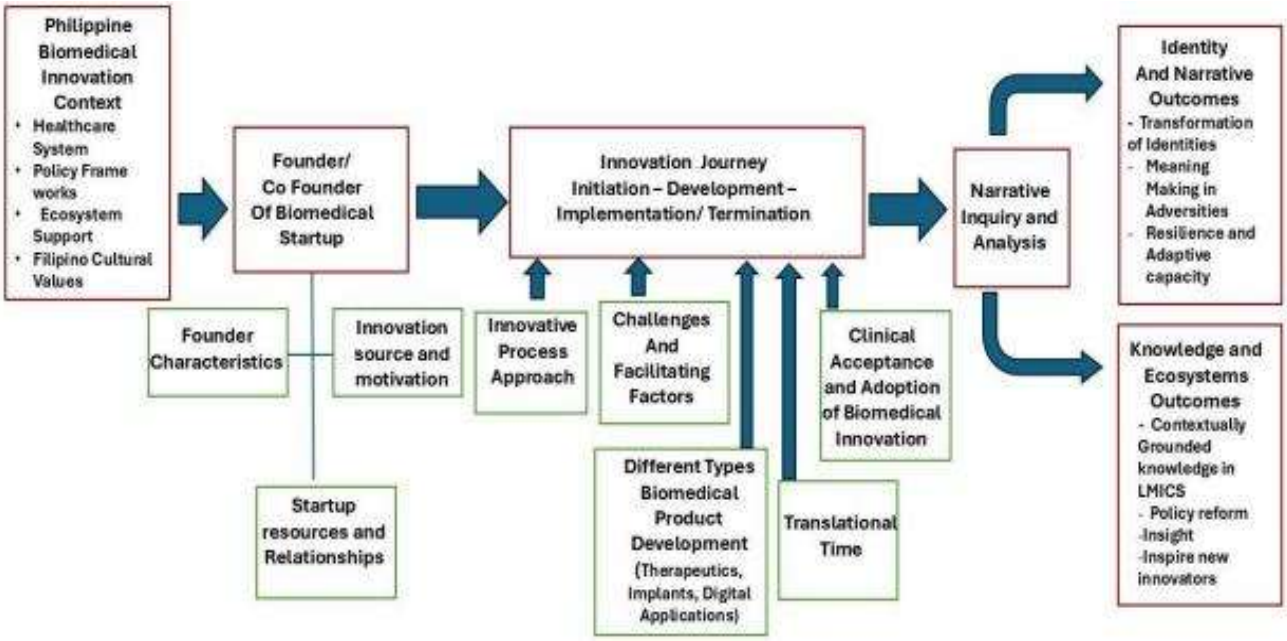
Conceptual Framework

This study employs a conceptual framework designed to understand the complex innovation journey of biomedical product development and how this journey shaped their identities as they contribute to the biomedical startup ecosystem. The framework shows the multiple layers of interactions within the innovation journey. It recognizes that innovation is not solely due to the individual founders nor purely due to the contextual phenomenon, but a dynamic collaboration between the founders' characteristics and their strategic choices, the current startup context, and the systemic factors in play.

The framework shown above operates on the sequential logic that moves from contextual conditions that Philippine biomedical startups face in their daily operations, such as national policies and agency support, as well as innate cultural values like "bayanihan" and mission-driven services. It reflects that the context of specific institutional, regulatory, and economic circumstances enables and constrains the founder's actions.

From this context emerge the inputs that the founders bring into the innovation journey. The individual founder characteristics significantly influence whether a biomedical product concept is pursued and developed. The framework acknowledges that founders are not undifferentiated individuals but each with their own distinctive backgrounds, orientations, professional networks, and psychosocial characteristics that shape their strategies and decision-making throughout their innovation journey.

Figure 2.7. Conceptual Framework for Understanding Biomedical Startup Founders of Innovation Journey.



The professional and educational background represents the baseline capacity of founders to pursue biomedical innovation. Advanced training in biomedical science, biomedical engineering, drug or vaccine development, or medical device development are possible technical competencies a founder may possess. Direct exposure to clinical problems and experiencing unmet health care needs often motivates founders

to pursue innovative solutions for any identified treatment gap or health system concern. In addition, some founders may have orientations like entrepreneurial mindset, opportunity recognition capability, and substantial risk tolerance that may incline them to pursue innovative solutions. Lastly, the social network and academic partnerships constitute a critical component that may be advantageous to their innovation journey. Access to mentors, advisors, business partners and angel investors can provide both guidance and support, particularly for first-time founders. Collectively, these founders' characteristics create individuals who navigate complex challenges through their product development and commercialization.

The center of the conceptual framework focuses on the innovation journey itself. It illustrates how the innovation journey is a complex, contingent, temporal process that involves multiple interconnected phases that include initiation, development, and implementation or termination. Aside from the founder's characteristics and the resources available, this journey is shaped by the different approaches founders may follow, such as design-thinking, lean start-up methodology, or any combination. It may also vary depending on which biomedical product is being developed, whether it's for diagnostics, therapeutics, medical devices, or digital health. The type of product will equate to the varying translational time it takes for an innovation journey. The different challenges and facilitating factors founders encounter, whether technical, regulatory, market, financial or ecosystem support, also influence the journey as well. And lastly, the adoption of innovation, as discussed in the Diffusion of Innovation Theory (Rogers, 2002) is a significant contributory component as physicians in general are wary of new technology or innovation and may be considered late majority or laggards when it comes to acceptance of new concepts of ideas.

The narrative inquiry represents the methodological lens that will be used in this study to make sense of the founder's experience. Through the life-story interviews and narrative analysis, the study aims to examine how founders narrate their journeys, construct meaning from critical events, and reconstruct their identities over time. This process may lead to two possible sets of outputs. Identity and narrative outcomes include transformed entrepreneurial identities, resilience narratives, and a new understanding of self as an innovator. The other set would include knowledge and ecosystem outcomes that could show contextually grounded insights about managing biomedical innovation in low-and-middle income countries, lessons that can inform current policy and support programs, and narratives that may inspire current and future biomedical startup founders.

Summary and Integration

This review of related literature has established the theoretical and empirical foundations for investigating biomedical startup founders' innovation journeys in the Philippine context. It integrates diverse literature into a coherent model, as seen in the synthesized conceptual framework that positions the founders' narratives on their innovation journey as the core analytical focus, while systematically integrating the contextual preconditions shaping those journeys. By employing narrative inquiry, this study aims to generate a rich understanding of the biomedical innovation process from the perspective of those living through the experience, contributing both to academic knowledge about innovation and entrepreneurship and to practical understanding of how biomedical innovations can be fostered in their own emerging startup ecosystems.

The following chapter describes the research design and methods employed to operationalize this conceptual framework through narrative inquiry. It details the rationale for narrative inquiry as the methodological approach, describes participant selection criteria and procedures, explains data collection protocols, delineates the data analysis approach for individual case narratives and cross-case synthesis, and describes trustworthiness strategies employed to ensure the quality and credibility of findings.

Chapter III

RESEARCH METHODOLOGY

Research Philosophy

This study centered on the constructivist-interpretivist paradigm. It contended that knowledge and reality are co-created through experience and social interaction (Creswell & Poth, 2016). This philosophical stance holds that meaning is not derived from a phenomenon but is constructed by individuals as they interpret their experiences within specific cultural and institutional contexts. Interpretivism paradigm extended the perspective by underscoring the researcher's and participant's shared process of sense-making, where the researcher was recognized not as a neutral observer but as an active co- constructor of new knowledge derived from narratives (Lincoln &Guba, 1986).

Narrative inquiry provided a framework to explore human experience as a story, focusing on how an individual established, conveyed, and reinterpreted their lives in the context of time, place, and relationships (Clandinin & Connelly, 2000; Polkinghorne, 1996).

Locale and Context of the Study

The locale of the study of biomedical startups was primarily in the island of Luzon, where the resources, talent, and investment were more concentrated. But through the course of the study, the locale was expanded to the whole of the country since there were also emerging biomedical startups in the Visayas and

Mindanao area. The context covers the evolving landscape of the Philippine biomedical innovation ecosystem. Institutions that included teaching hospitals, research technology hubs, and startup incubators (Teves et al., 2023; Hu et al., 2022; Perez et al., 2024) were tapped.

Research Design

The narrative inquiry approach provided a detailed exploration of a specific human experience. In this study, it captured the narratives of founders from successful biomedical startups as they went through their innovation journey (Jovchelovitch & Bauer, 2000; Creswell, 2014). It considered how these founders interpreted their struggles and how identities were strengthened for every challenge encountered, highlighting perseverance and resilience.

This approach prioritized exploration of an individual's unique experiences, rather than the deep essence of an experience, or cultural aspect of a phenomenon (Creswell & Poth, 2016). This design aimed to preserve and analyze stories, making the participant the main storyteller, focused on their turning points and meaning-making processes (Jovchelovitch & Bauer, 2000). The narrative inquiry framework of temporality, sociality, and place aligned with the multiple dimensions of the biomedical and health technology startup ecosystem (Clandinin & Connelly, 2000).

This study organizes the cross-narrative synthesis of the founders into five narrative thresholds. A narrative threshold is defined here as a researcher-identified passage in the founders' narratives and not universal stages. The narrative threshold involves the founder's self-understanding; the technology being built or the institutional

relationships that govern it. The threshold itself as a device is analytic, and not an application of standardized named technique. Rather, the thresholds are the study's plot of the narrative as seen in Polkinghorne's (1996) sense of narrative as a disclosure form in which events and happenings are configured into a temporal unity.

The choice of this design among the different qualitative approaches was focused on individualized interpretation of the founder's viewpoints, mindsets, and creative strategies to achieve their organizational goals. In contrast to other approaches, phenomenology focuses on the essence of a lived experience (Adams & Van Manen, 2017) with little emphasis on chronological progression or interactive relations within the startup, while grounded theory generates theories through constant comparison and coding (Charmaz, 2017) and heavily focuses on conceptual abstraction rather than the wholeness and integrity of a narrative. Meanwhile, case study design highlights a single exceptional startup and a specific bounded system (Yin, 2018), with little regard for how a startup navigates the landscape of an innovation ecosystem, and ethnography involves prolonged cultural immersion and participant observation to study organizations and cultural groups (Hughes, 2019), but it tends to be resource-intensive and less centered on individual biographical paths. Therefore, as narrative inquiry allowed to construct and reconstruct through the process of storytelling, it went beyond the usual nominal descriptions of innovations and capture the entrepreneurial journey with the Philippine biomedical and health technology innovation context.

Participants of the Study

Sampling Strategy and Sample Size

Participants in this study were selected through a purposive sampling strategy, guided by the given inclusion and exclusion criteria. Twelve (12) potential founders were initially recruited or identified for participation. Of these, nine (9) proceeded to the interview stage. Following the inclusion and exclusion criteria, eight founders were included in the final sample pool. This sample size was considered adequate in line with established qualitative research guidelines that ensure narrative depth and diversity (Clandinin and Connelly, 2000; Riessman, 2008). According to Creswell (2014), in a narrative inquiry study, the researcher may choose to concentrate on the experience of "one or more" personalities. Clandinin & Connelly (2000), on the other hand, highlight that narrative inquiry usually ranges from 1 to 15 participants. A related local qualitative narrative study done by Jarabe et al. (2025) on successful women in leadership positions in the Philippine Startup Ecosystem had five (5) participants. Ebai et al. (2021), in their narrative study on sustainability start-up founders, had thirteen (13) participants.

The narrative inquiry design obtained rich, detailed accounts of the experiences of these innovative founders that allowed for effective cross-narrative comparison and synthesis, consistent with recent narrative studies in the Philippine context (Mupas-Obedoza, 2022; Jarabe et al., 2025).

Participant Selection

The study participants were instrumental in leading their biomedical or health technology startup to become a successful venture. These individuals possessed

sufficient depth of experience and demonstrated progress for meaningful narrative construction.

For this study, eight founders met the following criteria:

1. Each was a **founder, cofounder, or a principal innovator-leader** of a biomedical startup including ventures developing medical devices, diagnostics, therapeutic technologies, or digital health technology platforms in the Philippines, who actively participates in decision-making in the startup's strategic direction, product development, and commercialization pathway.

2. Each **founder's startup had achieved** any of the following **success milestones:**

a) invented a biomedical product that is already at **Technology Readiness Level (TRL) 9** or already commercially produced (Mankins, 1995);

b) **secured Philippine FDA approval, license to operate or certificate of product registration** for the biomedical device, diagnostic or therapeutic, demonstrating compliance with national safety and clinical efficacy standards;

c) has active clinical or pilot use in at least two Philippine hospitals, healthcare facilities, or clinics, indicating acceptance and utilization by healthcare providers.

3. Each founder had **a minimum of three (3) years of active involvement** in the startup's development, ensuring sufficient and meaningful narrative reflection on challenges, turning points, and adaptive strategies (Surangi, 2022; Mupas-Obedoza, 2022).

The founders voluntarily participated in the narrative interview, reviewed and provided feedback on the individual narrative profile for member checking, and consented to share publicly available documents such as awards, citations, and media features for triangulation.

One founder was excluded from the original pool of participants as he had already shifted the startup from health technology to education technology and is currently being developed outside the country.

Study Recruitment process

After the required approval from the UPOU Faculty of Management Development Studies Research Ethics Committee (UPOU FREC) to perform this study was given **(see Appendix D)**, the recruitment process began

The study participants were recruited through referrals from a) institutional networks such as details from DOST-PCHRD websites and FDA listings, b) innovation hubs and incubators like QBO, Launch Garage, and Marian TBI, and c) university-based biomedical research units like Evelyn D. Ang Institute of Biomedical Engineering and Health Technologies (EDA-IBEHT) from De La Salle University, the National Institutes of Health (UP-NIH) and Surgical Innovation Biotechnology Laboratory (UP-SIBOL) from the University of the Philippines and lastly d) from professional networks of physicians under the Philippine Medical Association.

After completing a referral list with the founders' contact details, an introductory email was sent to initiate contact. This corresponding email introduces the study and outlines the participation requirements as well as the inclusion and exclusion criteria. This was followed by another email once the founders agreed to join the study, which

contains the study invitation that describes the overall purpose, procedures, and other details of the study (confidentiality, rights of the participants, and potential benefits) for their review.

The UPOU FREC- approved Informed Consent Form (see Appendix C) was sent after the founder agreed to participate in the study. The consent form provided the research study objectives, the amount of time and participation required, specific measures that will be implemented to safeguard the confidentiality of the participants' personal information, and the contact details of both the researcher and the ethics committee.

Voluntary Participation and Withdrawal Criteria

Both the study invitation and the Informed Consent Form stated that the study was strictly voluntary. Participants have the right to refuse to answer any personal or professional question they felt uncomfortable answering. Furthermore, participants possessed the absolute right to withdraw from the study at any time, up until the final data aggregation and anonymization phase, without penalty, loss of benefits, or negative consequences to their relationship with the researcher or the university. Once the participant chooses to withdraw, all previously collected data (including audio recordings, un-anonymized transcripts, and researcher notes) will be securely and permanently destroyed, and their data will not be included in the final thesis manuscript or any subsequent publications.

Data Collection

The primary data was collected through semi-structured narrative interviews. Each participant coordinated with the researcher for their scheduled online interview. Though each founder was given the option of either an in-person or online interview, all of them preferred the latter option through the Zoom platform. The semi-structured narrative interview format offered in-depth, open- ended questions that draw out the founders' narratives about their experiences, motivations, challenges, and aspirations during their innovation journey.

Zoom was the platform of choice for all online interviews. The Zoom invitation or meeting link was provided 24 hours before the scheduled interview.

Interview Protocol and Narrative Storytelling

The narrative of the founders was done through in-depth semi-structured interviews. The conversation was guided by prompts that encourage reflection on motivations, turning points, and challenges in their innovation journey, as seen in the Interview Guide Prompts approved by the UPOU FREC (See Appendix D). The said guide served as instruments to facilitate information collection about the founders' story his/her relationships and knowledge on his venture.

After the formal introductions, the interview opened with *"Can you tell me the story of your biomedical startup- from the initial idea to where it is today?"* or "*What were the key moments, turning points, and the different experiences that shaped your journey?"*

The following questions established the narrative inquiry framework, invited the founders to share their innovation journey in their own words and sequence rather

than in a seemingly sequential “pro forma” questionnaire (Jovchelovitch & Bauer, 2000). Following the interview protocol, a list of follow-up prompts (see Appendix A) was prepared to explore dimensions that may or may not be mentioned by the participant during the interview. It allowed the founders to elaborate on meanings emerging from their own experience and story. These prompts were used by the interviewer only as a guide to ensure that the founder would lead the conversation through his narrative.

Interview Procedure

The narrative interviews were conducted virtually. The researcher actively listened to the participants and used follow-up prompts when necessary. Audio recording and transcription were done using the built-in features of Zoom platform. No third-party transcriber was hired or involved. The interviewer also documented observations like the founders’ affect, verbal intonation, and other contextual cues.

After the initial automated transcript was generated, the researcher checked and verified the transcript. The audio recording was transcribed and checked within 48 to 72 hours post-interview to ensure accuracy. All recordings were listened to repeatedly by the researcher as part of the review to ensure correct transcription. Manual corrections were made as AI- generated transcripts may contain errors and ambiguities. Methods to ensure anonymity and privacy were applied to the final transcript.

Follow-Up Interview

Follow-up interviews were offered as part of the narrative inquiry process. A copy of the reviewed transcript was given to the participant for review to ensure

accuracy. The participant could request a follow-up interview for any clarification on the transcript. But apparently, none of the founders requested a follow-up or clarification.

Document Analysis

Documentary evidence served as an anchor for the events and assertions mentioned in the narrative interviews. It served as a supplementary context and means of validation and triangulation. Documents that are available publicly or participant-provided, like pitch decks, company websites, media articles, and features, were gathered and reviewed. Insights coming from this documentary evidence was woven in the narrative analysis to provide a multi-layered, credible portrait of each of the founders' experiences with the Philippine biomedical innovation ecosystem.

Duration of the Study

The study was conducted over approximately nine months, from January to September 2026. Ethics approval was undertaken and was given March 31, 2026. Participant recruitment, data collection, transcription, coding and individual narrative reconstruction as well as cross narrative synthesis were carried out from April to July 2026. The final stage involving theoretical integration, interpretation of the findings, formulation of recommendations and manuscript preparation was accomplished August to September 2026. (See Appendix A)

Data Analysis

Analytical Approach

This research study employed narrative analysis to extract meaning from the data derived from the interview. Narrative analysis was used to preserve as much as possible the narrative voice, chronological sequence, and the storied nature of the participant's account (Polkinghorne, 1996; Reisman, 2008).

Since the innovative journeys were inherently temporal, founders' stories can show how early motivation influenced later pivotal decisions, and how setbacks led to strategic adaptation. The use of narrative analysis preserved this important temporal sequence. It maintained the causality, progression, and development of the entrepreneurial experience. In addition, narrative analysis revealed turning points and personal transformation. It revealed how founders construct "before and after" narratives, and which moments they identified as transformative, which were central to the study's focus on meaning-making. Structural narrative analysis from Labov and Waletzky (1997) and the interpretative coding by Riessman (2008) established that ordering is itself analyzable data. Bruner (1991) supplies that underlying epistemology; narrative is a mode of constructing reality, not a transparent record of it. Consequently, an ordered sequence of thresholds is an analytic output of narrative inquiry, provided it is presented as configuration rather than chronology. McLean and Pratt (2006) analyze turning point narratives in relation to identity and meaning-making. McAdams (1990) and McAdams & McLean (2013) situate moments within an internalized, evolving life story that integrates reconstructed past and imagined futures. Mishler (2004) shows narrators acting as historians of the self who re-story lives and revise identities. These sources justify treating each threshold as

a site of identity work in which scientists and clinicians narrate arriving at entrepreneurship without having designed for it.

The basis for deviating from thematic analysis is that this approach may dissolve individual narratives into collective patterns, losing each founder's distinctive voice, interpretations, and meaning-making processes (Mupas-Obedoza, 2022; Surangi, 2022). The use of structured narrative analysis gave high regard to the whole narrative, preserving its unique narrative style, emphasis, and self-characterization. From an R&D management perspective, this study aimed to improve policy and practice; the entirety of the founder's narratives was vital rather than reducing the story to generalizable themes.

Lastly, using the narrative identity theory lens explicitly examined how individuals construct coherent identities through storied accounts of experiences (Clandinin & Connelly, 2000). Narrative analysis was the methodological partner of the narrative identity theory, as both centered on how stories constitute identity, meaning, and self-understanding (Polkinghorne, 1996; Riessman, 2008).

The use of narrative analysis has preserved the narrative structure, temporal sequence, individual voice, and meaning-making processes, and is a beneficial method for this study's research questions and theoretical framework

Data analysis procedures

For this study to maintain the rigor and transparency of narrative inquiry, the process was delineated into stages and ordered phases to balance individual depth and collective insight. It integrated Creswell's (2014) re-storying approach with cross-case synthesis (Eisenhardt & Graebner,2007; Hu et al., 2022; Binowo & Hidayanto,

2023; Jarabe et al., 2025). Analysis was supported by Atlas. ti qualitative data analysis software, enabling memo writing, systematic coding, and data management.

The stages of the data analysis flow are as follows:

Stage 1: Founders Individual Narrative Analysis: Phase 1 Transcription and Immersion; Phase 2 Narrative coding; and Phase 3 Individual Narrative Reconstruction

Stage 2: Cross-Narrative Synthesis

Stage 3 Interpretation and Theoretical Integration

In each stage, the interviewer did reflexive journalling to track researcher positionality, interpretation evolution, and any emerging biases. This promoted transparency and confirmability of the findings (Lincoln & Guba, 1986). Phase 1 involved transcription and immersion. The audio recording and transcription were listened to three times, as repetitive listening by the researcher allowed immersion in the unique flow and tone of the story. This was followed by Phase 2, where narrative coding in Atlas. ti software began. Coding was the process of segmenting text and assigning meaning to a stretch of dialogue. It revealed layers within each narrative or identified key incidents central to the participant's innovation journey. Transcripts were systematically coded into meaningful narrative elements. Coding was used as an organizing/retrieval procedure. Phase 3 involved the reconstruction of the founder’s individual narrative into a coherent chronological profile. The said profile provides a visual timeline map of key events, transitions, and milestones from ideation to the present. Each story was crafted into a picture that preserved the participants' distinct uniqueness and identity, voice, and perspective. Once all the individual narratives have

undergone the process of transcription, coding, and reconstruction, the analysis then proceeded to the cross-narrative synthesis.

The second stage involves comparative analysis using Atlas Ti systematically examined the individual narratives and reconstruct them side by side for comparison. Using code grouping and relationship matrices within AtlasTi, the researcher analyzed shared patterns, divergences, and common structural properties across the eight cases. This step grouped open codes into common categories under each of the five thresholds to address specific research questions: identifying common backgrounds and entry points (RQ1), tracking narrative patterns of adaptation under technical or regulatory constraints (RQ2), and synthesizing ecosystem recommendations (RQ3). Departures from the expected sequence, such as founders who stalled, skipped, or reversed a threshold, were not discarded as data noise. These were preserved and analyzed as negative cases in Emigh's (1997) sense, providing critical theoretical boundary conditions for the final synthesized framework. The five thresholds are interpretive narrative structures derived from recurring passages, transitions, and turning points across founders' accounts.

The final interpretive outputs were organized according to the study's research questions and examined in relation to R&D management practice, biomedical innovation ecosystem development and possible innovation policy improvement. Evidence from the individual narrative reconstructions and cross- narrative synthesis was integrated with relevant literature and theoretical frameworks. This analytical process provided the basis for the conclusion and recommendations presented in the succeeding chapters.

Strategies of Data Trustworthiness

According to Lincoln and Guba (1985), measures should be taken to ensure data trustworthiness in qualitative research. The trustworthiness of the study was established through strategies of credibility, dependability, confirmability, and transferability. **Credibility** was established through continuous interactions with the founders, including initial interviews, follow-up clarifications, member-checking of individual narrative profiles, and document review. The process of ***member checking*** involved participants reviewing the transcript of their interview as well as the constructed narrative profile. The founders were advised to confirm the accuracy of the story, request any changes or revisions, or provide additional reflections. This ensured that the findings represented are genuinely the founder's experience rather than the researcher's personal views. **Triangulation** of data sources using documents, the narrative itself, and field notes, and aligning them with theoretical perspectives will validate interpretations. The founder's narratives were validated by documents that are publicly available, such as social media features, company profiles, and any meritorious citations or awards given by organizations that celebrate the startup's achievements. Other sources of documentary evidence provided by the startup would corroborate the founder's retold experience, like their startup history, annual reports, initial prototypes, list of angel investors, pitch decks, and other documents that can help the researcher construct and substantiate their narratives. Grant approvals and progress reports, clinical trial registrations, safety monitoring reports, FDA compliance, license to operate, and product registrations are documents that the founders can provide as verification of product development and their claims of regulatory achievement and to prove regulatory challenges that

could have possibly been narrated. The documentary evidence will not be included in this study due to privacy and propriety issues participants may have.

In addition, **peer debriefing** or the "process of exposing oneself to an uninvolved peer in a manner of paralleling an analytical session" (Lincoln and Guba, 1985) was employed. It involved a fellow researcher (other MRDM students) or academic colleague (those taking Master's or PHD studies) of the researcher whose role was to review methodological decisions and potential research biases (Spall, 1998; Creswell & Poth, 2016). It will not involve interviewing additional participants or associates of the biomedical startup founders.

Transferability was supported through detailed descriptions of participants' narrative profiles, the surrounding context of the Philippine biomedical innovation ecosystem, and the data sampling and collection procedures. This would enable future researchers to assess the applicability of findings to similar startups in an LMIC context. Dependability was maintained through a comprehensive audit trail, including the Atlas Ti project files with coded transcripts, analytic memos, narrative profile versions, reflexive journal entries, and decision logs that document reasons behind interpretive choices. This allowed external verification of the analytical procedures done ensuring transparency and consistency throughout the research process.

Lastly, ***confirmability*** was achieved by building all claims in direct participant quotes or documentary evidence. There was clear traceability from raw data through coding to final interpretation. The researcher's reflexive journal documented assumptions, biases, emotional responses, and positionality. This practice will acknowledge how personal backgrounds on R&D management and perspectives as a health practitioner may influence interpretation. All the measures mentioned ensure

that the study presents a credible account of the founders' entrepreneurial journey within the Philippine biomedical innovation ecosystem (Creswell & Poth, 2016; Lincoln & Guba, 1986).

Ethical Considerations

The study abides by the ethical standards of the UPOU and the Philippine Research Ethics Board Guidelines. The research proposal was submitted to the UPOU Research Ethics Board for evaluation and approval prior to data collection. Detailed information on the study's purpose, data collection methods, measures to maintain confidentiality and data protection, voluntary participation rights, and potential benefits were provided in the participants' study invitation. Participants were given informed consent forms to be signed prior to the study. The study posed minimal risk to participants as the interview questions focused on professional entrepreneurial experiences rather than sensitive personal matters. The participants were given the option to skip any questions they found uncomfortable answering or terminate the interviews without consequences.

To maintain participant confidentiality, the names of founders were protected by using pseudonyms in all reports and publications. Details such as startup names or specific technology were masked or hidden in the discussion. All the study's digital data, like audio recordings, transcripts, and coded files, were encrypted and password protected and secured in a separate portable hard drive.

Responsible Use of AI

The use of AI tools in this study was strictly limited to the process and programs stated in Appendix F.

In the data collection, AI was specifically used for the transcription of the audio recordings. The researcher will only utilize secure and built-in transcription of Zoom that guarantees data is not used to train external public language models. All AI-generated transcripts were manually reviewed and verified against the original audio to ensure accuracy and prevent AI hallucinations or bias. Furthermore, no raw, identifiable participant data were uploaded to open-access generative AI platforms for data analysis, ensuring full compliance with the Data Privacy Act of 2012. All AI tools used were properly cited.

In the Data Analysis, Atlas Ti was the software used for manual coding. Other functions stated were for the creation of figures and visuals, the creation of an outline for the document, as well as grammar checking

Data Retention

In compliance with the Data Privacy Act of 2012 and the Philippine Health Research Ethics Board Guidelines (2020), all audio recordings, de-identified transcripts, coded files, and narrative profiles will be retained securely for a period of three (3) years following completion of the study. After the three-year retention period, all remaining electronic data will be permanently and securely deleted from the hard drives.

The research followed measures to ensure that the participants' narratives remain true to their original meaning and represent their unique innovation journey accurately during the duration of the study without compromising the founders' privacy and security.

Declaration of Conflict of Interest

The researcher declares no conflict of interest in the conduct of this study. The researcher holds no financial, personal, or professional stakes in any of the participating biomedical startups or their competitor companies. The researcher conducted the research purely for academic purposes in partial fulfillment of the requirements for the Master of Research and Development Management degree. Furthermore, the researcher is not affiliated with any regulatory body (such as the FDA) or funding agency that holds authority over the participant's ventures.

Chapter IV

RESULTS AND DISCUSSION

This chapter presents the findings on the innovation journey of eight founders of biomedical startups across the Philippines. Using the constructivist- interpretivist stance and the narrative inquiry lens, this section examines how founders narrate and make sense of their experiences within their specific institutional, social, and geographic contexts. It highlights the answers to the three research questions on the founders' backgrounds, motivations, challenges encountered, adaptive strategies, and their envisioned systemic reforms to improve the current biomedical ecosystem. The analysis draws on Narrative Identity Theory, Resiliency Theory, Diffusion of Innovation Theory, Effectuation Logic, and the different Innovation Process Approaches as mentioned in the previous chapter. These theories have helped interpret how founders construct their identities, respond to adversity, navigate the adoption of their technologies, and facilitate commercialization. Following Clandinin and Connelly's (2000) three-dimensional narrative inquiry space, which treats an experience as occurring simultaneously along the dimensions of temporality, sociality, and place, the raw transcripts were re-storied into individually reconstructed narratives that preserved each founder's chronology and voice, member-checked for accuracy, and subsequently analyzed across cases for patterns of convergence or divergence. This section is organized into two main parts: the first presents the individual narrative profiles of the founders, and the second highlights the cross-case synthesis and theoretical integration of their narratives. Before presenting the individual narratives, it is necessary to situate the participants' organizational and personal contexts, as their backgrounds directly shape the meaning-making

processes examined in this study. Table 4.1 summarizes the demographic and venture-related characteristics of the participants, including the pseudonym, educational background, role in the startup, the category of biomedical startup, and year of active involvement. The set of demographics also reinforces the purposive criterion-based nature of the sampling strategy, illustrating the diversity of entry points, disciplinary training, and startup maturity represented across the participant pool.

Table 4.1

Demographic, Professional Background and Venture Characteristics of Study Participants

	Pseudonym	Category	Location	Role	Gender	Professional Background	Length of Startup
1	Builder	Biomedical Device	Mindanao	Co-Founder	Female	Doctor of Medicine/ Subspecialist	6 years
2	Steward	Biomedical Device	Luzon	President /Project Leader	Male	Biomedical Engineer	>10 years
3	Collaborator	Pharma	Visayas	Founder	Male	Pharmacy	10 years
4	Strategist	Digital Health Tech	Luzon	Co-Founder	Male	Microbiology	5 years
5	Catalyst	Digital Health Tech	Luzon	Co-Founder/ President	Male	Business Management	6 years
6	Optimizer	Digital Health Tech	Visayas	Co-Founder	Male	Psychology	5 years
7	Anchor	Digital Health Tech	Luzon	Co-Founder	Male	Law	8 years
8	Trailblazer	Diagnostic	Luzon	Founder	Male	Doctor of Medicine/ Subspecialist	>10 years

Table 4.1 shows the diversity of the participant pool recruited for this study, representing the three major island groups of the Philippines. The categories of biomedical startups show a majority in digital health technology with four startups, followed by biomedical device development with two startups, and pharmaceutical and diagnostic development with one of each, respectively. The founders' professional backgrounds were similarly varied; two had medical backgrounds, four had paramedical backgrounds, and three had non-medical backgrounds.

Rather than serving as a mere anonymization device, each pseudonym listed in Table 4.1 was deliberately drawn from a defining disposition, role, or recurring motif that emerged from the founder's own narrative. It functions as an interpretive label that captures the essence of their storied identity as an innovator. In this sense, the pseudonym acts as an early analytic gesture - on how each founder appears to construct and enact meaning across their innovation journey, consistent with the Narrative Identity Theory's premise that individuals continuously author and reauthor a coherent sense of self through the stories they tell of their specific experiences.

The next section will present the individually reconstructed narrative of each participant, tracing their innovation journey from initial entry point through the challenges, adaptation, and turning points that shaped their venture and their sense of self as told in their own words.

Individual Narrative Profiles

1. The Clinician Who Builds What's Missing

The **Builder** was a clinical subspecialist and an expert in her field, balancing both government and private clinical practice in Mindanao. She served as a mentor

in a training program in her clinical department, officer-in-charge of her institution's research and technology unit, and a co-founder of their biomedical startup.

What made her story distinct was not the accumulation of roles but the way she came to understand them as inseparable. She was first and foremost a physician trained to work with what is available to provide necessary care to patients. It was only when those limits became so constrained, and a global pandemic threatened the lives and functions of both her colleagues and their patients, that she started asking not what was available, but what was possible.

a. Innovation Journey

Her innovation journey started serendipitously during her clinical residency training. One of her seniors brought a consumer-grade 3D printer in 2019, and they both started exploring how it could be used for surgical planning and their clinical training. Later, both discovered, through collaboration with an industry network**,** a scientific community and network dedicated to 3D fabrication. This collaboration opened contacts that helped them improve their skill set with this newfound hobby.

In 2020, the COVID-19 pandemic acted as a critical turning point. As clinicians were at risk of exposure to the virus, she and her co-founder experimented and created innovative protective setups and workflows to ensure continued services to their patients safely. She stated it as:

"A lot of people say a lot of negative things about COVID, but COVID actually opened a much greater opportunity in our laboratory…COVID actually gave us the push that we needed na ano parang medyo diba you thrive under adversity."

The laboratory developed multiple products and work processes that ensured diagnosis and treatment of patients despite limiting circumstances. These innovations were later commended by specialty medical societies and published in a reputable journal, becoming the startup's early flagship work.

With increased opportunities and commendations, the hospital began institutionalizing and providing resources to the unit. A team of biomedical engineers, chemists, and physicists created an interdisciplinary collaboration for the design, materials, and mechanical performance of implants to be used in their specialty. The goal was to make this implant biologically compatible and clinically sound. The unit was supported by the Department of Science and Technology to acquire a high-temperature 3D printer, which pushed them to explore advanced polymers for their products.

By 2021, the unit was able to successfully make implants for clinical use that replace the need for expensive imported implants and a procedure that has no available clinical specialist within the region. These implants benefited indigent patients who could have succumbed to the illness without this innovation. The said product was granted approval by the regulatory agency under the clause of compassionate use since the implants were fully customized for each patient. The unit is now in the process of establishing a private spin-off company to fully commercialize their products.

b. Motivation and Values

The Builder's core motivation was equity in access to complex medical treatment. In her narrative, she described patients coming from far-flung areas and remote islands of Mindanao who usually come at a point where medical intervention

was already critically needed. These were patients who cannot access or afford high-cost commercially available implants, as she says,

"Mga pasyente na kawawang kawawa, mga vulnerable, sila talaga yung walang-wala, tapos late na pupunta sa iyo na halos wala ka nang maibigay na solution."

She elucidated the need as:

"Walang microvascular surgeon in our region currently … yun yung other option na yun na pupunta dito sila mag-fly in sila to do the surgery itself… Sobrang mahal, it's around … parang implant pa lang, for a reconstructive … implant, it costs around … yung cheapest at least around 200,000 pesos."

This pushed the founding team to explore locally developed, patient-specific solutions reduced cost and made treatments possible in a resource-constrained clinical environment. She framed her innovation work as offering alternatives to patients who otherwise "*just give up*" because of the cost and distance.

She valued training and competence building, emphasizing how important mentorship is. The developed innovation served to improve their clinical skills to ensure patient safety in their specialties and other specialties as well.

c. Challenges and structural constraints.

Yet this founder's story is not one of linear success. She identifies several layers of challenges. The first obstacle encountered was regulatory ambiguity. When they approached the regulatory agency to explore formal registration and commercialization, they were told that there was currently no existing system locally for the type of patient-specific customized solution. The guideline given by the

specific ASEAN Medical Device Directives (Association of Southeast Asian Nations [ASEAN], 2015) states an exemption for custom-made devices. This does not clearly support their goal of commercialization to make the services available to a greater population,

On top of that, the hospital acted as both an enabler and constraint for the startup's growth. A public hospital's mandate restricts the possibility of commercialization of their product. Their growth is limited to the support and budgetary allocation of the institution in terms of manpower and supply. Aside from this, she also describes procurement processes as frustrating recounting simple purchase would require multiple approvals across months' time of waiting.

This is aggravated further by the startup relying heavily on contract-based personnel. Hence, these individuals who were trained can leave, and the need to retrain new staff is a recurring reality. The risk of loss of institutional memory and technical skills places the unit at a disadvantage.

Finally, most of the innovations they made earlier in their journey were self-funded. But for the spin-off to materialize, they would need an infusion of substantial funds, which they are currently seeking through investors.

These challenges contribute to moments when she almost gave up. She speaks openly of frustrations, red tape, and regulatory ambiguity, describing how such factors can be emotionally and mentally draining.

d. Adaptation, Resilience and Identity Reconstruction

Despite these compounding pressures, the Builder sustained the capacity to persist, adapt, and continue to find meaning in her work.

Her narrative across these challenges reflected what Richardson (2002) describe as “meta resilience”: not merely the absence of breakdown but an active reintegration process where the individual emerges from these challenges with new strength and deepened purpose. As she herself mentioned*, “We’re still doing what we can … We’re smarter now, wiser”.* The statement captured not only coping but conscious growth through adversity.

What is notable in the Builder’s narrative was the gradual reconstruction of her personal identity. She entered the innovation space not by design, but by accident, sharing a hobby with a colleague. Over time, her self-story evolved from clinician to researcher, then to innovator, followed by being an administrative lead and finally to an ecosystem advocate. This trajectory was aligned closely with McAdams’ (1990) Narrative Identity Theory, which holds that individuals construct a coherent sense of self through the stories they tell about their lives, integrating experience, present roles, and future goals. The Builder’s innovation journey showed that she does not merely perform the act of innovation but transforms into an innovator through a cumulative act of choices, sacrifices, and breakthroughs that were all meaningful and connected.

She repeatedly returns to the picture in her mind of these patients, people from Mindanao’s most underserved areas, now recovered and living a productive life with their innovative locally made implants. In Richardson’s framework (2002), these mental images functioned as the biopsychospiritual protective factor. It replenished her internal reserves and sustained forward momentum even when the challenges were overwhelming. These patients were not only beneficiaries of their technology, but more so, they were proof that their story matters.

In her story, her trainees served as a parallel anchor. She took satisfaction in watching her residents develop competence through simulation models. This dual anchoring in patients and mentees revealed the full scope of her identity as a founder. She didn't just build a product but a legacy of practice. It has shown a model of what hospital-based innovation can look like when a clinician refused to accept the limits set but pursued to push boundaries and made a possibility into a reality.

e. Vision and Message to Future Innovators

The Builder imagined a future biomedical innovation ecosystem where hospital- based innovation will be the norm, present in every region, institutionalized, properly supported with funding and manpower, with a provision having its innovation commercialized. These units can create locally developed solutions for the actual health needs that stem from ideas that frontline health workers saw firsthand.

Her message to future innovators was to *"not give up and recognize that your ideas are valid*" and to see that these ideas can change lives if pursued with persistence, collaboration, and grounded understanding of patient realities.

The Builder's story was a story of a clinician cofounder who transformed a seemingly trivial idea into a passion project that achieved actual clinical impact and improved patient care with the support of her institution and grants from the government. Despite the struggles, she chose to advocate for a more enabling biomedical innovation ecosystem, for her own R&D unit's future and the next generation of biomedical innovators.

2. The Pragmatic Steward of a Legacy Mission

The **Steward** was an engineer by training, sent abroad for his graduate studies in the field of bioengineering, with the goal of returning and leading the research and development of their biomedical startup, and who today serves as its president. What made his story unique is that he was not the company's founder but its key project leader. The company was founded in the early 1990's by a Filipino surgeon who made an international research reputation and substantial private fortune abroad. The physician founder financed the development-driven company in the Philippines largely out of conviction rather than commercial calculation. The Steward's story was a story of inheritance and translation; it was a narrative of an engineer who was given a rare chance to actually "*practice bioengineering*" in a country where, as he puts it, *"There are limited opportunities in terms of product development".* He carried the responsibility of keeping a mission-driven company alive in a market that is focused on imports rather than locally made products. He came to understand himself as someone who must hold both the founder's purpose and the continuity of the company dearly.

a. Innovation Journey

The **Stewards**' innovation journey was inseparable from the biography of the company's founder, Dr Legacy, a world-renowned Filipino physician who immigrated to the United States in the middle of the twentieth century. He had successfully established his practice and even became famous in his specialization. He became the chairman of his department and a successful clinician-researcher with hundreds of publications. Dr Legacy established the earliest biomechanics laboratories in the United States, at a time when, as the Steward recalled, "*There*

were no laboratories doing that type of research". This physician translated much of his research into implant designs that he patented and licensed to major American device manufacturer, which reaped him a substantial amount in royalties

The Philippine company emerged around the 1990s. Its entry point came when, Dr Legacy, the founder, periodically returned to the Philippines doing medical and surgical missions and found out that there were no implants that he used for his needed procedures. He first established a company to import implants so that he could use them for his surgeries, which was then followed by investing in a venture that develops biomedical products. This development company driven by what the Steward describes as two intertwined motives, a desire to bring affordable, high-quality implants to Filipino patients and a company that will develop his own designs. And since this was in the early 1990s, there were limited technical experts in the country. And here is where the Steward comes in; he was one of the Filipino engineers who was sponsored by Dr Legacy to learn the craft, with an explicit agreement that he would return afterward to build the company's research and development. An attempt to manufacture locally and sell into the United States market failed, in the Stewards' assessment; was due to the company's lack the capital to compete against established international companies. The venture tried to license some of its technology in China but eventually closed down and concentrated on the Philippine market. The consequence of that development-first orientation is the tension at the center of their journey. Despite the venture successfully accumulated patents, developed ideas and products, but as he states plainly: *"We never captured the market."* Most implants used in the country remain imported and the company held a small fraction of the market. During that time, they admittedly did not concentrate on marketing. With the founder now gone and his children assuming leadership: one

of the sons serving as chairman of the board and the Steward as president, the emphasis on marketing was now the top priority. The future of the company focused on continuing the founder's legacy by ensuring that the ideas and mission of making implants available to the Filipinos will become a reality.

b. Motivation and Values

The motivation of Stewards' narrative was a value he inherited: an ***obligation to give back***. This strong motivation stems from a story that Dr. Legacy repeatedly told his people about why he pursued being so successful and pushed him to really be a renowned physician. His wealth, which he so dearly wanted, was never an avenue for him to forget his roots. The founder believed that his wealth was not something he could bring into the next life and that his blessings were to be shared with others, especially his countrymen who are still struggling. He felt obliged to return it to the community, to his colleagues and to his patients. This was seen in Dr. Legacy's drive to sponsor not only engineers but also doctors to train in the United States, covering airfare and accommodation. He also established businesses in his hometown that employed his townspeople.

Another value that directly shaped the Stewards' own sense of purpose was the conviction that products should be developed and locally made. He described how the field of product development in the Philippines was decades behind other countries. He developed a strong loyalty to the venture that had made him into the man he is, an innovator who has a place to design, prototype, register and manufacture products for the country.

Another value he held dear was concerned how he was taught to treat people. The Steward recalled the founder as someone who always looked at the potential in people and always gave them the benefit of the doubt. Dr. Legacy believed that people were inherently good and would do the right thing. This value was something the Stewards absorbed and made a mark or influence on his own leadership style: *"You have to give people a chance to prove their worth"*.

On the business side, the Steward saw himself as less of a risk taker compared to Dr. Legacy, whom he describes as "a *very big risk taker who nonetheless gambled intelligently*". This divergence, he saw, would benefit the future of the company since he was more careful in his decisions in order to ensure that the Dr Legacy mission continued/

The Steward emphasized the founder's purpose:

"Many thought Dr Legacy was in it for the money? …but… He was not in it for the money, you know? It was never about the money. Well, I guess, personally, he had a lot of motivation to develop his ideas. But he also wanted that also to benefit Filipinos So it was not just about, money still, uh you know, I think he wanted to, uh… revolutionize, change. Not just our… by providing implants that change how. Things are… were being done in general, you know, in terms of marketing."

The Steward planned to honor and continue for the country to benefit from the products they had intended to bridge the gap in our healthcare system.

c. Challenges and Structural Constraints

The Steward placed the company's central difficulty not in technical or regulatory, but market related. The venture, he explained, was good at generating

ideas, creating products, and facilitating patents and registration with the regulatory agencies, but a hurdle that keeps them from expansion was marketing. The reason was a matter of principle: Dr. Legacy was not comfortable with the way marketing was practiced in the local sector. Aside from the marketing culture, there was low implant utilization in the Philippine health sector. Insurance reimbursement in health packages was limited and accepted in selected tertiary hospitals. Patients would rather not get treated or seek medical intervention due to the high cost of implants.

He also identified the difficulty and length of product registration. The Steward advocated not relaxed requirements but *"just a priority in terms of processing*"; a green lane for local manufacturers. He contrasted this with China, where foreign firms were required to conduct local clinical studies regardless of a product's history internationally, making imported technology's registration slow and expensive. But the Chinese government made a pivot; companies that produced and manufactured domestically could be cleared in a matter of months. Multinationals unwilling to forgo that market therefore bought or built local operations in China, bringing their technology and know-how with them. The engineers the multinationals trained after learning the craft now founded their own ventures, making a substantial domestic medical device industry where it was absent before. Regulation, in this illustration, became an asset and a capacity-building industrial policy.

The Steward expressed frustration with the fragmentation between agencies in our government. Government hospitals routinely purchased medical supplies and devices, but this goes through the procurement process, usually done locally to the lowest bidder. This lowest bidder was usually a big shipping company pushing imported products. Meanwhile, the DOST has funding in millions for product

development but with relatively no takers. There was a dissonance between the agency that has needed and the push on the agency that could be instrumental in addressing the need.

"*One way, for example, is… Government hospitals, they always buy implants and devices, like even catheters, for example, or just simple implants, plates and screws or pins. And … these are all, you know, bid out to different entities. It's not centralized, right? So, essentially, you 're using government money to buy these products. And they're all imported, essentially. So, …they have these projects, government, the DOST, is trying to encourage medical device development. So they're spending money on these projects that they, you know, there are not many takers of, you know, funding…So they spend money to develop products. But then they spend more money to buy products that are not developed locally."*

There were, he observes, no large or long-term government contracts directed to local developers or visible efforts toward such arrangements. Aside from that there was a flood of unregistered medical devices found on consumer online marketplaces, which he feels should be monitored and regulated by the government as it will affect the industry in a big way.

d. Adaptation, Resilience and Identity Reconstruction

What was notable in the Stewards' narrative was how he responded to the constraints; he adapted by revising the company's founding logic without abandoning its original purpose. The decision to pause the research and development efforts and redirect the company toward production and marketing was presented not as repudiation of the founder's passion but as a sequencing judgement. These innovative medical-grade registered products must now find their niche in the

Philippine health needs market. The commitment was explicit that development will not be forgotten since it was the founder's passion. It was just momentarily deferred and reshaped into more collaborative efforts with clinicians and teaching hospitals in the future.

The same pragmatism appeared in how he interprets the company's history. He was willing to name the model's vulnerability directly, as the development was sustainable for the founder because it functioned *"as an expensive hobby, he could afford"* with his royalties and successful clinical practice. But he saw wisdom in how the venture pivoted from licensing technologies abroad, and in withdrawing from the US Market when the company could not out-capitalize. He was explicit that structural change does not happen overnight, and the realities of the government and market constructs are realities that must be accepted in the meantime. He learned that their inability to penetrate the market was temporal and treated this outcome as instructive rather than as a failure. He said that *" You can't go against market forces singlehandedly."* His own adaptation was to accept this limit but work inside this constraint and slowly overcome it in the future.

There was a discernible evolution in how he told his story. He began as an engineer with limited opportunities to do the work he wanted to do, then became a scholar sent abroad to improve his craft, followed by being a leader and builder of biomedical implants and now a president of a company whose survival depends on the capabilities that were previously untapped. The founder identity that emerges was that of a steward, not the originator of the vision but the person responsible for making the vision survive and serve its purpose of helping patients.

e. Vision and Message for Future Innovators

Steward's vision followed directly from the constraints he described. First, a priority processing workflow for local manufacturers, especially for biomedical devices. He does not ask for lower fees or lower standards, just a shortened and clear regulatory timeline for startups. Second, a biomedical startup ecosystem that has more support from the government, not just in terms of funding, but a government that grows the biomedical industry in terms of hospital uptake of products that are locally developed. He argued that the state can boost the industry by participating in it. A concrete and coherent policy that pushes the funding agency and the agency that needs a specific health device to be intertwined so that public money is not spent developing products the public health system declines to purchase.

His message to aspiring biomedical innovators is unromantic and realistic. He offered honesty rather than discouragement. He says, simply put, *"it is difficult*". As a startup, innovators must compete against established foreign firms that can manufacture products in volume at prices hard to match, unless the product is genuinely new. He said, "*I'm just saying that they have to understand that it's not going to be that easy.*"

The practical advise was the lesson his own company's history taught most is that developer and inventors "*good in developing products but you also have to consider the market*". The market must be accounted for and factored in from the onset. He continued his message as accordingly strategic rather than inspirational: "*They should think well about what they are getting into and how to get around the obstacles*" that were already present.

Taken together, the Steward's identity was measured not by having authored the vision but by having kept it intact while rebuilding on the commercial base beneath it. He was ready to pivot and adapt, pausing development to build reach, partnering rather than working alone, and pressing publicly for procurement, reimbursement, and regulatory arrangements that would let local devices reach patients. His larger measure of success was whether the share of the market that Filipino patients receive rises remarkably, so that the next generation of developers inherit a booming biomedical industry.

3. The Collaborative Entrepreneur turning Local Resources into Health Solutions

The **Collaborator** was a pharmacist by training and a founder of a biomedical startup emerging from a family enterprise. He established his own venture and identity through research, collaboration, and translational ambition. What made his narrative distinctive is not simply that he built a spin-off company, but that he learned that innovation cannot mature in isolation.

His story began early, when he chose a path not heading to a medical degree but to work on formulation, experimentation, and production of medicines. He came to understand himself as someone who takes the path less taken, strongly believes in academe-industry collaboration, and believed that Filipinos should have more locally made medications in the market.

a. Innovation Journey

The Collaborator's journey began with their family venture, where he was exposed to entrepreneurship and manufacturing in his early years. After finishing his

undergraduate studies, he tried going to medical school but recognized a deeper interest in product development and creating new medicines. He worked in the family company initially but later created a new company for himself to achieve the desired growth and a new environment that would foster innovative ideas.

The startup's early phase was anchored in building a research and development team, or as he states: *"good people na fit sa culture ng startup*". He found there was not enough local and technical capabilities to support the scale of innovation he envisioned. So, he began seeking out collaboration; his first partnership was with his alma mater, which became the turning point for his venture. Newly relocated, Dr. Narra and Dr. Acacia**,** both university research scientists now residing locally in the area, served as partners and mentors in the field of biomedical innovation. Hand in hand, they landed their first research grant from the United States Agency for International Development (USAID), enabling them to fund their first medical-grade commercial product. The academe-industry collaboration continued to produce more research-based products supported by the Department of Science and Technology (DOST). These products were not only isolated product stories, but proof that research can move from university to actual marketable technology, followed by regulatory approval and commercialization,

As the company matured, the scope of its innovation expanded beyond incremental products toward advanced platform technology. The Collaborator continuously tries to develop products that ensure medicines will be accessible and affordable to Filipinos. His narrative shifts in confidence from proving innovation can happen locally to asking how he can be instrumental in improving the biomedical ecosystem to elevate the present economy.

b. Motivation and Values

At the center of the Collaborator's narrative was a persistent desire to make a difference and provide a scientifically proven product that answers to the needs of the patients and the current market. He repeatedly framed his motivation in terms of making products that are not merely copies, but distinctly innovative.

"We have this mantra … that we need to make products that are … differentiated or set apart … from the industry. And I think one way to achieve it is to have a scientific study para lalong mas innovative yung products na gagawa"

He was also motivated by a strong belief that good ideas should not remain untapped within the academe but rather translated to novel technologies and products in the industry. He saw translational work as an ethical and development task. He framef it as: "*if knowledge can become a product to solve a problem, then there should be pathways available to help it move to the market*".

"Actually, marami akong na-encounter na ganyan … mga researches that were done 10 or 15 years ago, walang takers talaga sa industry. kasi, number one, industry, walang capability na i absorb yung technology mo,, So, the sad part of it, ay yung experiment or yung results doon lang wala na, nangyari hanggang sa prototype lang. Hindi na siya mag tu-turn into commercial value "

The Collaborator's key value was strategic realism. Although one may see him as a clear visionary, he knew the reality and the limitations of the current ecosystem. He repeatedly noted that not every discovery was ready for the market and that academic inventors often overestimated how quickly a technology can be absorbed. His role was often to mediate the possibility and practicality. He took pieces

of a larger scientific vision and transformed them into a phased plan to produce feasible, fundable, and commercially viable products for the current market.

He strongly pushed for the development of products from locally available resources by local scientists and local companies, not just as substitutes for imported technologies but as proofs that the Philippines can build its own biomedical capabilities. This stance was rooted in the historical loss of Erythromycin, discovered locally yet patented and monetized abroad. The Collaborator wanted to stop the *"raw material mentality"* and believed it was time for bioentrepreneurs to scale and monetize our own innovation, as his narrative illustrated.

c. ***Challenges and Structural Constraints***

The Collaborator's story was an account of sustained friction. He identified the first two years of the startup as the most difficult, especially in hiring of his initial team. He had to find good people who will willingly undertake the same uncertainty as himself.

"The most difficult stage in a startup is to hire good people. Nafit sa culture ng startup. So because startup is a startup, the first tendency for an employee who wants to apply in a company, pag maginig na startup, ay walang pera yan kaagad. So parang … parang mangyari yan dito, aside … from you that you're gambling your future. They will also gamble their future as well.

Another challenge seen in the biomedical ecosystem itself was on technical capacity. In the early years, he described his area and his region as places where scientific and technical skills for pharmaceutical research and development were

very limited. This meant that his challenge was not only to build a company, but to help build the local environment for this expertise to flourish.

The most forceful part of his narrative, however, concerned regulation. He repeatedly returned to the regulatory agency's expectations, timelines, processes, and documentation as major hurdles for MSME innovators. He argued that local firms are often expected to meet standards and timelines modeled after large global pharmaceutical companies, despite an incomparable difference in terms of technological capacity and resources. Aside from this, product assessment and registration timelines were detrimental to any startup. A product may take years to develop, and more years to undergo regulatory review, only to be rejected, a detrimental blow to a small company.

"Sometimes regulatory comes way ahead than innovation. And that is not really a concern, pag ganoon kasi kailangan din naman ibalanse ng regulatory nila.lalo na sa technological capacity ng Filipino companies. If they're asking too much for Filipino companies to be at par with (international) pharmaceutical companies, then we cannot really compete, wala, babagsak at, babagsak ang industry. …Pero sa atin, hindi, kailangan ano doon ka agad sa global standard, but that's actually very detrimental for Philippine manufacturers. You see, it's a very big leap, both in terms of technical skills, and also in terms of technological capacity. Wala, wala pa hindi, hindi ka pa nakakapag- first steps sa technology, doon ka na agad sa step 10 (in regulatory) *So, hindi, so mangyayari doon, we will always depend on foreign manufacturers "*

Beyond the structural constraints, his narrative also contained a subtle internal heaviness. He acknowledged that this journey was burdensome and lonely. The

loneliness emerged as part of his existential condition, trired to build something ahead of the market, as well as the burden of leading a startup in a struggling biomedical ecosystem.

d. Adaptation, Resilience, and Identity Reconstruction

What was notable in the Collaborator's narrative was how he adapted to the constraints through a philosophy of calibrated adaptation. He did not frame innovation as the pursuit of perfect technology from the outset. Instead, he argued for the "best-fit" technology: a product that is sufficiently grounded, usable, and appropriate for the current market realities can be improved over time, with further improvements as funding comes in.

The same orientation shaped the way he understands the industry-academe collaboration. In his account, the most productive collaboration was the one that balances scientific potential with realistic deployment, allowing a portion of a discovery to be translated to a commercialized product rather than pushing for an all- or-nothing leap. He stated:

"Sometimes *scientists, or people coming from the academe, …if they have seen potential for an invention, or a discovery, they tend to overshoot their discovery. But if they have partners with the industry, parang sabi na industry, ay hindi pa yan, … the market is not yet ready to absorb that kind of technology, wala pang environment to do it…So hindi pa kaya, … gawin natin, atras muna tayo, no? Let's take up some parts of your academic publication, ilagay natin sa produkto na ito. Dito lang muna tayo. So, Ibenta natin yan, produce natin yan, then improve, improve, improve, get fundings, improve, get funding improve . Hindi yung parang*

long shot na. And at the end, kung sobrang long shot na, walang mangyayari. No one will really consume the technology that you develop"

He also showed adaptive learning in his engagement with regulation itself. Rather than withdrawing from the system, he described investing time and resources to understand regulatory pathways so that the company can better respond to the demands the regulatory agencies impose.

"So, yung ginagawa namin, in order for us to know how the regulatory works, nag-invest kami more time and effort to attend sa mga conferences kung saan din sila natuto. So, kung alam namin …ay may mga FDA regulatory dun nag-attend ditong klasi ng mga seminar. Attend din tayo doon. Para kung anong ibabato nila sa amin, may isasagot, kami, para hindi kami nahuhuli ba. So, kung anong mga organization sila sumasali, sumasali din naman kaminatuto din at na i-improve din yung skills, namin."

This signaled a shift in identity. He didn't stay as the pharmacist wanting to create medications but as someone conversant in policy, institutional logic, and system navigation. This also reflected Richardson's Meta resilience framework (2002), where disruptions were not portrayed as endpoints but as conditions that demand adaptive calibration. He repeatedly framed risk as necessary and positioned that enduring these pressures led to a deeper, more resilient entrepreneurial identity.

"*I think yung pag risk. I think that's actually what keeps us moving further. it's very important for an innovative company to move forward. Kasi pag walang risk, Ibig sabihin walang ring kayong innovation. Parang the same lang with other companies, …you're just one of them.*"

There was a clear evolution in how he told his story. At the beginning, he was a pharmacist with an inclination to produce medications and improve the family business. In Narrative Identity terms, he became a founder of a spin-off, builder of research partnerships, translational innovator, and finally an ecosystem actor who speaks about regulatory reform and an advocate of Filipino technologies. The Collaborator narrative was a coherent self-story of a non-conformist entrepreneur deliberately choosing to make a difference.

e. Vision and Message for Future Innovators

The Collaborator's vision was a Philippine biomedical ecosystem in which companies, universities, scientists, clinicians, and government are closely aligned, having a progressive mindset that allows technologies to move from idea to product without being stranded in institutional gaps. He saw localities as possible nodes of innovation, especially in terms of funding, talent, and academe-industry collaboration, as seen in Singapore and Boston. His aspiration was not just to imitate these ecosystems but to cultivate conditions in which regional culture and identity can emerge, like the use of locally produced raw materials and available academic expertise.

His message to future innovators was both practical and philosophical. He pushes to seek collaboration. *"Partner with an institution that can help your startup grow".* He encouraged them to share technology earlier, once regulatory standards are met, rather than keeping it until the technology is perfected. By the time the "*technology is perfect*," the need could have been answered.

Taken together, the Collaborator's story was that of a founder exposed at an early age to an industry that he had grown to love, whose inquisitive mind

needed space to grow, led him to create his own research-driven spin-off. His venture was nurtured by mentors and partners from the academe and guided by a goal to contribute to locally produced medications. He was not just building products; he was also moving to create conditions under which a local biomedical ecosystem can become thinkable, workable, and eventually self-sustaining.

4. The Resilient Strategist who improves Healthcare systems

The **Strategist** was a microbiologist by training who was initially a government researcher-scientist. His venture started when he saw the discomfort of people not having access to better healthcare. What made his narrative distinct was that he persevered despite years of self-funding and multiple rejections. He built on this defeat and strategized his next step for his venture and people. His innate characteristic that refused to accept that "*impossible*" was a final answer pushed him to direct his energy at building his company that contributed to solutions for the country's economy and healthcare systems.

a. Innovation Journey

The Strategist's journey started in a government research lab where he and his co-founder worked to help develop a specific vaccine. His work, though meaningful, led him to observe the daily patient influx to avail of healthcare services, seeing a long pile- up of patients even in the early hours of the day. The need for technology to intervene to solve a rampant systemic problem gave birth to his company.

The company had its entry point when their team joined a hackathon that QBO initiated, where his team placed second. With his validated idea and concept and

their own savings, he and his co-founder ventured into establishing the startup in 2021 despite being amidst the pandemic. They created digital tools that will help Rural Health Units to improve their clinic visits. After months of work, there were unfortunately no takers. The United Nations Development Programme (UNDP) COVID Innovation Challenge provided the much-needed funding to continue when they emerged as one of the four winners.

What followed from 2021 to 2023 was continuous pitching to more than thousands of rural health units all over the country, only gaining a single partnership. But he never gave up on their innovation. He said that "*We understood for almost 3 years we 're broke; we didn't have anything, we only had an idea*." He pivoted, and "*it's part of their last hurrah*." He offered the same technology to the private sector, where he bega getting his revenue. He then partnered with enabling institutions like the USAID, the Department of Science and Technology, and eventually the World Health Organization, expanding the company's reach. With a WHO project running since 2023 across multiple regions in the Philippines, he and his team saw technology actually working for patients who needed it the most.

By 2026, the company had become a recipient of the DOST-PCHRD Startup Grant Fund and was even recognized by a local award-giving body as developing outstanding rural healthcare innovation. His company is now planning to tap the ASEAN market for digital healthcare solutions and become a publicly listed corporation in five years' time.

b. Motivation and Values

At the center of the Strategist's narrative was a motivation he traces deep from his family background. He describes himself as "a son of an OFW," or Overseas

Filipino Worker. He articulated what he calls his life mission to make being an OFW "*an option, not a requirement for Filipinos to have a decent life*." He sees this phenomenon as having a "*social toll*" and affecting future generations. This motivation gave his entrepreneurship a moral register that extends beyond commercial return. He dreamed big not only for himself but for all whom he has taken under his venture. He wanted to grow large enough to "make a dent" in the Philippine economy.

This same motivational architecture was inseparable from the desire to make a difference in the Philippine healthcare system. The recurring image of patients queuing overnight for routine vaccination became the initial spark of patient-entered value in his venture, which persisted and deepened over time as his partnership with agencies like WHO highlighted underreporting of significant health data, such as causative factors contributing to maternal and neonatal morbidity.

A second core value, arguably the most defining one in his account, was resilience, which he treated as a discipline he actively rehearses. He named two personal touchstones he returns to when the pressure is overwhelming. The first was a phrase borrowed from the film "Give Up Tomorrow". He told himself each night that he could quit tomorrow, so that the deadline for quitting never actually arrives. The second was Theodore Roosevelt's "*Man in the Arena*" passage, portions of which he recited during this interview: "*It is not the critic who counts … The credit belongs to the man who is actually in the arena … who at best knows in the end, the triumph of high achievement, and who at worst, if he fails, at least fails in daring greatly*". He recalled reading this passage "*every night with one tear in my eye,*" during the venture's darkest stretches.

He stated: *“Funny thing, you know, …matigas kasi yung ulo ko, I am very, very stubborn, … I meet 100 people. Hindi ako maniniwala na hindi possible yung something, even though 99 of those people told me that what I am doing will not work. But I really believe so much to what we can do. I don't want to sound arrogant, but I always keep telling myself and my co-founders that. “It's always darkest before the daw” right? I've never met anyone who was able to build his or her own company from nothing. And if wala akong kilalang ganon, then I will be the first one…. that's how I see it. And if they see it's impossible, I see it's just a series of difficult possible things that have to be done.”*

That same stubbornness matured, over the course of the narrative, into a more deliberate and reflexive value: strategic pragmatism. He repeatedly reframed the startup’s multi-year public-and-private sector engagements as not just opportunities, but a series of experiments intended to reveal which business model, product, and customer segments would actually work. These aligned closely with the effectuation principle of treating acceptable losses and available means, rather than having a fixed master plan (Sarasvathy, 2001).

c. Challenges and Structural Constraints

The Strategist narrative was not a story of one crisis but of several compounding and overlapping pressures sustained over a period of years. The founder’s account of hardships centers on nearly three years when he and his co-founders had to finance their companies for their salaries as a government scientist, even pushing him to do odd jobs to keep the startup afloat. He described his family and friends repeatedly urging him to abandon his venture and return to conventional employment. He also described deliberately minimizing his own personal expenses

to keep the startup alive on his savings alone through years without a paying customer.

Another challenge was that neither he nor his cofounder had a business operations background prior to their startup experience. He stated that "*we don't know anything about business,*" so the foundational commercial skills like marketing, pricing, and customer acquisition had to be learned directly through trial and error rather than structured training.

The most forceful and recurring constraint in his account was regulatory and fiscal. He described different categories of taxes and how the Bureau of Internal Revenue can be very punitive for failing to file a zero-revenue return for a specific month. He contrasts this with practices in Singapore where startups are not taxed until they reach a certain threshold. He characterized our taxation laws as regressive and disproportionately burdens early-stage founders compared to large-scale established companies. He stated that, "*The ones who should be paying more should be the ones in the top … not the people who are still starting.*"

Aside from that, business registration itself required navigating various government agencies in different locations, with uncoordinated processes; and no dashboard consolidating procedures for new startups or business ventures. He was careful to frame this as a systemic critique rather than a personal grievance, because as a founder he experienced that doing business in our country is not just hard but, as he termed it, at an "*Ultra-hard mode*" level.

These compounding pressures, financial, institutional, and regulatory, produced moments of doubt and almost giving up, which he managed to overcome with resilience and discipline.

d. Adaptation, Resilience and Identity Construction

Despite these pressures, the Strategist demonstrated a sustained capacity to persist, adapt, and continually reinterpret setbacks as usable information that reflects Richardson's Metatheory of Resilience (2002). The founder's own account of his nightly ritual of telling himself that he could "*give up tomorrow*" and his passage of the "*Man in the Arena*" constructed coping mechanisms consistent with the second wave: a repeated self-administered practice of restoring equilibrium after each new rejection rather than a single static disposition.

Equally notable in his narrative was a gradual and cumulative reconstruction of his own professional identity. Over the course of his story, his self-description evolves from several distinct roles: from a bench researcher; to a founder improvising a business, to a grassroots negotiator, finally a system-changing advocate whose startup was trusted by the World Health Organization and DOST to help improve health systems across the regions of our country. Following McAdam's Narrative Identity Theory (2008), the Strategist told his story as he knew how each experience integrated into what he was and what he hoped to be. His identity reconstruction was visible in how he engaged in the regulatory system he otherwise heavily criticizes. He described doing a crash course in taxation, up to a point where he confidently states, *"name all the taxes we are paying in the company"*. This was an explicit self-narrated shift from someone who admits to knowing nothing about business to someone conversant in policy and compliance.

His two personal touchstones, as earlier mentioned, functioned in his accounts but as active recurring practices that carried him through his identity evolution. As he puts it, reflected on how the company has changed him personally. He said, "*I would*

say creating this business is a journey to the self. It made me a better person. It made me a better son. It made me a better partner in business."

e. Vision and Message for Future Innovators

This founder's vision extended past his own company towards conditions where biomedical and technology ventures could be nourished in their earlier years. He envisioned that the government startup funds system be also evaluated through validated business success indicators, rather than just mere compliance documentation. He hoped to see a taxation and business registration system that was progressive and startup-friendly, far from the fragmented and limited system he had experienced. Lastly, he aspired to have practical entrepreneurship and tax literacy be part of the educational system.

His message to aspiring biomedical health technology founders: *"Look for paying customers first; what product do they need*?" He described years of hardship that followed from building first and selling later. He urged future founders to remain in the arena, listen to constructive criticism, and continue to push toward their fullest potential even when the outcomes remain uncertain.

The Strategist called his narrative a *"journey to the self".* He further stated:

"… *I would say creating this business is a journey to the self. It made me a better person. It made me a better son. It made me a better partner in business … Because the business will highlight all your flaws, all your strengths; it will put you under a magnifying glass…I know that I'm not perfect. But I know I've been better. That's… I can confidently say I've been better … as a person, and mas ngayon."*

The five years in which uncertainty exposed his limitations, strengthened his resilience, and taught him to value time with family more than status and wealth. The transformed self who emerged from this journey was measured not only by the company he builds or the systems he improves. His larger measure of success was whether the opportunities created by that growth allow more Filipinos meaningful lives here at home.

5. The Catalytic Entrepreneur of Community-Based Healthcare Innovation

The **Catalyst** was a seasoned entrepreneur and had a background in a Master of Business Administration. He was not a clinician, nor a researcher or digital platform developer, but along with his socially responsible and civic- oriented groupmates in Manila, bonded together to solve a longstanding healthcare gap.

His narrative was distinct in the sense that it was not a mind-blowing innovative solution. Their startup chose to deal with a problem that had been embedded in primary healthcare: the problem of a "***days-long journey "***of a patient needing diagnosis and treatment. It has been the norm that patients would go for consultation and would go out of the clinic with a diagnostic workup request, advised to return upon completion. This workup can be completed within a matter of days, depending on the financial capability of patients or the availability of the services. Once the physician saw the results of the diagnostics, the patient will be advised and given medications for his ailment. The paper prescription will be an actual medication, again dependent on the patient's financial capability or the local government support. The problem of a days-long journey was the stark reality of millions of underserved Filipinos. This healthcare gap was the push that these friends saw and chose to act on, as a

"*social enterprise*" to address the long-standing cries of Filipinos on a fragmented and underfunded health system.

a. Innovation Journey

The Catalyst's account of the venture began with a specific systemic problem, described as a days-long wait in the Philippine primary healthcare system. He described how an indigent patient seeking diagnosis at a local health center would typically be turned away for lack of on-site laboratory or imaging facilities, then referred to a public hospital where long queues and delayed results stretch the wait even more.

"Ang problema, ang doktor, hindi ka naman mabibigyan ng diagnosis kasi wala ka namang laboratory, hindi ka na-x-ray, hindi ka nakuhanan ng dugo…bibigyan ka lang din nila … laboratory order ng doktor. Para ngayon, ang next namang step ng—lalo na pag indigent ka, hahanap sila ng libreng, ano, laboratory, or pupunta sila sa public hospital magpa- check. Ang problema naman din doon, una, napakahaba ng pila, or, uh, tapos yung resulta rin, matagal. So if ever naman tumuloy sila doon, and then they have to wait for another day to get the results, kukunin na naman nila, then ibabalik na naman nila sa doctor, then doon lang sila mabibigyan ng diagnosis ng doktor ng health center."

The startup was established around the last quarter of 2021 at the height of the COVID-19 pandemic. He and his board mates, all members of a socio-civic organization, engaged in community assistance, observed that patients with chronic illness had nowhere to turn since medical facilities were directed to pandemic response. At the onset, the venture was framed as a "*social enterprise*" rather than a commercial startup.

“So it really started —until now, it's a social enterprise; we're more focused on the service rather than the profits. So we're mostly entrepreneurs. Mga founders nito are entrepreneurs in different fields, different businesses. So nagsama-sama sila to create the startup.”

The technology itself followed a path of what the Catalyst calls “*trial and error*”. The group first tried developing the software abroad, only to find that it did not function as intended upon deployment, and adjustments were too costly for the overseas team to troubleshoot concerns. After roughly six months, they abandoned the imported system. He said,

“*Sumuko na kami. Sabi na lang naming, let's start from scratch. Let’s develop it ourselves. Para talagang based on the needs of Filipinos talaga.”*

A working beta version was then launched in one of the nearby provinces in Manila. The service began by catering to 200 patients per day and had grown to about 500 per day by the time of the interview.

Currently, the startup has made its mark catering to approximately 1.3 million patients across 81 out of 82 provinces of the Philippines. Its workforce has grown to more than 700 people, with an anticipated headcount of 1,000 by the year’s end. Aside from serving as one of robust partners of the national insurance system or Philippine Health Insurance Corporation (PhilHealth) especially with its YAKAP Program on preventive-care benefit, it also gains revenue from diversified sources such as partner local government units (LGU’s), health maintenance organization (HMO) contracts and other private companies. The company was expected to strategically expand in the coming years with the innovative AI software they have been developing as a diagnostic support tool for faster turnaround time of results and continuously training

new hires to prepare for the new phase of the venture. What started as a solution to a specific unaddressed health gap now becomes a tangible answer to many Filipinos needing a better healthcare system.

b. Motivation and Values

The Catalysts' motivation stemmed from a deep patient-centered need that has long been overlooked. Being inculcated with the values of socio-civic organization to help the underserved, this servant leader could not look the other way. He and his friends invested enough capital on the idea that at the onset was unsure of its return. This framing positioned the venture less as a profit-maximizing startup and more as a social mission to improve the country's preventive health care system.

Patient care moved the company, addressing needs even beyond the initial preventive aspect. This founder valued proactive continuous care over episodic transactions. He distinguished his company as not stopping with diagnosis, but continuing with monitoring, medicine distribution, telemedicine follow-up, and home-care visits for high-risk patients. He mentioned:

" Ang maganda kasi, sa amin, talagang proactive kami. Pag may sakit, doon sa 100,000 na yun, kung sino yung mga may sakit, talagang binabantayan namin, including yung pag-serve ng medicines through GAMOT program. Tapos yun na yung tine-telemed na sila to monitor kung nag-i-improve sila. Meron din kaming, uh, mga home care sa mga community."

He further elucidated the need to match enrollment with actual and proper humane service delivery. The Catalyst never swerved from his original purpose

of providing improved quality health services despite the profitability of the venture being a low-hanging fruit.

c. Challenges and Structural Constraints

Despite the strong motivation, the Catalyst's story was not without hindrance. The most persistent source of disruption in his account was regulatory: rapidly changing PhilHealth policies, especially for the preventive healthcare package, which required the organization to adjust operating procedures on short notice.

"Ang pinaka-ano (hirap) namin kasi is regulatory, kasi laging nagbabago. So we have to adapt quickly, …For example, yung PhilHealth YAKAP, lagi silang may bagong policy. So kailangan mabilis kaming mag-adjust. Kasi kung hindi, marami kaming hindi maseserve"

Another layer of difficulty was finances and human resources. Both of these factors have to match the pace of geographic and patient volume. Recruiting and training sufficient personnel proves to be a difficult task. Hence, the startup has now created a dedicated training department focused on developing newly hired staff.

The venture's early endeavor on an outsourced system that proved unworkable in the local context required the company to abandon six months' worth of initial effort and rebuild the platform internally, a setback he narrated as a pragmatic pivot. One of the lessons learned the hard way. Technical experts had to be developed and sent to training to ensure that the company would continue to provide innovative solutions in the future.

All these layers of challenges, the Catalyst and his cofounders faced head-on. And when asked directly whether there was a time they had considered giving up,

his answer : "*it never occurred,*" attributing this to the camaraderie of building the company alongside long-time friends.

d. Adaptation, Resilience and Identity construction

The Catalyst sustained the capacity to persist, adapt, and continue to find meaning in his work. His narrative resilience was constructed around routinized organizational adaptability and distributed problem–solving. When asked to recall a specific instance of a plan not working as intended, he could not isolate one defining episode.

"Parang wala akong maisip na, ano eh, na exact scenario. But it happens a lot … that's a good this of have a great team is laging nasosolusyonan kung may problema man."

Placing it against Richardson's (2002) concept of resilience was an active reintegration process rather than mere absence of breakdown. This pattern suggested reintegration distributed across a team rather than in a singular person to withstand and recover from acute setbacks.

He entered the venture already self-identifying as a seasoned entrepreneur, and his self-story does not evolve from one professional role to another. His leadership role redirected his identity toward a mission he experienced as more directly meaningful, which aligned with McAdams' (1990) Narrative Identity Theory. He doesn't follow the stepwise reconstruction of self; instead, as a continuity between his past ventures, and reframed the present enterprise as a version that fully expressed value of direct service to others.

“ I think in terms of passion, in terms of eagerness to work, compared to my different businesses before, mas …passionate ako ngayon. Kasi nakakatulong kami. We are really helping people directly. Marami kaming stories akong na-ano from the field na talagang nakatulong talaga yung startup sa kanila, … so that makes a big difference compared to my other businesses.”

The statement captured not a transformation of professional engagement but a deepened purpose of what has already been part of his identity.

This was further anchored in the concrete image of friends who co-founded that company with him. He repeatedly returned to the fact that the startup was built and sustained by the same board mates from his socio-civic organization. He frames his story as a shared endeavor, through difficulties and triumphs, with errors as an avenue for cooperation rather than a reason for abandonment. This dual anchoring in peer relationships and tangible patient stories revealed the scope of his identity as a co-founder. He did not described it as gaining a company that would reap him millions, but a shared undertaking among friends that changes the lives of millions needing better healthcare.

e. Vision and Message to Future Innovators

This founder imagined a future biomedical innovation ecosystem in which the government provides dedicated support for digital technology, especially for health technology companies. He argued that the Filipino entrepreneurial capacity is not the limiting factor but the absence of structured institutional support. He attributed his own ventures' relatively smooth success to access to startup capital as a matter of good fortune, since his founding team could self-fund the venture. This was in contrast to

founders who may have an equally strong idea but lack capital or resources to develop it.

“Kasi ito yung maganda with Filipino, kasi very enterprising ang Filipinos. Kulang lang talaga rin sa support. Ang swerte lang sa amin kasi we are a group of entrepreneurs, so siguro in terms of funding, hindi kami nahirapan to start it up So kami lang, we accepted the fact na itong in- invest namin, we might not recoup it, no. So ang swerte lang namin, it was able to be successful. But imagine kung yung iba na walang capacity, but they have a good idea, but they just don 't—they just don't have the money or the resources to pull it through. …. I think, from the government. Sana merong support for all tech startups, especially pag health or …something that has a social impact.”

His explicit message to future innovators was to prioritize team composition over individual capacity. It was a message of collaboration both inside and outside their venture. He advised:

“Make sure that they have the correct team. They have people na kasama nila … a good support system in terms of people around them … And if it needs to be funded, yun din, kailangan.. Kasi, I think, especially on the tech side in the Philippines, hindi siya pwedeng ikaw lang mag-isa eh. I think you need a very competent and big team that has different roles that can contribute to the development of the tech that you want to do, especially in medical … so you need medical professionals, you need funders (investors), you need people that know how to develop in terms of the IT system. So, it's basically first creating a very good team with you or behind you, so that you 'll be sure that you, I mean, you 're bigger the chances of success.”

He closed his reflections by returning to the scale and persistence of unmet need in the Philippine healthcare system, hoping that more technology entrepreneurs would direct their efforts to the underserved population. This need would not be diminished as the country's population, along with the problems of poverty and hunger, grows exponentially over time.

The Catalyst's story was a story of a civic-minded entrepreneur who redirected an established peer network and accumulated entrepreneurial skills toward a mission-driven venture born out of the necessity during the pandemic. Despite hurdles of challenges, he continued to advocate for stronger institutional support for health technology startups and for the country's underserved population.

6. The Agile Optimizer for Improved Patient Experience

The ***Optimizer*** was trained in psychology and worked outside healthcare before entering the venture. He did not present himself as a clinician or software developer but as an observer, a patient himself affected by existing workflow and clinic processes. He entered into the startup through a friend's invitation, believed in the vision of improving the healthcare system, and came to lead through account management, communication, relationship building, and a larger purpose for the product. His narrative consistently returned to improving patient experience, developing features incrementally with user input. He believed in building with people who believed in and trusted in their work, and placing everything in God's ultimate purpose for the company.

a. Innovation Journey

This founder's journey started during the pandemic, when the clinical setup and patients were having a hard time accessing healthcare amidst numerous contact restrictions. A single clinic request from a friend asking for a digital system to help his clinic workflow turned into his startup's entry point. The formative opportunity turned into a successful setup; the earliest validation of their technology was a digital platform that improves patient experience. The team saw that the system was working and asked: "Why not create a system for every clinic?"

The pivot was from a single tailored system to a broader platform. The Optimizer mentioned that the product was intended to cover both the patient and the operational side of a clinic account. Its stated purpose revolves not only digitalizing workflow but improved the patient's experience adding value to the doctors' clinic management.

This journey of product development took four long years and was recently launched. He described the period as difficult precisely because it required sustained work before any income could be expected. The scale of the envisioned numerous features to accommodate the different needs of the existing market. He also characterized the development as incremental, saying that the team did not try to make all envisioned features available at once. Instead, it was released in phases: *"for this month, it's just three features, uh, next month another three*." He termed it an agile approach.

From being an initial account manager, he transitioned to a co-founder as the healthcare purpose of the venture resonated with him. Over time, he saw the startup being the digital solution of choice for patients and health practitioners. He has seen

their platform as providing reduced friction before consultation, within clinic operations, and across administrative interfaces.

b. Motivation and Values

The Optimizer was rooted in his own experience waiting in long queues of patients, followed by another line for HMO approval and another for diagnostic workup. A system that was present despite having a health insurance provider. These were not presented as an emotional trigger but as a visible, cumulative inconvenience of fragmented, manual, and seemingly uncertain clinic transactions. He asked the question, *"Can there be a better way of doing this?"* This experience pushed for the motivation of better patient care and service.

The strongest stated motivation was believing in the startup's vision. He believed in what they are doing and, despite the long wait in product development, as he stated:

"It doesn't matter what plan, which, or which value we will take, but this goal, this vision. And that's what keeps, what keeps me going. I mean, even if it's hard or challenging finances-wise, people-wise, that's where I'm convinced that it will work outaside from the needs, aside from the target market, it's really the vision".

He believed that this technology could address health-care needs, and working with a team that shared this goal made the journey more meaningful.

His values also centered on shared responsibility. He rejected the image of the entrepreneur who simply hires to execute a personal plan. He wanted people in the company to have the opportunity to think and contribute. This was clear in his words: *"Those people under you are the very important asset in your company".*

Lastly, faith was another explicit value uncovered in his narrative. He volunteered an important element that was not discussed in his story, as he terms *"that is my faith in God."* He located the origin of the vision, wisdom for discerning problems, provision in terms of manpower and finances as part of divine guidance and providence. For the Optimizer, faith was not an incidental language of encouragement but an important frame on how he attached meaning to his work and journey.

c. Challenges and Structural Constraint

The Optimizer saw his story as not a linear success but filled with interacting constraints and placed the most immediate pressure on the product's technical readiness and the team's ability sustained a long development period.

The principal challenge he named was technical. A system intended for multiple clinics had to be capable of carrying an increasing amount of health care data. These compounded difficulties with data privacy guidelines as well as multiple interfaces of different HMOs. He described the technical work as the "*headache*" or critical concern because it was inseparable from the product itself. He had to make sure that the system could responsibly support the workflows as use expanded.

The second challenge was the four-year waiting period for the platform development. This long "*return of investment*" was a test for their startup, which the team held on because of their firm belief in the venture's vision. The desired features compounded the pressure, because targets and planned deliverables could fail to be met. He said the product could still be better but felt compelled to deliver because the market's need was there.

"Yung alam mo na pwde pang maging better but because of the need of the market, idedeliver mo sya".

Their response was to release in a bounded setting and provide a route for feedback and upgrades.

d. Adaptation, Resilience and Identity Construction

This founder practiced an adaptive user-informed approach to development. From an initial clinic as a reference, limited roll-out in their founding city in the Visayas, and incremental addition of enhanced features. This created a feedback environment for their initial clients. This approach resembled the Lean Startup Methodology (Ries, 2011), where the team treated the end user feedback as information for feature refinement and improvement.

When the work felt uncertain and difficult, he would go back to the vision, the end goal. This outlook was accompanied by concrete practices: reducing the scale of rollout, phasing the additional features, inviting early feedback, and leading the team to visibly traverse pivotal decisions to cope with the challenges.

The experience altered how he understood leadership. He said that the journey *"really changed me; it was 180 degrees … on how I think about the company and so as leading people".* In his account, a leader has to be visible, set an example, and lead through different contingencies if targets are not met. He came to value meetings, ideas, and sacrifices as collective work that is valuable. He described success as collective:

"I saw it as an opportunity to hope that this will not be a one-man show, or this will not just be a one, one, one-man game. The completion or the success of this company points to everyone who trusts in the vision, everyone who rows with us."

Within Richardson's resilience framework (2002), this account may be interpreted as a dynamic process of restoring direction under stress. Friendship and colleague relationships, the shared vision, visible contingency planning, and religious faith appeared as protective measures. The evidence supported persistence and adaptive calibration; a completed transformation or full meta-resilience was not seen in his narrative. His resilience is seen as sustained collective work, spiritual trust, and repeated return to purpose amid uncertainty.

The Optimizer's identity narrative moved from an outside perspective to acting in leadership as managing director, co-founder, relationship builder, and public advocate of his venture's purpose. His present sense of being a cofounder was not based on technical authorship, but was tied to improving administrative workflows, extending useful functional improvements gradually, and refining the technology with input from his users. This trajectory was consistent with the narrative identity theory's attention to how people organize past roles, current commitments, and future aspirations in a coherent self-story. This founder constructed coherence through recurring motifs of process improvement, bounded scaling, and enhancement of workable solutions. He found himself far from his old self; this improved version of a leader and entrepreneur will push his venture and his team forward.

e. Vision and Message to Future Innovators.

For the Optimizer, his vision was simple. He hoped that the government would be more open to innovation, especially digital tools not only for healthcare

but for public workflows. He wished to see that red tape of manual procedures be abolished by digital solutions. This would enhance the biomedical innovation ecosystem exponentially, creating ventures that would address the healthcare gaps present in the current system.

He wanted aspiring innovators to be collaborative rather than heroic. He urged them to work for something larger, while allowing others to work with them. He was adamant that founders must not assume that it's a one-man game or that they must do everything alone. His account implied a leadership ethic that embodies visibility, preparedness, and sharing the credit with his reliable team. Lastly, faith provided the deeper orientation from which he held these commitments. In his view, the idea, the people, and the timing of the venture were all from a higher being, with an omnipotent purpose bigger than themselves.

The Optimizer's story illustrated how locally grounded opportunities could become starting points for broader healthcare innovation. He embodied an entrepreneurial identity centered on disciplined improvement of the system through collaboration, faith, and sustained attention to the experiences of patients and health care providers. His journey affirmed that meaningful innovation may begin with a modest local problem but develop into a solution for improving healthcare for more Filipinos.

7. The Disruptive Anchor: Fighting for Mental Health Awareness and Service Accessibility.

The Anchor was a successful legal practitioner who practiced business and migration law abroad when a personal crisis occurred. This founder's narrative was neither stemming from patient need nor an invention. He termed his entry as

“unprofessional” when he himself was saved by the technological interventions available. He repeatedly made this experience the interpretive center of his story, placing the startup's life-changing investment worth building to save lives specifically in the Philippines.

a. Innovation Journey

The founder started his innovation journey after surviving a personal crisis that resulted in his second life. He pivoted away from law in 2019 and reoriented his priorities. He described this reorientation with emotional vigor, framing his departure from a commercial mindset to a social and morally responsible mindset. He called it a shift “*from the dark side to the light side*.” By 2020, he was presented with an idea to invest in a mental health venture, but he declined and decided to put it on hold. He scanned and studied the current mental health landscape of the country. He describes it as stark:

“*When I did a little bit of research … small clinics treating a couple dozen people a week, 114 million population, zero technology, no data protection, no government support, no subsidies at the time, and just the big dynasty corporations with their ecosystems purely commercial, commercially driven.”*

The great need motivated him to agree to be part of the startup. He described it as disruptive and aggressive.

“I just wanted to do something completely different and disruptive, lower the cost for access, broaden the ability for anyone to get mental health support from all around the country just using a device, and provide quality care, and start to educate people that mental health just isn't in the mind”.

He described the venture's market entry as deliberately assertive to capture his first client in the early stages of their venture.

The founding timeline predated the pandemic, but COVID-19 boosted the venture's trajectory as the multiple restrictions, isolation, and general fear have made the mental health concerns more evident and accelerated the technology's adoption. The formative crisis became a turning point. He described it as:

"Mental health has always been a prevalent crisis, a silent crisis, basically, unaddressed. And then when COVID happened, it completely lifted it to the surface, right? And so, well, yeah, corporations had to manage people from afar, and the isolation caused people to really get into some, um, you know, critical psychological states. "

The venture capital for its technical platform came from an international grant from a foreign embassy. He described it as a "*catalytic funding*". The same country that provided them the grant also provided the expertise to ensure that the idea was feasible and technically sound, creating the platform ready for use.

Despite the good uptake of the technology, especially in the private sector, the venture faced another turning point, midway through its lifespan. The Anchor realized he could not work with some of the founders. Through this internal organizational turmoil, his motivation pushed him to continue what they originally started. He was adamant and frustrated with what is happening in the Philippines.

"The suicide rate is insane… hardly anyone knows about it. I didn't want to give up because who the hell is doing anything about it? I don't see any other founders out there doing anything about it other than trying to make money. And I

could say the same about government. So, I'm honestly operating from a place of complete frustration and anger."

The startup was described as serving close to 400, 000 Filipinos across roughly sixty private companies and forty subsectors, big, trusted retail names in the current Philippine Economy. They also partnered with some local government units in Metro Manila as well as key professional organizations and hospitals. The Anchor aimed to expand this venture to not only a mental health platform but overall behavioral health and even moving it to address preventive health care.

b. Motivation and values.

It was noteworthy that this founder's most explicit and recurring motivation for his start-up is to address the glaring lack of accessible, adequately funded mental health support in the country. He also framed the fight against big pharmaceuticals and commercial forces that may have a vested interest on the healthcare data. Moreover, he described the outdated viewpoint of most in the government and the greater society towards mental health. As he stated:

"And we're far behind. We're decades and decades behind the rest of the world with mental health. We still think the moment you have a mental health problem, like, shove drugs down someone's throat. No one's doing that around the world. We're living in the Stone Age. It's high time that the next generation starts to take control of their health. Because it's affecting their physical health, their biological health, their physiology, their social health."

In relation to breaking the barriers of the current mental healthcare in the country, the Anchor was equally motivated to educate the public that it is not confined

to the mind alone. The effort was evident as he stated, "*took into account, you know, other factors, not just the mind, but physiology, social structures, and whatnot*." He described this as an explicit design commitment, as it trains its own psychologists to adhere to a biopsychosocial framework and not just the standard clinical treatment regimen. He reiterated in the last part of his interview that, though it is a health technology company and in the age of Artificial Intelligence, he pushed to maintain a human-centered approach.

"I think what's special about (the startup) is that our values center around our human centricity. We're human-centered. Uh, even our technology aspirations, you know, in the era of AI, our goal is not to eliminate human intervention. It's to ensure that there are always humans in the loop. Because the foundation of our species, as humanity, is human connection. … So, part of our mission is to ensure that humans still can stay connected"

These statements indicated that the Anchor's motivation, combined with urgency brought about by his personal crisis, continued to fuel the venture, made the technology-mediated service available to the greater population.

He wanted to be intentionally and behaviorally where the current populace is, and that is in the digital world. He genuinely wanted to make a difference not only for his generation but even for the next generation. His love for this country was evident in investing his resources, time, and effort, leaving his previously lucrative life to make a dent in the future of Filipinos.

"You have to be able to keep your eyes on the horizon, understanding that it's a difficult environment to be able to make a difference. And so, it explains the brain drain, right? Kawawa naman, for whoever the hell is remaining here."

c. Challenges and Structural Constraints

In his journey, the Anchor encountered several persistent overlapping constraints on his operating a health technology venture in the Philippines. He identified that the health technology ecosystem in the country is, as he terms it, the "*infancy of the industry."*

He saw the associated task of educating the prospective institutional clients from both the corporate and government sectors as hard. The resistance was present despite the technology being inexpensive. This viewpoint was rooted in the ability of an employer to see it as a cost rather than an investment on the welfare of their workers.

"Kasi, end of the day, there are HR leaders and corporate executives that need a budget to pay for the service. Kahit ang mura. We have a service, for example, an (intervention) hotline, covering (number) people for (4-digit amount) per month. Hotline 24/7, circumflex model, developed with the (Foreign) government, saved lives every day. They don't want to pay for it. Their budgets don't cover it. Companies don't realize that if you give your staff a platform that allows them to de-stress, or recover from anxiety, or recover from depression, may return yan. Hello? If mag-absent yung mga tao, because they get sick, because of the stress caused by anxiety, depression, whatever it is, may epekto yan. There's a bi-directional relationship between your mind and your body. Hindi nila gets."

Another layer of difficulty the Anchor named was the currency instability and lack of government subsidy packages to help businesses alleviate this economic swing that owners have to absorb. He linked this volatility directly to the cost of

delivering a data-secure healthcare platform that refuses to cut corners on operating costs despite the financial pressure.

He also characterized the domestically available grant funding as structurally unsuited to the pace required in developing cutting-edge health technology, both in amount and in disbursement schedule.

“Because, like, when we look at the local available funding lines from the government here, ang sobrang liit. And then the way they release the tranches is over a long period of time… It's not sustainable. The grant environment in the Philippines is not conducive to technological disruption because the amounts are too small and they're given over too long a period. How is that possible in a global technology environment where technology is changing not every year, ha? It's changing every quarter. So … you need a grant environment where they give you large swaths of grant funding immediately so that you can actually construct and engineer and design, you know, the architecture of the technology”.

He described the length of time for preparation, approval, and release of the funds as too long; another competitor would have launched the technology or idea in this fast-paced global digital technology market.

Lastly, the Anchor described the general administrative burden of running a business in the Philippines as comparatively slow and outdated, compared to an online same-day business registration in other countries. Actual physical long queues and manual filing in some government agencies were a reality.

“It's difficult in the sense that everything is still archaic from a submission standpoint, right? You have to submit things to the (government agency), to the

(another government agency). You have to deal with their physical offices. Uh, you have to line up for hours every quarter. You know, it's like, I feel like we're living in the 1970s."

d. Adaptation, Resilience and Identity Construction

At the level of concrete adaptation, he described leveraging the initial international grant not only for capital but for structured technical mentorship, absorbing security, encryption, and infrastructure knowledge which he did not previously possess by working directly with the provided consultants. He described his relationship-based market entry as a second adaptive mechanism using existing personal connections and credibility conferred by an internationally funded and vetted platform. He was explicit that he considered relationship building with government agencies, despite his frustration with the government priorities on health and well-being, as a practical necessity.

"So that's one thing that I learned in particular with the (Foreign) Embassy, is the importance of relationship building. Um, even though I'm frustrated at government, it is still a necessity to maintain a relationship on, you know, with the hierarchy there."

He described managing his own reaction to that same frustration deliberately, *"I just try to make myself immune to that and just focus on the delivery of the service that I got, right?"* This suggests a form of compartmentalized pragmatism in which this founder separated his critical assessment of institutional dysfunction from his continued willingness to work within and through those agencies to ensure his startup mission is served.

Following the Anchor's narrative about the venture's change in composition of original co-founders, read against Richardson's (2002) conceptualization of resilience as an active reintegration following disruption, he reported doubt during the turbulence itself but continued rather than exiting. This decision to continue is not just a coping mechanism, but he compared it to the greater severity of his earlier personal crisis and drew strength on what his venture is doing with the local communities. He offered a summary self-assessment, describing the startup as giving him "*a holistic, durable, resilient layer".* He stated that engagement with unfamiliar financial and institutional complexity had produced *"this internal commercial resilience that now my emotions don't have to be tethered to."* The additional knowledge or the financial literacy has functioned as a buffer against emotional volatility.

This founder's identity story traced a marked reconstruction. His initial work proved to be experientially and unsustainably "*toxic*," leading to the point of his crisis. The personal crisis served as a hinge in his story, separating a professional identity around his legal practice from a morally and socially significant legacy mission. He saw himself as someone who builds and leads a health technology company, not through clinical or technical credentials, but through a combination of legal, business, technical, and financial literacy specifically in service of this mission. This trajectory was consistent with McAdam's (2008) account of narrative identity as an integrative structure that an individual organizes past experience, present roles, and future goals into a coherent self-story. His repeated recollection of how he survived his crisis suggested that this event functions as his constructive narrative meaning, giving purpose to his transformation, and towards reaching his venture to break barriers of mental health systems in the country.

e. Vision and Message to Future Innovators

He envisioned his startup shifting from reactive to preventive healthcare with an explicit connection to existing insurance regulation as vital. He articulated his ambition is "*to get ahead of the sickness down chain*" by expanding suicide prevention into a broader wellness and longevity proposition. This ambition was connected to a wider claim for the Philippines, as restoring the previous position of advanced technological prowess regionally.

"We're not investing in our people's health, and we're not investing in our people's minds. Imagine if we did that. Filipinos are the most loving, compassionate, warm people on the planet. And we're educated, and we speak English very well in the region. It will only take a couple of decades to get our people back on track. I honestly want to compete with Asia again. There's no reason why we can't be doing better than Vietnam, Malaysia, Singapore, Indonesia. There's no reason. So, I'm backing the Filipino people."

The Anchor's most direct systemic recommendation was the creation of an accessible entrepreneurial education ecosystem capable of converting a founder's mission-driven idea into a financially viable enterprise. He located this gap in concrete technical business terms such as *"unit economics, financial summary glidepaths, net income structuring, dividend and shareholder agreement*", arguing that without this literacy, founders remained vulnerable to exploitative venture capital terms.

His explicit message to aspiring innovators emphasized partnership over solitary effort. He advised,

"Look for allies where you have a common goal. Because you can't do it alone. You have to look for allies and partners that you can collaborate with, uh, if you're seeking true change and disruption."

He specified that this collaboration should be selective, oriented toward shared values and perseverance. He described it as "*those with right values, and long-term vision with the resilience to withstand the weather."* He understood the difficulty and burden that no single founder should bear alone.

The Anchor, after gaining stability from his personal struggles and conflict, aimed to reach the dark and hidden realms of mental health struggles in our country. He didn't let his second life, as he termed: "*go on its usual pace"*. Instead, he pushed to disrupt by developing a timely technology for all those unheard struggling voices. He capitalized on his relationships, giving him financial and technical ability for this platform. He continued despite economic and organizational instability, adapting through learning the complexities of the business.

8. The Providential Trailblazer of Pathways for Biomedical Innovators

The Trailblazer's innovation began upon his return home from his specialty studies in the United States. He described himself as a clinician-scientist and a diagnostic researcher who trained abroad and then pursued research, clinical service, and technology translation in the Philippines. His story was an intertwining of clinical encounters, laboratory work, institutional leadership, spin-off company formation, and building of partnerships. This addressed a single concern: the unavailable, costly

imported diagnostic technologies needed by Filipinos and the health system that he found himself in.

This founder repeatedly described his journey as acting at a point where an established pathway did not yet exist. He rebuilt an understaffed institutional initiative, looked for resources when the laboratory capacity was insufficient, pursued a university-linked commercialization route that had no precedent, and later created his own biomedical innovation ecosystem to ensure and sustain his diagnostic technology venture. The Trailblazer narrative portrayed himself not just as a physician filling an observed healthcare gap, but as an innovator traversed a succession of conditions in which other established systems found it difficult and refused to accept the status quo of imported diagnostics. He chose to think beyond the box of healthcare constraints, which was his narrative's central movement. He argued that viability and service should coexist. His story moved from laboratory and clinical frustration toward organizational construction, then toward a wider vision of domestic biomedical capability for underserved communities.

a. Innovation Journey

This founder placed the beginning of his story in the walls of the academe. He returned from an overseas training full of hope and vigor to start meaningful work in a prestigious training hospital. The narrative soon became one of dissonance between expectation and realistic conditions. In his words, he characterized himself as unprepared for the difficulty of conducting research in a resource-constrained setting. Laboratory upgrading and funding for diagnostic research was needed. He summarized it as plainly*: "I ended up building the initiative from scratch, no?"* He then volunteered for a newly vacated institute leadership position that proved crippled

without a staff complement. Not letting dismay get the best of him, he began formulating a program, sought modest initial institutional funding, and built a national diagnostic research initiative. A diagnostic project of a clinically important infectious disease gave the institute a concrete research focus and much-needed funding. This produced the first medical diagnostic product that gained international recognition. He expected that this milestone would create a momentum, but instead he encountered an industry wary of adapting domestic technology.

Rather than treating the bleak industry uptake as a blow that the technology developed lacked value, he interpreted it as an institutional and translational move. He described studying the National Technology Transfer Act and recognizing the spin-off route to establish a company while retaining his connection to the university. This proved to be a turning point for his venture, as after several years of waiting for the academic board's approval around 2013, his startup was established with investments from his savings and those of family and friends. The Trailblazer, as he stated, "*knows research and development processes at the back of his hand*". The commercialization side required him to enter domains he was unprepared for.

In the early period of the company, the founder reported using his personal earnings from clinical practices to cover his human technical resources, reagents, and other operating needs. It was a difficult practical response to insufficient revenue and an uncertain market for locally developed technology. Then the COVID-19 pandemic hit, which became the venture's largest operational opening. It provided a major opportunity to demonstrate the relevance of local capability for the production of diagnostics since the international supply chain was severely affected. The success of the startup of a commercially in-demand product brought the

Trailblazer much sorrow. The intense competitive conflict presented a threat to the founder's safety. He painfully recounted regretting developing the technology.

"When the competition was so fierce, and it already involved personal safety. So, I didn't realize na yung importing business is also being protected because people are benefiting from the procurement, no? I was so naive, no? And I was so scared and worried. But at that particular point in time, I hated the day that I created the (technology) kit. I hated it. I wanted it to go away, and I want everything to go away."

Despite the threats, he didn't stop. He continued his work, developing diagnostics for infectious diseases. He was given accolades after accolades for his work. The trailblazer developed his own ecosystem, subsidiaries under his original venture. He described it as moving towards vertical integration. He created complementary functions for technological development, diagnostic services, quality feedback, commercialization, and specialized ethical support. His ecosystem extended outward, connecting academia, industry, and government. He now continues to push the boundaries, crossing over to diagnostics for non- communicable diseases and Artificial Intelligence in healthcare. He envisioned his startup as a frontliner in biomedical device development for marginalized patients and to push the Philippines to provide services to countries that share the same healthcare gaps.

b. Motivation and values

The Trailblazer had a persistent value of refusing to accept a restrictive status quo without inquiry. He questioned a proposition that certain things cannot be done or achieved, whether it's because of the costs or availability of a service. He always asked the question "*Bakit?*" or why. All of these restrictions deprived a

patient of the services or treatment that could answer his/her needs. He associated this disposition with an intuitive sense that the more difficult path could add meaning to his work. He mentioned:

"Well, for me it was more of like challenging the status quo kasi it's one of my principles in life. The ability to ask the question, 'Why not?' No? Pagsinabi nilang, 'Hindi pwede kasi toxic yan,' ang sagot ko palagi, 'Bakit hindi pwede?' I reached a point wherein, you know, that it's hard to explain, eh. It is, it is something that you feel in your gut that it's the right thing to do, and that if you pursue it, it will add more meaning to what you are actually doing."

He maintained being a physician and attended patients after patients, but conventional care alone could not resolve the barriers he saw. Innovation became a way of extending care beyond the individual consultation. His motivation was professional and existential. He wished to contribute to the community and country that had formed him.

He repeatedly focused on people who could not access available health services, especially diagnostics that cost from thousands to tens of thousands of pesos. He worried that technologies could be technically available yet economically or geographically out of reach. His vision was not to prevail against technologically advanced product developers in wealthier countries but to develop technologies and platforms adapted to communities whose constraints resembled those at home.

"There is a value in creating technology, providing profitability, and still serving humanity," he stated. This statement may be seen as contrasting, as it is on opposite sides of biomedical entrepreneurship. For this founder, financial sustainability was a necessity for diagnostic development, specialized personnel, and

other required resources. But service was necessary because an enterprise oriented only to the most affluent population "*does not sit well with him*" and fails to give meaning to his work.

The Trailblazer motivation was not only social in nature. There was an inward aspect as well. He narrated mentors and friends who recognized the potential of the work, helped obtain resources, advocated with decision makers, and encouraged him during the near-exhaustion point. These relationships worked as concrete resources that sustained him during the uphill journey. His family was an equally important motivation. He mentioned at the end of the interview how it was a vital part of his story.

"I think one thing that is also very personal is the work-life balance. Don't separate your family from your dreams. Make sure that they are a part of it so that when it's late at night, and you're not home, they will not wonder why you're not home yet. So that when they see you in pain, they understand why it is. And when they see you at your happiest, they also understand why, no? But making them, making them a huge part of your dream is the only way for you to attain some form of work-life balance. It's not perfect all the time, and that's okay, no? But if you make your family a part of it, every step of the way, they will be your biggest north star; that's how I see myself, to ensure my survival and my sanity at the same time."

The Trailblazer also used spiritual allusions of a higher being watching over his journey. He interpreted unexpected assistance or sudden breakthroughs in a seemingly impossible situation as divine providence. Alongside mentors and family, faith was read as protective resources within his narrated resilience process.

c. Challenges and Structural Constraints

His journey, like the other founders, has seen a lot of challenges. For the Trailblazer, he repeatedly connected financial challenges to the particular cost structure of diagnostic research and development. This indicated that competitive salaries for scientific personnel, research supplies and reagents, and organizational expenses needed sales or profit to keep the work moving. Earlier reliance on his clinic earnings has enabled continuity, but only to a certain extent. The startup programs and grants were also crucial to survival, but expenditure recovery remained difficult when local adoption was uncertain.

Current regulatory timelines proved also challenging for his venture. He described technologies that had remained without action for many months and very much delayed the innovation cycle. He was unsure whether those delays reflected protective regulations, competitor influence, or innate institutional slow pacing.

"Bureaucracy, red tape ng other government agencies in the, from regulatory to approval and all of that, hindi mo alam kung they're really trying to help you …. Or they are just simply slow, no? … but the effect of them all, whatever the reasons are, it delays the innovation cycle."

He made a related distinction between the academe's generative role and its operational limits. Academic institutions could support idea generation, research and a scientific basis for a company, but their procurement timetables were not designed for rapid commercial product delivery. The Trailblazer's decision to use the spin-off structure was an adaptation to overcome this challenge.

One of the strongest challenges was local technology adoption, even with his colleagues. Awards and technological development did not automatically create confidence among prospective users. He stated:

"Even if we develop a technology, kahit may mga awards siya or whatever, parang there is hesitancy for, for the local clients to, to take on a local technology compared to, uh, the foreign ones. So, it, it was always an uphill climb, no? All the way."

He interpreted this hesitation partly through a culturally rooted colonial mentality, always equating an imported technology to be superior to those locally developed.

Lastly, the participants' expertise in product development did not automatically transfer to people management. He discussed employees' differing motivations and the difficulty of finding *"the right fit"*. The venture created a leadership burden that was organizational and personal. He needed to learn all the business side from finance, marketing, governance, and human capital management since he could not hire senior experts to help him navigate the operations of a starting enterprise.

d. Adaptation, Resilience and Identity Reconstruction

Across this story, the Trailblazer repeatedly met an absence of resources. When a research unit lacked capacity, he developed a program and sought funding. When personal resources were insufficient for executive hiring, he used formal business education and faculty consultation. When academic procurement was becoming restrictive, he explored the spin-off venture for growth. These episodes form a consistent pattern of adaptive problem solving.

Effectuation logic (Sarasvathy, 2001) offered a restrained descriptive lens of his narrative. He began with who he was, his knowledge, his connections, his resources, then constructed possibilities from those means. His decisions also involved enriching himself with the Technology Transfer Act, business education, product quality protocols, and organizational planning. The stronger interpretation was a blend of situated improvisation and deliberate capacity building.

The founder framed resilience as he described: *"the feeling of exhaustion and the point of giving up every night"*, but renewed vigor and urgency the following day to return to his endeavor. He also returned frequently to the idea that a dream requires action, movement, and progress despite uncertainty.

"So, the lesson I have learned is, don't be afraid to dream big. Think bold… start somewhere and then just persevere. Kasi sometimes hindi mo naman pwedeng gawin yung buong lahat ng pangarap mo all in one day. But the first step is the most crucial part. So, at the end of the day, the battle is between you and your dream, no? You have to ask the question, 'Do you want it? Do you want the dream?' If you say no, then it's no. If you say yes, you just keep moving on a personal level, uh, sabi nga ng mentor ko, 'Have a dream, start somewhere, and then persevere'."

This was not just a complicated pursuit of external validation or material return. He spoke more of internal and personal. He found meaning in how he had existed and contributed a significant difference to the community that nurtured him.

Richardson's Resilience Theory (2002) may be useful in a limited, process-oriented sense. The Trailblazer's narrative described disruption, access to protective factors, a reorientation of action, and a continuous process of meaning-making. Mentors and family were part of the protective relationships. While patients and clinical

exposure supplied a recurring purpose, faith tied down the entirety of the unpredictable direction of the journey. He made formal learning and organizational restructuring coping resources. The Meta Resilience theory (2002), in his narrative, may not be used to claim that the founder became stronger after every adversity. The Trailblazers story documented the resilient action as a relational and iterative process under continuing pressure.

Lastly, the Narrative Identity Theory (Polkinghorne, 1995; McAdams, 2018; Clandinin & Connelly, 2000) helped illuminate how the founder knit roles into a coherent self-story. He entered as a clinical scientific specialist. He became an institutional builder when he created a program under sparse conditions. He crossed into entrepreneurship and pushed for a spin-off from the university. He became a learner of finance, marketing, governance, and people management. He became an ecosystem architect when he built integrated functions and external partnerships.

All these earlier identities were not sequential, not disappearing when another emerged. These were all layered, intertwined, and held together. His scientific expertise provided credibility, while his clinical care supplied the inspiration. The entrepreneurial side created a pathway for product development, and his leadership role focused on the integration of people and function. He positions this as something permanent and cemented to his persona:

“It has already got ingrained into my DNA that I just can't leave that. I can't turn my back anymore. Second is, if you want to have the biggest dream. You need to take the boldest risk; I think it's called audacity in a good sense, wherein you need to be audacious to take the bold risks if you want to take the biggest dream in your lifetime.”

His journey had created a personality, an identity that had evolved into someone who found his meaning and purpose.

“Not that there is, not that being a doctor is not meaningful enough. It's absolutely meaningful. But it's, I don't know how to explain it. It's that feeling in your gut that you're supposed to do something that is beyond comfortable. I started somewhere in 2013 for (startup), and I'm still here, persevering. To get to the next level, I think we're almost there. May mga challenges pa rin kami hanggang ngayon, pero it's an unexplainable feeling in your gut na parang, I'm almost there, I'm almost there."

e. Vision and Message to Innovators

The Trailblazer envisioned a future in which domestic biomedical innovation would become a regional front-runner in diagnostics, particularly for marginalized communities and countries facing similar resource conditions. He pushed for technological fit: solutions that respond to the environment, disease burdens, and healthcare gaps.

This founder was adamant about more enforceable uptake of local innovation. He argued that existing policies supporting domestic products required stronger implementation and political will. He saw the need to connect the push of research and technological development with the pull of procurement and adoption. In his narrative, local innovators could develop viable products yet still be displaced by imported alternatives because clients, institutions, regulations, and procurement practices have no clear pathway for local uptake.

For aspiring innovators, the Trailblazer encouraged them: though the journey is long and difficult, never give up on your dream.

“It's very challenging kasi the path is not easy. So, siguro ang masasabi ko lang sa kanila is, if you really believe in what you are trying to achieve, hold on to that dream, no? And no matter how difficult the passages are, use that dream as your north star and just keep moving forward and just keep moving. Help will come at all points, at every corner.”

B. Cross Narrative Synthesis and Theoretical Integration

This section compared the eight founder narratives side by side to examine the biomedical innovation journey started, sustained, interrupted, redirected, and continued. The unit of analysis remained the founder’s narrative. Consistent with the constructivist-interpretivist narrative inquiry, each journey was read across temporality, sociality, and place (Clandinin & Connelly, 2000).

Five recurring narrative thresholds organized the comparison:1) arrival; 2) building and validation; 3) regulatory qualification; 4) procurement and adoption; and 5) Internal and external environment. These thresholds were passages, not fixed stages. They may overlap, remain faint, recur after a pivot, be delayed or foreclosed, or re-enter after withdrawal. The common analytic sequence was therefore not the chronology but the passage. Within each threshold, the analysis identified the triggering condition, founder action, enabling or constraining relations, interruptions or turning points, and the forward movement. This preserved the non-linear character of the innovation journey (Van de Ven et al., 1999; Coyne & Van de Ven, 2024). But

these thresholds were inductively derived from the narratives and not through methodological literature.

Across the eight accounts, the central movement was from engagement with concrete clinical or social problems toward an innovation that becomes legitimate, adoptable, and socially accessible. The founders entered through different relational and professional circumstances and built improvisation. Their routes diverged more sharply when a working technology must become qualified and procurable. Persistence, redirection, withdrawal, and re-entry were therefore treated as outcomes of particular encounters rather than consequences of a single linear path. The eight purposely selected accounts support situated interpretation and should be taken into context rather than outright generalization.

The eight founders' innovation journey, across calendar time and narrative thresholds: arrival, building and validation, regulatory qualification, and market adoption, as seen in Figure 4.1. Each horizontal line represents one founder and positions significant events according to their narrated chronology. The said journey map is not an assumption of fixed or uniformly sequential stages. Instead, it is a visual representation of the different durations, interruptions, and rates of movement within each journey.

The journey map shows that founders did not move through thresholds at the same pace or in a uniform sequence. Some journeys progressed steadily, while others were interrupted by extended development periods, regulatory obstacles, weak market uptake, or the need to change direction. The Builder's trajectory stalled at regulatory qualification, where product registration limited movement toward wider commercialization. The Steward and the Trailblazer experienced poor market uptake.

Similarly, the Strategist reported approximately three years of poor uptake among local government units before finding a more viable market route in the private practice. The Optimizer shows a different form of delay, spending about four years building and refining the platform before bounded deployment became possible. These trajectories distinguished technical completion from regulatory eligibility, market entry, and sustained adoption. Other founders advanced through partnerships, funding support, institutional spin-offs, or changes in their operating strategies.

The map should therefore be interpreted as a comparison of narrated movement rather than as a standardized stage model. Thresholds could overlap, recur, be delayed, or remain incomplete. Where arrows extend beyond the last documented event, they indicate the founder's anticipated direction rather than an achieved outcome.

1. Threshold One: Arrival or Entry

Triggering condition. Entry was relational and problem-led rather than the result of a deliberate market search. The Builder began with a colleague's consumer-grade fabrication equipment; the Steward through a return-of-service obligation; the Optimizer through a friend's invitation; the Catalyst through a socio-civic network; the Anchor entered following a personal crisis. The Collaborator, the Strategist, and the Trailblazer began in technical or clinical roles where the healthcare gap became visible before commercial intent formed. These routes-serendipity, obligation, invitation, network convergence, biographical discontinuity, and professional exposure- differed, but the entrepreneurial intent generally followed engagement with the problem.

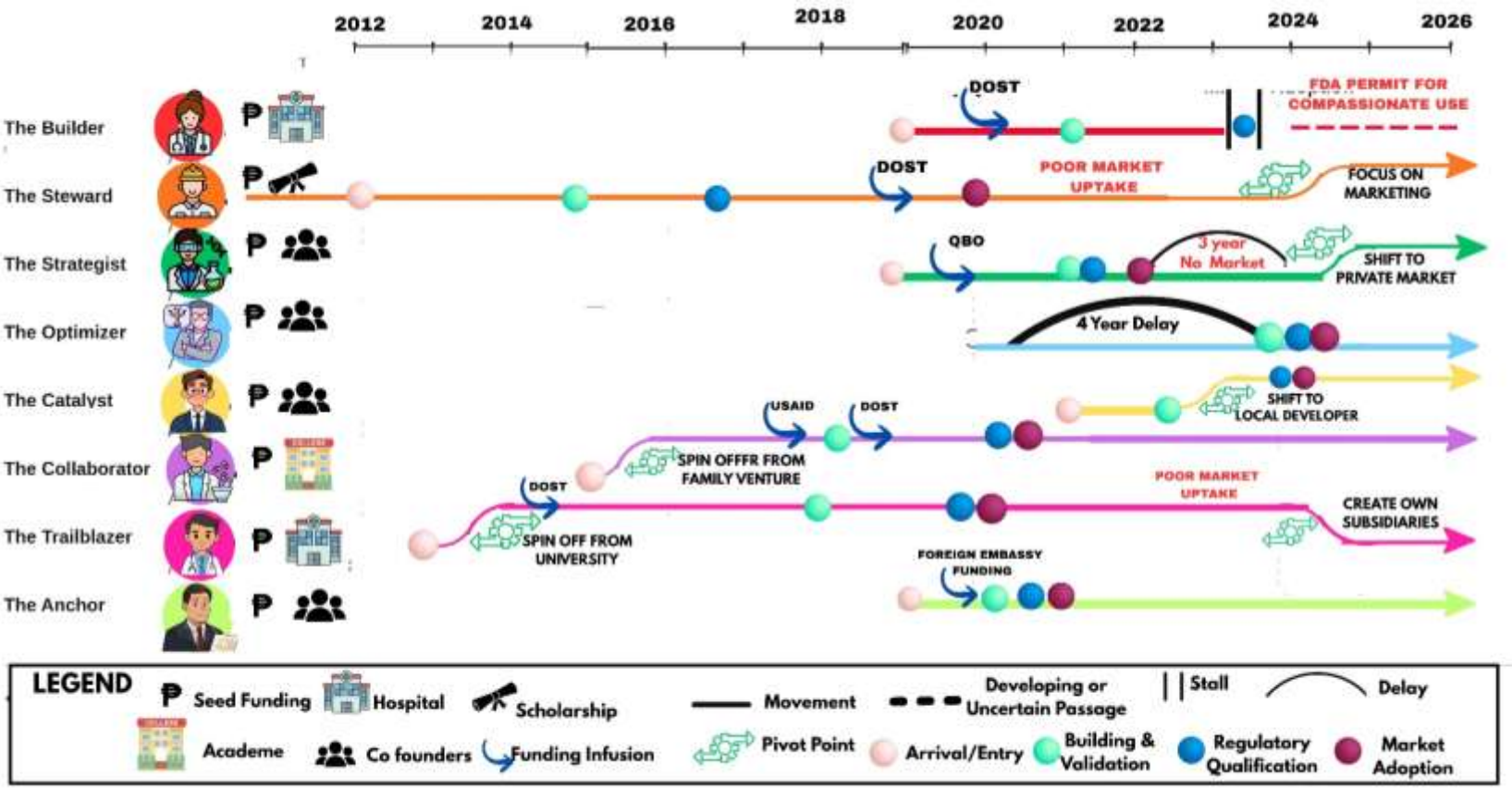
Founder action and strategy. Founders converted their available resources – their knowledge, equipment, professional roles, and relationships into initial capacity

to put up the venture. This pattern is consistent with the Effectuation Logic Theory (Sarasvathy, 2001; Fisher, 2012), where founders begin from available means, namely who they are, what they know, and whom they know. The Builder has her hospital institution, the Steward his predecessor's provisions, the Catalyst his socio-civic network, and the Anchor his working relationship with the foreign embassy.

Enabling and constraint context. The immediate enabling relations were hospital employment for the Builder, sponsorship for the Steward, a family enterprise and academic alma mater for the Collaborator, a professional friendship for the Optimizer, a socio-civic organization for the Catalyst, a government laboratory for the Strategist, an international network for the Anchor, and an academic position for the Trailblazer. These relations provided the venue to witness the problem firsthand and gave them access to resources. The same resources also became a constraint on how limited their initial movement and capacity would be. These varied among the founders and depended on their positions and capacity.

Turning point and interruption. A beneficiary-centered purpose converted a visible healthcare gap into a commitment to an innovative solution. The Builder identified the need for an affordable technology and procedure for their patients. The remaining narratives have similar orientations in different needs: unavailable affordable implants for the Steward, accessible local medicines for the Collaborator; affordable diagnostics for the Trailblazer; lack of accessible, effective primary healthcare for the Catalyst; the long and complicated clinic waiting time for the Optimizer; reliable health data for the Strategist; and mental health services for theAnchor. These findings confirm the mission-driven orientation described in Philippine entrepreneurship literature (Jarabe et al., 2025; Vadil et al., 2023). Additional motivational logics derived from the narratives are presented in Table 4. 2

Figure 4.1. Cross-Narrative Journey Map of Eight Biomedical and Health Technology Founders in the Philippines Across Four Innovation Thresholds.



Note: Temporal positions are based on the founders' narrated accounts and available supporting records. Colored nodes represent the four narrative thresholds, while symbols identify selected enabling conditions, funding events, pivot points, delays, and obstructions. The figure presents significant events and does not represent every activity undertaken by each venture.

Table 4.2

Motivational Logics Across the Eight Narratives

Motivational Logic	Founders	Representative formulation
Equity of access	Builder Trailblazer Steward Catalyst Anchor Collaborator	Locally produced technology as a direct response to cost and distance as barriers to care or unavailability of healthcare services
Technological sovereignty	Collaborator Steward Trailblazer	Reversal of a raw-material mindset but believes that technological innovation capacity can be developed locally
National and generational repair	Strategist Anchor	More employment for Filipinos, making working abroad an option, not a requirement”
Civic Duty and Servant Leadership	Catalyst, Optimizer	The venture is framed as a social enterprise and as a continuation of civic commitment
Faith and providence as an operative frame	Optimizer, Trailblazer	Volunteered declaration of faith on how a “higher being” has a purpose for the venture
Inherited obligation and legacy custody	Steward	The venture held in trust for a founder’s purpose rather than pursued return

Consequence for onward movement. This first threshold produced commitment and a relational platform but not a complete venture plan. The initial motivation later sustained persistence, redirection, or return. It carried founders into development with questions on capital, initial personnel, and institutional access.

Financial concern began during this passage but continued recursively into the next. The Strategist and his co-founder used their savings, while the Trailblazer paid personnel and operating costs from clinical earnings.

Grant evidence was noted in five narratives. The Builder, the Collaborator, and the Trailblazer reported national science-agency support; the Strategist from an international development organization after local rejection; while the Anchor through a foreign embassy grant. The Steward, Catalyst, and Optimizer did not report an initial grant route. Grant-enabled development, but it could be mismatched depending on the product that the startup is producing.

2. Threshold Two: Building and Validating Under Constraints

Triggering condition. The second passage began when commitment had to be translated into a working technology. All eight founders described reaching a functioning product. The pandemic was a founding condition for the Strategist, the Catalyst, and the Optimizer. On the other hand, the other three founders noted that the pandemic was an accelerant of the work already underway: the Builder, Trailblazer, and the Anchor. The Anchor adds that COVID brought to the surface a long unaddressed concern on mental health: “Mental health has always been a prevalent crisis, a silent crisis, basically, unaddressed. And then when COVID happened, it completely lifted it to the surface”. This convergence is consistent with the lemonade principle in the effectuation theory under which unforeseen contingencies are leveraged (Sarasvathy, 2001; Fisher, 2012). It is likewise consistent with Van de Ven et al. (1999) observation that the initiation period is typically set in motion by a shock or a turning point that mobilizes resources. The pandemic appeared to have functioned in precisely this way for the majority of the participants. The other

two founders saw the pandemic as largely immaterial to their venture as both the Steward's and the Collaborator's venture as it predates its development.

Founder action and strategy. Building proceeded through improvisation, phased release, partnership, and repeated recombination of available resources. The Builder moved from consumer-grade equipment to a heavy-duty clinical device. The Strategist and his cofounders sustained the development through their salaries and "odd jobs". The Catalyst abandoned an outsourced platform after six months and rebuilt it from scratch. The Optimizer released platform features in bounded increments over the four-year development period

The Collaborator used academic partnership to augment the lack of technical experts, while the Trailblazer financed the wages of his scientific personnel through intervals constrained by these founders. The Optimizer's four-year construction period for his platform, the Strategist's three-year absence of a paying client, and the Collaborator's account of delayed return due to long registration waiting time highlight that time itself became a resource constraint. The "valley of death" occurrences described in translational literature (Miller 2009; Parrish et al., 2019; Truebel & Thurston, 2020) were experienced and seen in their stories as the startup continued technical work without a reliable venue.

Turning point and interruption. As earlier mentioned, three founders saw the COVID-19 pandemic as the turning point because it accelerated their work and even the adoption. The Builder stated, *"COVID actually gave us the push that we needed,"* while the Trailblazer's diagnostic kit was able to gain market share since the international supply was disrupted.

Consequence for forward movement. The build passage produced differentiated positions rather than a uniform transition to market readiness. Some ventures moved toward formal qualification; some combined building, validation, and early use; some launched in bounded settings, and some returned to development after feedback or failure. Technical achievements therefore opened the next question rather than resolving the journey: which user, authority, purchaser, or institution would recognize the technology as legitimate and usable? When the answer remained uncertain, founders paused, narrowed the offer, sought another partner, or carried development and market search simultaneously.

3. Threshold Three: Regulatory Qualification

Triggering condition. Regulatory qualification became salient when a working technology had to become recognizable to an authority or administratively operable as a venture. Its form varied with product type, venture size, and institutional context. Device and pharmaceutical founders described direct product qualification; digital and service ventures more often described business registrations, taxation and data protection compliance. The Catalyst and Optimizer encountered product qualification only faintly compared with device and pharmaceutical accounts; the Anchor's passage was primarily administrative and data protection related. Threshold three was therefore neither equally visible nor uniform for all eight journeys.

Founder action and strategy. The Builder sought a formal route for patient-specific customized devices and continued through authorization for individual clinical use while the broader commercialization route remained unavailable. The Collaborator invested time and resources to understand requirements and prepare

for regulatory hurdles. The Trailblazer continued submitting technologies despite long registration timelines. The Strategist and the Anchor both learned to navigate taxation, registration, filing, and dispersed administrative processes as part of venture leadership. Across these actions, founders sought to become credible institutional experts and well-versed in the business and regulatory guidelines to evade oversight.

Enabling and constraining context. Table 4.3 distinguished the reported forms of obstruction from the perspective of the biomedical founders. These are missing categories: proportionality; duration and transparency; bureaucratic red tape; taxation and business-registration ambiguity. These categories should not be treated as one uniform regulatory failure. For the Builder, the missing category obstructs wider use of the technology in other medical specialties and the commercialization pathway. For the Collaborator, the issue was proportionality of the technological capacity of startups with the regulatory bar set for product registration. For the Trailblazer, the long registration timelines, as he stated, *"delay the innovation cycle*". For the Strategist and the Anchor is more of the fragmented business registration process. These differences explain why the passage redirected some ventures strongly and remained faint in others.

Turning point and interruption. Qualification interrupted the assumption that technical validity would carry a venture forward on its own. A device or technology could be used in individual cases yet remain outside a registrable commercial class. A pharmaceutical company could practice strategic phasing of commercialization of products in order to regain capital. A digital founder could launch limited features while awaiting a full platform. The interruption was not just waiting; it changed product scope, founder work, and timing of market entry.

Consequence for onward movement. Founders responded through persistence, anticipatory learning, workaround delay, or redirection. The Builder's case

shows work-around delay with a spin-off route to overcome the obstacles encountered. The Collaborator institutionalized recursion between development and qualification by preparing products over time. Regulatory qualification was therefore a variable passage, not a universal gate only crossed once. It was also dependent on the technology being developed.

No founder advocated lower regulatory standards. The common request was clarity, categorical coverage, proportionality, consistency, and predictable timelines. The Stewards' proposal for priority processing for local manufacturers. This distinction is important to the biomedical innovation journey: founders represented rigor as compatible with legitimacy and adoption, but unpredictability and mismatch as forces that could prolong, redirect, or foreclose the venture's movement.

4. Threshold Four: Procurement and Adoption

Triggering condition. This passage began when a working, qualified innovation had to be taken up and sustained by purchasers, providers, employers, or users. It is the point at which narratives most clearly separate technical completion from commercial realization. The strongest supported pattern concerns the Steward, Strategist, Trailblazer, Anchor, Builder and Collaborator. The Catalyst and Optimiser do not narrate the same obstruction and are treated as negative cases.

Founder action and strategy. The Steward's company has accumulated patents and products from decades of research and development, and he states the outcome plainly: *"We never captured the market".* The Strategist responded to the prolonged low uptake among public sector clients that led the startup to pivot toward private-sector customers to generate revenue. The Trailblazer continued to seek domestic market confidence despite internationally recognized, *"There is hesitancy for local clients to take on local technology compared to foreign ones, so*

it was always an uphill climb". The Collaborator described academic research completed decades ago for which, in his words, *"no takers in the industry".* The Anchor sought companies and employers that treat mental health as an investment in their manpower rather than discretionary cost. The Builders maintained clinical use within the institution while pursuing a spin-off route.

Enabling and constraining context. Adoption depended on relations with organizational buyers rather than on individual clinicians alone. Hospital procurement units, local government units, employers, insurers, private clinics and institutional partners could validate and finance continued use. They could also decline, delay, or redirect it. The Steward and Collaborator described development funding and purchasing as disconnected. The Steward stated:

"So, they spend money to develop products. But then they spend more money to buy products that are not developed locally. For example, … if we need this particular implant, why don't we bid this out to a local company … These are simple, established products already. So, if they say, okay, we'll buy everything from whoever, you know, develops this, then obviously, bibili namin yan din finund namin yan. Ang problema kasi, I think, is (Government Agency) is funding it, but (different Government Agency) is the user."

The Collaborator had a similar perspective, saying that: *"So, on the other hand, the (Government Agency) is encouraging Filipino manufacturers to do research and to do these things to make our own technology. But on the other hand, the (Government Agency) is not open to technology, and they want to kill the technology that is being developed also by the government. What the industry should really do,*

kasi … binuhay ka nga ng gobyerno , yung papatayin ka naman on the other side. So parang walang … walang a whole-of-government approach in those terms."

Table 4.3

The Distinguishable Regulatory and Administrative Code Families from Founder's Narratives

Problem	Code Family	Founder	Object of the Obstruction
Missing Categories	Regulatory Ambiguity or Regulatory Gap (9)	Builder Collaborator Catalyst Trailblazer	Absence of a registrable category of settled rules for product
Proportionality	Misaligned Technology vs Regulatory (6)	Collaborator Steward Trailblazer	Regulatory standards are more advanced than the technological capacity, based on the capability of multinationals
	Unfriendly Taxation (6)	Strategist, Builder	Fiscal treatment of pre-revenue firms
	Bureaucratic Red Tape (11)	Collaborator Optimizer Anchor Trailblazer	Procurement approvals, interagency fragmentation, manual submission to a regulatory agency
Duration and Transparency	Lengthy Regulatory Process (6)	Collaborator Steward Trailblazer	Duration and transparency of assessment, requirements calibrated to the capability of large multinational firms
	Business Registration Ambiguity (2)	Anchor	and absence of consolidated registration pathways

Note: Figures in parentheses are coded segments recorded in the 11 coding audits and indicate coding density

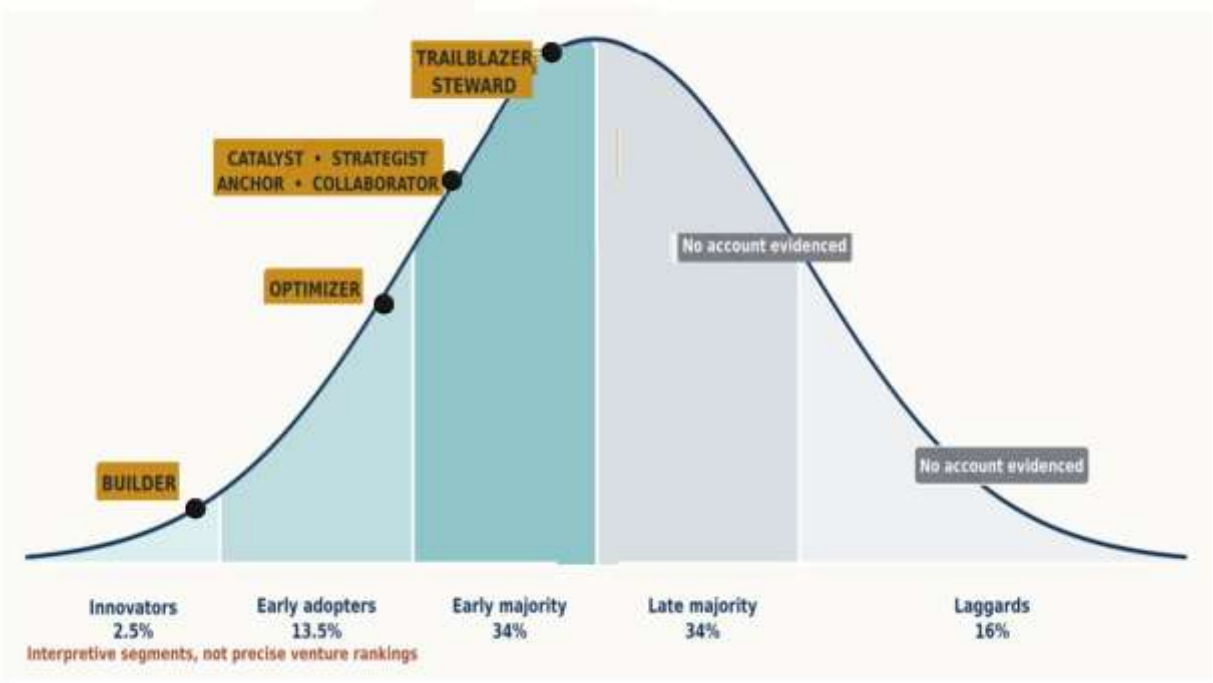
The Diffusion of Innovation Framework frames technology adoption as governed by the perceived attributes of the innovation, the characteristics of the adopters, communication channels, and the social system (Rogers, 2003). In the narratives, the relevant adopters extend well beyond individual clinicians. It included

hospital procurement units, human resource decision-makers, local government units and insurance administrators. Figure 4.1 provides an interpretive view of the venture's diffusion status based on the founder's accounts. Most remained in the early majority, while one founder is still in the innovator phase and another in the early adopter.

Turning point and interruption. The decisive interruption was the failure of validation to produce dependable revenue. Rogers' (2003) diffusion framework extends beyond the clinical and goes to the organizational actors and players, which is also consistent with Greenhalgh et al. (2004) in locating adoption with the organizational conditions rather than technical merit. From the founders' perspective, a product could function, receive recognition, or be used in a bounded setting without being procured or sustained, and there is no pathway for the return of investments.

Consequence for onward movement. The ventures diverged through the pivot, stalled continuation, recursion, bounded option. The Strategist bypassed a weak public route and generated private-sector revenue. The Steward suspended research and development to rebuild commercial capability, treating withdrawal from further development as strategic reintegration rather than abandonment. The Trailblazer continued to build capabilities and his own ecosystem. The Anchor continues institutional engagement while absorbing economic swings due to exchange-rate pressure. These consequences show why development funding and market adoption were interconnected rather than separate problems. The Trailblazer stated this recursive mechanism directly: *"So, isipin mo, you're putting out significant resources to create something, but you 're having difficulty convincing local adaptation to buy it. So yung recovery na expenditure is, is very challenging. So, you don't have enough resources to continue your work, to build better technologies."*

Figure 4.2. Interpretive positioning of the eight biomedical startups along Roger's Diffusion Innovation Curve.



*Note: Venture placement is an **analytic interpretation** of reported adoption trajectories. Roger's categories formally described adopters, not ventures. This study did not survey adopters or measure market shares. According to the figure indicate approximate diffusion status rather than an empirical adoption distribution. Adapted from Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press*.

Weak uptake, limited cost recovery, limited cost recovery constrained renewed development. Capital shortage and adoption were therefore experienced as two sides of the same passage. When procurement or reimbursement did not create a revenue path, founders returned to product revision, sought another customer segment, continued self-financing, or took a strategic pause.

5. Threshold Five: The Systemic Environment and the Founder Identity – Relational Reconfiguration Across the Journey

Triggering condition*.* The fifth threshold is not a terminal ecosystem stage. It becomes visible whenever onward movement requires founders to reconfigure relationships with government, academe, industry, or community. These relations were encountered during entry, building, qualification, adoption, withdrawal, and re-entry. They supplied resources, legislation, legitimacy, feedback, service, settings, resistance, and demand. This threshold therefore describes how founders positioned and repositioned their ventures within those relationships.

Founder action and strategy*.* Founders sought different relational routes. The Builder used a hospital innovation unit and later considered a spin-off. The Collaborator combined academic and commercial work while learning the institutional language of regulation. The Strategist moved from a government laboratory and pushed towards private clinic partnerships. The Catalyst worked through a founding peer group, insurance systems, local government, and communities. The Optimizer developed a professional invitation, user feedback, team-based iteration, and bounded private rollout. The Anchor combined foreign support, enterprise clients, and continued institutional engagement. The Trailblazer recursed among clinical work, academe product development, qualification, and complementary ventures. The Steward withdrew from an attempted scale route and suspended research and development to rebuild commercial capacity.

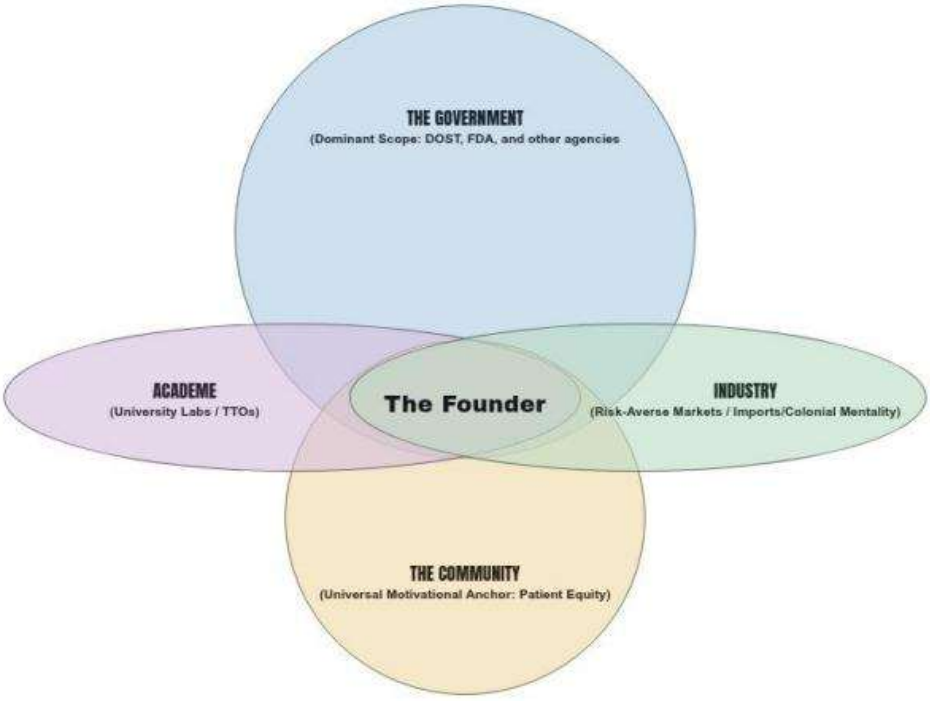
Enabling and constraining relations. Academe provided laboratories, partners, and legitimacy but could restrict commercialization through mandate and process. Industry and private organizations supplied clients and revenue but also

organizations with risk-aversion or weak willingness to pay. Government and development institutions funded and authorized work while founders encountered delays, fragmented administrative processes, and limited market support. Communities supplied feedback and purpose, while presenting affordability and acceptance constraints.

a. Relations Encountered across the Journey

Figure 4.3 summarizes the four relational domains narrated by the founders. Its unequal spheres reflect coding density, not independent institutional influence, where the pervasive hand of the Government and the vast unaddressed clinical needs of the Community represent the dominant scopes defining the journey environment. The figure represents relations encountered during the journey rather than an ecosystem taxonomy.

Figure 4.3. Asymmetrical Relational Domains encountered by the Philippine Biomedical Startup Founders.



Turning point and interruption. The same relationship could change function over time. The academic institution could enable validation and later limit commercialization. Public funding could support development, while another process delayed qualification or procurement; industry could reject one route and provide revenue after a pivot. Lastly, community needs could sustain purpose while affordability could affect its market share, as mentioned earlier.

b. Adaptive dimensions within the Innovative Journey

Resilience and narrative identity explain how founders continued after obstacles and interruptions. These two are not separate entities. As per Richardson's Meta Resilience Theory (2002), reintegration is predominantly individual or ritualized resilience for the Strategist, Builder, Anchor, and Trailblazer. While team or group resilience was seen for the Catalyst and Optimizer, and organizational or strategic resilience was seen for the Steward and Collaborator. These loci were overlapping tendencies, not outcomes determined by venture structure. Founders could combine personal practice, team support, beneficiary commitment, acquired commercial literacy, organizational redesign, and faith at different points of their journey.

Identity was reconstructed through the same events. The Builder, Steward, Collaborator, Strategist, and Anchor narrated sequential reconstruction as later roles accumulated through new demands. The Strategist described it as*: "Creating this business is a journey to the self. It made me a better person … because the business will highlight all your flaws, all your strengths."* The Trailblazers displayed layered accumulation: clinician, scientist, institution builder, entrepreneur, and ecosystems architect, concurrent and mutually reinforcing roles one on top of the other. These roles are not separate from one another, where his scientific expertise

supplied credibility, clinical practice provided motivation, and entrepreneurship provided pathway and direction. He characterizes the composite as permanent rather than assumed: *“It has already got ingrained into my DNA …. I can't turn my back anymore. "*

The Catalyst provides principal negative evidence against universal transformation. He entered as an experienced entrepreneur, so his account shows intensified purpose rather than a new professional identity:

"In terms of passion, in terms of eagerness to work, compared to my different businesses before…Kasi nakakatulong kami. Yun yung malaking difference nitong business na to compared to my other businesses."

The Optimizer’s case is an intermediate case. He moved from an outsider into co-founding leaders and said the experience: *" has affected me personally, really to changed me 180 degrees on how I think about the company and so as leading new people.”*This could be attributed to being part of the venture for around five years; his account may not yet show the meta-resilience as described by Richardson (2002) for the time being.

Across the cases, resilience and identity describe related adaptive arrangements. The founders whose reintegration is organizational and strategic: the Steward and the Collaborator are among those whose identity narratives are sequential and positional, moving through defined roles within an institution. The founder whose identities accumulate rather than succeed one after another also has an individualized resilience. The founders whose identities show the least reconstruction are the same founders whose resilience is distributed across the team. These are cross-case interpretations grounded in the founder’s narrated experience.

Chapter V

CONCLUSION AND RECOMMENDATIONS

Summary of the Study

This study examined how founders of biomedical and health technology startups in the Philippines narrate and construct meaning from their innovation journey, from ideation through commercialization of a product. Studies of the biomedical innovation ecosystem in the country have documented structural barriers such as regulatory barriers, limited access to funding, weak university and industry linkages, and constrained market access (Teves et al., 2023; Hu et al., 2022; Perez et al., 2024). The said literature, however, has limited information on how founders themselves experience, interpret, and manage that condition through gained knowledge, adaptive strategies, and relational practices that formal innovation management frameworks do not capture.

The central research question was: **What are the narratives of biomedical startup and health technology founders in the Philippines as they navigate their innovation journey from ideation to the market commercialization of their product?** Specifically, the study aimed to describe the backgrounds, entry points, formative experiences, opportunities, and motivations that shaped the pursuit of biomedical innovation and health technology in the country; to examine how founders retell or re-story their experiences of navigating technical, regulatory, financial, and market-related challenges throughout the innovation journey; and to synthesize the envisioned future of biomedical innovation from the founders' narratives, advocating mechanisms for the biomedical innovation and health technology ecosystem.

Guided by a constructivist- interpretivist paradigm, the study used narrative inquiry as its design. Eight founders participated and were purposively selected through criterion-based indicators of venture and a minimum of three years' involvement with the startup. These founders also represent four categories of biomedical and health technology development.

Data was gathered through semi-structured narrative interviews conducted online. Verified transcripts were reconstructed as chronological narratives and returned as individual narrative profiles for member checking. Coding and cross-narrative synthesis examined convergence, divergence, and negative or qualifying cases. Documentary materials supplied by the participants and available publicly served as a means of triangulation. Credibility, dependability, confirmability and transferability were supported by member checking, peer debriefing, and audit trail and reflexive journaling (Lincoln & Guba, 1985).

The journeys were synthesized through five non-linear thresholds that emerged inductively from the accounts themselves. These are arrival or entry; building and validating under constraint; the technology, regulatory qualifications, procurement and adoption, and the systemic environment as well as founder identity. These were narrative passages that could overlap, recur, remain faint, be delayed, or be terminated. These narratives were based solely on the founders' perspective of the selected respondents, not representing other actors involved in the innovation journey

Summary of the Findings

This section is organized based on the study's research objectives.

In response to Objective 1 on the backgrounds, entry points, formative experiences, and motivations of the founder, the following findings were identified. Entry was relational and problem-led rather than an intentional search for a commercial opportunity. Business intentions generally followed engagement with a concrete health care or social problem. Initial entry depended largely on founders' position and relationship, aside from seed capital.

The different founders' work converges to a single motivational anchor. All of their narratives accounted for continuation work on patient-centered motivation. Other motivational logics were identified, namely equity of access, technological sovereignty, national and generational repair, civic duty, faith, and inherited obligation. This beneficiary-centered purpose serves as initial motivation and sustainable force through the obstacles of the innovation journey.

Third, prior professional position and social relation were enabling conditions of entry, while funding, institutional restrictions, and technical manpower were constraining ones. All eight narratives were carried at some stage on the personal resources of the founder or the founding group.

The first threshold addressed the first objective; it was therefore not a uniform entrepreneurial decision but a relational passage in which exposure, available ties and resources, and responsibility to beneficiaries converted a problem into actions. There was one noted exception, but it did not overturn this pattern.

In response to Objective 2 on retelling the navigation of technical. regulatory, financial, and market-related challenges, the following findings emerged. All eight founders described reaching building and validation of a functional and market-ready technology, but this does not automatically equate to regulatory qualification or market adoption. They advanced through improvisation and resource combination – phased release, self-financing, partnerships, rebuilding, and continued testing during the pre-revenue interval.

The COVID-19 pandemic is a decisive turning point for majority of the founders; three founders saw the crisis as the founding condition of the venture, while the other three as an accelerant of the started work.

Regulatory qualification varied by product, venture, and institutional context. Biomedical product development encountered concerns on product categories, evidentiary requirements, assessment periods, and feedback, while digital health technologies more often met registration, taxation, data protection, and procurement. First were a problem of missing categories, speed, clarity, categorical coverage and proportionality and consistency of health technology regulation, which domestic startup innovators seek regulatory improvement. Across these differences, founders sought clearer categories, proportional requirements, useful feedback, consistent administration, and predictable timelines.

Procurement and adoption formed the decisive transition after validation. Direct cases appeared in the Steward, Strategist, Trailblazer, Anchor, and Builder narratives; the Collaborator contributed a qualified case centered on industry translation and absorptive capacity to have the technology adopted by the systems that require it. The Catalyst and Optimizer were negative case narratives; the binding constraint appeared

at the point of procurement and adoption: the former was sustained through national health insurance partnership as well as local governments, whereas the latter reached out to private deployment. These variations distinguish a functioning output, qualification, bound use, sustained adoption, and scale.

Financing and adoption were mutually constraining. Weak uptake limited recovery of development costs. Limited recovery of costs will limit further product development, staffing, and qualifications. Grants could sustain technical work but could not substitute for procurement, reimbursement, institutional purchasing and other dependable revenue paths. The central financing difficulty thus extended beyond early capital to passage from validated output to continuing demand.

Resilience and identity developed through these encounters as an interrelated adaptive architecture. Resilience may be seen as Individual or ritualized reintegration most visible for the Strategist, Builder, Anchor, and Trailblazer, team-distributed adaptation for the Catalyst and Optimizer; and organizational or strategic reintegration for the Steward and Collaborator. On the other hand, the identity reconstruction of the founders was noted to be sequential for the Builder, Steward, Collaborator, Strategist, and Anchor, and layered for the Trailblazer. The Catalyst showed continuity and deepening of an entrepreneurial identity, while the Optimizer occupied an intermediate or partial position in terms of identity reconstruction. Continued movement enabled reinterpretation of self, while identity and beneficiary commitment supported persistence, redirection, withdrawal and re-entry. The transformation noted was therefore not universal.

Identity reconstruction was a variable outcome of the innovation rather than the necessary consequence of it. Sequential reconstruction, in which the self-story moves through a series of positions which supersede the last, was observed in five cases. Layered accumulation, in which roles are concurrent and mutually reinforcing, was observed in one. Continuity and deepening, in which what changes is not the identity but the intensity, was observed in two narratives. The last modality of identity reconstruction was the study's principal negative evidence with respect to transformation. Placing this together with the resilience finding, the same adversity appears to be metabolized differently depending on the identity configuration the founder brings to it. Resilience and identity, therefore, are best understood as two descriptions of one adaptive architecture and should not be treated separately.

In response to Objective 3 regarding the envisioned future of Philippine biomedical innovation and health technology, it was a projected continuation of each journey. Scale remained prospective and uneven rather than a shared achieved endpoint. Founder proposals clustered around five clusters that had constraints during their journey. These are regulatory improvement without deregulation; alignment of development funding with regulatory procurement and adoption; funding designed for the pre-revenue interval; simpler, digitalized, better-coordinated fiscal and administrative processes; and stronger human as well as institutional capability through increased entrepreneurial, financial, technical, collaborative, and translation capacity. These proposals were grounded in narrated experience and remain directions for future policy solutions.

The message for future biomedical startup founders and innovators emphasized collaboration, early attention to a paying market, and adaptive

persistence. Collaboration addressed limits in expertise and resources; market attention would focus product development not only on the need but also on the demand and possible revenue path; persistence and resilience meant revising, seeking allies, pausing, and redirecting efforts. These messages summarize the range of narratives without claiming uniform generalizations.

Together, these findings support the study's conclusions: the founder's entry to the innovation journey was relational and problem-led, with beneficiary-centered purpose sustaining action; the decisive transition from validation to procurement and sustained adoption; regulatory passage varied by product, venture, and context. The founders consistently sought clarity, proportionality, feedback, and predictability; resilience and identity formed an adaptive architecture for continued or redirected movement.

Conclusions

Based on the narrative journey of the eight diverse biomedical founders in the Philippines, this study yields these core conclusions.

First, the innovation journeys began through relationships, professional positions, and direct encounters with clinical or social problems rather than through deliberate market opportunity recognition. Existing roles and networks provided the founders with access to problems, knowledge, collaborators, and initial resources. Business intention generally developed after engagement with the perceived healthcare gap. Although their entry routes differed, continued participation

was anchored in identifiable patient groups, communities, or future beneficiaries. Motivation functioned both as initial and sustaining logic throughout the journey.

Second, the most consequential transition in the journey was not from idea to technical feasibility but from validated technology to procurement and sustained market adoption. The founders demonstrated an ability to build and validate biomedical innovations through improvisation, resource recombination, and existing personal and professional networks. However, technical viability did not consistently lead to revenue or clinical acceptability. Development financing and market adoption consequently emerged as interconnected conditions, where funding enabled the technology to be developed, while procurement, reimbursement, and institutional acceptance determined whether the startup could survive beyond validation.

Third, regulatory qualification functioned as a variable passage rather than a uniform stage in the innovation journey. Its effects differed according to the product type, venture size, and target clients. The founders' narratives identified missing regulatory categories, disproportionate requirements, extended regulatory timelines, and limited transparency as conditions that delayed, redirected, or restricted commercialization. Their narratives did not call for deregulation but emphasized categorical coverage, proportionality, consistency, transparency, and predictable regulatory pathways that preserved standards of safety and efficacy.

Fourth, resilience and narrative identity emerged as interrelated dimensions of the founders' adaptive journey. Resilience was narrated through individualized and ritualized, team-distributed and organizational forms of reintegration. Narrative identity followed pathways of sequential reconstruction,

layered accumulation, and continuity and deepening. Their stories indicate that adversity was interpreted and absorbed according to the founders' prior identity configuration and the structure of the venture. Identity transformation was therefore not universal, and resilience could not be attributed to individual temperament alone.

Across the eight narratives, the innovation journey was portrayed as a non-linear process, from engagement with concrete healthcare concerns to the pursuit of legitimate, adoptable, and socially accessible innovation. The journeys diverged most clearly after validation, when regulatory qualification, procurement, and adoption either enabled the startup's movement or produced delay or redirection. Resilience and narrative identity shaped how the founders navigated these interruptions. The study therefore concludes that the decisive challenge in the Philippine biomedical innovation journey is not the invention alone, but the translation of viable technologies into institutionally accepted and sustained public benefit.

In the end, the findings indicate that Philippine biomedical innovation is not impeded by the lack of capable innovators or supportive legislation, but by fragmented pathways linking development funding, regulatory approval, procurement, and market adoption. Aligning these mechanisms is essential for locally developed biomedical and health technologies to reach the Filipino patients and communities they were foremost intended to serve.

Implications of the Study

Theoretical Implications

The study contributes four qualifications to the frameworks it applied. First, for the effectuation logic, described in the entry and early development, in this setting

more adequately than causal models of opportunity recognition and the bird-in-hand, affordable-loss, and lemonade principles were each stated by the founders in terms close to Sarasvathy's (2001) own formulation. Second, Richardson's metatheory of resilience was confirmed as a process seen in all accounts but varies depending on the structure of the startup. Third, the Narrative Identity theory was supported without the accompanying assumption of universal transformation, and the study points to a condition under which reconstruction occurs (McAdams, 2018; Powell & Baker, 2014). Fourth, and most consequentially, the Diffusion of Innovation framework proved to a significant impact in at two levels in this setting: a) at the level of technology where adopters extend well beyond individual clinicians to procurement units, human resource decision makers, local government units and insurance administrators, and b) at the level of the policy instrument itself, where a legislature whose relative advantage is not communicated and was not applied in startup operations, despite it being well it is designed (Rogers, 2003).

The study indicates that the innovation journey framework's proposition of overlapping and cyclical rather than strictly sequential holds in a resource- constrained setting (Van de Ven et al., 1999; Coyne & Van de Ven, 2024). The threshold sequence derived inductively from the narratives is a sequence of passages, not of stages, and financing was found to run beneath all of them rather than occupy a single position within the sequence.

Recommendations

Based on the findings of this narrative inquiry, the following recommendations are proposed to support further validation, contextualization, and development of knowledge concerning the founders' innovation journey.

Validate the findings of the study with the perspectives of other actors in the biomedical innovation system. Future studies may explore the experiences and perspectives of regulators, funding institutions, healthcare organizations, procurement decision-makers, and other stakeholders in the development, qualification, registration, and adoption of biomedical innovations. Their accounts can validate, challenge, or provide explanations for the barriers and concerns identified in the narratives, particularly related to procurement and adoption.

Examine the relationship between technology development, financing, and adoption. Further research is recommended to explore how financing constraints, technology development, market readiness, procurement processes, and eventual adoption interact across the innovation journey. This investigation may clarify whether the shift from product development towards market adoption represents a recurring challenge among a greater number of biomedical startups.

For the Higher Educational Institutions and the Commission on Higher Education. There is a need to review embedding practical business and financial literacy in science, engineering, and health professional curricula, covering unit economics, financial planning, shareholder and investment terms, and taxation, to better prepare future biomedical innovators.

For the Department of Science and Technology and the Department of Health. It is imperative to strengthen hospital research and development units by providing financial and administrative support, especially in far-flung regions of the country. This would nurture the capacity and the innovative minds of our healthcare workers who see the actual need in their locality.

Lastly, **for future biomedical innovators**, it is suggested to adopt a collaborative and market-informed approach, they should engage with multidisciplinary partners, the intended market, and other relevant stakeholders early in the innovation process. Innovators should assess pathways for adoption, financing, and sustainability while maintaining responsiveness to patient and community needs.

Directions of Future Research

By capturing the narratives of biomedical startup and health technology founders as they navigate the Philippine innovation landscape, this study established a foundational baseline for understanding the intersection of narrative identity reconstruction and systemic institutional studies to explore:

1. Validation studies that would involve other actors in the innovation ecosystems, such as TBI Managers, funding institutions, clinician product users, procurement officers, hospital administrators, and local government units, to confirm the findings raised in the studies.
2. Biomedical and digital health technology sector-specific studies to refine the findings, as it was noted to be diverse depending on the product being developed and the timelines of development.

3. Policy research to further investigate the concerns raised on the different national policies on research and development.

4. Longitudinal or ethnographic qualitative research would address the cross-sectional limitation of the present study. A prospective observation of the day-to-day decision-making would show how founders navigate the journey in real-time.

5. Further studies on discontinued or stalled biomedical ventures can identify factors that contribute to the failure of the startup and push for systemic changes that would improve the biomedical innovation ecosystem as a whole.

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Appendices

APPENDIX A

List of Follow-up Prompts for Narrative Interview

Talaan ng Follow-up Prompts para sa Naratibong Panayam

These prompts serve as flexible guides to ensure coverage of key dimensions. They will not be used as a structural questionnaire. The interviewer will allow the founder's narrative to unfold organically, using prompts only when natural conversation requires clarification or deepening. The sequence and wording of prompts will be adapted to each participant's unique storytelling style.

Ang mga prompts na ito ay magsisilbing gabay upang matiyak ang sasaklawin ng mga mga susing dimensyon. Hindi gagamitin ang mga ito bilang istruktural na talatanungan. Kakailanganin lamang ang prompts kung ang natural na daloy ng usapan ay may kagyat na kahingian na maglinaw at magpalalim, binibigyang-pagkakataon ng tagapanayam na organikong magbahagi o magsalaysay ang kinakapanayam. Nakabatay ang pagkakasunod-sunod at paglalahad ng prompts sa Estilo ng pagkukwento o pagsasalaysay ng bawat kalahok.

Background, Relationships, Motivations, and Opportunities

(Research Question 1):

Mga Pinagmumulan, Ugnayan, Motibasyon, at Oportunidad

(Tanong Pampananaliksik 1):

Personal (Personal)

. Who were the most influential people in your decision to start this venture— family, mentors, colleagues, or others?

Sino o sino-sino ang nakahikayat o pinakanakaimpluwensya sa iyo sa pagdedesisyon na simulan ang pagtatangka sa industriya/proyektong ito?

. Can you describe what inspired you to address this particular health challenge? Was there a personal experience that motivated you?

Maaari mo bang ilahad kung ano ang nagsilbing inspirasyon sa iyo upang tugunan ang partikular na hamon na ito sa kalusugan? May personal ka bang karanasan na nakapagpahikayat sa iyo?

Professional (Propesyonal)

. Tell me about your educational and professional background. What experiences led you into biomedical entrepreneurship?

Ano ang iyong educational at professional background? Ano ang karanasan na nagdala sa iyo sa industriya o pagnenegosyo sa biomedical?

. How did you first identify the opportunity for this innovation? What gap did you see in the market or in healthcare delivery?

Paano mo unang natuklasan o natukoy na may oportunidad para sa inobasyong ito? Ano'ng kakulangan ang iyong nakita sa merkado o sa paraan ng pagbibigay ng serbisyong pangkalusugan?

Navigation of Challenges and Adaptive Strategies (Research Question 2):

Pagtugon sa mga Hamon at mga Estratehiya sa Pag-angkop (Tanong Pampananaliksik 2)

Personal (Personal

. Tell me about a time when something didn't work as planned. How did you adapt or pivot?

Ibahagi ang isang panahon na may hindi gumagana o umaayon sa plano ang ang mga bagay? Paano ka umangkop o kagyat na pumihit sa ibang solusyon?

. Can you describe a critical moment when you almost gave up? How did you overcome that challenge?

Maaari mo bang ikwento ang isang kritikal na sandali na halos sumuko ka na? Paano mo napagtagumpayan ang hamon na iyon?

Professional (Propesyonal)

. What were the most significant obstacles you faced throughout your journey— technical, regulatory, financial, or market-related?

Sa iyong kabuoang pakikipagsapalaran, ano ang suliranin o hadlang (mapateknikal, regulatoryo, pinansiya, o iba pang kaugnay) na iyong kinaharap na para sa iyo ay naging pinakamahalagang danas na rin?

. What strategies or approaches have been most effective in navigating the innovation process?

Ano-anong estratehiya o dulog ang pinakamabisa o epektibo sa pagharap sa proseso ng inobasyon?

Future Visions and Systemic Recommendations (Research Question 3):

Mga Pagtanaw sa Hinaharap at Sistematikong Rekomendasyon (Tanong Pampananaliksik 3)

Personal (Personal)

. What is your vision for the future of biomedical innovation in the Philippines?

Ano ang iyong nakiktang kinabukasan ng biomedical innovation sa Pilipinas?

. What do you hope your story will communicate to others?

Ano ang mensahe ng pag-asa ang nais mong iparating sa iba sa pamamagitan ng iyong kwento?

Professional (Propesyonal)

. What systemic changes would most help founders like you succeed?

Sa iyong palagay, anong pagbabago sa sistema ang lubos na makatutulong sa katulad n'yong mga founders para magtagumpay?

. What recommendations would you make to policymakers, funders, or aspiring entrepreneurs?

Ano-anong rekomendasyon ang nais mong ipaabot sa mga mambabatas, tagasuporta o naghahangad na maging mamumuhunan sa biomedical innovations?

- **Isinalin sa Wikang Filipino ni Mr. J. Pozon**
  Assistant Professor, University of the Philippines Rural High School, College of Arts and Sciences Coordinator UPRHS, Departamento ng Filipino

APPENDIX B

Study Timeline

Phase	Activities	Timeline
Stage 0	Ethics approval, participant recruitment, informed consent	January – February 2026 (Week 1-8)
Stage 1 Phase 1–3 (Individual Narratives)	Data collection: Interviews via Google Meet/Zoom or in-person (ongoing); Transcription and immersion; Narrative coding in Atlas Ti; Individual narrative reconstruction for all 8–12 participants	March – June 2026 (Weeks 9–21)
Phase 4 (Cross-Narrative Synthesis)	After ALL individual narratives are complete: Comparative analysis in Atlas Ti; Identification of similarities, differences, emergent themes; Creation of thematic matrices and concept maps	July - August 2026 (Weeks 22-28)
Phase 5 (Interpretation & Integration)	Literature integration: Conceptual interpretation aligned with research questions; Generation of actionable recommendations; Theoretical contributions; Final write-up and member-checking revisions	Aug-Sept 2026 (Weeks 29–35)

APPENDIX C

Informed Consent Form

University of the Philippines Open University

INSTITUTIONAL RESEARCH ETHICS COMMITTEE

INFORMED CONSENT FORM

for Biomedical startup founders or co-founders in the project

"Narrative Inquiry on Innovation Journey of

Biomedical Startup Founders Philippines"

Principal Investigator: Christina Q. Marquez MD

Organization: University of the Philippines Open University

Sponsor: N/A

Project Name: **"NARRATIVE INQUIRY ON THE INNOVATION JOURNEY OF FOUNDERS OF BIOMEDICAL STARTUPS IN THE PHILIPPINES"**

PART I: INFORMATION SHEET

INTRODUCTION

I am Christina Q. Marquez, would be doing a research study entitled "A Narrative Inquiry on the Innovation Journey of Founders of Biomedical Startups in the Philippines." This serves as an invitation for you to participate in the said study that aims to explore your past experiences as a biomedical startup founder. Your participation is entirely voluntary, and you may take your time to decide whether you wish to participate. If there are any concerns about the study, I would gladly take time to explain and address any raised issues. If some of the words or concepts in this form are vague or ambiguous, you can ask for clarification at any time.

PURPOSE OF THE RESEARCH

This study aims to explore and understand how biomedical startup founders in the Philippines narrate and construct meaning from their innovation journey—the experiences, challenges, and decisions involved in taking a biomedical product from the laboratory stage through to market commercialization.

In simpler terms, I would like to hear the unique story of how you brought your biomedical innovation from an idea to a product people use.

TYPE OF RESEARCH INTERVENTION

This is a qualitative research study, specifically a narrative inquiry that seeks to gather rich, detailed stories and experiences from biomedical startup founders. This research involves in-depth interviews with you about your experiences, insights, and reflections on your innovation journey. There are no physical treatments, medications, or invasive procedures involved in this study.

PARTICIPANT SELECTION

You have been selected to participate in this study because you are a founder or co-founder of a biomedical startup in the three main island group of the Philippines that has achieved significant milestones in product development or commercialization—such as obtaining regulatory approval, reaching an advanced stage of technological readiness, or demonstrating clinical adoption in healthcare facilities. Your experience, knowledge, and unique perspective on navigating the innovation journey are valuable to this research.

VOLUNTARY PARTICIPATION

Your participation in this study is completely voluntary. *You are free to choose whether or not to participate*. Your decision to participate or not to participate will not affect your current or future relationship with the researcher, the University of the Philippines Open University, or any organizations that may have referred you to this study. Whether you decide to participate or not *will have no bearing on your professional standing, business relationships, or access to any services.*

RIGHT TO REFUSE OR WITHDRAW

You have the right to withdraw from the study at any time, without any penalty, loss of benefits, or negative consequences to your relationship with the researcher or the university.

If you decide to withdraw, your decision will not affect your relationship with the researcher or the University of the Philippines Open University.

You may withdraw at any time up until the final data aggregation and anonymization phase, without penalty or loss of any kind. If you withdraw, all previously collected data -including audio recordings and un-anonymized transcripts - will be securely and permanently destroyed. Once data has been fully anonymized and aggregated into the cross-narrative synthesis, individual data can no longer be separated or removed."

OTHER ETHICAL CONSIDERATIONS

Proper use of AI will be done, and the use of AI technology will be properly cited. The AI platform of Google Meet or Zoom will be used to transcribe the interview. No third-party AI tool will be used to transcribe to ensure the security of the data.

PROCEDURES

6.1 Format and Overview

This research involves individual, in-depth interviews with you, the founder or co-founder of a biomedical startup. The interviews will explore your experiences navigating the innovation journey of your biomedical product.

6.2 Interview Details

Location: The interviews will be conducted at a location that is convenient for you. You may request it to be done in your startup or via an online platform you prefer virtual participation.

Process: You will be asked to share and discuss your experiences related to your innovation journey —from the initial idea or research conception through to where your product is today. The interview will last approximately 60 to 90 minutes. You are free to choose not to answer any specific question that you do not feel comfortable with. No one else except the interviewer will be present unless you specifically request that someone accompany you

A follow-up interview may be arranged if clarification is needed or if you wish to add additional information to your narrative

6.3 Recording and Documentation

The interviews will be audio-recorded to ensure accuracy in capturing your narrative and to allow the researcher to transcribe and analyze your responses accurately. · Artificial Intelligence (AI) tools and applications may be used to transcribe the audio recordings into written text for analysis purposes. The researcher will ensure responsible use of AI in handling the transcription process and will only use the said AI, which is built-in Google Meet or Zoom platform.

The researcher will ensure the correctness and accuracy of the interview transcript. No third-party transcriber will be involved. The principal investigator will handle all transcription and verification.

All recordings and transcripts will be kept confidential and subject to the same privacy protections outlined in this form. You will have the opportunity to review the transcript of your interview and request any changes or corrections to ensure accuracy before it is used in the study.

6.4 Types of Questions

Following the nature of narrative inquiry study design, the researcher will ask open-ended questions and let you narrate your innovation journey.

During the interview, you will be asked two types of questions:

- Professional Questions: These focus on your startup's milestones, technical hurdles, regulatory processes (e.g., FDA approval), funding, and market strategies that covers development of a biomedical product from start to finish and lastly also your reflection on what possible improvements can be done in the Philippine biomedical startup ecosystem.

- Personal Reflections: These focus on your individual experiences and mindset as a founder, such as your motivations, how you handled setbacks, your resilience during difficult periods, and your personal vision for the healthcare ecosystem. (Please note that we are strictly interested in your personal experiences as they relate to your role as a founder, not sensitive details regarding your private or family life)

6.5 Documentary Evidence for Triangulation

With your permission, the researcher may also review and reference publicly available information about your startup, such as awards and recognitions your startup has received, · media features or news articles about your startup, · company website, or publicly available pitches, product registrations, or regulatory approvals.

DURATION

Your participation in this study will involve an initial interview of 60 to 90 minutes and a possible follow-up interview of 30 to 35 minutes if needed. You will be asked to review your transcript, which will take around 30 minutes to 1 hour, and provide feedback on the accuracy of your narrative

The overall study is estimated to be completed within 6 months to 1 year from the time data collection begins. Your participation may occur at any point during this timeline.

Approximate total time commitment: 2 to 2.5 hours over several months.

RISKS

This study involves minimal risk and no physical treatments. However, there are some potential minor risks to consider:

Psychological/Emotional Discomfort: Since the interview explores your journey as a founder, which may include discussing challenges, failures, or difficult periods, you may experience mild emotional discomfort or reflection stressful experiences. To mitigate this, you are free to skip any question you do not feel comfortable answering, take breaks during the interview, or request that the interview be paused or rescheduled

Conflict of Interest: Please be assured that the principal has no financial, personal, or professional interests in your startup. This interview is strictly for academic purposes. The researcher is not affiliated with any investors, competitors or regulatory agencies (e.g., FDA), and your participation will not affect your business, funding opportunities, or regulatory standing in any way.

Confidentiality Concerns:

Although measures will be taken to protect your identity, there is a small possibility that someone familiar with your startup could potentially identify you based on specific details about your innovation journey. Hence, to ensure that this will not happen, your name will not appear in any publications or presentations. Your startup will be referred to by a code number in the research data. Detailed identifying information will be removed or anonymized in any written reports.

Time Commitment: I understand how valuable your time and the interview require your availability. Hence, we would accommodate your availability. You can choose a time and location that is most convenient for you.

BENEFITS

There are no direct financial or material benefits to you for participating in this study. You will not receive payment for your participation.

Indirectly, you could reflect on and narrate your own innovation journey, which may provide personal insights. Also, you may have the satisfaction of contributing to research that may help improve support for future biomedical startups in the Philippines.

Your narrative will contribute to a deeper understanding of how biomedical startup founders in the Philippines navigate innovation. Your experiences, strategies, and recommendations may inform improvements to policies, funding mechanisms, and institutional support for biomedical innovation in the country. Your participation contributes to advancing scientific knowledge in business development, innovation management, and entrepreneurship in low-to-middle income countries like the Philippines.

REIMBURSEMENTS

No compensation is provided for participating in this study. However, if you incur any reasonable expenses directly as a result of your participation, the researcher may discuss reimbursement options with you. Any such reimbursement will be discussed and agreed upon before the interview takes place.

CONFIDENTIALITY

All information collected during this study will be kept strictly confidential to the extent permitted by the Data Privacy Act.

The following measures will be in place:

· No identifiable information in research data: Your name, your company or your specific innovation will not appear on any research forms, transcripts, or electronic files. Instead, you will be assigned a code number (for example, "Participant 001", Biomedical Startup “A ” with product “X ”) to identify your data.

· No publication of identifying details: Any findings or publications resulting from this study will not include information that could identify you or your specific biomedical product.

· Anonymized reporting: If direct quotes from your interview are used in reports, presentations, or publications, they will be presented in a way that does not reveal your identity.

Limits to Confidentiality:

While the researcher will make every effort to protect your privacy, please be aware that the Research Ethics Committee may review research records to ensure ethical compliance.

SHARING THE RESULTS

The results and findings of this study could be used for scholarly purposes, which may include completion of the researcher's master's thesis publication in academic journals or professional magazines, · presentations at academic conferences or professional meetings, and reports shared with relevant government agencies and organizations working on biomedical innovation policy.

You will be allowed to review a summary of the findings from the study, which will be made available to you once the research is completed. You may request a copy of this summary upon request. You will not have automatic access to detailed research records or the researcher's full notes, but the summary will provide you with the main insights and conclusions from the study. If you participate, you will be asked whether you wish to receive the summary of findings and contact information will be collected for this purpose.

To protect your privacy in any publications made for the study, measures will be strictly followed to ensure that no information that could personally identify you or your specific biomedical product will be disclosed in any publication. Your startup and innovation will be discussed only in general, anonymized terms

DATA MANAGEMENT

All audio recordings, transcripts, and research notes will be stored securely in a separate portable hard drive. All files will be encrypted and password-protected, accessible only to the principal investigator.

Data access: Only the principal investigator will have direct access to the audio recordings and identified transcripts.

Data retention and destruction:

All research data will be stored securely and retained according to the FMDS REC's data retention guidelines.

Following the Philippine Health Research Ethics Board guidelines (2020), the standard minimum data retention period for research data—including audio recordings and transcripts from qualitative interviews—is 3 to 5 years after the publication or completion of the study. For this study, all de-identified transcripts, coded files, and narrative profiles will be securely retained for three (3) years after completion of the study.

WHO TO CONTACT

If you have any questions about this research study or would like more information, please contact: **Christina Marquez, MD (Principal Investigator)**

Email: cqmarquez@up.edu.ph

For questions about your rights as a participant or to report concerns or complaints, you can contact the

UP Open University Faculty of Management and Development Studies

Research Ethics Committee (FMDS REC) at UP Open University, Los Baños, Laguna, Philippines, 4031

Monday – Friday: 8:00 AM – 5:00 PM PHT.

Email address: fmds-ethics@upou.edu.ph

The FMDS REC is an independent committee that reviews research to ensure it meets ethical standards and protects the rights and welfare of research participants.

PART II: CERTIFICATE OF CONSENT

(*This section is mandatory)*

"I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked to have been answered to my satisfaction.

I consent voluntarily to be a participant in this study."

Print Name of Participant: _____

Signature of Participant: _____

Date: (MM/DD/YYYY)_____

If Illiterate

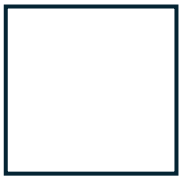
A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb print as well.

Print Name of Witness: _____

Signature of Witness: _____

Date: (MM/DD/YYYY) _____

Thumbprint of Participant



STATEMENT BY THE RESEARCHER OR PERSON TAKING CONSENT

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. **An interview will be conducted.**
2. **The interview will be recorded and kept confidential.**
3. **The participant can withdraw at any time.**

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability.

I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily. ”

A copy of this Informed Consent Form has been provided to the participant.

Print Name of Researcher: Christina Marquez MD

Signature of Researcher: _____

Date: (MM/DD/YYYY): _____

APPENDIX D

UPOU Ethics Approval

	UP OPEN UNIVERSITY Faculty of Management and Development Studies Research Ethics Committee		
	CERTIFICATE OF ETHICAL APPROVAL	REC Form No.	4(C)
		Version No:	01
		Date of Effectivity:	

31 March 2026

This is to certify that the following protocol and related documents have been granted approval by the Faculty of Management and Development Studies Research Ethics Committee (FMDS REC).

The FMDS REC is the body that implements the university policy of overseeing the ethical soundness of the institutional research produced, including any research conducted by faculty members, students, REPS, and staff at the faculty office level. All FMDS research proposals must undergo ethics review and shall gain certification clearance from the FMDS REC.

The committee operates according to Philippine Health Research Ethics Board (PHREB) guidelines and regulations.

REC Protocol No.	2026-002-GS-FMDS		
Principal Investigator(s)	Dr. Christina Q. Marquez		
Title	A Narrative Inquiry on the Innovation Journey of Founders of Biomedical Startups in Manila, Philippines		
Document Type	Study Protocol		
Protocol Version No.	02	Version Date	11 March 2026
Other Documents	1. 2026-Marquez_Form 6(D) Study Protocol Assessment Form v02.pdf (version 2, 11 March 2026) 2. 2026-Marquez_FREC Form 8(A) 1st Resubmission Form.pdf (version 1, 11 March 2026) 3. 2026-Marquez_Full Protocol v02.pdf (version 2, 11 March 2026) 4. 2026-Marquez_ICF_English v02.pdf (version 2, 11 March 2026) 5. 2026-Marquez_Protocol_Corrections_Summary Marquez v01.xlsx (version 1, 11 March 2026) 6. 2026-Marquez_Protocol_ICF_Alignment v01.xlsx (version 1, 11 March 2026) 7. 2026-Marquez_Diagrammatic Workflow.pdf (version 1, 28 January 2026) 8. 2026-Marquez_Endorsement Form.pdf (version 1, 23 January 2026) 9. 2026-Marquez_Form 1(B) CV Form.pdf (version 1, 28 January 2026) 10. 2026-Marquez_Form 4(E2)_Non-Health-Related Assessment Form_v01.pdf (version 1, 23 January 2026) 11. 2026-Marquez_Form 6(A)_Application Form_v01.pdf (version 1, 23 January 2026) 12. 2026-Marquez_Form 6(A)_Application Form_v02.pdf (version 2, 28 January 2026) 13. 2026-Marquez_Form 6(D)_Study Protocol Assessment Form_v01.pdf 14. 2026-Marquez_Form 6(F)_ICF Checklist_v01.pdf (version 1, 23 January 2026) 15. 2026-Marquez_Form 6(G) ICF_English_v01.pdf (version 1, 23 January 2026) 16. 2026-Marquez_Form 6(G) ICF_English_v02.pdf (version 2, 28 January 2026)		

Page 1 of 2

	UP OPEN UNIVERSITY Faculty of Management and Development Studies Research Ethics Committee		
	CERTIFICATE OF ETHICAL APPROVAL	REC Form No.	4(C)
		Version No:	01
		Date of Effectivity:	

	17. 2026-Marquez_Form T5A_Proposal Rejoinder.pdf (version 1, 23 January 2026) 18. 2026-Marquez_Full Protocol_v01.docx (version 1, 23 January 2026) 19. 2026-Marquez_Interview Guide_v01.pdf (version 1, 23 January 2026) 20. 2026-Marquez_Letter Request_v01.pdf (version 1, 23 January 2026) 21. 2026-Marquez_Proposal AI Report.pdf (version 1, 23 January 2026) 22. 2026-Marquez_Proposal SI Report.pdf (version 1, 23 January 2026) 23. 2026-Marquez_Thesis Approval Sheet.pdf (version 1, 28 January 2026)		
Type of Review	☑ Expedited ☐ Full Board Meeting Date: N/A	Duration of Approval from Date to:	31 March 2026 to 31 March 2027

FMDS REC Chair	Signature	Date
ROSE NONETTE C. CAPADOSA	[redacted]	31 March 2026

APPENDIX E

Open Code Inventory

The following appendix presents the complete inventory of 248 open codes generated during the initial phase of data analysis. Each code was derived from a close examination of eight interview transcripts and represents a concept, action, experience, condition, or meaning that emerged from the founder’s account if their biomedical innovation journeys.

The inventory includes in vivo codes drawn directly from the participants' words. These codes were intentionally retained to preserve the original language, meaning, and perspectives of the founders and to ensure that the analysis remained grounded in their narratives. The open codes served as the primary building blocks for constructing the individual narrative profiles and the subsequent cross-narrative synthesis organized according to the narrative thresholds presented in Chapter IV.

(A)

Academe as Organizational Enabler
Accessible Healthcare
Adaptation: Built his own ecosystem
Adaptation: Focus on Marketing
Adaptation: Learn Taxation laws
Adaptation: Local Resource-Based Innovation
Adaptation: Skills Development of Staff on FDA regulations
Adaptation: Staging Strategy as Regulatory Workaround
Adaptation: Strategic Realism for Commercialization
Adaptation: Quadruple Helix
Adaptation: Experimentation of Different Business Models

Adaptation: Working together as a team to provide solutions

Adaptation: Learn the Business

Adaptive Strategy and Bricolage

Addressing Mental and Behavioral Health

Addressing the Market Need Faster

Administrative Role

Advocacy and Lobbying as Strategy

Availability of Locally Developed Medicines

Awards /Accolades for Innovation

(B)

Background: Adept in business side

Background: Author of various Journals and Books

Background: Biomedical Researcher

Background: Conducted Medical Missions

Background: Department Chairman

Background: Doctor

Background: Financially endowed due to his royalties

Background: Inventor of a biomedical device

Background: Mixed Race

Background: Passionate

Background: Project Leader of the Founder

Background: Sub Specialist

Background Psychology

Background: Entrepreneur

Background: Grew up in a poor family

Background: Physician- Immigrant

Background: President of the Company

Belief in God and his purpose for his startup

Belief that his startup can make it

Belief that his wealth is something he needs to give back

Belief that the Filipinos can make it

Building and Improving Shared Technology

Built department from Scratch

Bureaucratic Red Tape

Business Registration Ambiguity

(C)

Caters to Treatment and Monitoring as well

Challenge: Corruption

Challenge: Dissonance of Technology and Market need

Challenge: Early Startup Hiring Shared risk

Challenge: Failure to Meet Deadline

Challenge: Fast change of PhilHealth regulations

Challenge: Long wait for ROI

Challenge: Marketing

Challenge: Misaligned Technology vs Regulatory

Challenge: Philippine Funding Infusion is too small

Challenge: Production Scale and Supply Constraint

Challenge: Talent Scarcity and Initial Team Formation

Challenge: Unfriendly Taxation to Startups

Challenge: Lengthy FDA Regulatory Process

Challenge: Funding

Challenge: Support from Government due to Erratic Economy

Clients because of good relationships with enabler institution

Co-Founder

Co-founders: Socio-Civic Organization

Co-Founders that want to make a difference

Collaboration as Turning Point

Collaboration with Key Hospital Partners

Colonial Mentality

Commercialization

Company in the US due to a lack of technical experts in the country

COVID-19

Creating an environment for budding Biomedical innovators

(D)

Dependence on Imported Technology

Develop Scientifically Proven Products

Difficulty in acceptance of new technology

Difficulty in acceptance of local technology

Digital Health Technology

Discrepancy in healthcare data

Disruptive Health technology

Doing Business is ultra hard mode

Dream big

(E)

Early Industry Exposure

Educational Background: Law and Entrepreneurship

Emotional/ Affective Disclosure

Enabler: BNI or Referral Organization

Enabler: QBO TBI

Enabler Legislation: Philippine Innovation Act

Enabler: Foreign Embassy

Entry Point: Innovative Solution to a Healthcare system gap

Entry Point: Make a company to create implants for Filipinos

Entry point: Spin-off family venture

(F)

Family Influence

Family Influence as Significant Background

Fast pace of Technology Globally

Faster turnaround time

Feedback from clients

Flood of Unregistered products due to online platforms

Focus on prevention of disease

Formative Crisis as Turning Point

Friends as cofounders

Frustration

(G)

Goal: First Digital Health Technology of choice

(H)

Health Technology Company

High Number of Unregistered Products

High Risk High Reward Orientation

Hopeful

Hospital Institution as a Restrictor

Hospital Institution as Enabler

Humor or Lightness as Coping Mechanism

(I)

Identity: As the Doer rather than a critic

Identity: More Collaborative

Identity: More passionate

Identity as an Innovator to Biomedical Ecosystem Advocate

Identity as an improved version of oneself

Identity as Clinician – Innovator

Identity became more trusting...give people chances

Identity Establishment

Identity: Better Leader

Identity: Learned more Business strategies

Implants are out-of-pocket expenses

Importance of Support Staff

Improve Patient Experience

Influential Person: Father

Influential People: Colleague and Mentor

Influential People: Family

Innately Calculated Risk Taker

Instrumental Collaborator

Interdisciplinary and Multi-Institutional Collaboration as a Necessity

International Technology Exposure

Investment on Human Resource

(J)

Joined academe

(L)

Lack of Business knowledge

Lack of Credibility

Lack of funding: Out-of-Pocket Dilemma

Lack of Technology experts with FDA

Lack of Whole-of-Government Approach

Learn from mistakes

Legacy Mission

Legislation for Increased support for Research and Innovation

Limited Market because Patients don't seek treatment

Locally Developed Technology

Locally Produced Biomedical Products as an answer to Health Inequity

Lone Wolf Burden of a Founder

Lost Filipino Technology as part of his meaning-making

(M)

Made a lot of Money from Royalties

Masipag at magaling ang Filipino

Meaning Making

Meaning Making: Living to the fullest potential

Meaning Making: Regional trailblazer and translational founder

Medical Specialist

Mentor

Message: Find Allies with Passion and Purpose

Message: Collaborate

Message: Do not quit

Message: Find the Best Market

Message: It's a difficult Journey

Message: Learn from your team

Message: You can single-handedly change the system

Message: Focus on the market

Message to Future Innovators: Share in order to improve technology

Message: Find the best team

Metaphor and Evaluative Phrasing

Motivation: Create Jobs for Filipinos

Motivation: Innovation Driven

Multiple Rejections

(N)

Never lose the Vision

Non-conformist Orientation

(O)

Organization Enabler: UN

Organizational Enabler: DOST

Organizational Enabler: USAID

Organizational Enabler: WHO

Other R&D Innovation Hospitals as Enabler

Other sources of Revenue

Outsourced initially to India

(P)

Pandemic Mode

Partner with Private Professional Organizations

Partners with PhilHealth

Patient-Centered Motivation

Perseverance despite difficulty

Persistence despite Skepticism

Personal fulfillment as motivation

Pharmacy

Philanthropic Endeavors

Pioneer Mindset

Pivot: From Communicable to non-communicable

Point of Giving Up: Threat to Life

Poor compliance with health facility safety

Positive Outlook

Preference for Imported Technology

Problem Identified: Long Lines for Vaccination

Procurement Policy Reform

Providing per-demand features

(R)

Reforms on Innovation being Accessible

Regional Context

Regulatory Ambiguity or Gap

Regulatory Reform

Reported Speech/ Voice of Others

Resilience

Role Overload

(S)

Seeing how they do things in other countries

Seeker of Opportunity Orientation

Self-Reflection

Serendipitous Entry Point
Skill Development as Motivation
Social Enterprise
Solution for HMO LOA
Spin off
Staffing and Human Resource Instability
Started Locally
Systemic change: Better business environment
Systemic Change: Community that combines
Passion and Business knowledge
Systemic change: Digitalization of processes
Systemic Change: Implement existing laws prioritize local innovations
Systemic Change: Include into the Academe
Business and Taxation
Systemic Change: Include in the Curriculum Business and Taxation
Systemic Change: More Financial Support
to health technology innovators
Systemic Change: More Startup-Friendly Tax Laws
Systemic Change: One-Stop Shop for MSME and Startups
Systemic Change: Technology-Based Industrial Development
(T)
Tapped and Helped the Country
Technical Challenges
Technology that is Human-Centered
Technology used all over the Country
Temporal Markers
Thankful for being given the opportunity for bioengineering
That there is a larger purpose
Train their Manpower
Trial and Error
Trusting the Vision and the Process
Turning perceived difficulty into opportunity

Turning Point: Industry -Academy Collaboration

Turning Point Funding Infusion

Turning Point to Create A spin off Company

Turning Point Shift from Government focus to Private Market

Turning Point: Change in Management

Turning Point: Joining TBI

(U)

Untapped Undergraduate Research

Using their Regulatory as a means to learn new technology

(V)

Vision: Regional Innovation Cluster

Vision to use technology in other specialties

Vision: leaders In preventive Healthcare

Vision for a Decentralized Innovation Ecosystem

Vision: Philippine be a Frontliner in Biomedical Innovation in Asia

Vision of Hope and Continuity of Innovation Support

APPENDIX F

Declaration of Artificial Intelligence (AI) and Tools Use in Research

In order to adhere to the University's principles of academic integrity as well as transparency in the methods used, this section declares the different applications and tools used for this study. These applications were used to support the data collection, transcription, analysis, and completion of the manuscript. The researcher maintained full intellectual ownership and responsibility for the critical analysis, theoretical development, and final conclusion presented in the study.

Artificial Intelligence (AI) Powered Applications and Programs

1. Tool: Zoom Meeting and Transcription Services

https://www.zoom.com/

The tool was used to schedule, conduct, record, and transcribe semi-structured narrative interviews for the eight founders. The said program provided high-quality audio-visual recording, as well as time-stamped transcripts. These transcripts were used as raw data before coding. There was a noted limitation in transcribing mixed English and Tagalog ("Taglish"). This was addressed by the manual checking of the transcription by the researcher to ensure that the actual speech was recorded and to ensure complete accuracy before analysis.

2. **AI Tool:** ChatGPT 4.5 (Model by OpenAI)

https://openai.com/index/chatgpt/

The tool served as a writing assistant for the initial outline for structural content of Chapter II, IV and V. It also provides critique on the flow and clarity of the manuscript as a whole. Its role is to polish the academic manuscript. The AI had no role in analysis, interpretation and final conclusion.

3. **AI Tool: Grammarly**

www.grammarly.com

The tool was used in the editing of grammar and spelling as part of manuscript preparation. It also functioned as a preliminary plagiarism check to ensure academic integrity and originality.

The researcher had a final review of all suggestions made by the tool. It was not used for any analytical content.

4. **AI Tool: Canva**

www.canva.com

The tool was used to create digital images, especially for Chapter IV to visualization of the concepts and findings. This was also used in the creation on innovation journey of each founder during the thesis defense. All images were manually done. AI was used for suggestions of images, arrows, icons to depict the data better.

The researcher manually placed shapes, lines, and texts in the images. No data transcript was fed to create any image.

5. Tool: ATLAS.ti (Student License)

https://atlasti.com/atlas-ti-web

The software was used to facilitate manual coding of the narrative interview transcripts of the eight founders. It organized the researcher's analytical work, such as organizing manual codes, writing memos, and seeing patterns and concepts present in the data. It resulted in 248 open codes presented in Appendix E. The researcher did not avail of or use the automated AI coding provided by the tool. Coding and interpretation were all manually done by the researcher and were used solely as an aid in data organization.