

An Exploration of the Critical Processes of Individual Innovations

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Abstract. How do individual innovators progress from motivation to innovation outcome, and why do similar innovation efforts stabilize as either incremental or radical? Existing research classifies outcomes ex post but offers little process explanation of how such outcomes emerge through sequences of decisions under constraint. We address this gap through a Straussian grounded theory study of ten individual-led innovations in the consumer electronics sector. Analysis of extended secondary data from interviews, autobiographical accounts, technical talks, and archival materials traced how innovators translated motivational orientation into concrete decision criteria and navigated trade-offs at critical junctures. We induce a process model organized around the core construct of non-negotiable goals: the small set of protected criteria innovators refuse to compromise, regardless of pressure. The model yields five propositions. First, innovators translate motivation into non-negotiables that function as invariant decision anchors. Second, innovation advances through decision-making under constraint, where constraints activate rather than merely impede progress. Third, inflection points (failure, feedback, validation) intensify decision-making but do not deterministically redirect trajectories; their influence is mediated by non-negotiables. Fourth, incremental and radical outcomes are not fixed categories but emergent stabilization states: incremental when non-negotiables are preservable within existing architectures; radical when preservation requires architectural change or new system logics. Fifth, trajectories remain reversible until final stabilization; shifts occur when current strategies become unsustainable for preserving non-negotiables. The framework contributes (1) a processual reconceptualization of incremental/radical innovation as stabilization outcomes, (2) non-negotiables as the missing mechanism linking motivation to action, (3) trajectory reversibility as a formal theoretical construct, and (4) an empirically grounded extension of effectuation and bricolage specifying the boundary conditions of adaptive action. For innovators, articulating non-negotiables

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enhances decision coherence under pressure; for organizations, recognizing persistence as commitment rather than escalation enables more discriminating innovation support.

Keywords: Individual innovation; grounded theory; non-negotiable goals; innovation trajectories; decision-making under constraint; incremental innovation; radical innovation; motivation.

1. Introduction

Innovators, engineers, designers, and entrepreneurs who drive new products from concept to reality have long been recognized as central agents of innovation [1, 2]. From Dyson's bagless vacuum to Cooper's handheld mobile phone, individuals working alone or leading small teams have produced both incremental refinements and radical breakthroughs. Yet despite extensive research on organizational innovation and industry dynamics, we know surprisingly little about how individual innovators actually progress from initial motivation to a stabilized innovation outcome.

1.1. The limits of outcome-based innovation theory

The distinction between incremental and radical innovation has served as a foundational organizing principle in innovation studies [3, 4]. Incremental innovation refines existing products within established architectures; radical innovation introduces new architectures or usage logics that depart from existing norms [5]. These frameworks have proven influential for understanding technological change at industry and firm levels.

However, they share assumptions that limit their explanatory power for individual innovation. First, innovation outcomes are treated as analytically primary and classified retrospectively by impact, obscuring the processes through which they developed [6]. Second, these theories assume innovation paths are shaped primarily by structural conditions rather than individual agency [7]. Third, they imply linearity and irreversibility, portraying innovation as following stable trajectories until disrupted [8].

When examined from the perspective of individual innovators, these limitations become acute. Individual innovators rarely have foresight into whether their innovation will be classified as incremental or radical. Many innovations later described as radical began as attempts to improve existing solutions [2]; others framed as disruptive may stabilize incrementally due to technical or market constraints [9].

1.2. Motivation as incomplete explanation

Motivation research has established that intrinsic drivers (interest, enjoyment, personal meaning) and extrinsic drivers (rewards, recognition, mandates) shape engagement with innovation [10, 11]. Intrinsically motivated individuals explore more widely and persist longer through challenges [12].

Yet the relationship between motivation and innovation outcomes remains underspecified. First, motivation is typically treated as a stable predictor variable, yet empirical findings are mixed: intrinsically motivated innovators produce both radical and incremental outcomes; the same holds for extrinsically motivated innovators [13]. Second, motivation research abstracts from the practical contexts in which innovation unfolds the concrete decisions innovators make regarding design choices, resource allocation, and trade-offs. What remains missing is an explanation of how motivation shapes the decision criteria innovators use when confronting constraints.

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1.2. Constraints and the problem of trade-offs

Constraints, like resource scarcity, technical limitations, and market pressures, have traditionally been framed as barriers to innovation. A growing body of research challenges this view, demonstrating that constraints actively structure innovation processes. Bricolage research shows that resource scarcity can foster creative recombination [14]; frugal innovation studies highlight how constraints prioritize affordability and accessibility [15]; crisis research demonstrates that extreme constraints force rapid prioritization [16].

A central insight is that constraints force **trade-offs**. Innovators must continually choose between competing alternatives, performance versus cost, usability versus sophistication. Each choice commits the innovator to a particular direction while closing off others, gradually shaping the innovation trajectory [17].

Yet existing research stops short of explaining how innovators decide which trade-offs are acceptable. Some compromises are accepted; others are rejected, even when rejection prolongs development. What explains this selectivity? Recent work hints at an answer: innovators distinguish between what can be adapted and what must be preserved [18]. But the mechanisms through which such distinctions are made and sustained remain undertheorized.

1.3. Process perspectives and their limits

Process-oriented scholarship challenges outcome-based explanations, emphasizing sequences of action, interpretation, and decision-making under uncertainty [6, 19]. Innovation outcomes are understood as provisional and contingent, shaped by cumulative decisions rather than predetermined by initial conditions.

Process research has shown that innovation rarely follows linear progression; it involves backtracking, goal redefinition, and shifts in direction [8]. Feedback prompts reassessment and redirection [20]. However, process perspectives have limitations for understanding individual innovation: they focus primarily on organizational settings [21], and they stop short of specifying how trajectories stabilize, why some paths become locked in while others remain fluid.

1.5. The research gap

Synthesizing these literatures reveals a coherent gap. Outcome-based theories classify innovations as incremental or radical but offer limited insight into how such outcomes emerge. Motivation research identifies drivers of engagement but struggles to explain how motivation translates into concrete decisions under constraint. Constraint research demonstrates that trade-offs are central but does not specify the criteria innovators use to judge which compromises are acceptable. Process perspectives emphasize emergence but remain under-specified at the individual level.

What is missing is an integrated explanation of how individual innovators progress from motivation to innovation outcome through decision-making under constraint. Specifically, we lack understanding of:

- (1) How motivation becomes operationalized into decision criteria that guide trade-offs.
- (2) How innovators distinguish between what must be preserved and what can be compromised.

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(3) How repeated decisions accumulate to stabilize innovation trajectories as incremental or radical.

(4) Why innovation paths sometimes shift direction and why they sometimes persist despite failure.

1.6. The present study

This study addresses this gap by asking: **How do individual innovators progress from motivation to innovation outcomes, and why do some innovation trajectories stabilize as incremental while others stabilize as radical?**

We investigate this question using Straussian grounded theory methodology [22], analyzing ten cases of individual-led innovation in consumer electronics. By tracing sequences of decisions, trade-offs, and responses to constraint, we induce a process model anchored in the core concept of **non-negotiable goals**, the protected criteria innovators refuse to compromise.

We make four contributions. First, we reconceptualize incremental and radical innovation as emergent stabilization states, not fixed categories. Second, we introduce non-negotiables as the missing mechanism linking motivation to action. Third, we specify trajectory reversibility as a formal property of innovation processes. Fourth, we embed these insights in an empirically grounded process model explaining how motivation, constraint, decision-making, and outcome are dynamically related.

2. Methodology

2.1. Research design and approach

This study develops an explanatory theory of individual innovation using Straussian grounded theory methodology [22, 23]. Grounded theory is appropriate when the research objective is to generate a process-oriented, conceptually integrated explanation of a phenomenon for which existing theories provide incomplete accounts. Innovation at the individual level, specifically, how innovators translate motivation into outcomes through decisions under constraint is such a phenomenon.

The study adopts an interpretive orientation, consistent with grounded theory's emphasis on understanding action from actors' perspectives and tracing how meaning shapes decision sequences over time. The research design is theory-building rather than theory-testing; the goal is not to verify existing frameworks but to induce an explanatory model grounded in empirical cases.

Within the grounded theory tradition, the Straussian variant was selected for its structured yet flexible approach to analyzing processual phenomena. Its explicit attention to conditions, actions/interactions, and consequences aligns with the study's focus on innovation as a trajectory shaped by decisions under varying constraints.

2.2. Case selection and theoretical sampling

Cases were selected using a two-stage sampling strategy consistent with grounded theory principles. Initial purposive sampling identified cases meeting four criteria: (1) individual or individual-led innovation, defined as the innovator exercising primary and sustained decision-making authority; (2) location within the consumer electronics sector, controlling for broad technological and market context; (3) availability of rich, triangulable secondary data sufficient to trace decisions, trade-offs, and responses to constraint; and (4) clear

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evidence of both motivational orientation and stabilized innovation outcome, permitting cross-case comparison.

Theoretical sampling guided subsequent case expansion. As open and focused coding revealed recurring patterns concerning the translation of motivation into priorities and decision-making under constraint, additional cases were selected to test the robustness of emerging categories, challenge provisional interpretations, and maximize variation along analytically significant dimensions (e.g., motivational configuration, nature of constraints, inflection points). Sampling concluded at ten cases, the point at which theoretical saturation was achieved: additional cases no longer introduced new category properties or altered relationships among categories.

Inclusion criteria remained consistent throughout: the innovator exercised primary decision authority; sufficient process data existed; the innovation progressed beyond concept to realized artefact; clear constraints were documented; and the outcome could be analytically classified as incremental or radical based on stabilized form rather than stated intent. Cases were excluded when decision authority was diffuse, innovation was primarily collective, or the available data focused solely on outcomes without documenting development processes.

Table 1 summarizes the ten cases and their classifications. These classifications were derived analytically rather than preconceived and were used to structure cross-case comparisons.

Table 1: Case Overview and Classifications

Innovator	Innovation	Motivation	Outcome
James Dyson	Bagless vacuum technology	Intrinsic	Radical
Clive Sinclair	Low-cost personal computing	Extrinsic	Incremental
Trevor Baylis	Wind-up radio	Extrinsic	Incremental
Nolan Bushnell	Consumer video gaming	Extrinsic	Incremental
Tony Fadell	Portable digital music devices	Extrinsic	Incremental
Nick Woodman	Action camera	Intrinsic	Incremental
Ayah Bdeir	Modular electronics platform	Intrinsic	Radical
Jaap Haartsen	Bluetooth wireless technology	Extrinsic	Radical
Fujio Masuoka	Flash memory	Intrinsic	Radical
Martin Cooper	Handheld mobile phone	Extrinsic	Radical

2.3. Data sources

The study relies on secondary qualitative data. This choice reflects the longitudinal nature of individual innovation processes, which often unfold over years or decades and cannot be captured through short-term primary data collection. Secondary sources provide access

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to extended temporal sequences and enable reconstruction of decision points, failures, and adaptations that retrospective interviews alone may smooth or rationalize [6].

Data were drawn from multiple publicly available sources for each case, including:

- In-depth interviews and podcast transcripts
- Autobiographical accounts and memoirs
- Recorded lectures, technical talks, and keynote presentations
- Archival materials, including historical documentation and contemporary reporting
- Documented reflections on development challenges, failures, and trade-offs

Multiple sources per case enabled triangulation across accounts differing in time, audience, and purpose. Discrepancies between sources were treated as analytically informative rather than as credibility threats; they revealed how innovators' interpretations of their own actions evolved over time.

Retrospective bias was addressed through three strategies. First, analysis prioritized concrete descriptions of actions, technical choices, and responses to constraint over abstract claims about intention or vision. Second, accounts were compared across multiple time points, with early descriptions weighted against later reflections. Third, particular attention was paid to documented moments of failure, uncertainty, and reversal, which are less susceptible to heroic retrospection.

Data collection proceeded iteratively with analysis, consistent with grounded theory. Early collection prioritized broad process documentation; later collection became increasingly selective, targeting materials that illuminated decision-making under constraint, prioritization of goals, and trajectory stabilization.

2.4. Operational definitions and analytical classifications

To enable systematic cross-case comparison, motivational orientation and innovation outcome were classified using transparent, empirically grounded criteria. Classifications were not assumed at case selection but were derived through analysis and revisited iteratively.

Table 2: Analytical Classification Criteria

Construct	Categories	Empirical Indicators
Motivational Orientation	Intrinsic	Voluntary initiation without immediate external reward; sustained experimentation absent commercial validation; willingness to absorb personal cost; prioritization of personally meaningful goals over market/organizational pressures; problem-framing in terms of satisfaction, elegance, or personal standards.
	Extrinsic	Innovation initiated through organizational assignment, market opportunity, or external mandate; decision-making shaped by performance targets, deadlines, or financial

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		objectives; explicit reference to adoption, recognition, or competitive positioning.
Innovation Outcome (stabilized form)	Incremental	Stabilized outcome optimizes, refines, or improves within existing technological architecture or product category; continuity with dominant design; reliance on known components/principles; framing in terms of enhancement rather than redefinition.
	Radical	Stabilized outcome involves architectural reconfiguration, new system logic, or novel usage logic; sustained rejection of dominant design assumptions; creation of new problem-solution pairings not accommodable within existing frameworks.

Motivation was treated as a processual and potentially mixed construct. Where both intrinsic and extrinsic elements were present, classification was based on the motivational orientation that consistently shaped decisions at critical junctures (responses to failure, willingness to change direction, commitment to non-negotiables). This approach reflects contemporary motivation research emphasizing contextual and dynamic motivation [11].

Innovation outcomes were classified retrospectively based on the stabilized trajectory, not on initial intent, claimed novelty, or eventual market impact. This distinction is theoretically central: an innovation may begin with modest aims and stabilise as radical, or begin with radical ambition and stabilise incrementally. Classification captures the outcome of the process, not the input.

2.5. Data analysis: grounded theory procedures

Analysis followed the three-stage coding sequence of Straussian grounded theory: open, axial, and selective coding. Although presented sequentially, analysis moved iteratively between stages as categories developed and relationships were tested against data.

Open coding constituted the initial, granular stage. Data were examined line by line and incident by incident to identify actions, decisions, and responses described by innovators. Codes were phrased in action-oriented terms wherever possible (e.g., refusing compromise, testing repeatedly, rejecting existing assumptions) to preserve process orientation. Open coding was intentionally expansive, preserving subtle variation. Constant comparison within and across cases ensured that codes captured recurring patterns rather than isolated incidents.

Focused coding synthesized the most analytically significant open codes into higher-level conceptual categories. This stage involved selecting codes that appeared frequently across cases or that captured processes central to the research questions, specifically, how innovators prioritized goals, responded to failure, navigated trade-offs, and protected core commitments. Focused codes were evaluated against additional data; those lacking explanatory reach were discarded or refined. This stage moved analysis from description toward conceptual specification.

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Axial coding specified relationships among categories by identifying conditions, actions/interactions, and consequences associated with key processes. Attention was directed to contextual conditions (resource scarcity, technical limitations, institutional constraints, market pressures) and how innovators' responses to these conditions shaped innovation trajectories. A central focus was the identification of critical decision points, moments where innovators confronted tensions between competing objectives, received feedback challenging existing assumptions, or faced constraints requiring reassessment. Axial coding revealed that decision-making was consistently filtered through non-negotiable goals derived from motivational orientation.

Selective coding constituted the final integrative stage. All categories were organized around a core explanatory concept: **non-negotiable goals guiding decision-making under constraint**. This core category accounted for observed variation across cases and provided coherence to the emerging theory. Categories that did not contribute meaningfully to the explanation were excluded, ensuring parsimony without sacrificing analytical depth.

Constant comparison functioned as the primary analytical mechanism throughout all stages. Data were compared within cases, across cases, and across coding stages to ensure consistency and refine category boundaries.

Memo writing accompanied all stages of analysis. Memos documented emerging insights, articulated questions, explored relationships among categories, and recorded moments of analytical tension or uncertainty. Memos supported theoretical sensitivity and provided an auditable record of theory development.

2.6. Rigor and trustworthiness

Rigor in grounded theory is established through systematic procedures, transparency, and sustained engagement with data, not through statistical validation. This study adopted multiple strategies to ensure analytical credibility.

Theoretical saturation was assessed analytically, not numerically. Saturation was reached when additional cases no longer introduced new category properties or altered relationships among categories. Sampling concluded at ten cases, at which point the core explanatory framework remained stable across successive case additions.

Negative case analysis was employed throughout. Instances where innovators appeared to diverge from emerging patterns were examined closely and used to refine category boundaries and specify the conditions under which particular processes held.

Triangulation across multiple data sources per case reduced reliance on any single narrative and enabled cross-verification of key events, decisions, and constraints.

Audit trail documentation includes coding records, analytical memos, and iterative versions of the developing theoretical model. This transparency enables readers and reviewers to assess the credibility of the analytical path from raw data to final theory.

Reflexivity was supported through sustained memo writing that explicitly engaged with interpretive decisions, competing explanations, and moments of uncertainty. This practice discouraged premature closure and encouraged deeper examination of relationships among categories.

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2.7. Boundary conditions

The study is designed as a mid-range theory grounded in ten cases within the consumer electronics sector. This boundary was deliberately imposed to control for broad technological and market variation, enabling a sharper focus on individual-level processes. The framework is intended to be analytically transferable to other contexts, but its empirical foundation remains sector-specific. Transferability requires empirical assessment in new settings, not methodological assertion.

3. Findings

3.1. The emergent theory: an overview

This study investigated how individual innovators progress from motivation to innovation outcomes and why some innovation trajectories stabilize as incremental while others stabilize as radical. Through grounded theory analysis of ten innovation cases in the consumer electronics sector, a process model emerged (shown in Figure 1) in which innovation outcomes are neither predetermined by initial intent nor linearly achieved. Instead, innovation unfolds as a dynamic, decision-driven trajectory shaped by how innovators define and protect non-negotiable goals while navigating constraints.

The model is organized around five core constructs:

(1) **Motivational orientation** (intrinsic/extrinsic) provides the foundation from which non-negotiables emerge.

(2) **Non-negotiable goals** are the concrete expressions of what the innovator refuses to compromise.

(3) **Constraint environments** (resource, technical, institutional, market) create conditions requiring trade-offs.

(4) **Decision-making under constraint** constitutes the core process, wherein innovators repeatedly evaluate options against non-negotiables.

(5) **Inflection points** (failure, feedback, validation) intensify decision-making but do not deterministically redirect trajectories.

(6) **Stabilization** occurs when cumulative decisions converge, yielding either incremental or radical outcomes, neither of which is inherently superior, and both of which remain reversible until final stabilization.

3.2. Motivation and the formation of non-negotiables

In all ten cases, innovation originated from a clearly identifiable motivational orientation. Intrinsically motivated innovators like Dyson, Woodman, Masuoka and Bdeir, were driven by personal dissatisfaction, curiosity, or a self-defined standard of how a product "should work." Extrinsically motivated innovators like Sinclair, Baylis, Bushnell, Fadell, Haartsen, and Cooper, responded to organizational mandates, market opportunities, or externally defined problems.

However, motivation type alone did not predict whether an innovation stabilized as incremental or radical. Both intrinsic and extrinsic cases produced both outcome types (Table 1). What mattered was not the source of motivation but its translation into **non-negotiable goals**.

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The theory proposes a central explanatory mechanism:

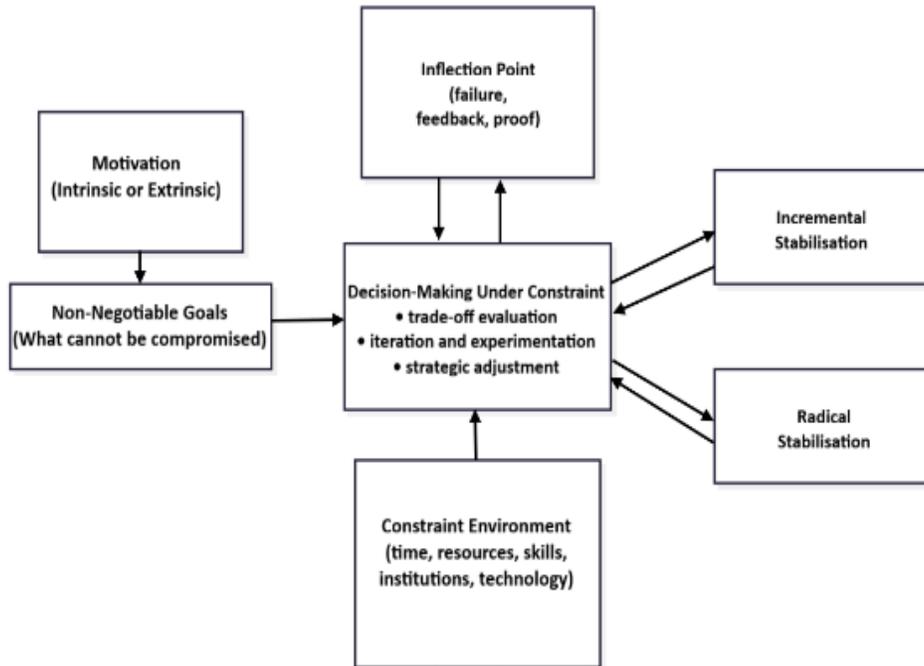


Figure 1: Grounded theory process model

Innovation trajectories are shaped not by motivation or constraints alone, but by how faithfully innovators preserve non-negotiable goals through decisions made under constraint across successive inflection points.

Non-negotiables are defined as the small set of core requirements an innovator is unwilling to compromise, regardless of pressure. They function as practical decision criteria, not abstract aspirations.

"I refused to accept loss of suction. That was the problem. Everything else could change, but that could not." - James Dyson

"It had to be affordable. If it wasn't affordable, it wasn't the thing I was trying to do." - Clive Sinclair

"The whole point was that you could use it anywhere, even where there was no electricity. If it needed mains power, it was just another radio." - Trevor Baylis

"I wanted personal freedom. That meant the device had to be with the person, not the place." - Martin Cooper

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Across cases, non-negotiables varied in content, affordability, portability, accessibility, robustness, suction performance, and low-power operation but were invariant in function. They demarcated what could be traded and what could not.

3.3. Decision-making under constraint

All innovators operated within constraint environments: resource scarcity, technical immaturity, institutional resistance, market uncertainty, or time pressure. Constraints did not merely impede progress; they activated decision-making by forcing explicit trade-offs.

Decision-making under constraint was not a one-time event but an iterative process. Innovators engaged in repeated cycles of prototyping, testing, failing, and revising. At each cycle, they confronted choices that required prioritizing some goals over others. The distinguishing feature of decision-making across cases was how innovators resolved trade-offs, specifically, whether proposed solutions preserved or violated non-negotiable goals.

Sinclair repeatedly accepted performance limitations to maintain affordability:

"We couldn't give them the best performance. We could give them something that worked and that they could afford. That was the trade."

Dyson repeatedly rejected solutions that compromised suction, even when doing so extended development by years:

"The manufacturers said, 'Put a bag in it and we'll sell it.' But that was accepting the problem, not solving it."

Cooper accepted technical compromises in handset size, battery life, and network compatibility to preserve portability:

"We could have made a car phone that worked perfectly. But that wasn't the vision."

Thus, decision-making under constraint is analytically specified as **the process of evaluating alternatives against non-negotiable goals**. Innovations advanced not when constraints were eliminated, but when innovators found pathways that preserved their non-negotiables within prevailing constraints.

3.4. Inflection points and trajectory dynamics

Across all trajectories, certain moments intensified decision-making: **inflection points**. These included repeated prototype failure (Dyson), rejection by manufacturers (Dyson, Baylis), public demonstration of feasibility (Cooper), standardization negotiations (Haartsen), and user feedback (Woodman, Bdeir).

A critical theoretical finding is that **inflection points do not deterministically redirect trajectories**. Their effect depends on how the innovator interprets the event through the lens of non-negotiables.

Cooper's successful public demonstration of the handheld mobile phone in 1973 did not change his direction; it validated it, reinforcing commitment to portability. Dyson's 5,127th failed prototype did not cause him to abandon suction performance; it confirmed that existing architectural approaches were inadequate and prompted a first-principles rebuild. Haartsen's rejection of existing wireless standards (DECT, WLAN) was not an

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acceptance of defeat but a redefinition of the problem space to align with low-power, short-range non-negotiables.

Inflection points are therefore **arenas of intensified evaluation**, not switches. They create conditions under which innovators must explicitly reaffirm, reinterpret, or revise their strategies but always with reference to what they have defined as non-negotiable.

3.5. Stabilization: incremental and radical as outcomes, not intent

Innovation outcomes in this study stabilized as either **incremental** or **radical**. These terms describe the stabilized form of the trajectory, not the innovator's initial ambition, the perceived novelty of the idea, or the scale of eventual impact.

Incremental stabilization occurred when innovators preserved non-negotiables through optimization, refinement, and cumulative improvement within existing product architectures or technological paradigms. Sinclair's low-cost computers, Baylis's wind-up radio, Woodman's action cameras, and Fadell's portable music devices all followed this pattern. Each innovator remained loyal to their core goal, but the pathway to preservation involved working within established categories and improving them.

Radical stabilization occurred when preserving non-negotiables required architectural change, the creation of new system logics, or the definition of new technological categories. Dyson's bagless vacuum required rejecting the century-old bag-based architecture. Masuoka's flash memory required inventing a new non-volatile storage architecture. Haartsen's Bluetooth required defining a new wireless protocol standard. Cooper's handheld mobile phone required redefining telecommunications from place-based to person-based. Bdeir's modular electronics platform required redefining who could build electronic systems and how.

Crucially, **outcome type was not correlated with motivation type**. Intrinsic motivation produced both incremental (Woodman) and radical (Dyson, Masuoka, Bdeir) outcomes. Extrinsic motivation produced both incremental (Sinclair, Baylis, Bushnell, Fadell) and radical (Haartsen, Cooper) outcomes.

3.6. Trajectory reversibility

A central and non-obvious finding is that **innovation trajectories are reversible until final stabilization**. An innovation initially pursued through incremental refinement may shift toward radical reconfiguration; an innovation initially framed as radical may stabilize incrementally.

Dyson's trajectory exemplifies the former. His early prototypes were incremental improvements to existing vacuum cleaners. Only after repeated failure to achieve acceptable suction within the bag-based architecture did he abandon that architecture entirely and rebuild from first principles. His non-negotiable (suction) remained constant; the means of preserving it shifted from optimization to architectural change.

Sinclair's trajectory, by contrast, remained consistently incremental. But the model accommodates the counterfactual: had affordability been achievable only through a fundamentally new computing architecture, Sinclair would have faced the same decision logic as Dyson.

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Reversibility is not indeterminacy. Shifts are not random; they occur when the current trajectory becomes **unsustainable for preserving non-negotiables**. Innovators do not abandon their goals. They abandon strategies that can no longer deliver them.

3.7. Cross-case theoretical integration

Table 3 summarizes the ten cases in terms of the core theoretical constructs.

Table 3: Cross-Case Summary: Motivation, Non-Negotiables, and Stabilization

Innovator	Motivation	Non-Negotiable	Inflection Point	Stabilization
Dyson	Intrinsic	Suction performance	5,127 failed prototypes; manufacturer rejection	Radical (architectural change)
Sinclair	Extrinsic	Affordability	Cost ceilings	Incremental (optimization)
Baylis	Extrinsic	Usability without electricity	Skepticism; funding constraints	Incremental (feature addition)
Bushnell	Extrinsic	User engagement	Market feedback	Incremental (refinement)
Fadell	Extrinsic	Usability, integration	Integration complexity	Incremental (system integration)
Woodman	Intrinsic	Usability in action	User testing	Incremental (form factor refinement)
Bdeir	Intrinsic	Accessibility for non-experts	User confusion with early versions	Radical (new platform logic)
Haartsen	Extrinsic	Low-power, short-range wireless	Rejection of DECT/WLAN	Radical (new protocol)
Masuoka	Intrinsic	Non-volatile, rewritable memory	Organizational neglect	Radical (new architecture)
Cooper	Extrinsic	Person-to-person mobility	Public demonstration; infrastructure constraints	Radical (new category)

The cross-case pattern is consistent. Every innovator:

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- (1) Held a clear motivational orientation.
- (2) Translated motivation into one or two non-negotiable goals.
- (3) Encountered constraints that forced trade-offs.
- (4) Made repeated decisions referencing non-negotiables.
- (5) Experienced inflection points that intensified but did not override this logic.
- (6) Stabilized as incremental or radical based on whether non-negotiables could be preserved within existing architectures or required new ones.

3.8. Summary of theoretical findings

This study proposes a grounded theory of individual innovation with the following central claims:

Proposition 1: Individual innovation trajectories are shaped by non-negotiable goals derived from motivational orientation. These goals function as invariant decision criteria throughout the innovation process.

Proposition 2: Innovation advances through decision-making under constraint. Constraints do not merely impede progress; they create the conditions under which non-negotiables are tested and trade-offs become explicit.

Proposition 3: Inflection points (failure, feedback, validation) intensify decision-making but do not deterministically redirect trajectories. Their influence is mediated by the innovator's interpretation through non-negotiables.

Proposition 4: Innovation outcomes stabilize as incremental or radical not through initial intent but through cumulative decisions. Incremental stabilization occurs when non-negotiables are preservable within existing architectures; radical stabilization occurs when preservation requires architectural change or new system logics.

Proposition 5: Innovation trajectories are reversible until final stabilization. Shifts are not random but occur when current strategies become unsustainable for preserving non-negotiables.

Together, these propositions offer an explanation of individual innovation that is neither voluntarist (outcomes determined solely by innovator agency) nor determinist (outcomes dictated by context). Innovation outcomes are emergent properties of decision sequences in which innovators remain loyal to what they value most while adapting how they pursue it.

4. Discussion

4.1. Summary of the grounded theory

This study investigated how individual innovators progress from motivation to innovation outcomes and why similar innovation efforts stabilize as either incremental or radical.

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Through grounded theory analysis of ten cases in consumer electronics, we induced a process model (Figure 1) in which innovation trajectories are shaped not by motivation type, initial intent, or technological novelty alone, but by the fidelity of decisions to non-negotiable goals under constraint.

The theory proposes five core propositions:

(1) Innovators translate motivation into non-negotiable goals, protected criteria that function as invariant decision anchors.

(2) Innovation advances through decision-making under constraint, where constraints activate trade-offs rather than merely impeding progress.

(3) Inflection points (failure, feedback, validation) intensify decision-making but do not deterministically redirect trajectories; their influence is mediated by non-negotiables.

(4) Innovation outcomes stabilize as incremental or radical not through initial classification but through cumulative decisions. Incremental stabilization preserves non-negotiables within existing architectures; radical stabilization requires architectural change or new system logics.

(5) Trajectories remain reversible until final stabilization; shifts occur when current strategies become unsustainable for preserving non-negotiables.

This framework reframes individual innovation as a decision-driven, commitment-anchored process rather than a linear pipeline or a function of fixed innovator traits.

4.2. Theoretical positioning

Table 4 summarizes how the proposed framework aligns with, extends, and departs from relevant theoretical traditions.

Table 4: Table of theories

Theoretical Tradition	Core Logic	Alignment	Extension / Divergence
Self-Determination Theory [10, 11]	Intrinsic/extrinsic motivation shapes persistence and engagement.	Motivation initiates and sustains innovation.	Specifies <i>how</i> motivation translates into action: via non-negotiables that function as decision criteria under constraint.
Effectuation [24]	Means-driven action; non-predictive control under uncertainty.	Shared emphasis on iteration, uncertainty, and adaptation.	Non-negotiables provide stability of commitment ; means and goals may adapt, but core commitments persist.
Bricolage [14]	Creative recombination of	Constraint is central,	Explains <i>which</i> compromises are accepted and which are

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	available resources under constraint.	not peripheral.	rejected: non-negotiables set the boundary.
Goal Shielding [25]	Focal goals inhibit competing goals, sustaining pursuit.	Non-negotiables act as protected focal goals.	Embeds goal shielding in an <i>innovation process model</i> spanning multiple decision cycles.
Escalation of Commitment [26]	Persistence despite setbacks, often irrational.	Observes persistence under failure.	Reframes persistence as rational commitment to non-negotiables , not automatic sunk cost fallacy.
Incremental/Radical Innovation [4, 5]	Outcomes classified by novelty, discontinuity, or architectural change.	Retains the utility of the distinction.	Reframes incremental/radical as emergent stabilization states , not fixed ex ante categories. Introduces reversibility .

Key Theoretical Move: The framework does not reject existing theories. It embeds their insights within a dynamic, decision-centric process model that explains how motivation, constraint, and commitment interact over time to produce observable innovation outcomes.

4.3. Theoretical contributions

Contribution 1: Incremental and Radical Innovation as Stabilization Outcomes, Not Fixed Types

Prior innovation research has largely treated incremental and radical innovation as stable categories defined by degree of novelty, technological discontinuity, or architectural change [4, 5, 27]. This study shifts the ontological status of these terms. Incremental and radical are not inherent properties of innovations, nor are they determined by the innovator's initial intent. They are final stabilization states that emerge from sequences of decisions made under constraint.

This reframing responds to persistent calls for more dynamic, process-oriented explanations of innovation [6, 19]. It dissolves the paradox of innovations that "should have been" incremental but became radical, or radical ambitions that stabilized incrementally. The appropriate question is not "Is this innovation incremental or radical?" but "How did this trajectory stabilize, and why did it follow that path?"

Contribution 2: Non-Negotiables as the Missing Link Between Motivation and Action

Self-determination theory and the psychology of motivation have established that intrinsic and extrinsic motivation shape persistence, creativity, and engagement [11, 12]. Yet motivation research has offered limited insight into how motivation becomes operationalized in concrete, repeated decisions under technical and resource constraints. The concept of non-negotiable goals addresses this gap.

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Non-negotiables are not merely "strong preferences" or "high priorities." They are protected decision criteria that innovators refuse to violate, even when violation would ease progress, reduce cost, or accelerate adoption. By identifying non-negotiables as the mechanism linking motivation to decision-making, the framework provides analytical precision missing from prior motivation-innovation research [13, 22]. Motivation does not simply "influence" innovation; it becomes materially embedded in the trade-offs innovators make.

Contribution 3: Non-Negotiables as the Boundary Condition of Adaptive Action

Research on bricolage and effectuation has powerfully demonstrated that constraint and uncertainty do not paralyze action; they stimulate creative recombination and adaptive means-ends redefinition [14, 24]. However, these traditions have been less explicit about how actors decide which adaptations are acceptable and which are not. The present framework introduces non-negotiables as the boundary condition for adaptive action.

This adds theoretical discipline to process theories of innovation under constraint. Not all adaptations are equivalent; not all compromises are permissible. The framework explains why Dyson rejected 5,126 prototypes rather than accepting bag-based filtration, and why Sinclair accepted performance limitations rather than abandoning affordability. Both acted adaptively but within firm boundaries defined by what they would not sacrifice.

Contribution 4: Trajectory Reversibility as a Theoretical Construct

Innovation research has long recognized that paths are not fully deterministic [20, 28]. Yet the dominant vocabulary of "trajectories," "paths," and "lock-in" implies increasing irreversibility. This study introduces reversibility as a formal property of innovation processes until the moment of stabilization.

Reversibility is not indeterminacy. Shifts from incremental to radical or radical to incremental are not random; they occur when the current trajectory becomes unsustainable for preserving non-negotiables. This construct reconciles empirical observations of path dependence with the equally persistent observation of strategic redirection. Reversibility is neither failure nor abandonment; it is the reconfiguration of means in service of stable ends.

4.4. Practical implications

For individual innovators: Articulate non-negotiables explicitly. The clarity with which an innovator can state "I will compromise on X, Y, and Z, but I will not compromise on W" directly enhances decision coherence under pressure. Non-negotiables are not constraints; they are liberating commitments that reduce paralysis when trade-offs proliferate. **For innovation educators and mentors:** Shift pedagogy from outcome classification to decision logic. Teaching students to distinguish incremental from radical innovation is less useful than teaching them to analyze decision points, identify what innovators protect, and trace how trajectories stabilize. Case teaching should foreground trade-offs, not merely successes.

For organizations and innovation sponsors: Recognize that individual innovators working under constraint are not simply "stubborn" or "escalating commitment." Persistence may reflect rational protection of non-negotiables essential to the innovation's value proposition. Premature compromise risks dissolving the very distinctiveness the organization seeks to cultivate.

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4.5. Limitations and future research

This study is subject to boundary conditions that also define opportunities for future inquiry. First, the empirical scope is limited to ten cases in consumer electronics. While this enabled controlled cross-case comparison, innovation processes in highly regulated, capital-intensive, or science-based sectors may involve different forms of constraint and institutional mediation. Future research should examine how non-negotiables function in contexts such as pharmaceuticals, clean energy, or defence.

Second, the study relies on retrospective accounts. Although triangulation mitigated post-hoc rationalization, real-time decision-making may involve provisional, shifting non-negotiables that retrospective accounts smooth. Longitudinal ethnographic or diary-based studies could capture the formation and contestation of non-negotiables as innovation unfolds.

Third, the framework centers the individual innovator. Yet many innovations emerge from teams, ventures, or distributed communities. Future research should investigate collective non-negotiables: how are they negotiated, how do they stabilize, and what happens when individual and collective commitments diverge?

Finally, the framework is explanatory, not predictive. Quantitative operationalization of non-negotiables, decision points, and stabilization outcomes would enable larger-sample testing and extension. Such work would also clarify the boundary conditions of reversibility: under what conditions do trajectories become irreversible, and when does protection of non-negotiables shift from adaptive commitment to maladaptive lock-in?

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