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From Innovation to Affordability: A Conceptual Framework Linking Insurtech Capability to Patient Financial Outcomes

Dr Venkatraman Kumar
Executive Director, AGS Health Pvt Ltd
Chennai, India
vraman88@gmail.com

Abstract

Healthcare affordability remains a significant concern because insured patients may still face substantial out-of-pocket (OOP) expenses arising from deductibles, copayments, uncovered services, and complex billing. This conceptual study develops a framework explaining how Insurtech Capability may contribute to Patient Financial Outcomes through Patient Financial Navigation and Benefit Optimization. Drawing on Dynamic Capabilities Theory, the Information Systems Success Model, Service-Dominant Logic, and the financial toxicity perspective, the framework defines Insurtech Capability through five dimensions: data integration and interoperability, analytics and decision support, process automation, digital financial engagement, and privacy, security, and governance. Interoperability and Organizational Integration are treated as enabling conditions, while Health-Insurance Literacy is a patient-level boundary condition. Six propositions describe the proposed direct, mediated, and moderating relationships. The framework distinguishes actual OOP expense reduction from cost predictability, reduced administrative burden, and reduced financial distress. It also recognizes that plan design, provider prices, network restrictions, and clinical requirements may constrain savings. The contribution is an integrated, patient-centered explanation of how digital insurance resources might translate into financial value. Because the framework is conceptual, its propositions require empirical testing before any causal or affordability effect can be established.

Keywords: Insurtech Capability; Patient Financial Outcomes; Out-of-Pocket Expenses; Patient Financial Navigation; Health-Insurance Literacy; Financial Toxicity.

1. Introduction

1.1 Background

Health insurance distributes healthcare costs between insurers and patients, but coverage does not eliminate deductibles, copayments, coinsurance, or excluded expenses (Cutler & Zeckhauser, 2000). Patients may also encounter fragmented billing, difficult benefit documents, and uncertainty about final charges. Financial toxicity research illustrates how healthcare expenses can create material hardship and psychological strain, including in publicly funded healthcare systems (Longo et al., 2020; Bradley et al., 2021). These concerns make patient financial outcomes an important consideration in healthcare insurance innovation.

Insurtech applies analytics, automation, artificial intelligence, and digital platforms to insurance processes and services (Eling & Lehmann, 2018; Braun & Jia, 2025). In healthcare insurance, such resources may support benefit verification, claims administration, cost estimates, and patient communication. Their financial value depends on the quality of information, coordination across organizations, and patients' ability to understand and use their coverage (DeLone & McLean, 2003; Paez et al., 2014).

1.2 Problem Statement

The research problem is the insufficiently articulated connection between organizational insurtech capability and patient-level financial value within the literature synthesized here. Insurance digitalization research explains technological transformation, while price-transparency and financial-protection research shows that information access or insurance coverage cannot be assumed to reduce personal payments (Eling & Lehmann, 2018; Mehrotra et al., 2018; Reshmi et al., 2021). This paper therefore asks how digital capabilities may

support patient financial navigation and appropriate benefit use, under what conditions these mechanisms may reduce OOP expenses, and how those savings differ from predictability, administrative relief, or reduced distress.

1.3 Research Gaps

The following gaps represent opportunities for conceptual integration within the selected literature, rather than claims that no relevant studies exist; this focused synthesis does not establish exhaustive novelty.

1. Insurtech Capability Conceptualization Gap: Digitalization research describes changes across the insurance value chain, while capability theory emphasizes coordinated deployment of organizational resources (Eling & Lehmann, 2018; Braun & Jia, 2025; Teece, 2007); bringing these perspectives together provides a basis for specifying a patient-facing capability comprising five complementary dimensions.

2. Capability-to-Outcome Mechanism Gap: Information-system benefits, price transparency, and financial protection are addressed in distinct literatures (DeLone & McLean, 2003; Zhang et al., 2020; Erlangga et al., 2019), leaving room for an integrated explanation of how digital capability may translate into lower patient payments rather than information access alone.

3. Patient Financial Navigation Gap: Research on insurance literacy explains consumers' ability to choose and use coverage and its association with care utilization (Paez et al., 2014; Tipirneni et al., 2018; Yagi et al., 2022), but these contributions do not by themselves specify a mediated pathway from organizational insurtech capability through financial navigation and benefit optimization to OOP expense reduction; this paper develops that theoretical connection.

4. Interoperability and Organizational Integration Gap: Insurance digitalization and resource-integration perspectives motivate

attention to coordinated information use (Eling & Lehmann, 2018; Vargo & Lusch, 2004), but their application here requires a clearer distinction between an organization's internal technical capability and the external ecosystem coordination proposed to condition patient navigation.

5. Health-Insurance Literacy Gap: Existing measures and reviews establish the relevance of understanding and using coverage (Paez et al., 2014; Yagi et al., 2022), while cost-related care avoidance illustrates its practical significance (Tipirneni et al., 2018); whether literacy changes the financial returns from insurtech-supported navigation remains a proposition for future investigation.

1.4 Research Aim and Objectives

Research Aim: To develop a conceptual framework explaining how Insurtech Capability may influence Patient Financial Outcomes, particularly Out-of-Pocket (OOP) Expense Reduction.

Research Objectives:

RO1: To identify the dimensions of Insurtech Capability in healthcare insurance and the theoretical perspectives explaining their relationship with Patient Financial Outcomes.

RO2: To explain how Insurtech Capability may influence Patient Financial Outcomes, particularly OOP Expense Reduction.

RO3: To examine Patient Financial Navigation and Benefit Optimization as mechanisms linking Insurtech Capability with Patient Financial Outcomes.

RO4: To explain how ecosystem interoperability, organizational integration, and Health-Insurance Literacy may condition the proposed relationships linking Insurtech Capability with Patient Financial Outcomes.

RO5: To develop an integrated conceptual framework linking Insurtech Capability, Patient Financial Navigation, and Patient Financial Outcomes.

1.5 Research Questions

RQ1: What dimensions constitute Insurtech Capability in healthcare insurance, and which theoretical perspectives explain their relationship with Patient Financial Outcomes?

RQ2: How may Insurtech Capability influence Patient Financial Outcomes, particularly OOP Expense Reduction?

RQ3: How may Patient Financial Navigation and Benefit Optimization mediate the relationship between Insurtech Capability and Patient Financial Outcomes?

RQ4: How may ecosystem interoperability, organizational integration, and Health-Insurance Literacy condition the proposed relationships linking Insurtech Capability with Patient Financial Outcomes?

RQ5: How can Insurtech Capability, Patient Financial Navigation, and Patient Financial Outcomes be integrated into a comprehensive conceptual framework?

1.6 Conceptual Contribution

This study develops an integrated conceptual framework explaining how Insurtech Capability may improve patient financial outcomes through Patient Financial Navigation and Benefit Optimization. Its contribution is not to claim that digital insurance tools automatically reduce costs, but to connect organizational capability with patient actions and distinguish actual OOP expense reduction from predictability, administrative burden, and financial distress. It identifies Interoperability and Organizational Integration as enabling conditions and Health-Insurance Literacy as a boundary condition. Six theoretically informed propositions are offered for future empirical testing.

2. Literature Review

2.1 Insurtech Capability in Healthcare Insurance

Insurtech refers to the application of digital technologies to insurance operations, information processing, and customer-facing

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services. Technologies such as artificial intelligence, analytics, automation, and digital platforms can improve operational efficiency and access to insurance information (Eling & Lehmann, 2018; Braun & Jia, 2025). However, technological adoption does not necessarily translate into improved patient affordability. In healthcare insurance, the value of digital services depends on whether information is accurate, accessible, timely, and integrated across insurers, healthcare providers, pharmacies, and billing systems.

This study conceptualizes Insurtech Capability as a multidimensional organizational capability comprising data integration and interoperability, analytics and decision support, process automation, digital financial engagement, and privacy, security, and governance. These dimensions must operate together to support reliable patient-facing services. Accordingly, the framework focuses not simply on the presence of digital tools but on how organizations coordinate these resources to support patient financial decisions.

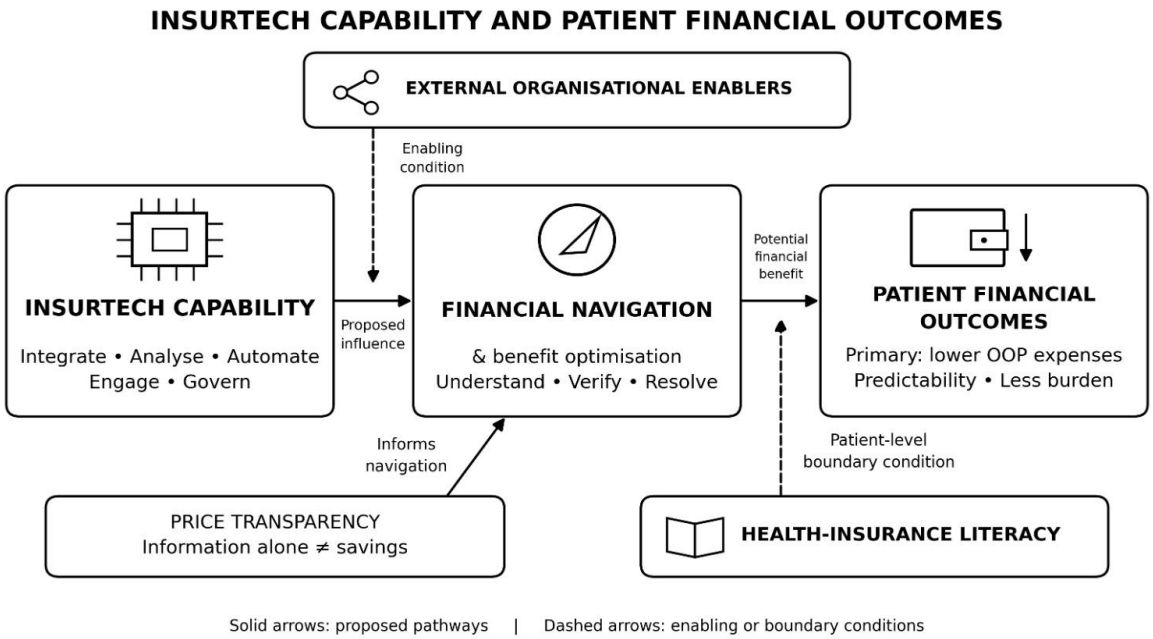


Figure 1. Conceptual synthesis of insurtech capability, financial navigation, and patient financial outcomes.
Proposed relationships require empirical testing. OOP = out-of-pocket.

2.2 Patient Financial Outcomes with an Emphasis on OOP Expenses

Patient financial outcomes include direct healthcare payments and the broader experience of managing healthcare expenses. Out-of-pocket (OOP) Expense Reduction is the primary outcome of this study and refers to a decrease in patients' personal healthcare payments relative to an appropriate baseline or comparison. Potential routes include identifying eligible benefits, correcting billing errors, understanding coverage restrictions, and making informed financial decisions. Research on health insurance and cost-sharing explains why coverage design affects the allocation of healthcare costs between insurers and patients (Cutler & Zeckhauser, 2000). Financial toxicity research demonstrates that healthcare expenses can create financial strain and affect patient well-being (Longo et al., 2020; Bradley et al., 2021; Pisu & Martin, 2022). However, financial well-being is broader than the amount paid. Research on healthcare price transparency indicates that access to price information may support cost-conscious decisions, but its effects on consumer behaviour and healthcare spending vary (Mehrotra et al., 2018; Zhang et al., 2020). Reviews also show that patient and caregiver OOP costs extend beyond a single bill or service category (Schmidt et al., 2024). Evidence from public and low- and middle-income health-insurance settings indicates that financial protection depends on scheme design, utilization, and context (Erlangga et al., 2019; Prinja et al., 2017; Rahman et al., 2022). In particular, Reshmi et al. (2021) reported increased healthcare utilization but did not establish conclusive improvement in financial protection; insurance coverage should therefore not be treated as proof of reduced OOP spending. Consequently, this study distinguishes actual OOP expense reduction from related outcomes: cost predictability, reduced administrative burden, and reduced financial distress. Improved information or

administrative efficiency should not automatically be interpreted as evidence of lower patient payments.

2.3 Financial Navigation through Benefit Optimization

Patient Financial Navigation refers to the activities through which patients understand insurance coverage, assess likely financial responsibilities, identify available benefits, and resolve insurance or billing difficulties. Benefit Optimization concerns the appropriate identification and use of benefits available under an existing insurance plan. Digital tools may support these activities through benefit verification, cost estimates, claims updates, and accessible financial guidance. Health-insurance literacy is relevant because possessing insurance does not necessarily mean that patients understand how to use their coverage. Paez et al. (2014) developed the Health Insurance Literacy Measure to assess consumers' ability to choose and use private health insurance. Tipirneni et al. (2018) linked health-insurance literacy with cost-related avoidance of care, while Yagi et al. (2022) reviewed evidence connecting health-insurance literacy with healthcare utilization and identified limitations in measurement and consistency across outcomes. These studies establish the relevance of insurance literacy and informed decision-making, but they do not independently demonstrate that insurtech reduces OOP expenses. This paper therefore proposes Patient Financial Navigation and Benefit Optimization as a mediating mechanism through which digital capabilities may translate into more effective use of available benefits and potentially lower patient payments.

2.4 Organizational Enablers within the Health Insurance Literacy Context

The framework distinguishes internal technical capability from external ecosystem conditions: internal interoperability concerns an insurer's capacity to integrate and use data, whereas ecosystem interoperability and organizational

integration concern partner participation, shared standards, coordinated workflows, and responsibilities across independent insurers, providers, pharmacies, and billing organizations. This distinction applies to the two similarly labelled components in Figures 1 and 2. Resource integration and system quality provide theoretical reasons to expect these levels to interact, but they do not establish the proposed moderating effect empirically (Vargo & Lusch, 2004; DeLone & McLean, 2003).

Health-Insurance Literacy is a patient-level boundary condition concerning the ability to understand coverage terms, interpret deductibles and cost-sharing obligations, identify covered services, and use insurance benefits (Paez et al., 2014). General digital confidence and broader financial literacy are adjacent concepts rather than indicators of this construct. The associations reviewed by Tipirneni et al. (2018) and Yagi et al. (2022) support its relevance, while the specific moderation of navigation-related OOP reduction remains untested. Plain-language explanations and human assistance may reduce barriers without changing contractual coverage.

2.5 Critical Synthesis of the Conceptual Gap

Existing literature highlights the role of digital technologies in insurance operations and healthcare financial protection (Eling & Lehmann, 2018; Braun & Jia, 2025). However, improved operational efficiency and information access do not necessarily reduce patients' out-of-pocket (OOP) expenses. Dynamic Capabilities Theory, the Information Systems Success Model, Service-Dominant Logic, and the financial toxicity perspective offer complementary insights into organizational capabilities, information quality, value creation, and financial burden. Health-insurance literacy influences patients' ability to understand coverage and use available benefits (Paez et al., 2014; Tipirneni et al., 2018; Yagi et al., 2022). Nevertheless, the integrated relationship between Insurtech

Capability, Patient Financial Navigation and Benefit Optimization, and patient financial outcomes requires further conceptual development. This study addresses this gap through six propositions incorporating organizational enabling conditions and health-insurance literacy while distinguishing actual OOP expense reduction from related financial outcomes. The proposed relationships require future empirical testing.

Table 1. Literature Synthesis of Insurtech Capability and Patient Financial Outcomes

Literature theme	Main focus	Relevance to this study
Insurtech capability	Digital technologies, analytics, automation, and insurance transformation	Establishes the technological foundation
Patient financial outcomes	OOP expenses, cost predictability, and financial distress	Defines the outcomes requiring explanation
Financial navigation	Coverage understanding, benefit verification, and billing resolution	Explains the proposed mediating mechanism
Interoperability and integration	Information exchange and coordination across organizations	Establishes enabling conditions
Health-insurance literacy	Understanding and using insurance information	Explains differences in the use of digital services
Price transparency	Access to cost information and its limitations	Distinguishes information access from actual expense reduction

Note. Supporting literature by theme: insurtech capability—Eling and Lehmann (2018), Braun and Jia (2025); patient financial outcomes—Longo et al. (2020), Schmidt et al. (2024); financial navigation—Paez et al. (2014), Yagi et al. (2022), used as indirect support; interoperability and integration—DeLone and McLean (2003), Vargo and Lusch (2004), used as theoretical support; insurance literacy—Tipirneni et al. (2018), Yagi et al. (2022); price transparency—Mehrotra et al. (2018), Zhang et al. (2020).

3. Theoretical Foundations

3.1 Dynamic Capabilities Theory

Dynamic Capabilities Theory explains how organizations integrate and reconfigure resources to respond to changing environments (Teece, 2007). It supports treating insurtech as an organizational capability rather than a collection of isolated applications. Insurers must coordinate technology, data, analytics, and workflows for digital services to become useful to patients.

3.2 Information Systems Success Model

The DeLone and McLean (2003) model emphasizes system quality, information quality, service quality, use, user satisfaction, and net benefits. In healthcare insurance, reliable platforms and accurate, timely, understandable coverage information are essential. An unreliable cost estimate or inaccessible interface may create confusion rather than financial value.

3.3 Service-Dominant Logic

Service-Dominant Logic views value as emerging through interactions and resource integration among actors (Vargo & Lusch, 2004). Patients, insurers, providers, and technology developers must coordinate information and actions. Patient financial navigation is a plausible process through which digital resources may be converted into practical value.

3.4 Financial Toxicity Perspective

The financial toxicity perspective emphasizes that healthcare expenses can create financial strain and affect patient well-being (Pisu & Martin, 2022). It grounds the focus on patient-level outcomes while requiring care not to treat better administration as proof of reduced expenses. Actual OOP payments, cost predictability, administrative burden, and financial distress should be measured separately. The integration also clarifies the distinction between antecedents, mechanisms, conditions, and outcomes. Insurtech Capability

is the organizational antecedent; Patient Financial Navigation and Benefit Optimization form the proposed mechanism; interoperability and organizational integration are enabling conditions; and health-insurance literacy is a patient-level boundary condition. OOP Expense Reduction is the primary outcome, while cost predictability, administrative burden, and financial distress are related but separate outcomes. Keeping these roles distinct reduces conceptual overlap and helps future researchers specify testable models.

3.5 Integrated Theoretical Logic

Together, these perspectives explain complementary parts of the proposed model: organizational capability enables digital resources; information-system quality determines whether information is usable; service interactions help turn resources into patient value; and the financial toxicity perspective clarifies why financial outcomes matter. This integration supports the proposed sequence from capability to navigation and benefit use, subject to organizational and patient-level conditions.

Table 2. Theoretical Foundations of Insurtech Capability and Patient Financial Outcomes

Theoretical perspective	Core principle	Role in the present study
Dynamic Capabilities Theory	Organizations integrate and adapt resources to respond to changing conditions.	Explains how insurers develop and deploy insurtech capability.
Information Systems Success Model	System, information, and service quality influence system use and benefits.	Explains why accurate information and usable digital services matter.
Service-Dominant Logic	Value emerges through interactions and resource integration.	Explains how digital resources may become actionable patient financial value.
Financial Toxicity Perspective	Healthcare costs can create financial difficulties and affect patient well-being	Establishes the importance of OOP expense reduction and related financial outcomes.

Note. Foundational sources: Dynamic Capabilities Theory—Teece (2007); Information Systems Success Model—DeLone and McLean (2003); Service-Dominant Logic—Vargo and Lusch (2004); financial toxicity perspective—Longo et al. (2020), Bradley et al. (2021), Pisu and Martin (2022).

4. Conceptual Framework

4.1 Insurtech Capability as a Multidimensional Construct

Insurtech Capability comprises five dimensions. Data Integration and Interoperability denotes the organization's internal ability to receive, reconcile, and use relevant insurance and healthcare information. Analytics and Decision Support concerns coverage interpretation, cost estimates, claims, and benefit decisions. Process Automation supports verification, claims processing, notifications, and administrative checks. Digital Financial Engagement provides portals, benefit summaries, cost estimators, and accessible guidance. Privacy, Security, and Governance concerns data protection, responsible use, transparency, and accountability. External partner coordination is treated separately as a contextual condition rather than counted again as an internal capability. These dimensions are expected to work together. Their potential contribution depends on operational integration and whether patients can use the resulting services. Figure 1 presents the conceptual pathway linking Insurtech Capability with patient financial value.

4.2 Patient Financial Navigation and Benefit Optimization

The proposed mediator captures how digital resources may become actionable patient decisions. Navigation includes understanding coverage, estimating costs, checking eligibility, and resolving claims or billing problems. Benefit optimization concerns

appropriate use of available benefits and timely completion of required procedures. Digital tools may improve these activities through accessible information and connected workflows, but their effect depends on accuracy, usability, and available support.

4.3 Patient Financial Outcomes

OOP Expense Reduction is the primary outcome: a decrease in patients' direct payments relative to an appropriate comparison. Cost Predictability concerns the ability to anticipate likely financial responsibility, even if the amount owed does not fall. Reduced Administrative Burden means less time and effort spent understanding coverage, submitting documents, tracking claims, and resolving billing. Reduced Financial Distress concerns financial strain or worry associated with healthcare expenses. These outcomes are related but not interchangeable.

4.4 Conditions Shaping the Proposed Relationships

Ecosystem interoperability and Organizational integration are proposed to strengthen the capability-to-navigation pathway in P5, whereas Health-Insurance Literacy is proposed to strengthen the navigation-to-OOP-reduction pathway in P6. In Figures 1 and 2, P2 and P6 should therefore be read as applying specifically to the primary OOP outcome, rather than automatically to every outcome within the enclosing box. The direct pathway P3 addresses broader financial outcomes and does not require an OOP reduction. Financial stress belongs to Financial Distress; Administrative Burden concerns time and effort, and fewer unexpected bills indicate predictability unless verified payments also decline. An important implication is that capability should be evaluated through both technical and patient-facing indicators. Technical indicators may include the completeness of information exchange,

timeliness of benefit verification, reliability of cost estimates, processing accuracy, and secure data handling. Patient-facing indicators may include comprehension of coverage, confidence in anticipated costs, successful use of eligible benefits, time spent resolving billing problems, and actual payments. A measurement strategy that uses only platform adoption or transaction speed could overstate patient value if it does not capture financial outcomes. Researchers should also define the counterfactual for OOP Expense Reduction carefully. A lower payment may reflect a change in treatment, insurance plan, provider, negotiated price, or patient circumstances rather than insurtech capability. Stronger designs should therefore account for relevant covariates and, where feasible, compare outcomes before and after implementation or across similar groups exposed to different service configurations. This caution is essential because the framework proposes plausible relationships but does not claim that the existing evidence proves causality.

4.5 Integrated Conceptual Logic

The framework proposes a direct pathway from Insurtech Capability to Patient Financial Outcomes and an indirect pathway through Patient Financial Navigation and Benefit Optimization. Interoperability and Organizational Integration are enabling conditions; Health-Insurance Literacy is a boundary condition. Benefit design, provider prices, network rules, clinical requirements, and patient circumstances may limit actual savings. The framework therefore makes conditional propositions rather than assuming that technology automatically reduces expenses. The theoretical logic is differentiated across the propositions: Dynamic Capabilities Theory supports the organizational capability premise in P1 and the Information Systems Success Model supports the direct user-benefit pathway in P3; the Information Systems Success Model supports the importance of

system and information quality for P1; Service-Dominant Logic informs the conversion of organizational resources into patient-facing value in P2 and P4; and the financial toxicity perspective clarifies the outcome focus in P2–P4. P5 specifies the organizational integration condition, while P6 draws on health-insurance literacy research to explain why the same navigation support may not yield equivalent benefits for all patients. These links provide theoretical rationale, but the precise relationships remain propositions to be tested.

5. Conceptual Propositions

The following six propositions express theoretically informed expectations for future empirical testing; their rationale follows the theoretical integration in Sections 3 and 4.

P1: Stronger Insurtech Capability is proposed to improve Patient Financial Navigation and Benefit Optimization by providing accurate, usable coverage information and coordinated digital support.

P2: More effective Patient Financial Navigation and Benefit Optimization is proposed to reduce OOP expenses through appropriate benefit use and billing-error resolution, subject to plan provisions, provider prices, and treatment requirements.

P3: Stronger Insurtech Capability is proposed to improve patient financial outcomes directly through more accurate claims, clearer cost information, and reduced administrative effort, even when contractual OOP payments remain unchanged.

P4: Patient Financial Navigation and Benefit Optimization is proposed to mediate the relationship between Insurtech Capability and OOP Expense Reduction by translating organizational digital resources into informed patient actions.

P5: Stronger ecosystem interoperability and organizational integration are proposed to positively moderate the relationship between Insurtech Capability and Patient Financial Navigation and Benefit Optimization through

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coordinated information exchange and workflows.

P6: Higher Health-Insurance Literacy is proposed to positively moderate the relationship between Patient Financial Navigation and Benefit Optimization and OOP Expense Reduction by strengthening patients' ability to interpret coverage and act on guidance.

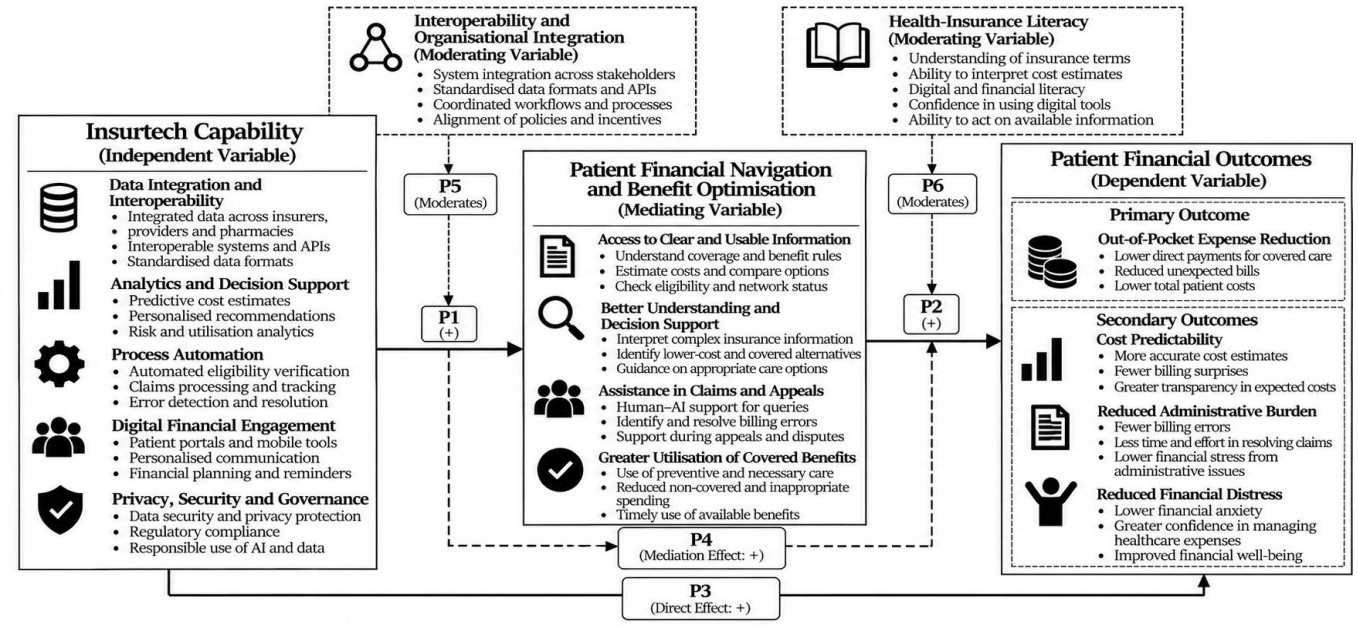


Figure 2. Proposed Conceptual Framework Linking Insurtech Capability to Patient Financial Outcomes

6. Conceptual Methodology

6.1 Research Design

This theory-driven conceptual study integrates the existing reference set to explain how Insurtech Capability may contribute to patient financial outcomes; it collects no primary data and tests no statistical relationships.

The literature synthesis is focused rather than systematic or exhaustive, and source selection follows relevance to the constructs, theoretical foundations, and affordability problem.

6.2 Five Development Stages

The five stages follow the structure illustrated in Figure 3.

Stage 1: Conceptual Foundation and Model Development

Define the affordability problem, synthesize relevant literature, integrate theoretical perspectives, and specify the constructs and initial relationships.

Stage 2: Conceptual Operationalization

Identify illustrative indicators and the insured-patient context for future empirical work while distinguishing internal capability, ecosystem conditions, navigation, literacy, and separate financial outcomes.

Stage 3: Theoretical Validation and Logical Consistency

Assess definitions, theoretical correspondence, and internal consistency, interpreting the retained figure's validation language as conceptual assessment rather than demonstrated content validity or independent expert review.

Stage 4: Proposition Development and Analysis

Formulate P1–P6 to explain direct, mediated, and moderating relationships, specifying that P2, P4, and P6 concern OOP Expense Reduction.

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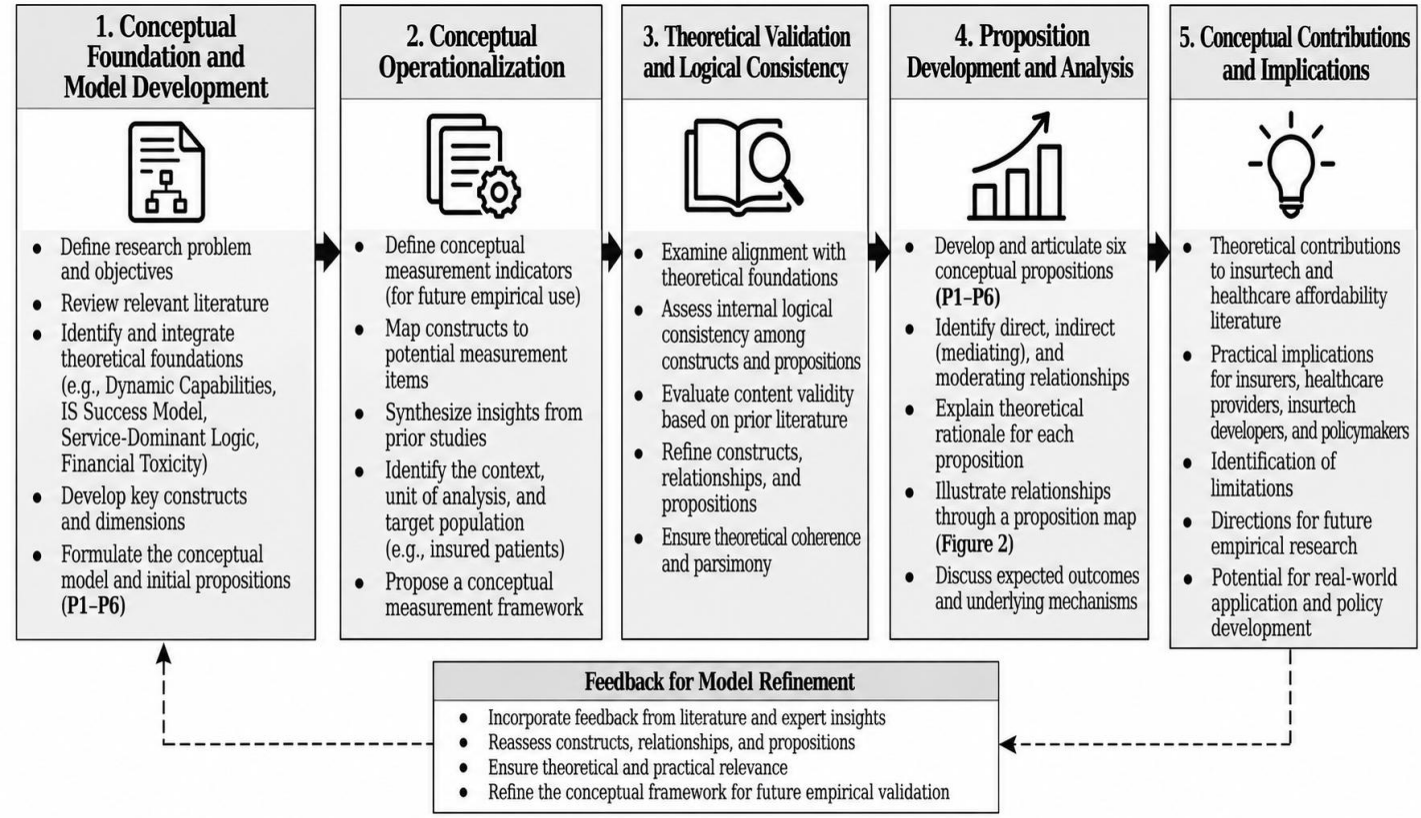


Figure 3. Conceptual Research Development and Proposition Validation Framework

Stage 5: Conceptual Contributions and Implications

Identify theoretical contributions, practical implications, limitations, and future research directions, using literature-based refinement without claiming expert consultation.

6.3 Future Empirical Assessment

Future studies should combine patient surveys with verified payment or claims records, define a comparison baseline, account for plan design, prices, utilization, and clinical requirements, and document measurement and analytical decisions.

All propositions remain untested, and improved predictability, reduced administrative burden, or reduced distress should not be interpreted as verified OOP savings.

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7. Theoretical and Practical Implications

7.1 Theoretical Implications

The framework extends the discussion of insurtech from operational efficiency to potential patient financial value. Dynamic Capabilities Theory explains resource coordination; the Information Systems Success Model emphasizes reliable systems and high-quality information; Service-Dominant Logic highlights interactions and resource integration; and the financial toxicity perspective clarifies the importance of patient financial outcomes. The proposed mediator and contextual conditions provide a basis for testing how capability may translate into patient-level effects.

7.2 Implications for Insurers, Providers, and Developers

Insurers may integrate benefit verification, cost estimation, claims information, and patient-facing guidance, while evaluating actual patient outcomes alongside processing speed and platform use. Providers may make cost estimates and coverage checks available at appropriate points in care and coordinate with insurers to reduce inconsistent information. Developers should prioritize plain-language explanations, accessible design, transparent estimates, interoperability, privacy, security, and routes to human assistance. A digital estimate should not be represented as a guaranteed final price. Implementation should be accompanied by safeguards against misleading precision. Cost-estimation systems should explain the assumptions used, indicate when information is incomplete, and communicate that final patient responsibility can change when treatment, coding, network status, or benefit rules change. Patients should have a clear route to ask questions, correct inaccurate information, and obtain human assistance. These safeguards are important for trust and for ensuring that digital systems do not shift the burden of navigating complex insurance arrangements entirely onto patients. Organizations should also consider

distributional effects. A service may improve average outcomes while remaining difficult to use for patients with limited digital access, language barriers, disabilities, or lower insurance literacy. Accessibility testing, plain-language content, multiple communication channels, and monitoring outcomes across patient groups can help identify such gaps. This is consistent with a patient-centred approach in which digital capability is judged by practical usability and equitable access as well as technical performance.

7.3 Implications for Policymakers and Healthcare Systems

Policymakers and healthcare systems may encourage accurate information exchange, transparent communication, responsible data governance, and accessible patient support. Initiatives to improve health-insurance literacy should accompany digital transformation so that services do not disproportionately benefit patients who already possess stronger digital and financial skills. Digital tools should complement, not replace, broader efforts addressing benefit design, provider pricing, network restrictions, and other structural sources of healthcare costs.

8. Limitations and Future Research

This study has several limitations. First, it develops a conceptual framework, and its six propositions have not been empirically tested. Second, the proposed constructs require operational definitions and validated measurement instruments. Third, the framework integrates literature from different healthcare and insurance contexts, which may limit its applicability across countries and healthcare systems.

Future research should test the propositions using quantitative, qualitative, or mixed-method approaches. Researchers may combine patient surveys with insurance claims, billing records, and verified out-of-pocket expense data to evaluate actual financial outcomes. Longitudinal and comparative studies could

examine changes following Insurtech implementation. Future studies should also investigate how insurance-plan design, provider prices, interoperability, organizational integration, and health-insurance literacy influence the proposed relationships. Finally, researchers should assess potential risks related to privacy, digital accessibility, and inaccurate cost estimates. Such investigations can establish when insurtech capabilities contribute to genuine patient affordability.

9. Conclusion

This paper develops a conceptual framework explaining how Insurtech Capability may contribute to Patient Financial Outcomes, particularly OOP Expense Reduction. The framework combines five capability dimensions—data integration and interoperability, analytics and decision support, process automation, digital financial engagement, and privacy, security, and governance—with Patient Financial Navigation and Benefit Optimization as a proposed mediating mechanism. Interoperability and Organizational Integration are enabling conditions, while Health-Insurance Literacy may shape patients' ability to translate information into financial benefit. Six propositions specify the expected direct, mediated, and conditional relationships. Integrating Dynamic Capabilities Theory, the Information Systems Success Model, Service-Dominant Logic, and the financial toxicity perspective connect organizational resources and information quality with patient value and financial well-being. The framework's contribution is to place affordability alongside operational efficiency while distinguishing actual expense reduction from predictability, administrative burden, and distress.

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