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Leveraging digitalization to improve customer relationships and operational efficiency in the insurance sector

Case study "SAA''

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Abstract

This research investigates how digitalization enhances customer relationships and operational efficiency within Algeria's insurance sector, with a focused case study on the Société Algérienne d'Assurance (SAA). Adopting an interpretivist, abductive, and qualitative approach, the study analyzes data from semi-structured interviews with key SAA stakeholders, internal strategic documents including the Digital Roadmap, annual reports covering the period 2017–2023, and SAA's internal customer satisfaction survey 2025. Findings reveal that digital initiatives such as the PGS claims platform and E-Recours inter-insurer system have significantly accelerated service delivery, reduced administrative costs, and improved client satisfaction, exceeding 75%. However, progress is constrained by regulatory gaps, particularly the absence of legal recognition for electronic signatures, legacy IT infrastructure centred on the outdated ORASS system, and uneven digital adoption across client segments. The study confirms the theoretical sequencing from digitization through digitalization to full digital transformation, while demonstrating its contextual limitations within an emerging public-sector institutional setting. It further shows that digital maturity at SAA is not solely a technological endeavor but a socio-institutional process shaped by governance, inclusion, and public mandates. This research contributes a triadic model of digital transformation for emerging markets integrating technical feasibility, regulatory enabling, and social embedding, and offers practical insights for public insurers navigating digital change while balancing commercial and developmental objectives.

Keywords:
Digitalization, Customer, Efficiency, Insurance, InsurTech.

Résumé

Cette recherche a étudié comment la digitalisation améliore les relations client et l'efficacité opérationnelle dans le secteur algérien de l'assurance, à travers une étude de cas centrée sur la Société Algérienne d'Assurance (SAA). Une approche qualitative, interprétativiste et abductive a été adoptée, s'appuyant sur des données issues d'entretiens semi-directifs avec des parties prenantes clés de la SAA, de documents stratégiques internes notamment la Feuille de Route Digitalisation , de rapports annuels couvrant la période 2017–2023, ainsi que d'une enquête interne de satisfaction client réalisée en 2025. Les résultats ont montré que des initiatives numériques telles que la plateforme PGS de gestion des sinistres et le système E-Recours inter-assureurs ont considérablement accéléré la prestation de services, réduit les coûts administratifs et amélioré la satisfaction client au-delà de 75 %. Ces avancées demeurent cependant freinées par des lacunes réglementaires, notamment l'absence de reconnaissance juridique de la signature électronique , par une infrastructure informatique héritée centrée sur le système ORASS obsolète, et par une adoption numérique inégale selon les segments de clientèle. L'étude a confirmé la séquence théorique établie allant de la numérisation à la digitalisation puis à la transformation numérique complète, tout en mettant en évidence ses limites contextuelles dans un cadre institutionnel public émergent. Elle a également démontré que la maturité numérique de la SAA ne relève pas d'un enjeu purement technologique, mais constitue un processus socio-institutionnel façonné par la gouvernance, l'inclusion et les missions de service public. La recherche a proposé un modèle triadique de la transformation numérique pour les marchés émergents, intégrant trois piliers interdépendants faisabilité technique, habilitation réglementaire et ancrage social et a offert des recommandations pratiques aux assureurs publics cherchant à concilier innovation numérique, objectifs commerciaux et responsabilités de développement.

Mots-clé:
Digitalisation, Client, Efficience, Assurance, InsurTech.

الملخص

تستكشف هذه الدراسة كيفية إسهام الرقمنة في تعزيز علاقات العملاء والكفاءة التشغيلية في قطاع التأمين الجزائري، من خلال دراسة حالة مركّزة على الشركة الجزائرية للتأمين **.(SAA)** اعتمدت الدراسة منهجية نوعية تفسيرية واستدلالية، استندت إلى بيانات مستمدة من مقابلات شبه موجّهة مع أصحاب مصلحة رئيسيين في الشركة، ووثائق استراتيجية داخلية شملت خارطة الطريق الرقمية لعام، وتقارير سنوية تغطي الفترة الممتدة من 2017 إلى 2023، فضلاً عن استبيان داخلي لقياس رضا العملاء أُجري عام 2025. كشفت النتائج أن المبادرات الرقمية، ولا سيما منصة **PGS** لإدارة المطالبات ونظام **E-Recours** للتسوية بين شركات التأمين، أسهمت بشكل ملموس في تسريع تقديم الخدمات، وخفض التكاليف الإدارية، وتحسين مستوى رضا العملاء بما يتجاوز 75٪. غير أن هذا التقدم لا يزال مقيّدًا بثغرات تنظيمية، أبرزها غياب الاعتراف القانوني بالتوقيع الإلكتروني، إلى جانب بنية تقنية قديمة تتمحور حول نظام **ORASS** المتقادم، واعتماد رقمي غير متكافئ بين شرائح العملاء المختلفة. أكدت الدراسة التسلسل النظري المُرسَّخ الذي ينطلق من الرقمنة الجزئية، مروراً بالتحول الرقمي، وصولاً إلى التحول الاستراتيجي الشامل، مع إبراز محدوديته السياقية في بيئة مؤسسية عمومية ناشئة. كما بيّنت أن النضج الرقمي لدى الشركة لا يُعدّ مشروعاً تقنياً صرفاً، بل عمليةً مؤسسية-اجتماعية تتشكّل عبر منظومة الحوكمة، ومتطلبات الشمول، والالتزامات العمومية. أسهمت هذه الدراسة في اقتراح نموذج ثلاثي للتحول الرقمي في الأسواق الناشئة، يقوم على ثلاثة ركائز متشابكة الجدوى التقنية، والتمكين التنظيمي، والتجذير الاجتماعي وقدّمت توصيات عملية لشركات التأمين العمومية الساعية إلى التوفيق بين الابتكار الرقمي والأهداف التجارية والمسؤوليات التنموية.

الكلمات المفتاحية:

التوضيف الرقمي، العميل، الكفاءة، التأمين، تكنولوجيا التأمين.

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Abbreviations

AI:	Artificial Intelligence
ATAWAD:	ATAWAD: Anytime, anywhere, any device
B2B:	Business-to-Business
B2C:	Business-to-Consumer
BI:	Business Intelligence
CAQDAS:	Computer-Assisted Qualitative Data Analysis Software
CAT-NAT:	CAT-NAT: Natural Disaster Insurance
CIB:	Interbank Card (Carte Interbancaire)
CNRC:	CNRC: National Commercial Registry
CNSA:	National Insurance Supervisory Commission (Commission Nationale de Supervision des Assurances)
CRM:	CRM: Customer Relationship Management
DAA:	DAA: Division Automobile
DAI:	Internal Audit Directorate (Direction de l'Audit Interne)
DGA:	Deputy General Directorate (Direction Générale Adjointe)
DGR:	Big risque division (Division des Grands Risques)
DIGIVALO:	Digital Value & Loyalty Project
DM:	Marketing Division (Division Marketing)
DSD:	Simple and Divers risaues Division (Division des Simples et Divers Risques)
DSI:	Information Systems Division (Direction des Systèmes d'Information)
DZD:	DZD: "Dinar Djazairi''- Algerian Dinar.
E-CRM:	Electronic Customer Relationship Management
EPE/SPA:	Entreprise Publique Économique / Société par Actions (Public Economic Enterprise / Joint Stock Company)
ERP:	Enterprise Resource Planning
GSA:	Automobile Claims Management System (Gestion des Sinistres Automobile)
InsurTech:	InsurTech: Insurance Technology
IoT:	Internet of Things
IPA:	IPA: Applied Predictive Intelligence

MH:	MH: Home Multi-risk Insurance
ORASS:	Core Insurance Management ERP System (legacy platform, deployed 2003)
P&C:	Property and Casualty Insurance
PDCA:	Plan-Do-Check-Act (quality management cycle)
PGS:	PGS: Claims Management Platform
PLS-SEM:	Partial Least Squares Structural Equation Modelling
RPA:	Robotic Process Automation
UAR:	UAR: Algerian Insurance Companies Union

General Introduction

The contemporary insurance industry stands at a structural inflection point driven by the exponential advance of digital technologies. For institutions such as the Algerian Insurance Company (Société Algérienne d'Assurance SAA), the largest state-owned insurer in Algeria, this transformation is not a distant strategic horizon but an operational imperative whose urgency is compounded by intensifying market competition, rising customer expectations, and the systemic pressure of global digitalization. This opening chapter establishes the investigative framework of the present research. It delineates the study articulates the study objectives, presents the personal and scientific rationale for the choice of topic, and demonstrates the dual relevance of the research on both theoretical and managerial grounds.

1. Study Context: The Digital Shift in the Financial Sector

Over the past two decades, digitalization has fundamentally reconfigured the architecture of the global financial services industry. What began as the incremental automation of back-office processes has evolved into a structural transformation of entire business models, distribution channels, and customer relationship paradigms. In the insurance sector specifically, the emergence of InsurTech, a convergence of insurance and technology, has introduced disruptive innovations including telematics-based Usage-Based Insurance, artificial intelligence-powered underwriting, blockchain-enabled smart contracts, and digital-first customer platforms that are radically altering the competitive landscape once dominated by incumbent carriers (Eling & Lehmann, 2018; Stoeckli et al., 2018). The scale of this shift is not merely technological; it is strategic. Research by (Naujoks et al., 2017) has established that digital pioneer insurers can simultaneously grow revenues by up to 28% and reduce gross costs by as much as 29%, with a 72% reduction in policy administration costs representing the single most impactful efficiency gain. These figures represent not incremental improvements but a generational discontinuity in organizational performance.

The Algerian financial sector has not remained immune to these global dynamics. Algeria's public authorities have articulated an explicit commitment to economic digitalization through a series of strategic frameworks, including the National Strategy for the Information Society and the broader economic diversification agenda embedded within Vision 2030. The banking and financial services sector has registered tangible, if uneven, progress: the introduction of electronic payment systems, interbank clearing platforms, and mobile banking infrastructure represent meaningful advances. Within the insurance

industry, however, the pace of digital adoption has remained markedly slower, constrained by a combination of legacy IT architectures, low levels of insurance penetration still hovering at approximately 0.7% of GDP as of the most recent available data a predominantly cash-based transactional culture, and a regulatory environment that has historically prioritized stability over innovation. The consequence is a structural gap between the digital transformation ambitions of Algerian financial institutions and the operational and relational capacities they currently possess.

The SAA occupies the leading institutional position within this context. Founded in 1963 and operating as a joint-stock company with public majority shareholding, SAA commands the largest portfolio of non-life insurance products in Algeria, serving millions of policyholders across an extensive national network of agencies. Despite its market leadership, SAA faces the paradox common to dominant incumbents in transforming industries: its scale constitutes both its primary competitive asset and a source of organizational inertia that can impede the agility required for comprehensive digital transformation. The institution operates in an environment where customer satisfaction surveys persistently identify slow claims processing, limited multichannel accessibility, and insufficient service personalization as principal drivers of policyholder dissatisfaction, precisely the dimensions that digitalization has been demonstrated to address most effectively. The convergence of these internal pressures and external forces defines the specific institutional context from which the research problem of this study emerges.

2. Research Question

The foregoing contextual analysis generates a central research question that structures the entirety of this study:

> How does the implementation of digital tools transform daily operational workflows and the nature of customer relationship management within the Société Nationale d'Assurance (SAA)?

This central question is decomposed into four subsidiary research questions, each of which addresses a distinct analytical dimension of the overarching research problem:

- What are the main benefits SAA gains from its digital transformation?
- What digital tools does SAA use to interact with its customers?
- In what ways does digitalization affect the operational efficiency of SAA's internal workflows, claims processing systems, and administrative functions?

- What institutional and technical barriers (legacy systems, bureaucratic resistance) hinder the full-scale adoption of digital governance within an EPE/SPA like SAA?

3. Study Objectives

In accordance with the research question stated above, this study pursues a general objective that defines its analytical scope and expected scientific contribution.
Indeed, the objective of this research is to analyze how the SAA can use digitalization as a strategic tool for the simultaneous improvement of customer relationship management and operational efficiency, while taking into account the specific constraints and opportunities inherent in its institutional, regulatory, and socio-economic environment.

4. Argumentation for the choice of theme

The motivations that led to the selection of this specific subject are multiple, and can be summarized as follows:

4.1 Subjective Reasons

The selection of this research topic is grounded, in the first instance, in a sustained personal interest in the intersection of digital management, financial services, and organizational transformation fields that have constituted the intellectual core of the present researcher's academic and professional formation. The study of insurance as an industry presented a particularly compelling opportunity: it is simultaneously one of the most data-intensive, risk-dependent, and customer-relationship-critical sectors of the economy, and yet one of the most resistant to rapid change, characteristics that render the dynamics of its digitalization analytically rich and practically significant. The choice to focus specifically on SAA reflects a conviction that rigorous empirical research on the digital challenges confronting Algeria's flagship insurance institution offers a more meaningful and contextually relevant contribution than a purely theoretical or internationally oriented study would. Direct access to the institution as the internship location for this study further enabled the integration of primary data collection with first-hand organizational observation, substantially enriching the analytical depth that a purely desk-based approach could not have achieved.

4.2 Objective Reasons

Beyond personal motivation, the choice of this topic is scientifically justified by three convergent objective considerations.

The first is a demonstrable gap in the academic literature: the overwhelming majority of empirical studies on insurance digitalization are situated in Western European, North American, and East Asian contexts (Eling & Lehmann, 2018; Gama et al., 2025). The Algerian insurance sector, and the North African financial services landscape more broadly, remains dramatically underrepresented in the peer-reviewed literature, despite the significant structural specificities state ownership patterns, regulatory frameworks, digital infrastructure constraints, and cultural dimensions of policyholder trust that distinguish it from the contexts in which dominant theoretical models were developed. This research addresses that gap directly by generating empirically grounded, institutionally specific knowledge from within an Algerian state-owned insurer.

The second objective justification concerns the strategic urgency of the research problem for the institution itself. SAA operates in a competitive environment where private and international insurers are progressively deploying digital tools to attract younger, more digitally literate policyholder segments. Failure to develop an evidence-based digital strategy risks progressive market share erosion a risk that is particularly consequential given SAA's role as a publicly mandated institution responsible for broad national insurance coverage. The third justification is the practical value of the case study methodology in this context: by studying one institution in depth rather than producing abstract generalities, this research generates findings that are immediately actionable by practitioners and replicable as a methodological model for future research on digital transformation in comparable emerging-market financial institutions.

5. Epistemological Positioning of the Study

This section presents the epistemological positioning adopted in the study, highlighting the research perspective that guides the interpretation of knowledge and the methodological choices made throughout the research process.

5.1 Epistemological Posture

This research adopts an interpretivist epistemological posture. Interpretivism holds that social and organizational realities are not objective facts to be measured in isolation, but are constructed through the perceptions, experiences, and interactions of the individuals embedded within them. In the context of this study, this means that SAA's digital transformation trajectory, the way it is experienced, interpreted, and narrated by managers, IT staff, and front-line employees, cannot be reduced to a set of financial ratios or

technology adoption indices. It must be apprehended from within the institutional context that gives it meaning: a state-owned insurer navigating the intersection of competitive pressure, legacy IT constraints, and an explicitly articulated digital agenda. This posture is therefore not merely a philosophical preference; it is the logical consequence of the nature of the research question, which asks how and in what ways digitalization shapes customer relationship quality and operational efficiency at SAA, questions that require interpretive depth, not statistical breadth.

5.2 Research Approach

Consistent with this posture, the study employs a qualitative approach guided by abductive reasoning. Rather than testing pre-formulated hypotheses derived deductively from theory, or generating theory inductively from a blank empirical slate, abductive reasoning moves iteratively between the theoretical framework established in the literature review and the empirical material gathered at SAA. The conceptual models and findings of the 30 studies reviewed in Chapter I serve as interpretive lenses through which field observations are examined, lenses that are themselves refined, confirmed, or challenged by what the data reveal. This back-and-forth between theory and evidence is precisely what the complexity of a digital transformation process in a unique public-sector institutional context demands. It is also the approach most consistent with the exploratory nature of the study, given the limited empirical literature on insurance digitalization in Algeria a gap identified in the general synthesis of the literature review.

CHAPTER I

THEORETICAL FRAMEWORK

The objective of this first chapter is to establish the theoretical and conceptual foundations upon which the empirical investigation of this research rested. Before examining digitalization at the Société Algérienne d'Assurance, it was necessary to construct a rigorous scholarly framework capable of framing the research problem, defining the key concepts, and situating the study within the existing body of academic knowledge.

To this end, the chapter was organized into two complementary sections. Section 01 presented a systematic review of the literature across three thematic axes the relationship between digitalization and the insurance industry, the transformation of customer relationship management through digital technologies, and the impact of digitalization on operational efficiency, culminating in a general synthesis that identified the specific research gap this study addressed. Section 02 then established the conceptual framework of the research, defining with scholarly precision the core concepts of digitalization, operational efficiency, and customer relationship management, and positioning the analytical scope of the thesis at the digitalization stage of the established three-stage theoretical hierarchy.

Section 01: Literature Review

This section reviews the main theoretical concepts and previous studies related to the research topic. It provides the academic foundation necessary to understand the key dimensions and context of the study.

1.1 Insurance and Digitalization:

The article by (Gobble, 2018), titled "Digitalization, Digitization, and Innovation," published in the Research-Technology Management journal in 2018, is a critical text in innovation management. It provides a necessary semantic distinction for researchers and practitioners in the digital economy environment. Her research falls within the disciplines of strategic innovation management and sociotechnical systems theory, approached from a linguistic and strategic perspective based on the theory of the importance of precise vocabulary for formulating effective organizational strategy. The study aligns with sociotechnical perspectives that argue technology is not isolated but rather a catalyst for redefining human work and value creation. The study addresses the confusion between the terms "digitization" and "digitalization," explaining that these terms are often used interchangeably, creating ambiguity that leads to strategic misalignment. Failure to

distinguish between the mere technical conversion of records and the radical restructuring of processes and business means risking stagnation at the level of basic technology upgrades while laboring under the illusion of being on a path of comprehensive transformation.

The study aimed to untangle the methodological overlapping of the terms digitization, digital transformation, and digitalization, building a definitive hierarchy that maps the progression between them, enabling leaders to accurately assess and guide the technological maturity of their organizations. The study utilizes qualitative conceptual analysis and a synthesis of literature; the author extracted and compared authoritative definitions, cross-referencing divergent perspectives of global analytical firms such as "Gartner" with academic definitions by scholars like Scott Brennan and Daniel Kreiss, in addition to lexical standards from the "Oxford Dictionary." This methodology resulted in reaching three layers of digital technology adoption: the first is defined as digitization, which is a purely technical and physical process converting analog information into a digital format, such as digital scanning or sensors on physical machines. Digitalization is the second layer, a sociotechnical process that leverages digitized data to change workflows, improve processes, and transform customer interactions. The third, "digital transformation," is a comprehensive, radical shift resulting from cumulative "digitalization" efforts. The author illustrates this progress using practical examples, pointing out that linking physical devices to sensors is considered digitization, while using their data to provide predictive maintenance services employs a digital business model. Based on these results, the author called for a decisive shift in the mindset of executives and advises practicing leaders to conduct an audit of their current technological initiatives to ensure they are not funding digitization projects under the guise of strategic transformation. She also recommends moving beyond the technical conversion of data toward a focus on digitalization, utilizing structural data to redesign operational pathways, eliminating inherited inefficiencies, and innovating digital revenue sources.

The limitations of the author’s study lay in the nature of the study being a conceptual introductory review rather than a primary empirical investigation, and its lack of large-scale quantitative data due to it being a semantic synthesis relying on qualitative industry examples, and quantitative data that would provide empirical metrics to measure the specific financial and operational effects of the transition from digitization to digitalization, despite offering an excellent theoretical classification (Gobble, 2018).

Researchers Maria Gradillas and Llewellyn Thomas, in their study titled "Distinguishing digitization and digitalization: A systematic review and conceptual framework," published in the Journal of Product Innovation Management in 2023, empirically proved the sequential dependency of these concepts. This study lies at the intersection of innovation management and information systems, adopting a sociotechnical perspective that analyzes digital transformation as a complex interaction between technological tools and social and economic structures. Depending on innovation theory, the study provides a distinction between the mechanical implementation of digital tools and systemic organizational paradigm shifts. This research paper addresses the same problem as the previous study by Gobble; the researchers aimed to resolve the conceptual overlap by conducting a systematic review of how both concepts are activated within innovation management literature to separate their meanings, and synthesizing non-interchangeable definitions to build a conceptual framework that systematically links these concepts to innovation outcomes such as product, process, and business model innovation. The researchers used a systematic literature review of 1,198 research papers, meticulously filtered to 288 papers, from which they extracted 26 distinct definitions. They applied "open coding," inspired by grounded theory, to these definitions. This analysis classified definitions according to four dimensions: entity, scope, procedure, and results, allowing the researchers to precisely draw boundaries between technical implementation and sociotechnical innovation.

The researchers concluded that there is a definitive divide between the two concepts. The data shows that automation and information technology correspond with digitization, while the Fourth Industrial Revolution, business models, and the shift toward service-orientation correspond more with digitalization. Open coding of the 26 definitions indicates that digitization is a purely technical process converting analog information into digital form, while digitalization is a sociotechnical process leveraging those digitized technologies to change the organization of social and economic structures. The authors propose that researchers and leaders stop using the two terms interchangeably; the scope of initiatives focusing on technical conversion and infrastructure implementation should be limited to digitization. Conversely, operational restructuring, customer relationship management, and strategic efforts seeking added value creation are considered digitalization.

By treating digitization as a prerequisite for digitalization, the stages of digital transformation are defined, governed, and measured more accurately. This study is limited by its restriction to specific fields in product management and innovation, making these definitions directed toward these fields; however, other fields may deal with these

definitions differently, limiting its application to other academic fields globally, despite its significant relevance to management and e-government studies (Gradillas & Thomas, 2023).

Any rigorous examination of digitalization in the insurance sector requires a preliminary conceptual clarification. (Gobble, 2018) and (Gradillas & Thomas, 2023) establish a foundational hierarchy between three progressive stages: digitization, the strict technical conversion of analog information into binary form; digitalization, the sociotechnical process through which digitized data restructures workflows and organizational models; and digital transformation, the overarching strategic paradigm shift that cumulative digitalization ultimately produces. This conceptual architecture matters because, as (Calderon-Monge & Ribeiro-Soriano, 2024) demonstrate through bibliometric mapping of 119 review articles, digitalization has become a macroeconomic engine projected to drive over half of global nominal GDP, permanently altering the competitive architecture of every major functional area of the firm. Conflating digitization with digitalization, as both (Gobble, 2018) and (Gradillas & Thomas, 2023) warn, leads institutions to misdiagnose their own technological maturity and invest in infrastructure upgrades while believing they are achieving strategic transformation.

Within the insurance sector, digitalization operates across three major vectors identified by (Eling & Lehmann, 2018) through a systematic review of 84 papers: the transformation of customer interaction through digital interfaces, the automation of business processes via Big Data and Artificial Intelligence, and the structural modification of products through telematics and blockchain-based smart contracts. Their critical finding, reinforced by (Braun & Jia, 2025) is that traditional insurers face not an immediate existential threat from technology giants, deterred by high regulatory barriers and low underwriting returns, but rather a more insidious structural drift driven by organizational inertia, legacy IT architectures, and a failure to reconceive the value chain. This conclusion is especially pertinent for state-owned insurers where institutional inertia may be compounded by ownership structures and procurement constraints, as the structural parallels documented by (Gama et al., 2025) for the South African context confirm.

The quantifiable scale of this transformation opportunity is established by (Naujoks et al., 2017), who applied thirty digital use cases to a representative German P&C insurer, demonstrating that digital pioneers can grow revenues by up to 28% while reducing gross costs by 29%, driven in large part by a 72% reduction in policy administration costs. (Eckert & Osterrieder, 2020) provide the structural explanation: Artificial Intelligence,

Cloud Computing, IoT, and Distributed Ledger Technology are not independent modules but systemically interdependent components. Effective AI requires Big Data infrastructure, which in turn requires cloud architecture; fragmented, ad hoc procurement strategies are therefore incapable of generating compounding efficiency gains. The InsurTech phenomenon represents the most disruptive expression of these pressures. (Stoeckli et al., 2018), applying Grounded Theory to 208 real-world InsurTech innovations, identified 52 technological characteristics synthesized into 14 transformational capabilities, including dynamic pricing, on-demand coverage, and peer-to-peer risk pooling, demonstrating through Value Network Theory that disruptive potential emerges from the alignment of multiple capabilities across interdependent activities, not from any single technology.

Empirical performance evidence confirms the strategic premium attached to comprehensive digital integration. (Ahmad et al., 2025; Cappiello, 2020) document the rise of peer-to-peer and citizen-centric prevention models that decouple customer relationships from traditional risk carriers. (Desyllas & Sako, 2013), through a fifteen-year longitudinal case study of Progressive Corporation's Pay-As-You-Drive model, establish that a $100 investment in 1996 grew to $587 by 2010, with an operating ratio of 78.6% against an industry average of 90.7%, an advantage attributable to the iterative reconfiguration of specialized complementary assets that competitors could not rapidly replicate. (Bohnert et al., 2019), through text-mining of 41 European insurers' annual reports, find that firms with comprehensive digital agendas addressing both internal and external dimensions exhibited Tobin's Q values more than 8% higher than those with partial strategies. (Jing, 2021) adds a crisis resilience dimension: digital platforms sustained accelerated growth during the COVID-19 disruption, with life insurance transactions reaching 95.41 million in February 2020 alone, illustrating that digital maturity functions as a stabilization mechanism during systemic shocks.

The literature simultaneously documents structural barriers to transformation, particularly in developing and transitional contexts. (Gama et al., 2025), reviewing 121 articles on the South African insurance sector, identify recurring patterns of delayed digital adoption driven by the prohibitive costs of legacy system integration, insufficient change management, low cybersecurity maturity, and misalignment between publicly regulated institutions' digital strategies and operational capabilities. A notable finding is that underwriting processes have attracted disproportionate scholarly attention relative to back-office operations and non-life distribution knowledge gaps especially consequential for

emerging-market institutions whose product mix differs substantially from the Western benchmarks dominating the academic corpus.

- **Synthesis**

The insurance digitalization literature converges on several analytically decisive propositions. Digitalization is a staged process requiring progressive advancement from technical data conversion toward business model reconfiguration (Gobble, 2018; Gradillas & Thomas, 2023). Performance gains are substantial in costs, underwriting precision, and firm valuation but conditional on architectural integration and comprehensive deployment rather than isolated investments (Bohnert et al., 2019; Eckert & Osterrieder, 2020; Naujoks et al., 2017). The most consequential disruptions emerge not from individual technologies but from the alignment of multiple digital capabilities across redesigned value networks (Cappiello, 2020; Stoeckli et al., 2018). Barriers of organizational inertia, legacy infrastructure, and digital literacy constraints remain formidable, particularly in emerging-economy and public-sector contexts (Eling & Lehmann, 2018; Gama et al., 2025).

1.2 Customer Relationship and Digitalization:

If the macroeconomic literature establishes why insurers must digitalize, the customer relationship literature clarifies what this transformation must ultimately produce for the policyholder experience. The dominant theoretical reorientation documented in this body of work is the categorical rejection of CRM as a sales-force automation tool in favor of its reconceptualization as an enterprise-wide strategic architecture for value co-creation. Gil-Gomez et al. (2020), drawing on the Resource-Based View and organizational ambidexterity theory, construct a formal framework linking the three core CRM modules, Sales, Marketing, and Services to economic, environmental, and social sustainability outcomes, establishing that CRM technology-based initiatives positively impact five innovation capabilities: product, process, administrative, marketing, and service innovation. Stancioiu et al. (2023) offer an applied illustration through an SME case study, demonstrating that a unified machine learning-governed CRM platform can dissolve the structural tension between B2B push and B2C pull dynamics, generating what the authors term a 'CRM Balance' that simultaneously reduces interaction costs and deepens relational value across customer categories.

The empirical decomposition of which E-CRM dimensions most powerfully drive customer outcomes in insurance is provided by Eekani et al. (2024), whose mixed-method study of Parsian Insurance policyholders in Iran identifies four key factors: service

customization, ease of use, data security, and multichannel communication. Multichannel communication exerts the strongest impact on customer loyalty both directly and through the mediation of satisfaction, trust, and brand attachment indicating that modern policyholders demand seamless, integrated interactions across mobile applications, web portals, and social media without losing contextual continuity. Service customization generates deep cognitive and emotional brand attachment by signaling individual recognition rather than generic risk categorization. Data security and ease of use function as threshold prerequisites: without secure, navigable digital environments, institutions cannot generate the baseline trust required for higher-order loyalty mechanisms to operate. Eckert et al. (2022), synthesizing 106 documents, complement this by mapping digital applications across four customer touchpoints contract conclusion, modifications, claims events, and routine contacts establishing that satisfaction is determined by institutional responsiveness and process transparency at each lifecycle stage.

The architectural challenge of delivering seamless multichannel experiences is addressed by Urban et al. (2016), who argue that legacy IT systems historically built as siloed, product-specific mainframes are structurally incompatible with the end-to-end digital customer journey contemporary consumers demand. Their proposed 'New Insurance IT Model' specifies a four-tier decoupled architecture: an agile Presentation Layer separated from the Core Processing Layer by a middleware API-based Integration Layer, unified by a Data Layer providing a 360-degree customer view. While originating as a consulting report rather than a peer-reviewed empirical study, its internal logic is consistent with the technological interdependency principle of Eckert & Osterrieder (2020), and its central claim that digitizing isolated processes without redesigning the holistic customer journey creates 'unsustainable technological debt' is broadly corroborated by the empirical literature.

Artificial Intelligence constitutes the most powerful personalization lever documented in this corpus. Adeoye et al. (2024), through a multi-domain case study synthesis covering usage-based auto insurance and wearable health integration, demonstrate that AI enables a fundamental shift from static demographic profiling to dynamic, real-time risk evaluation driven by IoT and social media data streams. AI-driven products do not merely price risk more accurately; they actively mitigate it by incentivizing safer behaviors through dynamic reward structures rooted in behavioral economics, creating a feedback loop between digital engagement and risk reduction. Shivani et al. (2025) extend this trajectory further with a conceptual InsurTech-bancassurance framework in which blockchain-based smart

contracts automate claims execution, IoT continuously updates risk profiles, and AI chatbots deliver 24-hour omnichannel service all embedded within the consumer's existing digital banking interface.

Digital trust emerges from the literature not as a supplementary feature but as the structural prerequisite for effective customer relationship management. Arnaboldi et al. (2017), from a Critical Accounting perspective, reveal a structural paradox at the heart of digital engagement: while social media enables dialogic accountability that builds institutional legitimacy, the same infrastructure simultaneously grants management unprecedented capacities for behavioral surveillance. Institutions must actively govern the boundary between transparency-building engagement and data-extractive monitoring. Buehler & Maas (2018) reinforce this from a consumer empowerment perspective, finding that digital tools decentralizing access to policy information generate measurable empowerment effects only when accompanied by robust privacy safeguards. Köhne & Köhne (2024), deploying PLS-SEM on 349 German insurance intermediaries, introduce a critical empirical corrective: while digitalization exerts a strong positive impact on intermediary productivity (path coefficient = 0.509, $p < 0.001$), it simultaneously generates a significant negative impact on revenue (path coefficient = -0.210, $p < 0.001$) evidence that excessive technological substitution at the customer interface harms top-line commercial performance even as it optimizes backend processes.

- **Synthesis**

The customer relationship literature establishes a coherent architecture of interdependent requirements. E-CRM must be conceived as an enterprise-wide strategic system, with multichannel communication and service personalization as its most commercially powerful dimensions (Gil-Gomez et al., 2020; Eekani et al., 2024). Data security and platform usability function as non-negotiable prerequisites for digital trust, mediating the pathway from digital engagement to retention (Eekani et al., 2024; Buehler & Maas, 2018). The customer journey architecture must be redesigned holistically rather than digitized piecemeal (Urban et al., 2016; Eckert et al., 2022). AI amplifies personalization potential substantially, but requires robust data governance and deliberate design of the transparency-surveillance boundary (Adeoye et al., 2024; Arnaboldi et al., 2017). Crucially, the evidence of Köhne & Köhne (2024) constitutes a necessary corrective: digitalization enhances productivity but risks suppressing revenue when it displaces rather than augments the human advisory relationship a finding of particular relevance where face-to-face trust remains the primary driver of policyholder retention.

1.3 Operational Efficiency and Digitalization:

The third axis of the literature addresses the transformation of internal operations, back-office functions, administrative workflows, underwriting processes, risk management structures, and labor organization that collectively determine an insurer's cost efficiency, processing speed, and organizational resilience. This body of work is theoretically grounded in Organizational Information Processing Theory (OIPT), through which (Yin et al., 2024) conceptualize digitalization not as a discrete IT procurement exercise but as the development of an enterprise-wide information-processing capability. As organizations face increasingly unpredictable and information-dense environments, their capacity to rapidly synthesize and act upon massive data streams directly determines their ability to reduce operational friction, resolve information asymmetries, and maintain systemic stability. This theoretical reframing positions operational efficiency not as a static cost accounting outcome but as a dynamic organizational capability that digitalization continuously builds.

The most precisely documented operational application is the automation of claims processing. (Nivedita, 2022), drawing on P&C insurance case scenarios and industry deployments, establishes that AI accelerates the overall claims lifecycle by up to 80% through the automation of routine administrative tasks and algorithmic triage of complex cases, while computer vision and machine learning-based anomaly detection reduce fraudulent claims by 25% to 40%. Robotic Process Automation (RPA) is proposed as a bridging integration layer that enables workflow modernization without requiring immediate wholesale replacement of legacy systems. These findings resonate directly with (Naujoks et al., 2017) cross-insurer evidence of a 72% reduction in policy administration costs among digital pioneers confirming that automation gains compound when technologies are architecturally integrated. The efficiency impact of Big Data analytics, identified by (Eckert & Osterrieder, 2020) as a foundational precondition for AI effectiveness, is rigorously quantified by (Guo et al., 2025) through a longitudinal panel study of 64 Chinese insurance firms from 2011 to 2022. Using Data Envelopment Analysis and fixed-effects panel regression, the authors establish a statistically significant positive relationship(Guo et al., 2025) between Big Data deployment and technical efficiency, transmitted through two pathways: lower administrative management costs via channel optimization, and improved underwriting precision reducing the overall loss ratio.

A structural heterogeneity finding of critical relevance emerges from (Guo et al., 2025): the efficiency benefits of Big Data are significantly stronger in non-state-owned enterprises than in their state-owned counterparts, a difference the authors attribute to the measurably lower organizational agility historically exhibited by state-linked institutions. While the authors confine this finding to the Chinese context, the organizational logic it identifies suggests that efficiency returns from data analytics investment are structurally moderated by governance model and ownership type an inference of direct analytical relevance to any state-owned insurer context. Yin et al. (2024), employing Propensity Score Matching, Heckman two-stage models, and Instrumental Variable regressions on Chinese A-share listed companies (2010–2019), further establish that digitalization significantly reduces operational risk measured through stock return volatility through two transmission pathways: internal control system quality (accounting for 10.36% of the total effect) and supply chain network centrality (15.17%). The risk-reducing effect is most pronounced in highly diversified firms, which the OIPT framework explains through their proportionally greater baseline need for advanced information-processing capacity.

The sequential relationship between process maturity and digital effectiveness often assumed rather than tested is established rigorously by (Buer et al., 2021), whose hierarchical multiple regression of 75 Norwegian manufacturing enterprises demonstrates that the interaction term between lean process maturity and factory digitalization is positive and statistically significant. Digital tools generate significant operational gains only when process maturity is already high; introducing automation into environments with poorly standardized workflows produces negligible benefits. The analytical principle that premature digitalization of dysfunctional processes 'digitizes waste' rather than resolving it is directly transferable to insurance operations management, implying a disciplined sequencing: processes must be documented, standardized, and streamlined before automation is applied.

Operational digitalization also fundamentally reconfigures the human labor dimension of insurance institutions, generating workforce transformation qualitatively more disruptive than previous technological waves. (Karanina et al., 2020), triangulating employer demand data with a structured survey of insurance market specialists, document a sharp decline in demand for routine-based roles in manual underwriting and claims processing, alongside urgent demand for a hybrid competency model combining advanced digital literacy with non-automatable interpersonal capabilities including emotional intelligence and relational customer management. (Guzmán-Ortiz et al., 2020), through PLS-SEM analysis of 341

insurance employees in Metropolitan Lima, establish that digital transformation explains 69% of the variance in individual job performance ($R^2 = 0.690$, path coefficient = 0.831, $p < 0.001$), with improvements in the customer service experience dimension exerting the strongest individual impact (0.428, $p < 0.001$), followed by business model adaptation (0.298) and employee capability development (0.198). This sequence underlines the institutional interdependence between external-facing digital investments and internal workforce productivity.

The governance dimension of operational digitalization is addressed by (Arnaboldi et al., 2017), who warn that the Big Data infrastructure driving efficiency simultaneously generates capacity for continuous internal performance monitoring that can suppress organizational autonomy and managerial judgment if digital surveillance substitutes for rather than supports institutional decision-making. This tension between efficiency potential and governance imperatives represents one of the defining unresolved challenges for large, institutionally complex financial organizations navigating digital transformation.

- **Synthesis**

The operational efficiency literature establishes several findings bearing directly on this research. Gains from automation, AI, and Big Data analytics are empirically substantial but conditional on architectural completeness, technological interdependency management, and process maturity (Buer et al., 2021; Eckert & Osterrieder, 2020; Naujoks et al., 2017). Digitalization reduces operational risk through dual transmission pathways, with greater benefits accruing to organizationally complex, diversified institutions (Yin et al., 2024). Big Data efficiency gains are structurally moderated by ownership type, with state-linked enterprises historically exhibiting lower agility in converting data assets into technical efficiency improvements (Guo et al., 2025). Operational digitalization is inseparable from workforce transformation: institutions cannot realize sustained efficiency gains without simultaneously investing in the hybrid competencies that automation displaces at the routine level and elevates at the advisory and governance levels (Guzmán-Ortiz et al., 2020; Karanina et al., 2020). Taken together, these findings establish that operational efficiency through digitalization is not primarily a technological outcome but an organizational capability requiring coherent strategy, sequenced process reform, and sustained human capital investment in the complex, regulated environment of a national insurance institution.

General synthesis:

The three thematic axes examined in this literature review the macroeconomic and structural dynamics of insurance digitalization, the reconfiguration of customer relationship management through digital architectures, and the transformation of operational efficiency through automation and artificial intelligence converge upon a set of analytically coherent and mutually reinforcing propositions. Across all three domains, the empirical and theoretical literature establishes with considerable force that digitalization, when strategically integrated and architecturally sequenced, generates measurable and compounding organizational performance gains: revenue growth, cost reduction, firm valuation premiums, customer loyalty improvements, and operational risk mitigation (Bohnert et al., 2019; Eekani et al., 2024; Naujoks et al., 2017; Yin et al., 2024). A unifying theoretical principle traceable from (Gobble, 2018) and (Gradillas & Thomas, 2023) to (Eckert & Osterrieder, 2020) and (Buer et al., 2021) is that these gains are not the products of isolated technological procurement, but of systemic, interdependent, and sequenced deployment: digital maturity must be built progressively, and automation generates value only where lean process foundations already exist.

Yet the literature simultaneously reveals a structural gap of direct consequence to the present research. The overwhelming majority of empirical studies are situated in developed-market, non-state-owned, or technologically mature institutional contexts Western Europe, North America, and East Asia. Research addressing the specific intersection of state ownership structures, emerging-market infrastructural constraints, and the organizational complexity of a large national insurer is virtually absent from the peer-reviewed corpus (Gama et al., 2025). The few studies that engage with governance heterogeneity offer findings of particular salience: (Guo et al., 2025) document significantly lower Big Data efficiency returns in state-owned enterprises relative to their private-sector counterparts, attributing the gap to structurally lower organizational agility; while (Köhne & Köhne, 2024) demonstrate that excessive digitalization of customer-facing functions can directly suppress revenue by displacing the human advisory relationships on which policyholder trust is historically built in low-digital-maturity environments. This convergence of established findings and identified absences defines the specific gap this research is designed to fill: there is no empirically grounded study examining how a state-owned national insurer in a North African emerging economy where digital infrastructure remains limited, insurance penetration is low, and cash-based transactions are predominant

can leverage digitalization to simultaneously improve customer relationship management and operational efficiency, within its distinctive institutional, regulatory, and organizational constraints. The present case study of the Société Algérienne d'Assurance (SAA) addresses precisely this gap, contributing to the extension of the digital transformation literature beyond its current developed-market boundaries and generating context-specific evidence of direct managerial relevance for the Algerian insurance sector.

Section 02: Conceptual framework

The conceptual framework of this research provides the definitional and theoretical architecture upon which the empirical investigation is built. Three interconnected domains, digitalization, operational efficiency, and customer relationship management, constitute its analytical pillars. Each concept is defined through the lens of established academic scholarship, with primary reliance on foundational management and insurance textbooks, supplemented where appropriate by peer-reviewed journal contributions. The purpose of this section is not to review the literature in the broad sense that task has been accomplished in Section 1 but to establish with precision the meanings, boundaries, and inter-relationships of the key concepts that will be operationalized in the field study of Chapters II and III.

2.1 Digitalization:

The concept of digitalization has entered both academic and managerial discourse with such frequency that its precise meaning has become obscured. A rigorous conceptual framework demands clarity, and clarity in this domain begins with a careful differentiation of three related but analytically distinct terms: digitization, digitalization, and digital transformation. These concepts are often conflated in practice, producing strategic confusion and misdirected investment. The following discussion draws principally on (Schwab, 2016), (Rogers, 2016), (Westerman et al., 2014), and (Brynjolfsson & McAfee, 2014) to establish these distinctions with scholarly precision.

Digitization, Digitalization, and Digital Transformation: A Three-Stage Distinction

Digitization refers to the most elementary stage of digital change: the technical conversion of analog information, text, images, sounds, and physical processes into a binary digital format that can be stored, processed, and transmitted by computing systems. Digitization is fundamentally a representational act; it changes the medium in which information exists,

not the logic by which it is used or the organizational processes through which it flows. A paper insurance policy scanned into a PDF file, a handwritten claim form entered into a database, or a physical archive migrated to an electronic storage system all constitute acts of digitization (Tapscott, 1996). The output of digitization is a change in format, nothing more. As (Schwab, 2016) notes in The Fourth Industrial Revolution, the digitization of information represents the foundation upon which all higher-order digital change rests, but it does not, in itself, alter organizational structures, competitive logic, or value creation mechanisms.

Digitalization moves decisively beyond representational change to denote the sociotechnical process by which digitized data is actively leveraged to restructure workflows, redesign business processes, and create new forms of organizational and commercial value. (Rogers, 2016) defines digitalization as "the integration of digital technology into business processes and customer experiences," emphasizing that the defining characteristic of this stage is not the existence of digital data but the strategic and operational use made of it. An insurer that deploys machine learning algorithms to automate claims triage, or that implements a customer portal enabling policyholders to self-manage their policies, is engaging in digitalization: the technology restructures the process, modifies the organizational roles involved, and alters the cost and quality profile of service delivery. (Brynjolfsson & McAfee, 2014) observe in The Second Machine Age that the economic gains of this stage are not inherent in the technologies themselves but emerge from the creative recombination of digital capabilities with organizational processes a recombination that is managerial and strategic in character, not merely technical.

Digital transformation designates the broadest and most consequential of the three stages: the cumulative, organization-wide strategic shift that emerges when sustained digitalization initiatives fundamentally reconstitute the organization's competitive model, value proposition, market positioning, and institutional identity. (Westerman et al., 2014), (Brynjolfsson & McAfee, 2014) define digital transformation as "the use of technology to radically improve performance or reach of enterprises," and insist that the transformative dimension lies not in the technology itself but in the manner in which leadership uses digital means to change how the organization creates value. Unlike digitalization which improves existing processes digital transformation entails the reimagination of what those processes are designed to achieve. In the insurance context, digital transformation would involve not merely improving claims processing, but fundamentally reconceiving the

insurer's role from indemnifier of losses to proactive manager of risks across the lifecycle of the policyholder (Eling & Lehmann, 2018).

The analytical scope of the present thesis is explicitly positioned at the digitalization stage. It examines how specific digital technologies and process redesign initiatives can measurably improve two defined performance dimensions operational efficiency and customer relationship quality within an existing institutional framework. This is distinct from a study of digital transformation, which would examine the wholesale strategic reconstitution of the institution's competitive identity. This positioning is not a limitation but a deliberate analytical choice consistent with the current stage of digital development of the host organization and with the research objectives defined in Chapter I.

Table I The Three-Stage Digital Hierarchy

Concept	Core Definition and Organizational Implication
Digitization	Conversion of analog information into digital binary format. Changes the medium of information, not the process or value logic. Necessary precondition for all higher digital change (Schwab, 2016; Tapscott, 1996).
Digitalization	Leveraging digitized data to restructure workflows, redesign processes, and generate new value. Changes how work is done; the primary focus of this thesis (Brynjolfsson & McAfee, 2014; Rogers, 2016).
Digital Transformation	Cumulative strategic paradigm shift reconstituting the organization's competitive model, value proposition, and institutional identity. Changes what the organization is (Eling & Lehmann, 2018; Westerman et al., 2014).

Source: Elaborated by the author based on (Schwab, 2016); (Rogers, 2016); (Westerman et al., 2014); (Brynjolfsson & McAfee, 2014)

2.1.1. Evolution and Basic Concepts

The evolution of digitalization as a managerial phenomenon is inseparable from the broader history of information technology in the twentieth and twenty-first centuries. (Castells, 1996), in his landmark work The Rise of the Network Society, identifies the emergence of the "informational economy" in the 1970s as the foundational rupture: the convergence of computing, telecommunications, and microelectronics created a new technological paradigm in which information processing, rather than the transformation of

physical matter, became the primary driver of productivity and value creation. This paradigm, Castells argues, did not emerge instantaneously but developed through successive waves of institutional adoption, each deeper and more organizationally penetrating than the last.

The first wave, running from approximately the 1950s to the 1970s, was characterized by the adoption of mainframe computers in large enterprises and government institutions for the automation of routine arithmetic and accounting tasks, payroll processing, inventory management, and actuarial calculations. This constitutes, in contemporary terminology, the digitization phase: information previously stored and processed on paper was migrated to digital systems, but the underlying organizational structures and process logics were largely unchanged. (Tapscott, 1996), in The Digital Economy, characterizes this period as one of "computing without communication," in which the transformative potential of digital technologies was constrained by the absence of connectivity between systems and organizations.

The second wave, spanning the 1980s and 1990s, was catalyzed by the proliferation of personal computing and, decisively, by the emergence of the Internet as a commercially accessible network infrastructure. Enterprise Resource Planning (ERP) systems, electronic data interchange, and early e-commerce platforms began to integrate digital information flows across organizational functions and across organizational boundaries. (Schwab, 2016) situates this period within the Third Industrial Revolution, the "computer revolution" and distinguishes it from what he terms the Fourth Industrial Revolution, which began in the early 2000s and is characterized by the fusion of physical, digital, and biological systems through technologies including Artificial Intelligence, the Internet of Things, cloud computing, and advanced robotics. It is this Fourth Industrial Revolution that generates the organizational imperatives at the center of this thesis: the pressure on institutions to move beyond digitization to genuine digitalization, or face progressive competitive irrelevance.

(Brynjolfsson & McAfee, 2014) provide the most analytically precise account of why this current wave of digital change is qualitatively different from its predecessors. Drawing on general-purpose technology theory, they establish that digital technologies and Artificial Intelligence in particular exhibit "exponential improvement" and "combinatorial innovation" characteristics that make their organizational impact fundamentally non-linear. Unlike steam or electricity, which enhanced the physical productive capacity of existing processes, digital technologies enhance cognitive productive capacity, enabling machines to perform not only physical but increasingly intellectual and relational tasks. This

cognitive dimension is what distinguishes digitalization from mere automation and explains why its organizational, competitive, and human resource implications are so pervasive and so difficult to manage with the institutional frameworks inherited from the industrial era. As (Westerman et al., 2014) observe in Leading Digital, "technology is not the hard part" of digitalization the transformation of organizational culture, leadership capacity, and operational processes is where the decisive battles are won or lost.

In the management sciences, the theoretical frameworks most directly relevant to this thesis's understanding of digitalization include the Resource-Based View (Barney, 1991), which frames digital capabilities as strategic assets generating sustainable competitive advantage when they are valuable, rare, imperfectly imitable, and organizationally embedded; Dynamic Capabilities Theory (Teece et al., 1997), which conceives of digitalization as requiring the continuous sensing of technological opportunities, the seizing of strategic options, and the reconfiguration of existing processes and resources; and the Service-Dominant Logic (Vargo & Lusch, 2004), which reframes the customer relationship as a co-creation process in which digital tools are instrumental not merely in reducing service delivery costs but in fundamentally reconstituting the nature of value exchanged between the institution and its stakeholders.

2.1.2. Insurance: Notion and Evolution

Insurance is among the oldest risk management institutions in recorded economic history. Its conceptual origins can be traced to the maritime lending practices of ancient Babylon and Greece, formalized in the Code of Hammurabi (circa 1754 BCE), which established early forms of risk-sharing in commercial lending. The modern institution of insurance, however, emerged in fourteenth-century Europe with the development of marine insurance in the Italian city-states, followed in the seventeenth century by the organization of life insurance and, crucially, by the emergence of the first scientific approach to risk quantification through probability theory and actuarial mathematics (Rejda & McNamara, 2017). Lloyds of London, established as an organized insurance market in 1688, represents the institutional crystallization of these intellectual and commercial developments.

(Rejda & McNamara, 2017) define insurance in their foundational textbook, Principles of Risk Management and Insurance as "the pooling of fortuitous losses by transfer of such risks to insurers, who agree to indemnify insureds for such losses, to provide other pecuniary benefits on their occurrence, or to render services connected with the risk." This definition captures the four foundational elements of the insurance mechanism: the

existence of an uncertain loss event (risk); the transfer of that risk from the individual to a collective institution; the pooling of risks across a large number of similarly exposed parties to generate statistical predictability; and the contractual obligation of indemnification.(Vaughan & Vaughan, 2014) Complement this definition by emphasizing the social function of insurance: it is, in their formulation, "a mechanism for reducing the adverse financial impact of random events that prevent the fulfillment of reasonable expectations," positioning insurance as fundamentally a social technology for managing the economic consequences of uncertainty.

A. Concept and Definition: Core Insurance Terminology

legal and actuarial concepts. The following definitions draw primarily on (Rejda & McNamara, 2017) and (Harrington & Niehaus, 2004) The two most widely adopted graduate-level insurance textbooks in the management sciences.

The insured (also referred to as the policyholder) is the natural person or legal entity whose assets, life, health, or legal liability constitute the object of the insurance coverage. The insured is the party that bears the risk before its transfer to the insurer and the party that receives indemnification upon the occurrence of a covered loss event. In collective insurance arrangements such as group health or workers' compensation programs the policyholder and the insured may be legally distinct parties, the former being the entity that contracts with the insurer and the latter being the individuals whose risks are covered (Rejda & McNamara, 2017).

The insurer is the company or public institution that, upon receiving the premium, assumes the contractual obligation to indemnify the insured against covered losses or to render agreed-upon services upon the occurrence of insured events. The insurer's capacity to accept and manage these transferred risks depends upon its ability to pool a sufficiently large and statistically homogeneous portfolio of risks so that the law of large numbers ensures that actual aggregate losses converge predictably toward their mathematically expected value the foundational actuarial principle upon which the financial viability of insurance rests (Harrington & Niehaus, 2004).

The insurance premium is the periodic financial consideration paid by the insured to the insurer as compensation for the assumption of risk. Actuarially, the premium is decomposed into three components: the net or pure premium, which reflects the expected cost of covered losses and must be sufficient to fund anticipated indemnification payments; the expense loading, which covers the insurer's operating costs, including agent commissions, administrative costs, and claims adjustment expenses; and the profit loading,

which provides the insurer's required return on underwriting capital.(Rejda & McNamara, 2017) observe that premium adequacy, the alignment of premiums with the true cost of covered risks, is both an actuarial imperative and a regulatory requirement, since underpriced premiums threaten solvency while overpriced premiums expose the insurer to competitive loss.

The insurance claim is the formal notification submitted by the insured to the insurer requesting indemnification following the occurrence of a loss event covered under the terms of the insurance policy. The claim process encompasses notification, documentation, investigation, assessment, and settlement a workflow that in the non-life insurance context constitutes the primary operational cost center and the most consequential customer experience touchpoint. The accuracy, speed, and fairness of claims handling are the primary determinants of policyholder satisfaction and retention (Eckert et al., 2022).

Types of insurance are conventionally classified along two principal axes. The first distinguishes life insurance coverage of risks related to human mortality and survival, including term life, whole life, endowment, and annuity products, from non-life insurance (also termed property and casualty insurance or general insurance), which encompasses all coverage lines unrelated to human mortality: automobile, property, civil liability, health and accident, marine and transport, agricultural, and engineering insurance. The second axis distinguishes mandatory insurance coverage required by law, such as third-party automobile liability or workers' compensation from voluntary insurance, taken at the policyholder's discretion. In the Algerian regulatory framework, Law No. 95-07 of January 1995 and its subsequent amendments establish this classification structure and govern the operations of all insurers, including state-owned institutions such as the Société Nationale d'Assurance (SAA) (Harrington & Niehaus, 2004; Vaughan & Vaughan, 2014).

Table II Core Insurance Concepts and Definitions

Concept	Definition
Insured / Policyholder	The natural or legal person whose risk is the subject of insurance coverage and who receives indemnification upon a covered loss (Rejda & McNamara, 2017).
Insurer	The institution that assumes contractual liability for covered losses in exchange for the premium, enabled by risk pooling across a large portfolio (Harrington & Niehaus, 2004).

Insurance Premium	The actuarially determined periodic payment made by the insured; composed of pure premium (expected loss cost), expense loading, and profit loading (Rejda & McNamara, 2017).
Claim	Formal notification requesting indemnification following a covered loss event; the primary operational cost center in non-life insurance (Vaughan & Vaughan, 2014).
Life Insurance	Coverage of risks associated with human mortality and survival, including term life, whole life, endowment, and annuity products.
Non-Life Insurance	Coverage of property, casualty, liability, and other risks unrelated to human mortality: automobile, property, civil liability, health, transport, agricultural, etc.
Mandatory Insurance	Coverage required by law (e.g., third-party automobile liability in Algeria under Law 95-07).
Voluntary Insurance	Coverage taken at the policyholder's discretion, priced competitively in the insurance market.

Source: Elaborated by the author based on (Rejda & McNamara, 2017); (Harrington & Niehaus, 2004); (Vaughan & Vaughan, 2014)

B. Importance of Insurance

Economic importance. Insurance performs three foundational economic functions. First, it enables the efficient allocation of risk across economic agents by allowing individuals, households, and firms to transfer financially catastrophic exposures to institutions equipped to absorb and diversify them, thereby facilitating investment, entrepreneurship, and consumption decisions that would otherwise be inhibited by risk aversion. As (Rejda & McNamara, 2017) observe, without the mechanism of risk transfer through insurance, many productive economic activities from construction and aviation to pharmaceutical development and international trade would be commercially unviable because no rational actor could bear their full risk exposure unassisted. Second, insurance institutions function as major institutional investors: the premiums collected constitute a substantial pool of long-duration investable capital that insurers channel into capital markets, infrastructure bonds, and sovereign debt instruments, contributing critically to the financing of productive investment in the broader economy. Third, insurance performs a countercyclical macroeconomic function by absorbing and redistributing the financial shock of catastrophic events natural disasters, pandemics, industrial accidents that would

otherwise produce cascading economic disruption and permanent capital destruction (Harrington & Niehaus, 2004).

Societal importance. Beyond its economic functions, insurance provides essential social protection to individuals and families exposed to the financial consequences of illness, disability, premature death, and property loss. (Vaughan & Vaughan, 2014) emphasize that insurance, by converting uncertain catastrophic losses into manageable, predictable premium payments, enables individuals to make long-term financial commitments, such as home purchases, business formation, and educational investments, with a degree of security that would otherwise require the immobilization of vast precautionary savings. Life and health insurance complement public social security systems by extending financial protection to risks and income levels that mandatory public schemes do not fully cover. More broadly, insurance promotes socially desirable behaviors: usage-based automobile insurance reduces accident rates by linking premiums to behavioral data; health insurance increasingly integrates wellness programs that incentivize preventive care; and liability insurance disciplines professional conduct by making the financial consequences of negligence directly proportional to the magnitude of harm caused (Rejda & McNamara, 2017).

Industrial importance. From an industrial perspective, insurance constitutes enabling infrastructure for commercial activity at every scale. Business interruption coverage enables enterprises to undertake capital-intensive projects without the risk that an operational disruption will produce permanent financial distress. Trade credit insurance enables exporters to extend payment terms to buyers in uncertain markets. Professional indemnity insurance allows regulated professions, such as medicine, law, engineering, and financial advice, to assume client-facing responsibilities without the paralyzing fear of unlimited personal liability. The energy, aviation, maritime, and construction sectors all require specialized coverage as a regulatory precondition for their licensed operations. In Algeria, the SAA, as the largest national insurer and a dominant force in non-life lines, occupies a position of structural importance not merely as a commercial entity but as a component of the economic infrastructure supporting industrial and commercial activity across the national territory an institutional responsibility that amplifies the strategic significance of its digital modernization agenda (Eling & Lehmann, 2018; Harrington & Niehaus, 2004).

2.1.3. Digitalization in the Insurance Sector

The impact of digitalization on the insurance industry operates through mechanisms that are both more pervasive and more structurally consequential than in many other financial services sectors. This specificity arises from the nature of the insurance product itself: unlike banking deposits or investment instruments, an insurance policy is a promise, a contingent contractual obligation whose value to the policyholder is realized only in the event of a covered loss. The quality of that promise is inseparable from the quality of the insurer's information about the risk, the efficiency of its claims settlement process, and the responsiveness of its customer interactions. Digitalization, by transforming all three of these dimensions, fundamentally alters the competitive architecture of the industry (Eling & Lehmann, 2018).

Eling and Lehmann, drawing on Porter's insurance value chain framework, identify three major vectors through which digitalization reshapes insurance operations: the transformation of customer interaction and distribution channels through digital interfaces; the automation and optimization of internal processes through Big Data analytics and Artificial Intelligence; and the structural modification of insurance products through usage-based, on-demand, and parametric instruments enabled by IoT telematics and smart contract technology. Each of these vectors operates across the full span of the insurance value chain product development, distribution, underwriting, policy administration, claims management, and customer service generating compounding efficiency and quality gains when they are integrated rather than deployed in isolation (Eckert & Osterrieder, 2020; Naujoks et al., 2017).

In the distribution domain, digital platforms and comparison aggregators disintermediate traditional agent-dependent networks, enabling direct-to-consumer sales at a fraction of the conventional acquisition cost while simultaneously generating granular behavioral data that enables more precise risk segmentation. In underwriting, machine learning models processing structured and unstructured data sources, including social media signals, telematics streams, and satellite imagery for agricultural risk produce actuarial assessments of a precision and speed that manual underwriting cannot approximate. In claims management, Artificial Intelligence applied to damage assessment, fraud detection, and workflow triage substantially reduces cycle times and processing costs (Nivedita, 2022). At the product level, the emergence of InsurTech models has driven a fundamental shift in the conceptualization of the insurable product: from standardized actuarial bundles priced

on demographic averages to dynamic, real-time coverage instruments priced on individual behavioral data and activated on demand through mobile interfaces (Cappiello, 2020; Stoeckli et al., 2018).

(Schwab, 2016) situates these insurance-specific transformations within the broader logic of the Fourth Industrial Revolution: industries whose core product is information its collection, analysis, and contractual deployment are structurally more exposed to digital disruption than industries whose core product is physical. Insurance, being fundamentally an information business, faces both the most acute competitive pressure and the most abundant opportunity from the digitalization of its data infrastructure and decision processes. For state-owned and publicly mandated insurers like the SAA, this observation carries particular strategic urgency: the inability to deploy digitalization effectively risks not only commercial obsolescence but an increasing inability to fulfill the institutional responsibilities broad population coverage, affordable premiums, reliable claims service that justify their privileged regulatory position in the national insurance market (Rogers, 2016; Westerman et al., 2014).

2.2. Operational Efficiency

Operational efficiency is among the most central and most frequently misapplied concepts in management practice. Its rigorous use as a research variable requires definitional precision, clear differentiation from adjacent concepts, and explicit identification of the mechanisms through which digitalization is expected to produce efficiency improvements in the specific organizational context under study.

2.2.1. Notion of Efficiency

In management science, efficiency is fundamentally an input-output relationship: an organization, process, or system is efficient to the degree that it maximizes the value of outputs generated per unit of inputs consumed, or equivalently, minimizes the inputs required to produce a given quantity and quality of outputs. Slack, Brandon-Jones and Johnston (Slack et al., 2013), in their widely adopted textbook Operations Management, define operational efficiency as "doing things right" the disciplined minimization of resource waste in the execution of defined processes. This definition highlights the comparative, relational character of efficiency: it is not an absolute quality but a performance ratio that acquires meaning only in relation to a reference standard, whether

that standard is the organization's own historical performance, a technical benchmark, or the best practice of a comparable institution.

In the insurance context, three analytically distinct dimensions of operational efficiency are conventionally measured. Process efficiency designates the speed, accuracy, and cost-optimality with which specific administrative workflows underwriting, claims processing, policy administration, and customer onboarding, are executed. It is operationalized through metrics such as average claims processing time, policy issuance cycle time, and first-contact resolution rates. Cost efficiency refers to the minimization of unit costs for standardized service outputs, and is conventionally measured in non-life insurance through two composite ratios: the expense ratio (administrative and acquisition costs expressed as a percentage of net premiums earned) and the combined ratio (the sum of the loss ratio and the expense ratio, which when below 100% indicates underwriting profitability). Resource efficiency designates the degree to which human, technological, and financial resources are deployed without waste, redundancy, or idle capacity a dimension that digitalization addresses directly by automating routine tasks and reallocating human attention toward higher-complexity activities (Guo et al., 2025; Slack et al., 2013).

The technical efficiency framework employed by (Guo et al., 2025), drawing on Data Envelopment Analysis methodology, provides a formally precise operationalization of efficiency relevant to this thesis: technical efficiency is measured as the ratio of an institution's actual output to the maximum output theoretically attainable with its given inputs, producing a continuous measure bounded between 0 and 1 that enables the comparison of efficiency levels across time periods and institutional contexts. This framework has the advantage of making efficiency measurement independent of price information a significant advantage in the regulatory and tariff-constrained environment of the Algerian insurance market, where premium rates are subject to administrative oversight rather than pure market determination.

A. Efficiency versus Effectiveness

The distinction between efficiency and effectiveness is foundational in management science and was most influentially articulated by Drucker (1966) in his seminal work The Effective Executive: "Efficiency is doing things right; effectiveness is doing the right things." Drucker's formulation captures a critical and frequently overlooked truth: it is entirely possible for an organization to be simultaneously highly efficient and profoundly ineffective that is, to execute wrong or irrelevant activities with great precision and minimal waste. A claims department that rapidly processes and rejects frivolous claims

at low cost is, by narrow metrics, highly efficient; but if its rejection criteria are miscalibrated and its denials trigger customer attrition, regulatory complaints, and reputational damage, it is institutionally ineffective. The efficiency of the means cannot substitute for the appropriateness of the ends.

In the operations management literature, (Slack et al., 2013) locate this distinction within a broader taxonomy of operational objectives: efficiency, effectiveness, flexibility, quality, speed, and dependability. They argue that effectiveness concerns the alignment of operations with external customer and stakeholder expectations, while efficiency concerns the internal optimization of resource use. Organizations that prioritize efficiency at the expense of effectiveness risk what (Porter, 1996) calls "operational effectiveness" as a competitive strategy the continuous improvement of existing activities without strategic differentiation, which generates neither sustainable competitive advantage nor durable customer value.

For the purposes of this thesis, both dimensions are analytically relevant. Digitalization at the SAA is expected to generate efficiency gains measurable reductions in processing times, cost ratios, and error rates but the research design also examines whether these gains translate into effectiveness improvements: higher-quality claim assessments, more accurate risk pricing, and more responsive customer service that meets policyholder expectations. A finding of efficiency improvement without effectiveness improvement would constitute a qualified, rather than a fully positive, evaluation of the digitalization initiative.

Table III Efficiency versus Effectiveness Key Distinctions

Dimension	Efficiency	Effectiveness
Core question	"Are we doing things right?" (Drucker, 1966)	"Are we doing the right things?" (Drucker, 1966)
Focus	Optimization of inputs, processes, and costs	Quality of outcomes relative to strategic objectives
Measurement	Expense ratio, combined ratio, cycle times, error rates	Customer satisfaction, retention rates, strategic goal attainment
Digitalization lever	RPA, process automation, AI-powered workflow management	Decision-support analytics, predictive modeling, smart CRM

Theoretical grounding	Operations management: Slack et al. (2013)	Strategic management: Drucker (1966); Porter (1996)

Source: Elaborated by the author based on (Drucker, 1966); (Porter, 1996); (Slack et al., 2013)

B. Efficiency versus Performance

Organizational performance is a broader and more composite concept than efficiency. While efficiency measures the input-output relationship within a given process or function, performance designates the totality of an organization's achievement relative to its strategic objectives encompassing financial results, operational quality, competitive positioning, regulatory compliance, customer satisfaction, and institutional resilience. (Kaplan & Norton, 1992), in their seminal Harvard Business Review article introducing the Balanced Scorecard, provide the most influential framework for this multi-dimensional understanding of performance. They argue that relying exclusively on financial and operational efficiency metrics causes organizations to manage "by looking in the rear-view mirror" optimizing historical processes while neglecting the leading indicators of future competitive position. Their framework distributes performance measurement across four interconnected perspectives:

- the financial perspective (revenue growth, cost reduction, return on capital), which captures the lagging financial consequences of organizational choices;
- the customer perspective (satisfaction, retention, acquisition, net promoter scores), which captures the value delivered to the external market;
- the internal process perspective (process quality, speed, innovation capability), within which operational efficiency is the central concern;
- The learning and growth perspective (workforce capability, information system quality, organizational culture), which captures the organizational foundations of future competitive capacity.

This taxonomy positions operational efficiency as one component specifically the internal process component of a broader performance architecture. An insurance institution may improve its process efficiency metrics while simultaneously underperforming on customer retention (if automation reduces service quality), on workforce capability (if staff are not retrained to work alongside digital tools), or on financial results (if efficiency gains are more than offset by revenue attrition from digitalization failures). (Guzmán-Ortiz et al.,

2020) provide empirical confirmation of this multi-causal structure in the insurance context, establishing that digital transformation explains 69% of the variance in individual job performance (R^2 = 0.690), with distinct and measurable contributions from customer service experience (0.428), business model adaptation (0.298), and employee capability development (0.198). This sequencing confirms that performance cannot be reduced to any single dimension, and that operational efficiency improvements must be evaluated within the full Balanced Scorecard framework to yield conclusions of genuine strategic significance (Kaplan & Norton, 1992; Slack et al., 2013)

2.2.2. Digitalization to Improve Operational Efficiency

The mechanisms through which digitalization generates operational efficiency improvements in insurance are documented with increasing precision in both the management science and insurance-specific literatures. (Davenport, 1993), in his foundational work Process Innovation, establishes the conceptual architecture for this relationship: efficiency improvements through information technology are not the product of overlaying digital tools on existing processes but require the prior redesign of those processes what Davenport terms "process innovation" as distinct from mere process improvement. Organizations that digitize inefficient processes embed inefficiency in digital form; organizations that redesign processes in light of digital possibilities generate qualitatively superior efficiency outcomes. This principle subsequently confirmed empirically by (Buer et al., 2021) in the manufacturing context and analytically anticipated by (Schwab, 2016) in the insurance sector constitutes one of the most important practical lessons for the SAA's digitalization agenda.

At the process level, Robotic Process Automation (RPA) constitutes the most immediately deployable and least architecturally disruptive efficiency lever: software robots automate high-volume, rule-based administrative tasks data entry, document classification, policy issuance, payment reconciliation without requiring the replacement of underlying legacy systems, generating immediate cost and error rate reductions (Nivedita, 2022). At the decision level, Artificial Intelligence and machine learning applied to claims assessment, fraud detection, and underwriting risk scoring produce precision gains that translate directly into lower loss ratios and reduced claims adjudication costs (Naujoks et al., 2017) quantify the aggregate potential at a 72% reduction in policy administration costs for digital pioneer insurers. At the infrastructure level, cloud computing eliminates the capital expenditure and operational overhead of proprietary data centers, enabling IT cost

structures to scale elastically with business volume rather than requiring fixed capacity over-provisioning (Eckert & Osterrieder, 2020).

(Yin et al., 2024) add a risk management dimension to the operational efficiency narrative, establishing through rigorous quasi-experimental econometric analysis that digitalization reduces operational risk measured through stock return volatility through two specific transmission pathways: the strengthening of internal control system quality, and the enhancement of supply chain network centrality. The implication for insurance institutions is that digitalization's efficiency contribution is not merely cost-oriented but also stability-oriented: digitalized operations are more predictable, more internally consistent, and more resistant to operational disruption than their manual equivalents. Big Data analytics, as (Guo et al., 2025) demonstrate through their panel analysis of 64 Chinese insurers, improves technical efficiency through two channels simultaneously administrative cost optimization and underwriting precision improvement with the caveat that state-owned enterprises exhibit structurally lower responsiveness to data analytics investments than private-sector counterparts, a finding of direct relevance to the SAA context.

2.3. Customer Relationship

Customer relationship management constitutes the second principal performance dimension through which this thesis evaluates digitalization's impact. Its conceptual grounding draws primarily on the marketing management and CRM literatures, supplemented by insurance-specific empirical evidence.

2.3.1. Notion of Customer Relationship

Customer Relationship Management (CRM) as a formal business discipline emerged in the 1990s at the intersection of database marketing, service quality theory, and enterprise software development. Its conceptual evolution over three subsequent decades has been substantial: from a sales-force automation tool designed to manage contact information and track sales pipeline activity, CRM has been reconceptualized as an enterprise-wide strategic philosophy whose purpose is the identification, acquisition, development, and retention of long-term, mutually value-generating relationships between the organization and its most valuable customer segments (Buttle & Maklan, 2019).

(Kotler & Keller, 2016), in Marketing Management the most widely cited marketing textbook in graduate management education define CRM as "the process of carefully managing detailed information about individual customers and all customer touch points to

maximize customer loyalty." This definition shifts the conceptual center of gravity from transaction management to relationship cultivation, recognizing that sustainable competitive advantage in service industries derives not from any individual sale but from the accumulated value of the ongoing relationship between the customer and the institution. (Peppers & Rogers, 2011), in Managing Customer Relationships, articulate this principle with particular sharpness: the fundamental objective of CRM is to "increase the value of the customer base by building better relationships with customers," achieved through the personalization of products, communications, and services to the individual rather than the demographic segment.

(Buttle & Maklan, 2019) offer the most analytically complete definition for the purposes of this thesis, conceiving of CRM as "a core business strategy that integrates internal processes and functions, and external networks, to create and deliver value to targeted customers at a profit," and emphasizing that it is "grounded on high-quality customer-related data and enabled by information technology." This definition explicitly positions CRM as a strategic architecture not a software product that integrates people, processes, data, and technology in the service of customer value creation. It also highlights the enabling role of information technology, establishing the conceptual link between CRM and digitalization that is central to this thesis.

In the insurance context, the customer relationship presents distinctive challenges absent in most other service industries. Payne and Frow (2013, p. 23), drawing on their strategic CRM framework, observe that insurance relationships are characterized by low engagement frequency the average policyholder interacts with their insurer only two to three times per year, primarily at renewal and at the point of claim and by a fundamental information asymmetry: the insurer holds superior actuarial knowledge about aggregate risk distributions, while the policyholder holds superior information about their individual risk profile and behavior. Managing this asymmetry requires CRM systems capable of constructing and continuously updating a granular, 360-degree view of each customer's profile, preferences, claims history, and lifecycle stage a data infrastructure task for which digital technologies are uniquely enabling. (Zeithaml et al., 1990), in their seminal work on service quality, establish that customer perceptions of service quality in financial services are driven primarily by five dimensions reliability, responsiveness, assurance, empathy, and tangibility all of which are directly modifiable through digital service design, providing a normative standard against which the customer relationship effects of digitalization can be evaluated.

Table IV Core Dimensions of Customer Relationship Management

CRM Dimension	Definition and Insurance Relevance
Customer Acquisition	Strategies for attracting new policyholders through targeted digital channels, comparison platforms, and personalized product offers (Kotler & Keller, 2016).
Customer Retention	Maintaining existing policyholder relationships through proactive renewal management, loyalty programs, and digital service quality (Peppers & Rogers, 2011).
Customer Development	Increasing the lifetime value of existing customers through cross-selling, upselling, and portfolio deepening enabled by behavioral analytics (Buttle & Maklan, 2019).
Multichannel Integration	Delivering contextually consistent experiences across mobile apps, web portals, social media, telephone, and agency networks (Eekani et al., 2024).
Service Personalization	Tailoring product recommendations, pricing, and communication to individual customer profiles through AI-enabled data analysis (Omotayo Bukola Adeoye et al., 2024).
Digital Trust	Building and sustaining customer confidence through data security, privacy governance, and transparent digital interaction design (Buttle & Maklan, 2019).

Source: Elaborated by the author based on (Kotler & Keller, 2016); (Peppers & Rogers, 2011); (Buttle & Maklan, 2019); (Eekani et al., 2024).

2.3.2. Digitalization to Improve Customer Relationship

The deployment of digital technologies in the service of customer relationship management termed Electronic CRM or E-CRM has fundamentally transformed both the scope of available relational instruments and the expectations against which insurance customers evaluate their insurer's service quality. (Kotler & Keller, 2016) observe that the digital revolution has "profoundly changed" the management of customer relationships in three respects: it has dramatically increased the volume and granularity of customer data available to firms; it has enabled the individualization of marketing and service at a scale previously impossible; and it has empowered customers with information and comparison capabilities that reduce informational asymmetries and raise service quality thresholds.

(Buttle & Maklan, 2019) identify five categories of E-CRM tools that collectively constitute the digital customer relationship infrastructure of modern financial services

firms: web-based self-service portals enabling policyholders to manage policies, submit claims, and access documentation without intermediary contact; mobile applications providing continuous, geographically unbounded access to insurance services through smartphone interfaces; AI-powered chatbots and virtual assistants delivering intelligent, contextually informed responses to customer queries at scale and without proportional human labor costs; data analytics and personalization engines applying machine learning to customer behavioral and transactional data to generate individualized product propositions, proactive renewal interventions, and predictive churn management; and social media monitoring and engagement platforms enabling institutions to track, respond to, and leverage customer-generated content as both a service quality intelligence source and a brand management tool.

(Eekani et al., 2024), in an empirical study of insurance policyholders employing a mixed-method design, establish that among these E-CRM dimensions, multichannel communication exerts the strongest positive impact on customer loyalty both directly and through the mediation of satisfaction, trust, and brand attachment. Service customization the personalization of products, pricing, and interactions to individual customer profiles ranks second in terms of loyalty impact, generating deep emotional brand attachment by signaling to the policyholder that the institution treats them as an individual rather than a demographic category. These findings align with the "one-to-one marketing" paradigm articulated by (Peppers & Rogers, 2011), which argues that the fundamental commercial advantage of CRM lies in the institution's ability to recognize, remember, and respond to each customer individually a capability that was previously limited by information processing constraints but is now feasible at scale through digital analytics infrastructure.

Payne and Frow (2013, p. 62) emphasize that the customer relationship must be managed across the full customer lifecycle from initial awareness and acquisition through policy onboarding, ongoing engagement, renewal, and potential winback after lapse and that digitalization enables institutions to maintain consistent, contextually appropriate engagement at each stage of this lifecycle without proportional increases in service delivery cost. (Eckert et al., 2022) identify the claims touchpoint as the single most strategically consequential moment in the insurance customer lifecycle: it is the moment at which the insurer's promise is either honored or violated, and the quality of the digital claims experience its speed, transparency, and fairness is the primary determinant of post-claim retention and proposition behavior. This observation establishes a direct link between the operational efficiency dimension and the customer relationship dimension of

this thesis: improving the digital infrastructure of claims processing is simultaneously an efficiency objective and a customer relationship management imperative.

Digitalization also creates new modalities of customer engagement that extend the insurer-policyholder relationship beyond the traditional transaction-based interaction model. (Schwab, 2016) describes this as the emergence of "on-demand, platform-mediated service relationships" in which digital intermediaries enable customers to access services precisely when needed, at individualized pricing, and without the friction of traditional agent-mediated processes. (Omotayo Bukola Adeoye et al., 2024) document that Artificial Intelligence deployed through natural language processing transforms the customer experience from an episodic, claim-centric sequence of interactions into a continuous, proactive engagement characterized by personalized alerts, risk prevention recommendations, and behavioral incentive programs what (Ahmad et al., 2025) describe as the transition from a reactive indemnification model to a proactive risk prevention partnership. For the SAA, operating in a competitive environment in which digital-native insurers and InsurTech entrants offer frictionless mobile-first experiences, the development of a sophisticated E-CRM infrastructure represents not merely a service quality improvement but a competitive survival imperative.

Digital trust constitutes the foundational prerequisite for all E-CRM effectiveness. (Zeithaml et al., 1990) establish that assurance and reliability are among the five primary dimensions of service quality perception; in the digital context, these dimensions are operationalized primarily through data security, privacy governance, and platform reliability. (Buttle & Maklan, 2019) observe that customers who distrust an insurer's digital data practices disengage from digital channels even when those channels offer superior convenience and efficiency, effectively nullifying the commercial benefits of E-CRM investment. (Buehler & Maas, 2018) confirm this empirically, demonstrating that consumer empowerment through digital tools generates loyalty effects only when accompanied by robust privacy controls that allow policyholders to perceive data sharing as consensual and controlled. For insurance institutions operating in markets where digital trust levels and data protection regulatory maturity are still developing as is the case in Algeria the trust-building dimension of E-CRM design deserves particular strategic attention alongside the efficiency and convenience dimensions that typically receive disproportionate investment focus.

Table V Digitalization Mechanisms and Customer Relationship Outcomes

Digital Mechanism	Customer Relationship Dimension	Expected Outcome
Mobile applications and self-service portals	Accessibility and responsiveness	Reduced friction; improved satisfaction at routine touchpoints (Buttle & Maklan, 2019)
AI-powered chatbots and virtual assistants	Continuous engagement; service availability	Lower interaction costs; 24/7 service without proportional labor cost (Omotayo Bukola Adeoye et al., 2024)
Predictive analytics and personalization engines	Service customization; proactive retention	Individualized offers; early churn detection; increased lifetime value (Peppers & Rogers, 2011)
Digital claims management platform	Service quality at the highest-stakes touchpoint	Faster settlement; transparency; primary driver of post-claim retention (Eckert et al., 2022)
Data security and privacy governance	Digital trust as prerequisite for E-CRM	Enables all higher-order loyalty mechanisms; critical in low-trust digital markets (Buehler & Maas, 2018)
Omnichannel integration	Consistency across interaction channels	Seamless experiences; strongest direct predictor of customer loyalty in insurance (Eekani et al., 2024)

Source: Elaborated by the author based on (Buttle & Maklan, 2019); (Peppers & Rogers, 2011); (Eekani et al., 2024); (Omotayo Bukola Adeoye et al., 2024); (Eekani et al., 2024)

Conclusion of chapter I:

The conceptual framework constructed across Sections 2.1, 2.2, and 2.3 establishes three analytically precise and empirically grounded pillars for this research. Digitalization understood as the strategic sociotechnical process by which digital capabilities are leveraged to restructure processes and create new value, distinct from mere digitization and from the broader paradigm shift of digital transformation operates as the independent variable. Operational efficiency, defined through its input-output relationship, distinguished from effectiveness and from the broader concept of performance and customer relationship quality defined through the CRM literature as the integration of

processes, data, and technology in the service of long-term customer value constitute the two dependent dimensions. The empirical chapters that follow investigate the extent to which digitalization initiatives at the SAA have generated measurable improvements in these two dimensions, and identify the organizational conditions that have facilitated or impeded the realization of the theoretical potential documented in this framework.

CHAPTER II

RESEARCH METHODOLOGY

This second chapter served a dual purpose in the overall architecture of the research. It grounded the study in its institutional context and presented the methodological choices that governed the empirical investigation.

The chapter was structured into two sections. Section 01 provided an analytical presentation of the host organization, the Société Algérienne d'Assurance, covering its historical formation, organizational structure, corporate identity, and the strategic and digital roadmap that defined its current trajectory. This institutional portrait constituted the necessary empirical backdrop for interpreting the findings produced in Chapter III. Section 02 then presented and justified the research methodology, detailing the epistemological positioning adopted, the qualitative single-case study design selected, the three data collection instruments deployed, semi-structured interviews, documentary analysis, and direct internship observation, and the NVivo-assisted thematic analysis procedure used to process the collected corpus. Together, these two sections ensured that the empirical investigation that followed was both institutionally grounded and methodologically transparent.

Section 01: Presentation of the Host Company

This chapter transitions from the theoretical framework developed in the preceding chapters to the empirical investigation of digitalization at SAA. As a necessary point of departure, Section 1 establishes the institutional context of the research through a rigorous analytical presentation of the host company its historical formation, organizational architecture, corporate identity, and the strategic and digital imperative that defines its present trajectory.

Table VI: Corporate Identification

Category	Details
Corporate Name	Société Nationale d'Assurance (SAA)
Legal Form	Public Economic Enterprise Joint Stock Company (EPE/SPA)
Share Capital (2023)	35 Billion Algerian Dinars (DZD)
Founded	December 12, 1963
Registered Office	Immeuble SAA, Lot 234, Quartier d'Affaires, Bab-Ezzouar, Algiers
CEO (PDG)	Mr. BENMICIA Youcef
Workforce (2023)	3,233 employees
Revenue (2023)	30.24 Billion DZD
Market Share (2023)	≈ 20.4% of the national non-life market
Distribution Network	16 Regional Directorates, 656+ points of sale nationwide
Client Base	Over 2 million policyholders
Core ERP	ORASS

Table 6: Corporate identification summary SAA Assurances (Source: SAA Internal Documents, 2023; Annual Report, 2022)

1.1 Historical Evolution and Market Context

The Société Nationale d'Assurance (SAA) was established on December 12, 1963, as Algeria's first insurance institution a mixed Algerian-Egyptian company (61% and 39% respectively), a structural compromise born of the newly independent state's limited technical and financial capacity. This founding condition is analytically significant: it establishes from the outset that SAA's institutional DNA was shaped by the imperatives of post-colonial state-building rather than market competition, a conditioning whose organizational traces remain visible six decades later. The institution's early trajectory was defined by successive waves of regulatory consolidation: full nationalization by Ordinance 66-127 on May 27, 1966; the elimination of private intermediaries in 1973; and the 1976 sectoral specialization law that assigned SAA exclusively to simple and mass risks automobile, life, and personal retail lines concentrating its portfolio into a structural dependency that would prove its most durable vulnerability.

The liberalization reforms of 1989 and 1995 (Ordinance 95-07) constituted the decisive discontinuity in SAA's competitive history. The opening of the Algerian market to private domestic and foreign insurers and the reintroduction of private agents and brokers created, for the first time, genuine competitive pressure on a portfolio that had never been commercially hardened. The consequence was a long-run market share decline from a peak of approximately 41% in the late 1990s to 20.4% by 2023 driven not by absolute revenue contraction but by the substantially faster growth of new entrants. This structural erosion is the empirical backdrop against which all subsequent strategic and digital initiatives must be understood. SAA's landmark responses included: the 2003 deployment of the ORASS integrated ERP platform; the 2010 regulatory separation of personal from non-life insurance; the 2014 formal adoption of portfolio diversification as the primary growth axis; the 2016 relocation to a purpose-built headquarters in Bab-Ezzouar; the acceleration of digital transformation from 2020 onward; and, in 2023 SAA's 60th anniversary year a capital increase to 35 billion DZD alongside a turnover of 30.24 billion DZD, confirming both the scale of institutional achievement and the competitive pressures that continue to define its strategic environment.

1.2 Organizational Structure

SAA's organizational architecture reflects the dual imperatives of centralized strategic governance and decentralized territorial deployment that characterize large

national institutions serving a geographically diverse market. The structure operates across three successive tiers. At the apex, the Board of Directors eleven members including shareholder-elected representatives and two statutory workforce delegates governs through an Audit Committee and a Risk Committee, with executive management vested in the Président Directeur Général (PDG). Three Deputy General Directorates (DGAs) structure the entire management apparatus: the DGA Technique & Commercial, overseeing underwriting operations through the Corporate Risks Division (DGR), the Simple and Diverse Risks Division (DSD), the Automobile Division (DAA), and the Marketing Division (DM); the responsible for financial control, actuarial analysis, and strategic performance; and critically for this research the DGA Support & Services IT, explicitly mandated with information systems governance, technological infrastructure, and the conduct of digital transformation. The institutional elevation of this last DGA to the same organizational level as the commercial and financial pillars is itself a significant indicator of SAA's commitment to technology-driven change. Cross-functional units reporting directly to the PDG include the Innovation and R&D Directorate, the Risk Management and Compliance Directorate, the Internal Audit Directorate (DAI), and an Information Systems Security Officer, the last reflecting a growing institutional consciousness of cybersecurity as a governance priority.

The second tier comprises 16 Regional Directorates distributed across the national territory, which constitute the obligatory intermediary between headquarters and the distribution network, translating strategic directives into locally adapted operational plans and supervising commercial and claims management activity across their respective zones.

Table VII SAA's 16 Regional Directorates

DR 1–4	DR 5–8	DR 9–12	DR 13–16
Alger I	Tizi-Ouzou	Sidi Bel Abbes	Batna
Alger II	Oran	Constantine	Ouargla
Alger III	Relizane	Annaba	Béchar
Mouzaia	Tlemcen	Sétif	Grands Comptes

(Source: SAA Internal Documents, 2025)

The distribution network the third and most commercially proximate tier constitutes the densest insurance coverage infrastructure in Algeria, comprising 656 or more points of sale organized as 304 direct integrated agencies, 235 approved general agents (AGA), 211 bancassurance windows, 83 sub-branches and antennae, and 44 registered brokers. SAA further operates three specialized subsidiaries: SAE-EXACT (50 technical vehicle inspection centers, partly associated with AXA through the IPA assistance platform), ASG

(security and guarding services), and an in-house printing company. Participatory interests in Africa Re, CAGEX, SGCI, SRH, and SIH extend the institution's financial ecosystem, while the SAPS/AMANA life insurance joint venture with the French MACIF Group covers the personal insurance segment. From an analytical perspective, this structural scale 16 regional entities, 656 distribution points, 3,233 employees is precisely the class of organizational complexity that a centralized, integrated digital information system is designed to manage. The persistence of the legacy ORASS platform thus represents not merely a technical gap but a structural constraint on strategic management capacity.

1.3 Corporate Identity: Mission, Vision, and Values

SAA's institutional mission operates on two distinct planes. On the micro-economic plane, the mission is to offer effective insurance coverage to individuals, professionals, and enterprises protecting their assets and persons against the financial consequences of risk. On the macro-economic plane, as a major financial institution, SAA carries responsibility for mobilizing long-term savings and contributing to national economic development in a society where insurance penetration remains critically low. This dual mandate simultaneously commercial and developmental creates a governance tension that distinguishes state-owned insurers from private-sector peers and directly conditions digital transformation decision-making. SAA's formally articulated strategic vision is to 'remain the reference actor of the Algerian insurance market,' operationalized through four commitments: maintaining market leadership across core segments; making customer satisfaction a permanent organizational concern; securing institutional commitments through revenue diversification; and proactively preparing for tomorrow's challenges including digitalization and emerging risk categories such as cyber risk and climate risk. The institutional values that underpin this vision are presented below.

Table VIII SAA's institutional value framework

Value	Operational Significance
Customer Listening	Systematic attentiveness to client needs as the basis for continuous service improvement.
Commitment	Honouring every contractual and relational obligation toward clients and partners.
Excellence	Continuously improving technical, commercial, and managerial performance across all functions.
Innovation	Positioning technology and process innovation as a primary lever of

	strategic adaptation and growth.
Transparency	Maintaining clear, honest communication with all stakeholders, clients, partners, and employees.

(Source: SAA Official Website, saa.dz; Internal Communications, 2023).

Examined critically, the inclusion of Innovation and Transparency among SAA's formal values alongside more traditional insurance principles reflects the cultural repositioning that its leadership has sought to accomplish alongside the structural transformation. A state-owned institution historically associated with organizational conservatism communicating Innovation as a core value signals a leadership-endorsed aspiration to reshape institutional culture. This is a necessary, though not sufficient, precondition for effective digital transformation.

1.4 The Strategic and Digital Context

The strategic and digital context governing SAA's current trajectory is shaped by the convergence of competitive erosion, operational underperformance, and accelerating global disruption of the insurance industry. The institutional response is embodied in the multi-year Strategic Vision (2015–2021, updated 2023–2025) and the Digitalization Roadmap (Feuille de Route Digitalisation) formally launched in November 2020. The Strategic Vision articulated five transformation axes: client-centricity; human capital valorization and innovation culture; portfolio diversification and organizational restructuring; information systems development explicitly designating ERP, CRM, and Business Intelligence as foundational strategic enablers; and partnership intensification across distribution channels. The performance logic is direct: SAA's operating cost ratio has systematically exceeded the normative market threshold of 28%, reaching 33.6% in 2020, a structural imbalance between an organization dimensioned during the monopoly era and a business volume constrained by competitive erosion a problem solvable only through revenue growth or fundamental productivity improvement, both of which digitalization is positioned to enable.

The 2020 Digital Roadmap operationalizes these commitments across five vectors: omnichannel customer experience delivery under the ATAWAD principle (Any Time, Any Where, Any Device); distribution transformation from 'stationary vendor' agency formats to hybrid PhyGital models; industrialized claims management through the GSA (*Gestion des Sinistres Automobile*) platform, which targets the claims settlement cycle and combats

fraud estimated at 10–20% of total claims charges; customer data valorization through the DIGIVALO project, which leverages SAA's historical policyholder databases via Data Science and CRM for predictive actuarial pricing and loyalty management; and product innovation through usage-based pricing models such as Pay-As-You-Drive. Alongside these initiatives, the EAD (*Expertise à Distance*) tool enables remote digital damage assessment, reducing physical expert deployment costs and improving turnaround times. The foundational prerequisite for all of these objectives is the replacement or substantial modernization of the ORASS ERP system a constraint explicitly acknowledged in SAA's own strategic documentation and directly consistent with the technological interdependency principle identified in the academic literature: effective CRM and AI tools require integrated data infrastructure, which requires a modern core system, which requires the prior dismantling of siloed legacy architectures (Eckert & Osterrieder, 2020). The structural creation of a dedicated DGA for Support and IT Services placing digital transformation governance at the same hierarchical level as commercial and financial management constitutes the clearest institutional signal that SAA views digitalization not as a peripheral IT project but as a central pillar of its competitive survival strategy.

1. PGS - Claims Management Platform

PGS is SAA's centralized digital platform for automobile claims management. It replaced a fully manual process in which each agency director managed and filed claims independently a system that created risks of document loss, unequal client treatment, and informal favoritism. As one senior director explained, agencies now simply scan and transmit documents to the Regional Directorate, which processes all files according to their registration order, ensuring impartiality and traceability.

Beyond operational gains, PGS has also eliminated the conditions that previously allowed certain employees to grant preferential treatment in exchange for informal favors. Its primary contribution lies in operational efficiency, although its impact on client satisfaction through faster and fairer settlements is equally important (Interview R1; Interview R2; Interview R3; Interview R5).

2. E-RECOURS - Digital Inter-Insurer Subrogation Platform

E-Recours is the platform through which SAA manages the legal and financial settlement of mutual claims between insurance companies a process known as subrogation (*recours*).

Before its deployment, representatives from each insurer held physical meetings, carried paper files, and reconciled claims manually, often delaying compensation for more than a year.

The platform now imposes strict processing deadlines. Any agency that fails to process a referred file within 15 days automatically triggers an alert to the Regional Directorate; continued delay escalates the alert to the General Directorate.

The operational impact has been substantial: SAA moved from processing approximately 1,000 files under the manual system to handling nearly one million files through the digital platform.

E-Recours therefore contributes simultaneously to operational efficiency and client satisfaction the two principal dimensions of this research **(**Interview R1; Interview R2; Interview R3).

3. EAD - Remote Digital Assessment Tool

EAD is a digital tool that enables remote damage assessment without requiring the physical presence of an expert at the client's location.

When a client declares a claim, they receive a digital link allowing them to upload photographs of the damage directly from their device. These images are then transmitted to the assessment center for evaluation.

One director summarized the process as follows:

"We scan the file, send it, and request the necessary processing the remote expertise, EAD."

By eliminating the logistical constraints associated with physical expert deployment, EAD reduces both assessment costs and processing times while extending SAA's service quality to clients located far from regional offices (Interview R1; Interview R2; Interview R4).

4. IPA - Client History and Risk Screening Tool (Automobile Directorate)

IPA is a screening tool deployed within SAA's Automobile Directorate that automatically retrieves a client's insurance history during onboarding.

When a new client is registered, the system immediately queries internal and governmental databases to verify prior claims, public authority flags, and previous insurance coverage.

As one practitioner explained:

“The system pulls the client’s history and runs a quick background check has this person had prior claims? Are they flagged by government authorities? Were they insured before?”

IPA reduces the risk of fraudulent subscriptions and provides underwriters with richer and more reliable risk profiles from the very beginning of the client relationship (Interview R3).

5. My SAA - Internal Digital Toolbox for the Agency Network

“My SAA” is an internal digital platform designed as a resource hub for SAA’s commercial network.

The platform provides agency employees with centralized access to product brochures, company presentations, and performance dashboards enabling real-time monitoring of commercial metrics such as prospecting activity, conversion rates, and portfolio development by agency and regional directorate.

Its implementation has partially digitized performance monitoring across the network and eliminated dependence on manual reporting methods such as fax or email.

Although more modest in scope than SAA’s major operational platforms, My SAA reflects the institution’s broader effort to digitize the internal dimension of its commercial operations (Interview R2).

6. CRM System - Customer Relationship Management Platform

SAA has implemented a CRM system integrated with the CNRC (*Centre National du Registre du Commerce*), which assigns each commercial employee a unique section code and enables the monitoring of prospecting activities across the network.

However, several practitioners openly acknowledged the platform’s current limitations.

As one director stated:

“What we have isn’t a true CRM it’s just a prospecting tool.”

The criticism primarily concerns the absence of a unified customer profile integrating claims history, portfolio holdings, and loyalty indicators.

Another practitioner described the platform as:

“An older tool recently launched and now in a phase of refinement operational, but with several stages still incomplete.”

The CRM system therefore represents a functional but still incomplete tool that has not yet reached the level of customer intelligence required by SAA’s strategic ambitions (Interview R2; Interview R5).

7. Online Sales Platform - Website-Based Digital Subscription Channel

SAA’s institutional website, relaunched in 2019, constitutes the company’s primary digital channel for online subscription and client communication.

The platform currently supports online sales for two products:

- **Multirisque Habitation (MH)** Home insurance
- **CAT-NAT** - Natural disaster coverage

Automobile insurance, despite being SAA’s largest product line, remains excluded from online subscription because Algerian regulations still require physically signed documents.

As one director explained:

“For MH and CAT-NAT, there is no legal obligation requiring an official wet signature that’s why we were able to launch online payments for these products.”

The platform also includes a messaging and complaint-management function for clients.

A complete redesign is currently underway after the discovery of configuration errors by the external developer responsible for the original platform (Interview R2; Interview R4).

8. DIGIVALO - Digital Valorization of Historical Customer Data (Strategic Project)

DIGIVALO is an internal strategic initiative intended to transform SAA’s historical customer databases into actionable intelligence for actuarial pricing, customer segmentation, and personalized offer development.

The project primarily targeted automobile insurance and aimed to introduce market-referenced vehicle valuation parameters into subscription and claims processes, an area where Algeria lacks standardized pricing references.

However, field interviews revealed that the project has not progressed beyond its conceptual phase.

Significantly, one senior director stated that they had no prior knowledge of the project, revealing a notable gap in internal strategic communication.

This lack of awareness itself constitutes an important analytical finding for the research (Interview R2; Interview R1).

9. ORASS - Core Insurance Management ERP (Legacy Platform, Deployed 2003)

ORASS is SAA's foundational enterprise resource planning (ERP) system. Deployed in 2003, it remains the institution's central operational platform.

All five interviewees referenced ORASS, and their assessments were largely consistent: although the system still performs essential operational functions, it is structurally misaligned with SAA's digital transformation objectives.

One director stated that ORASS is:

"Incompatible by approximately 90% with the institution's strategic objectives."

The same respondent explained that a replacement ERP has been under development for two years but remains unfinished due to continuously emerging requirements.

Another senior practitioner observed that incremental improvements are:

"No longer enough,"

and that the institution must:

"Take the next step toward a more modern, integrated system."

ORASS therefore represents both the operational backbone of SAA and the most frequently cited structural obstacle to its digital transformation (All five interviews R1–R5).

Section 02: Research Methodology

The methodology adopted in this study aims to explore, in depth, the state and dynamics of digitalization at the *Société Nationale d'Assurance* (SAA) and to analyze its concrete effects on customer relationship management and operational efficiency. Given the complexity of the subject which encompasses technical, organizational, and human dimensions simultaneously a flexible and comprehensive methodological approach was necessary. We therefore combined a theoretical analysis built in the literature review with an empirical field inquiry, allowing us to bridge the gap between existing conceptual

models of insurance digitalization and the practices actually observed within SAA. This approach was guided by the nature of our research question, the specificities of the Algerian insurance context, and the requirement to produce results that are both analytically rigorous and practically relevant.

2.1 Object and Scope of the Research

This research focuses on the process and outcomes of digitalization at SAA, examined from an internal organizational perspective. Rather than studying digitalization from the standpoint of the end customer or as an externally observable market phenomenon, our study concentrates on the institution itself: how SAA plans and executes its digital transformation, how digital tools are adopted and used at the operational level, how employees and managers perceive their effects, and where gaps remain between strategic ambition and operational reality. More precisely, the empirical investigation is organized around four focal areas corresponding to the four research sub-questions: the main benefits SAA gains from its digital transformation; the digital tools does SAA use to interact with its customers; The ways in which digitalization affects the operational efficiency of SAA's internal workflows, claims processing systems, and administrative functions; institutional and technical barriers (legacy systems, bureaucratic resistance) hinder the full-scale adoption of digital governance within an EPE/SPA like SAA.

The choice of SAA as the study terrain was not arbitrary. As Algeria's largest state-owned non-life insurer, with a 60-year institutional history and a market share of approximately 20.4% in 2023, SAA represents a case of exceptional analytical significance. It simultaneously embodies the organizational inertia and governance constraints characteristic of public-sector incumbents, and a formally articulated, leadership-endorsed digital transformation agenda a combination that makes it an ideal setting for examining how digitalization concretely unfolds in an emerging-market institutional environment where the literature provides little empirical guidance. Our internship placement within the institution also provided a direct and privileged access to data that would have been otherwise inaccessible.

2.2 Research Strategy: Qualitative Case Study

To conduct this investigation, we adopted a qualitative single case study strategy, in line with Yin's (2018) case study methodology. This choice rests on several complementary justifications. First, our research questions are of the 'how' and 'in what

ways' type they seek to understand processes and mechanisms, not to measure frequencies or establish statistical correlations. As Yin (2018) establishes, case study methodology is the most appropriate research strategy precisely when research questions take this form and when the researcher has no control over the events studied. Second, the research aims at a deep, contextual understanding of digitalization as it unfolds within a specific institutional environment; the goal is not to produce results generalizable to all insurers, but to generate empirically grounded insights that are rich and analytically transferable. Third, the complexity and uniqueness of SAA's institutional context its state-ownership structure, its monopoly legacy, its advanced-in-intention but constrained-in-practice digital transformation make it a case deserving dedicated, in-depth analysis.

The case is embedded in structure: while SAA as a whole constitutes the primary unit of analysis, the study examines several distinct sub-units within it. The customer-facing service processes are analyzed in relation to the customer relationship management sub-question. The claims management and administrative workflows are examined in relation to the operational efficiency sub-question. The Information Systems Division (DSI), which holds institutional responsibility for the digital transformation program, is engaged as a cross-cutting governance unit. This embedded design produces both institution-wide observations and domain-specific insights. Table I below summarizes the overall research design.

Table IX Summary of the Research Design

Dimension	Choice Retained
Epistemological Posture	Interpretivism
Research Approach	Qualitative abductive reasoning
Research Strategy	Single qualitative case study (Yin, 2018)
Unit of Analysis	SAA digital transformation processes and outcomes
Primary Data Source	Semi-structured interviews (5 informants)
Secondary Data Sources	Internal SAA documents + direct internship observation
Sampling Logic	Purposive / reasoned (non-probabilistic)
Analysis Method	Thematic analysis (Braun & Clarke, 2006) via NVivo
Validity Criteria	Source triangulation + audit trail + member checking

Source: Authors' own elaboration, 2025

2.3 Data Collection Instruments

Consistent with the requirements of qualitative case study methodology, data collection in this study relies on three complementary instruments: semi-structured interviews, documentary analysis, and direct observation. This triangulation of sources is

not a methodological formality; it reflects a deliberate strategy to counterbalance the inherent limitations of each individual instrument and to strengthen the credibility of the findings (Patton, 2002). Each instrument captures a distinct layer of SAA's digital reality.

2.3.1 Semi-Structured Interviews

Semi-structured interviews constitute the primary and richest source of empirical data in this study. This format was chosen because it combines the thematic orientation necessary to address the research questions with sufficient openness to allow informants to raise dimensions the researcher may not have anticipated a decisive advantage in an exploratory study (Kvale & Brinkmann, 2009). As Blanchet & Gotman (1992) note, the semi-structured interview allows the researcher to guide the exchange toward the study's thematic objectives while leaving the interlocutor the freedom to express their representations and experiences in their own words.

We conducted five semi-structured interviews with SAA managers and operational staff, selected based on their direct professional involvement with digitalization processes, customer relationship management, or operational efficiency functions. Each interview was conducted on-site at SAA's headquarters or by video call, and lasted between 35 and 55 minutes. An interview guide was developed in advance in collaboration with our academic supervisor, structured around five thematic blocks aligned with the research sub-questions: interviewee profile; current state of digitalization at SAA; effects on customer relationship management; effects on operational efficiency; and barriers, outlook, and propositions. The participants are presented in Table II below, anonymized through a coding system.

All interviews were recorded with the prior written consent of each participant and were fully transcribed for subsequent analysis. To mitigate social desirability bias the tendency of informants to present the institution more favorably than operational reality may warrant we formulated questions in an open, non-evaluative manner and systematically invited participants to illustrate their responses with concrete examples from their professional experience.

2.3.2 Documentary Analysis

Documentary analysis constitutes the second data collection instrument. Documentary analysis is defined as a systematic procedure for reviewing or evaluating documents both printed and electronic as a means of eliciting meaning, gaining understanding, and developing empirical knowledge (Bowen, 2009). In the context of this

study, this instrument serves two complementary functions: it provides the institutional and historical context within which interview data is interpreted, and it constitutes an independent data source that allows us to triangulate and corroborate or, where relevant, challenge the accounts provided by informants.

The documents consulted in this study include: SAA annual reports for the period 2017–2023; the 2015–2021 Strategic Vision document ('Éléments de la Vision Stratégique SAA') and its 2023–2025 update; the November 2020 Digital Transformation Roadmap ('Feuille de Route Digitalisation SAA'); internal project documentation for the GSA (Gestion des Sinistres Automobile), EAD (Expertise à Distance), and DIGIVALO initiatives; SAA's institutional website content and official public communications; and relevant regulatory documents issued by the Commission Nationale de Supervision des Assurances (CNSA). These documents were analyzed using a thematic content analysis grid organized around the three focal areas of the study, following Bardin's (1977) framework for the analysis of content.

2.3.3 Direct Internship Observation

The third data collection instrument is direct, non-participant observation conducted during the internship period at SAA. As Thiétart (2007) notes, observation constitutes an alternative mode of data collection to the interview, in the sense that the researcher can analyze factual data whose occurrences are certain, rather than verbal data whose factual inference is subject to interpretation. Our presence within the institution as student-interns provided access to the behavioral and processual dimensions of digital transformation that neither interviews nor documents can fully capture: the actual use or non-use of digital tools at the point of service delivery, the informal workarounds that employees have developed to navigate legacy system limitations, and the observable dynamics of customer interaction in digitalized versus non-digitalized service contexts.

Observations were conducted in the following operational areas: the customer service counters and reception areas of SAA's Bab-Ezzouar headquarters; the claims management unit working with the GSA platform; and several agency-level interactions observed during field visits. All observations were recorded in a structured field journal organized by date, operational unit, and thematic focus, following a pre-designed observation grid presented in Annex 1.

2.4 Sampling Logic

Participant selection followed a purposive, or reasoned, sampling logic a non-probabilistic approach in which participants are deliberately chosen based on their relevance to the research question rather than on random probability of selection (Miles, Huberman & Saldaña, 2014). This approach is described by QuestionPro (2022) as particularly suited when the target population is limited and when only certain profiles possess the characteristics required for the study. In our case, this strategy was appropriate because it allowed us to target interlocutors whose specific knowledge, experience, and organizational position provided genuine added value to the analysis: participants needed to have direct, active involvement with at least one dimension of SAA's digital transformation either as architects of the strategy, implementers of digital tools, or managers of customer-facing or operational processes affected by digitalization.

Three selection criteria were applied: (1) direct professional involvement with digitalization initiatives, customer relationship management, or operational efficiency functions at SAA; (2) a minimum of five years of service at the institution, to ensure informants could speak to the evolution of practices over time; and (3) informed willingness to participate, with prior written consent. Data collection continued until thematic saturation was reached the point at which successive interviews no longer produced substantially new thematic content a criterion consistent with the saturation principle formalized by Strauss & Corbin (1990).

2.5 Data Analysis: Thematic Analysis and NVivo

To ensure a rigorous and methodical analysis of the data collected, we opted for thematic analysis as formalized by Braun & Clarke (2006). Thematic analysis is a method for identifying, organizing, describing, and interpreting patterns within a dataset. It was chosen for this study because of its theoretical flexibility it is not committed to a single epistemological framework and is therefore compatible with our interpretivist posture and because it is capable of producing the nuanced, contextualized insights that our research questions demand (Nowell, 2017). As an analytical method, it further distinguishes itself through its adaptability and its ability to produce rich, detailed accounts of qualitative data (Braun & Clarke, 2006).

To support and structure this analysis, we used NVivo software a computer-assisted qualitative data analysis tool (CAQDAS) widely recognized in academic research for its

capacity to manage, organize, and analyze large volumes of textual data (Jackson & Bazeley, 2019). NVivo allows the centralization of all interview transcripts, field notes, and documentary extracts within a single project environment, and provides advanced functionalities for thematic coding, co-occurrence visualization, word frequency analysis, and the production of analytical reports. As Plard (2019) notes, NVivo allows the researcher to identify recurring themes, establish links between concepts, and generate interpretations that are systematic, transparent, and auditable.

The analysis proceeded in four stages, following the analytical protocol established in the literature. First, all interview recordings were fully transcribed and imported into NVivo alongside the documentary sources. Second, a pre-coding phase was conducted based on the three master themes corresponding to the research sub-questions: (1) digital maturity and barriers at SAA; (2) digitalization and customer relationship outcomes; and (3) digitalization and operational efficiency. Third, an open, inductive coding process was applied reading each transcript line by line to allow categories and sub-themes to emerge directly from the data, without pre-imposing a rigid classification (Strauss & Corbin, 1990). Fourth, a semantic treatment was applied to interpret the meaning, context, and intentions expressed in participants' responses, supplemented by a frequency analysis within NVivo to identify lexical patterns and verify the prominence of emerging themes. Results are presented in Chapter III using the Statement–Quote–Commentary (S-Q-C) analytical format: for each finding, we first state the interpretive observation, then anchor it in a verbatim extract from the data (anonymized), and finally comment on its significance in relation to the theoretical framework.

2.6 Difficulties Encountered

Like all field-based research, this study encountered several difficulties that merit honest acknowledgment, as each of them influenced the data collection process in specific ways.

The first and most significant difficulty was restricted access to sensitive organizational information. SAA's internal data on digital project budgets, system performance metrics, and detailed CRM analytics are classified as confidential. This constraint common in research conducted within publicly mandated institutions (Campendhoudt & Quivy, 2011) meant that certain quantitative performance dimensions could only be approached through participants' verbal accounts and publicly available annual report data, rather than through direct documentary evidence.

The second difficulty concerned the availability of interviewees. Several managers initially approached were unable to participate due to professional scheduling constraints or institutional reluctance to address strategic topics with an external researcher a sensitivity documented by all four examples reviewed from prior dissertations supervised in this program. In several cases, it was necessary to reschedule interviews multiple times, which extended the data collection timeline beyond what had been originally planned.

Third, the thematic sensitivity of the subject digital transformation touches on strategic, competitive, and human dimensions simultaneously generated a degree of institutional reserve in certain participants. Some informants were reluctant to address topics such as the limitations of ORASS, the gap between digital ambitions and operational realities, or specific instances of failed digital initiatives. This form of social desirability bias was partially mitigated through the use of open, non-evaluative question formulations and the systematic invitation to illustrate responses with concrete professional examples (Kvale & Brinkmann, 2009).

Finally, as is common in student-led research, constraints of time and institutional access limited the breadth of the study. A more extensive field investigation covering multiple departments, a larger number of informants, and a longitudinal data collection design would have provided an even richer empirical base. However, each difficulty encountered was also an opportunity to refine our methodological approach and to strengthen the rigor of our data collction and analysis procedures.

Conclusion of Chapter II:

The methodological framework adopted in this study is coherent, internally consistent, and calibrated to the specific demands of the research question. The interpretivist posture, the qualitative case study strategy, the three-instrument triangulation, the purposive sampling logic, and the NVivo-supported thematic analysis collectively form a rigorous framework capable of generating credible and analytically rich answers to the question of how SAA can leverage digitalization to improve customer relationship management and operational efficiency.

CHAPTER III

RESULTS AND DISCUSSION

The two preceding chapters of this dissertation have established the theoretical and methodological foundations upon which the present investigation rests. Chapter I constructed the conceptual architecture of the research, articulating the relationship between digitalization, customer relationship management, and operational efficiency through the lens of established academic literature. Chapter II presented the methodological framework adopted to generate empirical evidence, justified the qualitative case study design, introduced the host institution -- the Société Algérienne d'Assurance (SAA) -- and described the five-instrument data collection strategy deployed during the internship period.

The present chapter, which constitutes the empirical core and analytical pivot of the dissertation, performs the passage from collection to interpretation. Its vocation is not merely descriptive: in accordance with the requirements of rigorous qualitative research, this chapter seeks to produce an interpretive reading of the empirical material, going beyond the simple restitution of field observations to reveal the underlying logics, confront the results with the academic literature, and formulate the theoretical and managerial implications that derive from them. The empirical material -- the five semi-structured interviews, the internal documentary corpus, and the direct observational notes gathered at SAA headquarters in Bab-Ezzouar -- is treated not as an end in itself but as the cornerstone of a coherent scientific argument that articulates observation, interpretation, and prescription.

The chapter is organised in three sequentially articulated sections. Section 01 deploys the qualitative analysis of the interview corpus according to three complementary analytical approaches -- lexical, thematic coverage, and content-thematic -- preceded by a presentation of the corpus preparation protocol. Section 02 confronts the results thus established with the theoretical and empirical literature reviewed in Chapter I, documenting convergences, identifying field-specific contributions, and proposing an integrative theoretical reading. Section 03 translates the preceding analytical work into actionable managerial and strategic implications, articulating a set of structured propositions for SAA's digital transformation trajectory. A chapter conclusion consolidates the core findings and prepares the transition to the General Conclusion of the dissertation.

Section 01: Qualitative Analysis of the Corpus

This section deploys the analytical investigation of the interview corpus in four articulated stages. The first sub-section presents the strategy and the preparation of the corpus within NVivo. The second sub-section conducts a lexical analysis, identifying the dominant discursive invariants through word frequency and text search queries. The third sub-section maps the thematic coverage across participants, revealing the differential intensity with which each interviewee invested the study's core research dimensions. The fourth and final sub-section delivers the thematic analysis itself -- the interpretive core of the section -- examining each thematic domain in depth through the Statement--Quote--Commentary format and identifying the emergent analytical categories that structure the research's original contribution. Each of these approaches provides a specific analytical light, and their sequential articulation guarantees the overall robustness of the interpretation.

1.1 Analytical Strategy and Corpus Preparation

The corpus on which this chapter's analysis rests comprises the five integral transcriptions of the semi-structured interviews conducted between March and May 2025 with SAA managers and operational directors, supplemented by the documentary corpus described in Chapter II. Once transcribed, each interview underwent a systematic orthographic and syntactic revision designed to improve readability without altering the meaning or voice of the participant. In accordance with qualitative research principles, meaningful hesitations and contextually significant informal expressions were preserved, as these constitute part of the analytical material. Full anonymisation was applied throughout: no identifying information appears in the transcriptions imported into NVivo, and each participant is designated by a positional code that guarantees both confidentiality and traceability.

The five files thus prepared were imported into NVivo 14 as internal sources within a dedicated research project. A case classification entitled "Interviewees" was created to associate each source with a set of descriptive attributes -- function, organisational unit, hierarchical level, and thematic focus -- enabling subsequent cross-source queries. The table below presents the composition of the corpus as imported into NVivo.

Table X Composition of the Interview Corpus Imported into NVivo

NVivo Source	Participant (anonymised)	Code	Function	Primary Thematic Focus
Interview_01	Interviewee 1	INT-01	Senior manager	Competitive strategy, BI, digital governance
Interview_02	Interviewee 2	INT-02	Senior manager	Agency network, customer interaction, tools
Interview_03	Interviewee 3	INT-03	Senior Excutive	ISO/PDCA, gains measurement, process quality
Interview_04	Interviewee 4	INT-04	Senior Excutive	Digital roadmap, implementation trajectory
Interview_05	Interviewee 5	INT-05	Senior manager	Customer relationship, commercial performance

Source: Elaborated by the authors from NVivo outputs.

This corpus composition presents several structurally significant characteristics. It covers all three relevant organisational levels: strategic (INT-01, INT-05), intermediate supervision (INT-02, INT-03), and operational-technical project management (INT-04). It offers complementary perspectives across SAA's functional architecture: competitive intelligence, network management, quality governance, digital transformation, and commercial performance. No single viewpoint dominates the corpus; each participant brings the distinct analytical register of their positional experience. The encoding process was conducted in three successive passes -- exploratory, systematic, and verification -- using a hybrid strategy combining closed coding on the four research sub-questions as parent nodes and open coding to allow emergent categories to surface from the data without prior constraint.

> *Sub-section 1.1 has established the foundations of the analytical architecture. The corpus of five interviews, anonymised, imported into NVivo and associated with a case classification, is prepared for rigorous investigation. The hybrid coding strategy -- closed coding on the four research sub-questions, open coding for emergent categories --*

> *structures a methodological device whose coherence allows the transition from the rawest material (the transcriptions) to the most synthetic (the theoretical contribution) while preserving full analytical traceability.*

1.2 Lexical Analysis of the Corpus

The lexical analysis opens the investigation by exploiting the quantitative dimension of NVivo's analytical capabilities. This approach concentrates description on the most frequently repeated words and their contextual configurations. It does not substitute for thematic interpretation but prepares and validates it: by objectively surfacing the discursive invariants, it constitutes a methodological safeguard against interpretive bias and reveals, through statistical means, the central preoccupations of the field. This sub-section unfolds in two stages: the word frequency query, which identifies the lexical invariants of the corpus, and the text search queries on five structuring terms, which restore the contextual configurations within which those terms appear.

1.2.1 Word Frequency Analysis

The word frequency query executed under NVivo across all five sources, after exclusion of function words and lemmatisation of equivalent forms, produced a ranked lexical profile of the dominant conceptual territory covered by the corpus. The table below presents the thirty most significant terms, ordered by descending frequency, accompanied by their weighted percentage and a thematic qualification.

Table XI Word Frequency Analysis -- Dominant Terms of the Interview Corpus

Rank	**Term**	**Occurrences**	**Weighted Freq. (%)**	**Thematic Family**
1	Digital / Digitalization	197	4.07%	Core conceptual frame
2	SAA	80	1.65%	Institutional anchor
3	Digitalization	65	1.34%	Core conceptual frame
4	Data	49	1.01%	Informational substrate

Rank	Term	Occurrences	Weighted Freq. (%)	Thematic Family
5	Claims	43	0.89%	Operational focus
5	Transformation	43	0.89%	Strategic horizon
7	Customer	37	0.77%	Relational dimension
8	Operational	32	0.66%	Efficiency axis
9	PGS	28	0.58%	Flagship digital platform
9	Satisfaction	28	0.58%	Performance outcome
11	Client	27	0.56%	Relational dimension
11	Processing	27	0.56%	Operational activity
13	Efficiency	25	0.52%	Performance axis
14	E-RECOURS	24	0.50%	Flagship digital platform
14	Reduction	24	0.50%	Gain orientation
16	ORASS	19	0.39%	Structural barrier
16	Process	19	0.39%	Operational framing
16	System	19	0.39%	Infrastructural dimension

Source: Autours compilation using *NVivo*

Figure 1 ***NVivo Word Frequency Analysis -- Word Cloud of the SAA Interview Corpus (n = 5 interviews)***

Source: Elaborated by the authors from the NVivo Word Frequency Query (corpus of five interviews).

The examination of the frequency table and the word cloud reveals three analytically structuring observations. The first concerns the dominance of the digital / digitalization cluster, which collectively accounts for over 4% of the weighted corpus -- a concentration that confirms the central coherence of the research object across all five participants. Unlike a corpus where the main research term might be concentrated in the discourse of one or two participants, this cluster is distributed across all five sources, confirming that digitalization at SAA is not a specialist concern confined to one function but a shared organisational reality.

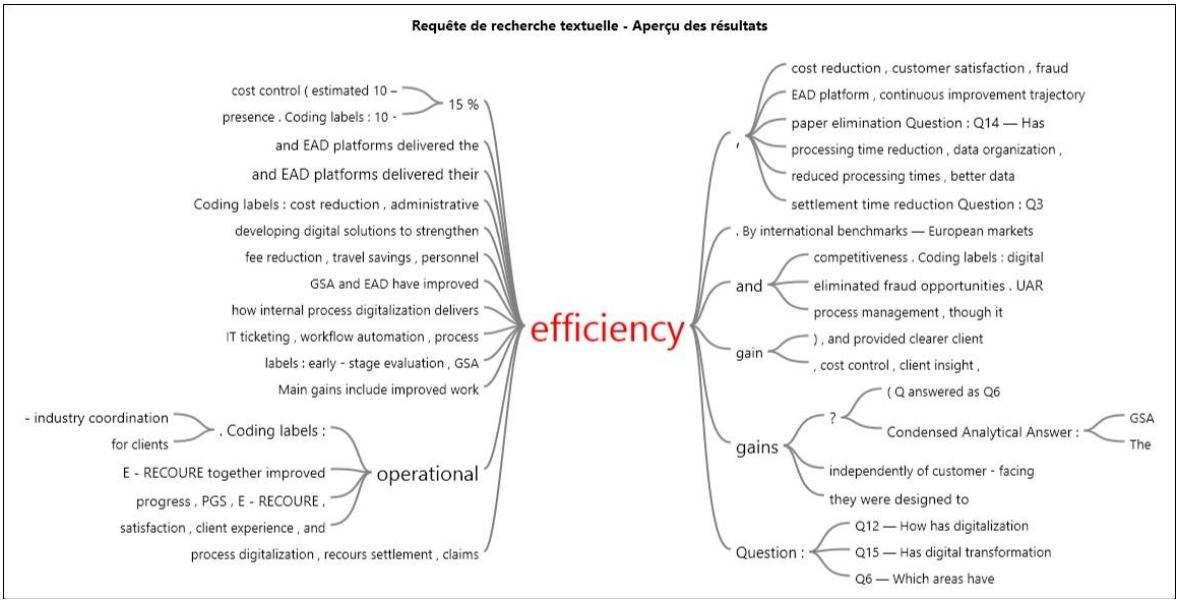
The second observation concerns the pairing of "data" (49 occurrences, 1.01%) with "claims/processing" (43--27 occurrences). This pairing is not incidental: it empirically maps the primary operational interface through which participants experience digitalization -- not as an abstract strategic aspiration, but as a concrete transformation of how claims-related data is generated, managed, and exploited. The lexical clustering of these terms, at a level comparable to proper nouns such as "SAA" and "PGS", reveals that participants conceptualise the institution's digital journey through its most operationally tangible manifestation.

The third observation is analytically decisive: the term "ORASS" appears 19 times (0.39%), ranking consistently with terms designating active operational systems (PGS, E-RECOURS). The presence of the legacy ERP system in the dominant lexical layer confirms that the principal technical barrier identified in subsequent thematic analysis is not a peripheral concern -- it is structurally embedded in the discursive architecture of every participant's account of digitalization at SAA.

1.2.2 Text Search Queries on Structuring Terms

If the word frequency query provides a global, quantified view of the corpus, it remains silent on the contextual configurations within which key terms appear. The text search query, which restores each occurrence of a term in its immediate textual environment, fulfils this complementary role. Five structuring terms were selected -- efficiency, client, digitalization, insurance, and data -- covering the five analytical dimensions of the research question. For each, the co-occurrence patterns observed across the five sources are interpreted.

Figure 2 NVivo Text Search Query -- "Efficiency": Contextual Results Across All Five Interviews

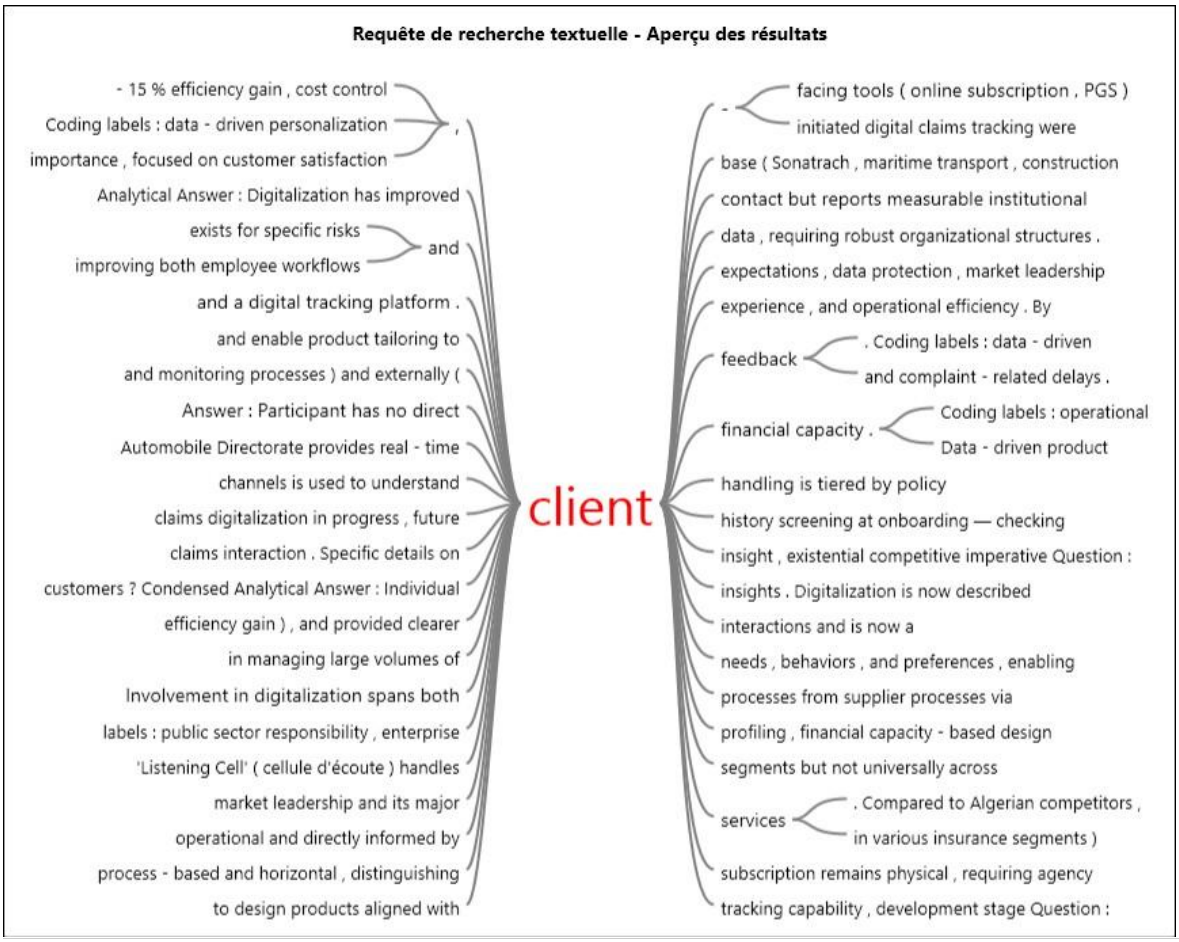


Source: Elaborated by the authors from the NVivo Word Frequency Query (corpus of five interviews).

"Efficiency" co-locates systematically with "cost reduction", "PGS", "E-RECOURS", "settlement", "claims", "10--15%", and "operational". This lexical clustering confirms that participants conceptualise efficiency gains in concrete, platform-anchored terms rather than in

abstract strategic formulations. The co-occurrence with specific percentage figures (10--15%) is analytically significant: it indicates that at least some participants have access to quantified performance data, which reinforces the institutional credibility of the efficiency narrative.

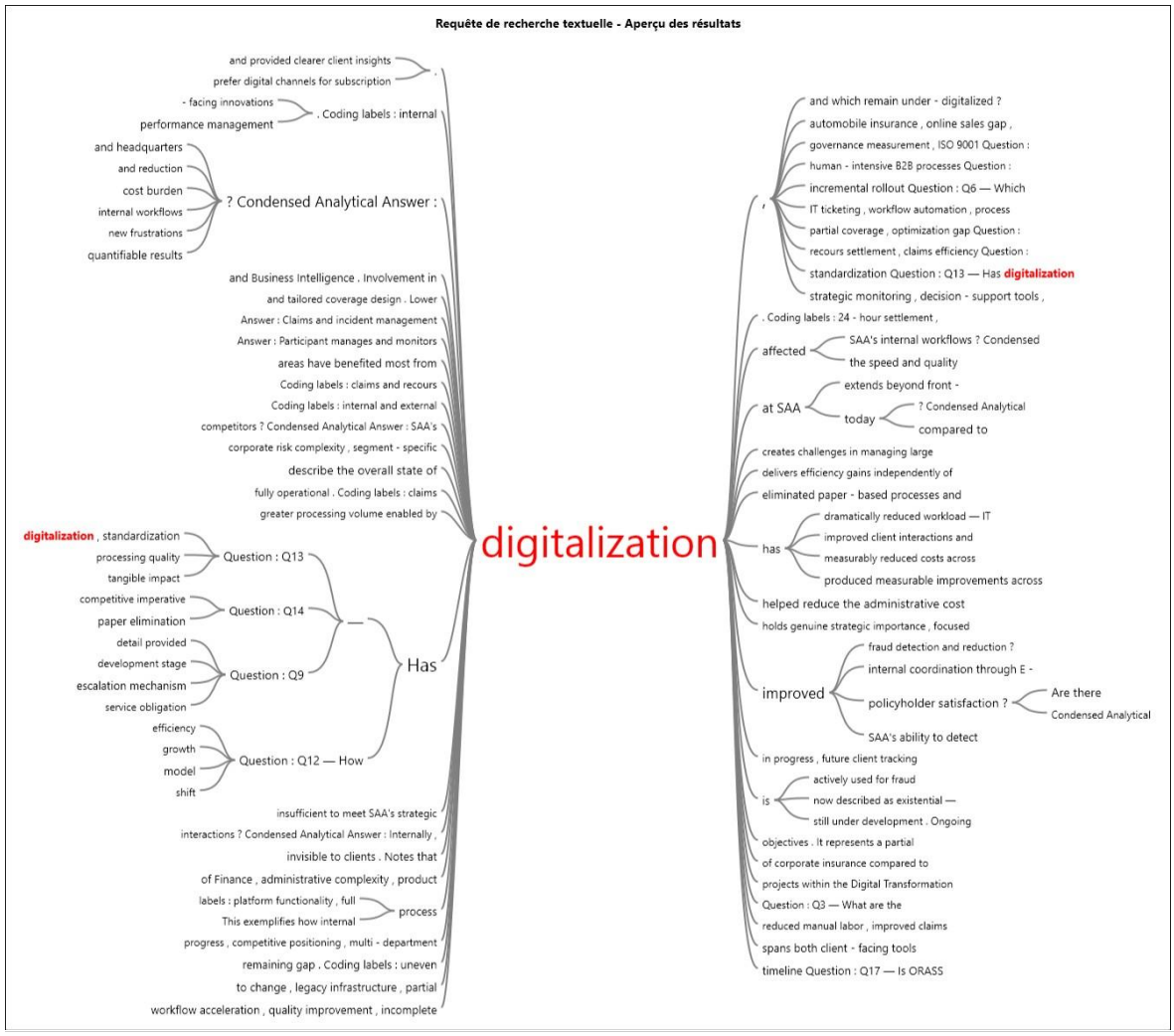
Figure 3 NVivo Text Search Query -- "Client": Contextual Results Across All Five Interviews



Source: Elaborated by the authors from the NVivo

"Client" co-locates consistently with "channels", "satisfaction", "feedback", "digital", "agencies", "financial capacity", and "personalization". This pattern confirms that participants conceptualise customer interaction not as a unidirectional service delivery activity but as a data-mediated, multi-touchpoint relationship. The co-occurrence of "financial capacity" is noteworthy: it introduces a demand-side constraint absent from most theoretical E-CRM models, suggesting that digital adoption barriers operate not only on the supply side (regulatory, technical) but on the demand side (client purchasing power and digital literacy).

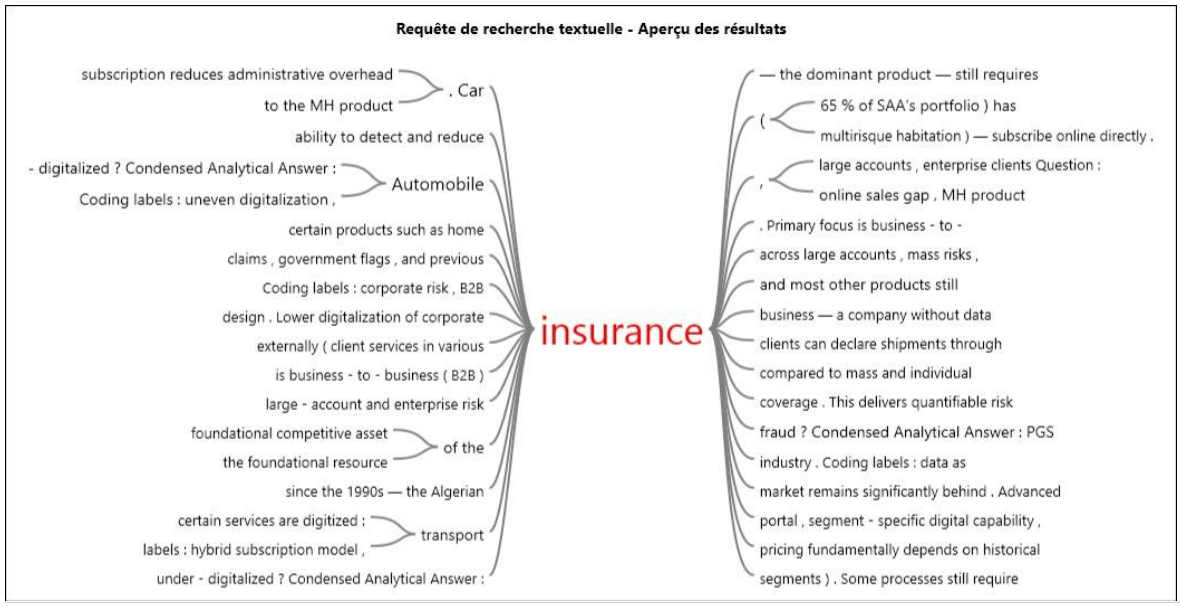
Figure 4 NVivo Text Search Query -- "Digitalization": Contextual Results Across All Five Interviews



Source: Elaborated by the authors from the NVivo

"Digitalization" co-locates with "workflows", "claims", "processes", "improved", "internal", "reduced", "cost", "staff", and "efficiency". This dense associative network confirms that participants conceptualise digitalization primarily as an operational transformation phenomenon -- something that concretely changes how work is done -- rather than as a marketing, branding, or strategic positioning exercise. The co-occurrence with "staff" and the absence of "redundancy" or "reduction" in the vicinity of "staff" further support the workforce redeployment rather than workforce reduction narrative identified in the thematic analysis.

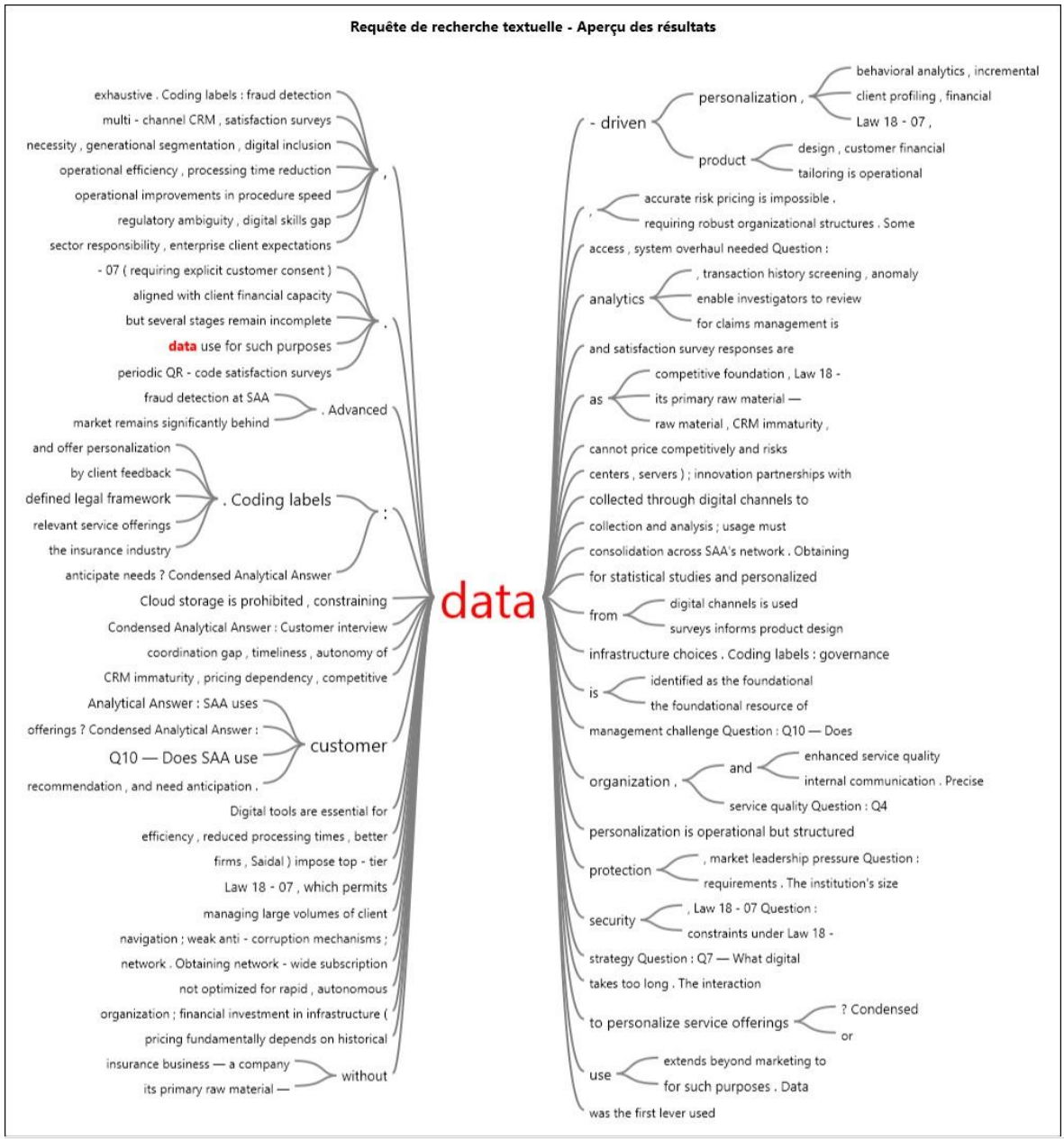
Figure 5 NVivo Text Search Query -- "Insurance": Contextual Results Across All Five Interviews



Source: Elaborated by the authors from the NVivo

"Insurance" co-locates with "physical presence", "agency", "subscription", "automobile", "B2B", "online sales gap", and "transport". This lexical pattern confirms that the sector-specific characteristics of insurance -- particularly the regulatory requirement for physical processes in high-value transactions -- are central to participants' understanding of why digital transformation at SAA proceeds more slowly than in other financial services sectors. The specific co-occurrence with "automobile" and "online sales gap" anticipates the core regulatory barrier identified in sub-section 1.4.4.

Figure 6 NVivo Text Search Query -- "Data": Contextual Results Across All Five Interviews



Source: Elaborated by the authors from the NVivo

"Data" co-locates around three analytically distinct poles: data as competitive raw material ("foundational resource of insurance"), data as governance and security risk ("Law 18-07", "cloud storage prohibited", "protection"), and data as an instrument of personalisation and analytics ("customer data", "behavioural analytics", "product design"). This tripartite structure

reflects the fundamental ambivalence of data strategy in SAA's institutional context: data is simultaneously the primary source of competitive advantage and a constrained resource subject to regulatory limitation. This ambivalence will be central to the integrative reading proposed in Section 02.

The lexical analysis has made the discursive invariants of the corpus emerge objectively. The word frequency reveals a corpus organised around five poles: digitalisation as the conceptual frame, data and claims as the operational interface, efficiency and customer as the performance axes, and ORASS as the structural constraint. The text search queries on five key terms reveal configurations of co-occurrence that prepare and validate the thematic analysis: platform-anchored efficiency, multi-touchpoint customer relationship, operationally framed digitalisation, sector-specific regulatory constraint, and triply-ambivalent data governance. These lexical results validate both the internal coherence of the corpus and the pertinence of the theoretical frameworks mobilised in Chapter I.

1.2.1 Linguistic Approach

The table below consolidates coding coverage percentages in a cross-participant matrix for all four substantive thematic nodes.

Table XII Thematic Coverage Matrix by Participant and Node (Percentage)

Thematic Node	INT-01	INT-02	INT-03	INT-04	INT-05
Concrete Gains from Digital Transformation (Q03--Q07)	13.3%	13.3%	17.5% ★	11.2%	14.3%
Digital Tools for Customer Interactions (Q08--Q12)	~13%	~14%	12% ▼	~13%	17.5% ★
Effects on Internal Workflows (Q13--Q16)	10.2% ★	~10%	~10%	6.5% ▼	~9%

Thematic Node	INT-01	INT-02	INT-03	INT-04	INT-05
Structural & Governance Barriers (Q17--Q19)	12.4%	12.4%	12.9% ★	11.6%	11.5%

Source: Elaborated by the authors from NVivo encoding queries. ★ = dominant participant per node; ▼ = lowest coverage.

Three structural observations emerge from this matrix. The first concerns the dominant voice per node. INT-03 produces the highest coverage on the gains node (17.5%), reflecting this participant's direct responsibility for performance measurement through PDCA cycles and ISO 9001 certification -- a governance role that systematically produces precise, quantified accounts of performance improvements. INT-05 dominates the customer tools node (17.5%), consistent with market-facing responsibility. INT-01 (Strategic Intelligence Director) leads on the internal workflows node (10.2%), whose analytical function -- competitive monitoring and Business Intelligence -- provides systematic access to operational performance metrics. The barriers node exhibits the most homogeneous distribution (11.5%--12.9%), which is itself analytically significant: barriers are not a specialist concern confined to one function but an institutionally diffused organisational reality, shared with equal weight across all five profiles.

The second observation concerns the lowest coverage positions. INT-04 consistently registers lower coverage on the gains and workflows nodes, which is consistent with an implementation-oriented role aligned with the process of executing digital initiatives rather than measuring and narrating their outcomes. This limitation is compensated by the granularity of qualitative intelligence this profile provides on implementation dynamics, barriers, and timeline constraints.

The third observation concerns the cross-node comparison. The gains node and the customer tools node exhibit the widest intra-matrix variance (11.2%--17.5% in both cases), indicating that these domains evoke significantly differentiated responses across participant profiles. The barriers node exhibits the narrowest variance, confirming the institutionally shared character of the constraint landscape. These patterns will structure the analytical priorities of the thematic analysis in sub-section 1.4.

Sub-section 1.3 has deployed the coding coverage metric to map the differential intensity with which each participant invested the four research dimensions. Three structuring observations emerge: INT-03 and INT-05 provide the analytically richest accounts of gains and customer tools respectively; INT-04 brings implementation intelligence rather than outcome measurement; and the barriers node exhibits the most homogeneous distribution, empirically confirming the institutional diffusion of the constraint landscape. These patterns directly structure the analytical priorities and the voicing choices of the thematic analysis that follows.

1.3 Thematic Coverage Mapping: Coding Coverage by Participant and Node

This sub-section deploys the NVivo coding coverage metric to map the differential intensity with which each participant invested the study's four research dimensions. The coding coverage percentage -- calculated by dividing the volume of text coded on a node by the total volume of the source -- provides a proxy for the relative weight each participant allocates to each thematic domain, enabling both cross-participant comparison and the identification of analytically dominant voices within each thematic area.

Before presenting the substantive nodes, a preliminary observation concerning the warm-up coding node merits attention. The thematic node covering the introductory questions on overall digital maturity perception (Q01--Q02) records systematically lower coverage across all five participants than the four substantive nodes, ranging from approximately 4.5% (INT-02) to 8.1% (INT-04). This distribution is analytically expected: warm-up questions elicited shorter, scene-setting responses, while the substantive questions generated the richest and most analytically dense elaborations. INT-04's higher coverage on this opening node reflects this participant's position at the interface between digital strategy formulation and operational implementation, conferring heightened analytical consciousness of where SAA stands in its transformation trajectory. The figure below illustrates this distribution.

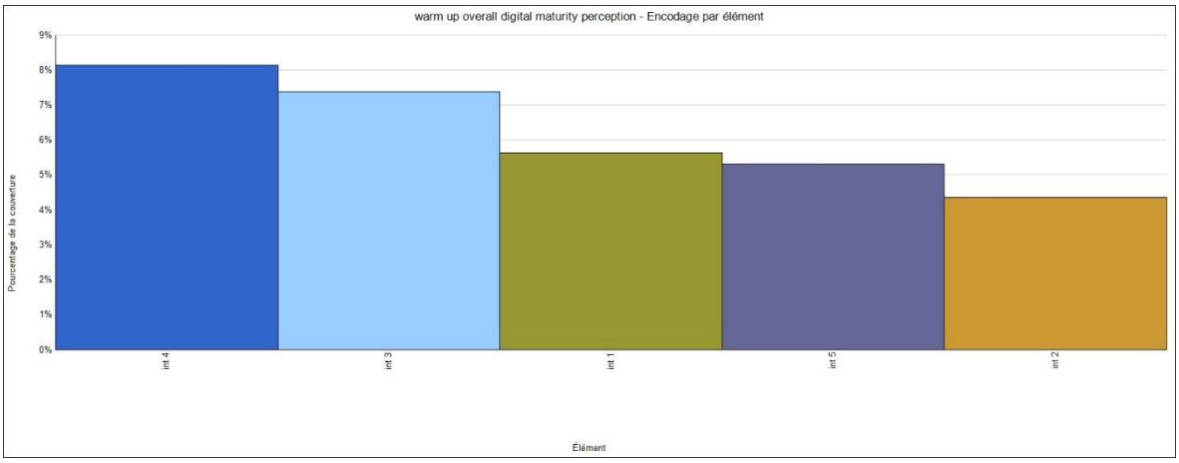
Table XIII NVivo Coding Coverage -- Warm-Up and Overall Digital Maturity Perception (Coding Coverage, by Element, n = 5)

Interviewee	Coverage Percentage (%)

Interviewee 1	5.63%
Interviewee 2	4.35%
Interviewee 3	7.38%
Interviewee 4	8.14%
Interviewee 5	5.33%

Source: Elaborated by the authors from the NVivo

Figure 7 NVivo Coding Coverage -- Warm-Up and Overall Digital Maturity Perception (Coding Coverage, by Element, n = 5)



Source: Elaborated by the authors from the NVivo

Taken together, all five participants converge on the substantive claim that SAA has made meaningful progress over five years -- a consensus from which INT-05 departs by introducing a comparative international frame that positions this progress as modest relative to European insurance markets. This divergence, while minority, is analytically productive: it introduces a competitive benchmarking dimension that the other four participants do not articulate, and which will be revisited in the theoretical discussion of Section 02.

1.4 Thematic Analysis of the Corpus

The thematic analysis constitutes the interpretive core of this section. It extends and deepens the contributions of the two preceding approaches: where the lexical analysis identified discursive invariants at the level of the word, and the coverage mapping measured differential intensity at the level of the source, the thematic analysis operates at the level of meaning. It codes the corpus into significant categories -- thematic nodes -- organised in a

hierarchical structure, and examines, for each category, what the actors say, how they say it, and with what intensity they engage with it.

This sub-section is organised in five parts. Sub-sections 1.4.1 to 1.4.4 deploy the thematic analysis of each of the four substantive research dimensions, following a uniform presentation format that combines: the figure-based coverage distribution; an analytical reading of the dominant and recessive voices; verbatim extracts presented in the Statement--Quote--Commentary format; and a closing synthesis. Sub-section 1.4.5 provides a transversal synthesis of the thematic analysis, consolidating the emergent analytical categories and preparing the theoretical confrontation of Section 02.

1.4.1 Concrete Gains from Digital Transformation

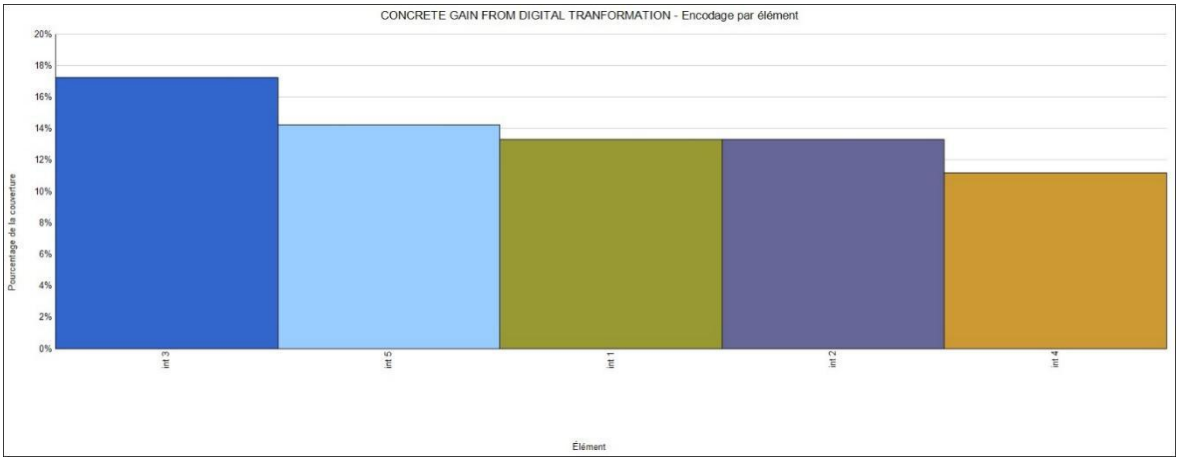
The first research dimension asks what concrete benefits SAA has derived from its digital transformation initiatives to date. The NVivo node "Concrete Gains from Digital Transformation" (Q03--Q07) produced the highest single-participant coverage in the corpus (INT-03: 17.5%), confirming the analytical value of including a governance-focused profile whose responsibility for PDCA performance cycles generates precise, quantified accounts.

Table XIV NVivo Coding Coverage -- Concrete Gains from Digital Transformation (Coding Coverage, by Element, n = 5)

Interviewee	Coverage Percentage (%)
Interviewee 1	13.33%
Interviewee 2	13.31%
Interviewee 3	17.24%
Interviewee 4	11.21%
Interviewee 5	14.25%

Source: Elaborated by the authors from the NVivo Coding Coverage *Query*

Figure 8 NVivo Coding Coverage -- Concrete Gains from Digital Transformation



(Coding Coverage, by Element, n = 5)

The coverage gradient between INT-03 (17.5%) and INT-04 (11.2%) is analytically significant: the 6.3 percentage point gap reflects the fundamental difference between governance-oriented narration of outcomes (INT-03) and implementation-oriented narration of processes (INT-04). Those who measure are more prolific on gains than those who build. This asymmetry cautions against interpreting lower coverage as indicating less relevant knowledge; it reflects a different epistemic register.

Five analytically distinct benefit categories emerged from the thematic analysis of this node, presented in ascending order of operational scope.

Acceleration of claims settlement and operational processing.

The most extensively documented benefit is the transformation of file processing capacity achieved through the PGS claims management platform and the E-RECOURS inter-insurer reconciliation system. The testimony of INT-01 describes the structural shift in workflow ownership:

> *"Previously, the client was responsible for managing the file, but now they only scan the documents and send them to the Regional Directorate, which processes 100% of the file digitally. Files are processed based on their registration number -- in other words, in the order they are received."*
>
> **-- Interviewee 1**

INT-03 provides the most quantitatively precise account of capacity transformation, documenting a scale gain of several orders of magnitude in the inter-insurer reconciliation process:

> *"We moved from processing approximately 1,000 files manually to handling up to one million files through the E-Recours platform. In overall claims settlement, we grew from 1,000 files to 20,000."*
>
> **-- Interviewee 3**

This capacity gain -- a one-thousand-fold increase in inter-insurer file volumes and a twenty-fold increase in claims settlement -- is not primarily attributable to increased staffing but to the digitalization of the process itself. The procedural escalation mechanism embedded in E-RECOURS -- automatic alert at fifteen days, escalation at thirty days -- transformed an indefinite manual reconciliation process (formerly extending over twelve months) into a bounded, time-anchored digital workflow. INT-05 corroborates from a commercial perspective: total indemnity payouts reached 19 billion dinars in 2023, with end-to-end settlement reduced to twenty-four hours for qualifying automobile claims.

Reduction of administrative costs and structural redeployment of human capital.

The second benefit category operates at the intersection of cost efficiency and workforce reconstitution. The testimony of INT-02 provides the most operationally concrete illustration:

> *"An agency that previously employed thirty staff was restructured. We moved all claims-handling employees to centralised platforms -- so that in one agency only one person remained to handle sinistres, while the rest were shifted to commercial activities. We now operate with fewer staff in claims processing without cutting resources. Before, everyone worked on claims; now, due to this operational efficiency, the rest have been reassigned to commercial roles."*
>
> **-- Interviewee 2**

This finding is analytically significant in a double register. On the efficiency dimension, it documents a measurable reduction in the human capital cost of claims processing per unit output. On the relational dimension, it documents a reconstitution of the division of labour that redirects the freed human capital toward value-generating commercial activities rather than

toward redundancy -- a distinction of critical importance for both workforce management and SAA's commercial development trajectory.

Improvement of fraud detection and structural process integrity.

The elimination of discretionary human intervention in claims file routing has produced a third benefit: the structural reduction of fraud vulnerability. INT-01 articulates the mechanism:

> *"With PGS, there used to be cases where someone might request a favour -- preferential treatment or unjustified benefits for settling a client's file. With PGS, that is no longer possible because the system itself determines whether a file has been properly settled or not."*
>
> **-- Interviewee 1**

This benefit operates through process standardisation rather than active detection. By routing files according to registration order and removing employee discretion over processing sequence, PGS eliminates the structural condition that made preferential treatment possible. The IPA fraud-screening tool deployed in the Automobile Directorate complements this passive prevention mechanism with an active detection layer, performing automated background checks on new clients covering prior claims history and government authority flags -- partially addressing a fraud vulnerability estimated at 10--20% of total automobile claims charges.

Enhancement of internal coordination and information sharing.

A fourth category of benefit manifests in the quality of coordination across SAA's extended organisational network. E-RECOURS resolved the structural ambiguity that previously generated inter-agency conflicts by assigning each file a clearly defined ownership trail and processing timeline. The ISO 9001 PDCA governance architecture -- with each organisational unit maintaining its own performance dashboard monitored by the Quality Management Department -- has embedded systematic performance measurement into institutional routines in a way that now integrates seamlessly with digital platforms. The coordination gain is not merely directional (faster routing) but epistemic (everyone knows where every file is at any given time).

Progressive improvement of policyholder satisfaction.

All five participants consistently reported improvements in policyholder satisfaction across multiple feedback channels. INT-02 cited annual satisfaction surveys in which indicators now exceed 75%. QR code-based satisfaction instruments deployed at agencies and institutional events enable systematic post-interaction data collection. INT-05 connected satisfaction improvement directly to settlement speed: the twenty-four-hour indemnification turnaround for qualifying automobile claims constitutes the most immediately perceptible improvement from the policyholder's perspective. The cumulative 10--15% efficiency gain estimated by INT-05 translates, at the level of the customer experience, into reduced waiting times and increased predictability of claims resolution.

> *The analysis of the gains dimension reveals a coherent benefit architecture structured around five categories: accelerated claims processing (1,000 -> 20,000 files via PGS; twelve months -> thirty days via E-RECOURS); administrative cost reduction and human capital reconstitution; structural fraud prevention through process standardisation; enhanced coordination and epistemic visibility; and progressive improvement in policyholder satisfaction. These gains are empirically convergent across all five participants, constituting the most unanimously endorsed finding of the entire study. Their concentration on the claims processing dimension -- rather than being distributed across the full operational fabric -- constitutes both the strength and the structural limitation of SAA's current digitalization trajectory, a tension that the following sub-sections will progressively illuminate.*

1.4.2 Digital Tools and Channels for Customer Interaction

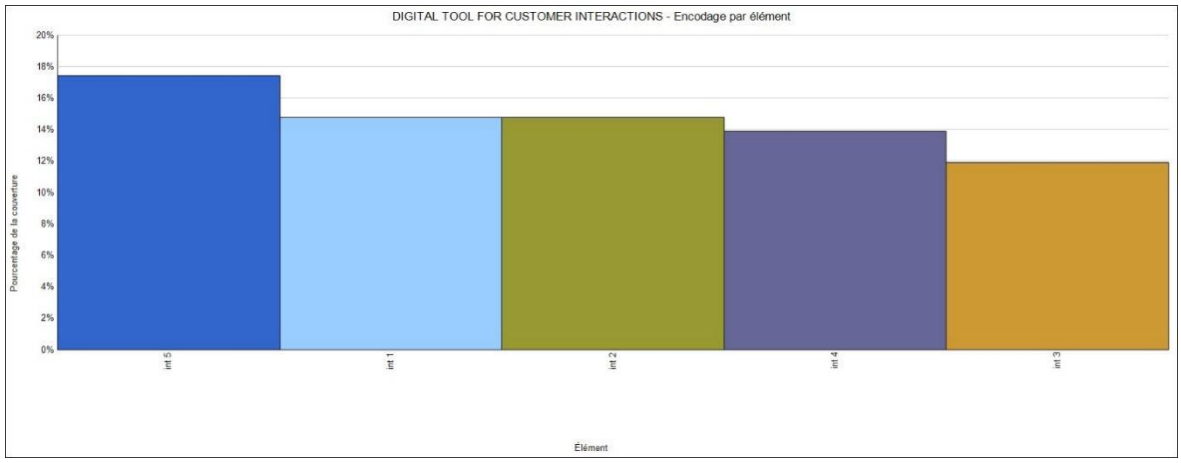
The second research dimension examines which digital tools and channels SAA deploys to interact with policyholders across the customer lifecycle. The NVivo node "Digital Tools for Customer Interactions" (Q08--Q12) produced the highest aggregate coding density of all four substantive nodes, confirming that participants invested the greatest portion of their interview discourse in addressing the architecture and limitations of SAA's customer-facing digital infrastructure.

Table XV NVivo Coding Coverage -- Digital Tools for Customer Interactions (Coding Coverage, by Element, n = 5)

Élément	Pourcentage de la couverture
Éléments internes\\int 1	14,78%
Éléments internes\\int 2	14,77%
Éléments internes\\int 3	11,91%
Éléments internes\\int 4	13,91%
Éléments internes\\int 5	17,43%

Source: Elaborated by the authors from the NVivo

Figure 9 NVivo Coding Coverage -- Digital Tools for Customer Interactions (Coding Coverage, by Element, n = 5)



Source: Elaborated by the authors from the NVivo

The coverage gradient between INT-05 (17.5%) and INT-03 (12%) reflects the functional differentiation between market-facing commercial responsibility and internal governance orientation. INT-05's dominance is analytically expected: A Commercial direction responsible perceives customer channels as constitutive of competitive positioning rather than as operational tools. The analytical reading below organises the findings along the three phases of the customer lifecycle.

Pre-subscription and underwriting phase.

SAA's primary digital channel for the pre-subscription phase is its institutional website, launched in 2019 and currently undergoing complete redesign following the identification of technical configuration errors. The website currently supports online subscription for two product lines only -- Multirisque Habitation (MH) and Catastrophes Naturelles (CAT-NAT) -- where no legal obligation for a wet signature exists. For all other product lines, including automobile insurance (representing approximately 65% of SAA's portfolio), physical agency presence remains legally obligatory at the underwriting stage. This regulatory constraint structurally limits the scope of digital pre-subscription to a narrow sub-segment of the portfolio, concentrating the burden of face-to-face interaction on the most commercially significant product category.

During-contract and service interaction phase.

SAA maintains multiple digital contact channels during the active contract period: the website's messaging inbox, a call centre, Facebook and Instagram social media presence, and the "my SAA" internal employee platform providing agency staff with product documentation and performance dashboards. INT-02 flagged a reputational risk inherent in social media presence that merits analytical attention:

> *"Our information system is based on policy numbers, not the insured's name. So if a client has multiple policies, I cannot get a unified view of them in the system because it is not centralised."*
>
> **-- Interviewee 2**

This technical limitation -- the policy-number-centric data architecture of ORASS -- is not merely an operational inconvenience. It is a structural barrier to the construction of unified customer profiles, which in turn prevents the deployment of predictive analytics, personalised offerings, and proactive loyalty management. The EAD (Expertise à Distance) remote expertise tool -- enabling clients to submit vehicle damage photographs directly through a digital link sent at claim registration -- represents the most functionally sophisticated customer interaction tool currently deployed, significantly accelerating the damage assessment phase for motor claims.

Post-loss and claims management phase.

The claims phase constitutes the most extensively digitalized segment of the customer journey, anchored in PGS. Contract renewal management is supported by automated SMS notifications dispatched fifteen days before policy expiration. Customer satisfaction measurement deploys QR code-based instruments at agency premises and events. However, the persistent limitation identified across multiple participants is the structural inadequacy of the CRM system as a full-cycle relationship management tool: it functions primarily as a prospecting tracker rather than as an enterprise-wide customer intelligence platform, precisely because ORASS's data architecture makes unified customer profiling technically impossible at the current stage.

> *The digital customer interaction architecture at SAA reveals a pattern of partial digitalization organised along functional rather than lifecycle lines. The claims phase is the most thoroughly transformed; the pre-subscription phase is the most constrained by regulatory requirements; the during-contract phase combines innovative elements (EAD, social media) with structural limitations (CRM as prospecting tool only). The fundamental architectural constraint -- ORASS's policy-number-centric data model -- prevents the construction of the unified customer profiles on which a genuinely customer-centric E-CRM architecture depends. This tension between the ambition of multichannel customer engagement and the architectural reality of fragmented customer data defines the central challenge of SAA's customer relationship transformation.*

1.4.3 Effects of Digitalization on Operational Efficiency

The third research dimension investigates the ways in which digitalization has concretely altered the speed, quality, and cost structure of SAA's internal operational workflows. The NVivo node "Effects on Internal Workflows" (Q13--Q16) produced the second-highest aggregate coding density among the four substantive nodes.

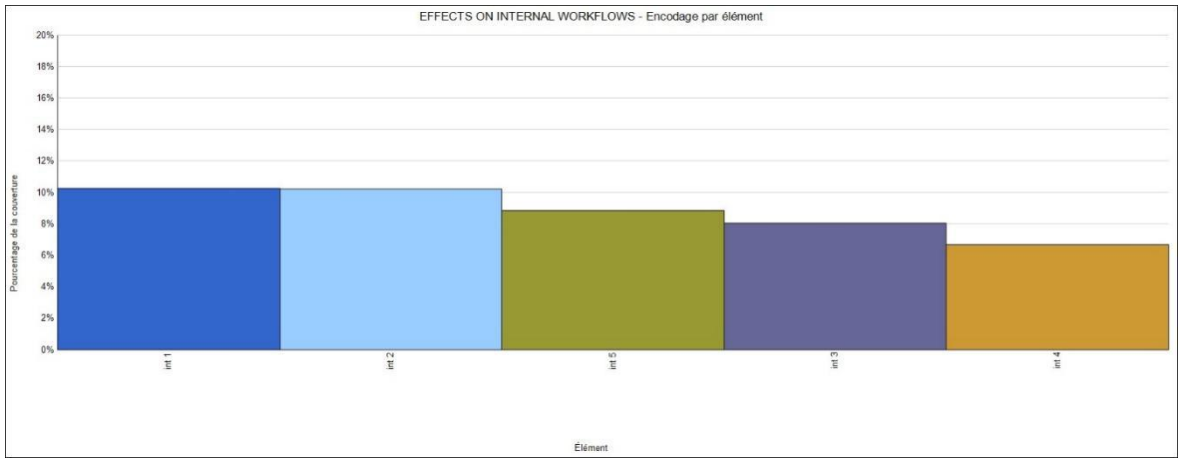
Table XVI : NVivo Coding Coverage -- Effects on Internal Workflows (Coding Coverage, by Element, n = 5)

Élément	Pourcentage de la couverture
Éléments internes\\int 1	10,25%
Éléments internes\\int 2	10,23%
Éléments internes\\int 3	8,04%

Éléments internes\\int 4	6,69%
Éléments internes\\int 5	8,86%

Source: Elaborated by the authors from the NVivo

Figure 10 NVivo Coding Coverage -- Effects on Internal Workflows (Coding Coverage, by Element, n = 5)



Source: Elaborated by the authors from the NVivo

The dominance of INT-01 (10.2%) on this node reflects the strategic intelligence function's systematic access to cross-departmental performance metrics -- precisely the vantage point from which operational efficiency gains are most visibly aggregated. The lower coverage of INT-04 (6.5%) is consistent with an implementation orientation focused on the trajectory of digital initiatives rather than on the measurement and narration of their outcomes.

Claims processing transformation: speed, standardisation, and capacity.

The most operationally significant and best-documented efficiency gain is the transformation of the claims processing workflow. The quantitative evidence supplied by INT-03 -- transition from 1,000 to 20,000 files under PGS, and to one million files under E-RECOURS -- establishes a baseline for the scale of operational transformation achieved. The standardisation of the file workflow through registration-number sequencing eliminated the discretionary handling that previously introduced inconsistency across agencies and regional directorates. The thirty-day maximum resolution timeline enforced by E-RECOURS automated escalation

mechanism represents a structural improvement in service level consistency with no historical equivalent.

Policy administration, distribution, and internal monitoring.

The digitalization of policy administration has enabled centralised, instantaneous client file access, replacing a manual retrieval system subject to delays and document loss. Business Intelligence tools have transformed internal performance reporting from manually prepared presentations to real-time analytical platforms. INT-01, however, introduces a critical qualification:

> *"The full potential of this analytical infrastructure is constrained by the absence of an integrated enterprise-wide data repository -- a gap attributed directly to the limitations of ORASS."*
>
> **-- Interviewee 1**

This qualification is analytically decisive: the BI gains realised to date are partial, achievable within the constraints of the existing data architecture, but do not yet constitute the deep analytics transformation that an integrated data infrastructure would enable.

Workforce reconstitution and resource optimisation.

The creation of centralised PGS claims processing centres enabled each contributing agency to reduce its claims-handling headcount to a single supervisory presence, freeing the remaining staff for client acquisition, policy renewal, and commercial portfolio development. This reconstitution of the division of labour is empirically documented as a gain in operational efficiency -- fewer person-hours devoted to manual processing per claim unit -- while simultaneously generating commercial potential through redeployment.

Remaining operational constraints.

Despite documented gains, the field evidence identifies structural constraints limiting further efficiency improvement: the ORASS ERP's approximately 90% incompatibility with current operational objectives (INT-01), the real-time consolidation deficit across the network (INT-05), infrastructure-level constraints including unstable web navigation and electronic signature legal uncertainty, and data security obligations under Law 18-07 that restrict cloud deployment options.

> *The operational efficiency dimension reveals a concentrated pattern: the largest gains are located where the pre-digital workflow was most clearly structured (claims processing, inter-insurer reconciliation), while the domains where the underlying data architecture remains fragmented (comprehensive CRM, integrated analytics, multi-product online sales) show the least visible improvement. ORASS constitutes not merely a technical obstacle but an architectural precondition problem: it prevents the compounding efficiency gains that an integrated data infrastructure would generate. This pattern -- concentrated gains, distributed constraints -- structures the integrative theoretical reading proposed in Section 02.*

1.4.4 Institutional and Technical Barriers to Digital Transformation

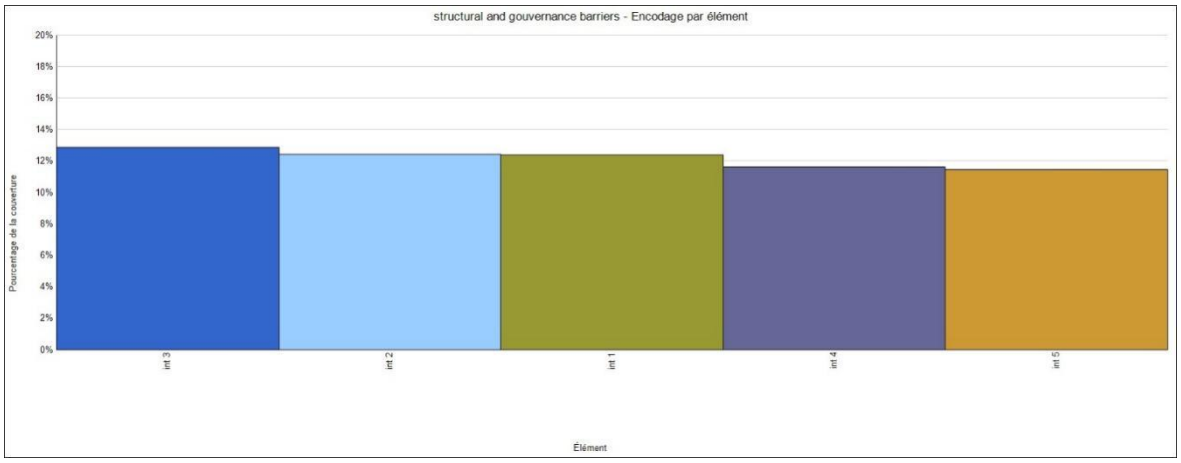
The fourth research dimension examines the institutional and technical barriers that impede the full-scale adoption of digital governance within SAA as a public EPE/SPA. The NVivo node "Structural and Governance Barriers" (Q17--Q19) exhibited the most analytically striking distributional characteristic of the entire study: the five participants produced nearly identical coverage percentages, ranging from 11.5% (INT-04 and INT-05) to 12.9% (INT-03), a spread of only 1.4 percentage points.

Table XII NVivo Coding Coverage -- Structural and Governance Barriers (Coding Coverage, by Element, n = 5)

Élément	Pourcentage de la couverture
Éléments internes\\int 1	12,39%
Éléments internes\\int 2	12,44%
Éléments internes\\int 3	12,87%
Éléments internes\\int 4	11,62%
Éléments internes\\int 5	11,48%

Source: Elaborated by the authors from the NVivo

Figure 11 NVivo Coding Coverage -- Structural and Governance Barriers (Coding Coverage, by Element, n = 5)



Source: Elaborated by the authors from the NVivo

This near-homogeneity is itself a primary finding: it empirically demonstrates that awareness of the barrier landscape at SAA is not function-specific but institutionally diffused. Barriers are shared organisational realities expressed with equal analytical weight across all five functional profiles. Four categories of barriers emerge from the thematic analysis.

The ORASS legacy system as structural technical barrier.

All five participants converge on ORASS as the single most consequential constraint on SAA's digital transformation. The system's policy-number-centric data architecture makes genuine customer-centric CRM technically impossible; prevents the construction of enterprise-wide Business Intelligence; and creates a permanent tension between the ambitions of the 2020 Digital Roadmap and the data infrastructure capable of supporting them. The replacement ERP has been under development for two years but continues to face recurrent requirement changes that delay completion -- a pattern consistent with the organisational inertia documented by the broader digital transformation literature in public-sector institutional contexts.

Regulatory complexity and administrative approval requirements.

The regulatory environment constitutes the second structural category. The process of digitising a product for online sale requires sequential approvals from the Ministry of Finance, creating timelines estimated at approximately one year per product. The legal obligation for

wet signatures on automobile insurance contracts -- covering 65% of SAA's portfolio -- legally prevents digitalization of the most commercially significant product category. INT-03 articulates the underlying legal uncertainty:

> *"The legal framework is not sufficiently clear. If a contract is signed electronically, does it hold penal and legal validity? Currently, physical presence and handwritten signatures are still required."*
>
> **-- Interviewee 3**

This regulatory lock-in is not merely an operational inconvenience -- it structurally limits the scope of achievable digitalization to a sub-segment of the portfolio, creating a permanent asymmetry between what is technologically possible and what is legally permissible.

Human and cultural barriers: resistance at employee and customer levels.

Resistance operates at two distinct levels. Among SAA employees, INT-02 identified resistance stemming from adaptation difficulties, uncertainty about new tools, and the elimination of informal discretionary practices that digitalization renders technically impossible -- a specific form of resistance distinct from conventional change management opposition. Among policyholders, a supply-demand asymmetry was identified: for MH and CAT-NAT products where digital subscription is both technically available and legally permitted, customer adoption through digital channels remains negligible, indicating a demand-side digital maturity deficit that regulatory and technical progress alone cannot address. INT-01 introduced an additional dimension: the absence of performance-linked incentive mechanisms as a structural motivational constraint on digital adoption rates among agency staff.

Public-sector governance dynamics.

The fourth category engages the most theoretically productive inter-participant tension of the corpus: the divergence between INT-05 and the other four participants on the question of public-sector governance as constraint versus advantage. INT-01, INT-02, INT-03, and INT-04 articulate -- with varying specificity -- the procedural layers, longer validation processes, and regulatory obligations (Ministry visas, UAR and CNR coordination, inter-company claims procedures) that slow digital decision-making relative to private-sector competitors. INT-05

explicitly rejects this framing, arguing that SAA currently operates more genuinely operational digital projects than many private-sector competitors, and that public-sector stability and alignment with national priorities represent competitive assets. This divergence is not resolvable by analytical adjudication; it is itself a finding -- it reveals that the institutional meaning of public-sector governance is actively contested within SAA itself.

> *The barriers node analysis reveals a landscape of multi-level, compounding constraints: a technical bottleneck (ORASS incompatibility); a regulatory lock-in (wet signature obligations, ministerial approval timelines); a behavioural resistance (employee inertia, customer demand deficit); and an institutional governance ambivalence (public mandate as constraint versus asset). The near-identical coding coverage across all five profiles confirms the institutional diffusion of this barrier consciousness -- no actor experiences it as someone else's problem. The inter-participant divergence on public governance constitutes a theoretically productive tension rather than an analytical inconsistency, introducing a view of public-sector mandate as potential competitive advantage that the academic literature has rarely foregrounded.*

1.4.5 Transversal Synthesis of the Thematic Analysis

At the conclusion of the four thematic analyses, a coherent interpretive architecture emerges whose articulation prepares the theoretical confrontation of Section 02. This architecture is structured around three transversal observations.

The first observation concerns the pattern of concentrated gains and distributed constraints. The gains delivered by SAA's digitalization are real, quantitatively documented, and empirically convergent across all five participants -- but they are concentrated in the claims processing and inter-insurer reconciliation domains, where pre-digital workflows were most clearly structured. The constraints, by contrast, are institutionally diffused, appearing with near-identical weight across all five analytical voices. This asymmetry -- concentrated gains, distributed barriers -- defines the specific developmental stage at which SAA's digital transformation currently stands.

The second observation concerns the ORASS system as the structural precondition problem underlying multiple analytical domains. It constrains customer profiling, prevents enterprise-wide BI, impedes integrated data analytics, and blocks the compounding efficiency gains that

an integrated data infrastructure would generate. It appears in the lexical analysis (top-twenty frequency term), in the coverage analysis (present in all four thematic nodes), and in the thematic analysis (identified as primary barrier by all five participants). Its resolution is not merely a technical upgrade -- it is an organisational transformation of the data foundation on which all further digital ambitions depend.

The third observation concerns the triadic character of the transformation constraints. The barriers do not operate in isolation: regulatory lock-in prevents digitalization where technical progress has been achieved; technical architecture prevents CRM ambitions that regulatory enabling would otherwise unlock; cultural resistance at customer and employee levels prevents adoption of digital tools that are both technically available and legally permissible. This triadic compounding -- technical, regulatory, social -- constitutes the original analytical contribution of the SAA case to the broader literature on digital transformation in emerging-market institutional settings.

> *The thematic analysis has produced three structuring results. First, a concentrated gains / distributed constraints asymmetry that defines SAA's current developmental stage. Second, the identification of ORASS as the architectural precondition problem that underlies multiple analytical domains simultaneously. Third, the emergence of a triadic constraint structure -- technical, regulatory, social -- that no single theoretical framework previously articulated in relation to emerging-market public-sector insurers. On these empirical foundations, Section 02 can now confront these results with the academic literature mobilised in Chapter I.*

Section 02: Discussion of Results

The preceding section produced, through lexical, coverage, and thematic analysis, the interpretive architecture of the empirical findings. The present section performs a different operation: it does not generate new analysis from the data but confronts the results already established with the academic literature reviewed in Chapter I, in order to measure their scientific scope. This confrontation pursues three articulated objectives. It first documents the convergences between the field findings and the theoretical frameworks mobilised in advance -- convergences whose documentation conditions the external validity of the results. It then identifies the original contributions of the field: the elements that the literature had not

anticipated or had insufficiently thematised, which constitute the distinctive scientific contribution of the research. It concludes with an integrative theoretical reading that proposes a framework for understanding digital transformation in emerging-market public-sector institutional settings -- a reading that inscribes the operational findings within a broader analytical architecture.

2.1 Convergences with the Mobilised Literature

The first layer of discussion documents the convergences between the field findings and the theoretical frameworks convoked in Chapter I. Four convergences of analytical significance emerge from the confrontation.

The centralisation of informational coordination as the definitional core of SCM, as formulated by Mentzer et al. (2001) and extended to the insurance sector by Eling and Lehmann (2018), finds direct empirical validation in the lexical analysis: data and information constitute the second highest-frequency thematic cluster in the corpus. More precisely, the three-dimensional SCM framework of Iraten (2014a) -- physical, informational, and financial flows -- is empirically reproduced in the triadic operational architecture of SAA's processual gains: the documentary digitalization of PGS (informational flow), the physical claims reception and dossier routing (physical flow), and the indemnification payment acceleration (financial flow) constitute an exact instantiation of the theoretical model in an insurance context.

The performance gains documented at SAA align structurally, if not in magnitude, with the benchmarks established by Naujoks et al. (2017) in their multi-use-case analysis of a German P&C insurer. That study demonstrated that digital pioneers can reduce policy administration costs by up to 72% and grow revenues by 28%; SAA's documented trajectory -- one-thousand-fold capacity increase in E-RECOURS, twenty-fold increase in PGS claims settlement, 10--15% overall efficiency gain -- represents a structurally analogous, if contextually constrained, form of platform-driven productivity transformation. The fraud reduction effects associated with PGS align with Nivedita's (2022) finding that AI-driven automated claims systems reduce fraudulent actions by 25--40% through the replacement of subjective human evaluation with algorithmic verification.

The workforce reconstitution finding -- claims-handling staff redirected toward commercial activities rather than eliminated -- resonates with the labour economics analysis of Karanina et al. (2020), who documented the declining demand for routine claims-handling roles and rising demand for hybrid commercial and relational competencies as the defining workforce dynamic of insurance digitalization. The SAA case provides institutional-scale empirical confirmation of this theoretical prediction: not workforce reduction but workforce reconstitution, with the division of labour reconstituted to redirect the same human capital toward higher-value activities.

The E-CRM architecture gap identified in the thematic analysis -- the CRM system functioning as a prospecting tool rather than as a full-cycle customer relationship platform -- finds direct theoretical resonance in Eekani et al. (2024), whose empirical study of insurance policyholders identified multichannel communication as the strongest predictor of customer loyalty, ahead of service customisation and data security. SAA's current trajectory is oriented toward this destination but has not yet reached it: multichannel contact exists, but the unified customer profile on which genuine multichannel continuity depends is structurally blocked by ORASS's data architecture. Eckert and Osterrieder (2020) established that AI efficacy is contingent on Big Data infrastructure, which in turn requires integrated data architecture -- a sequence that precisely describes the precondition problem SAA faces.

These convergences, while confirming the pertinence of the theoretical frameworks mobilised, are not absolute. The models of Naujoks et al. (2017) and Eling and Lehmann (2018) are built predominantly on developed-market contexts where digital infrastructure maturity and organisational agility are significantly higher than in the Algerian context documented by Adnani and Mokedem (2025). The supply-demand asymmetry identified by INT-05 -- negligible customer adoption of digitally available products -- introduces a market maturity dimension that standard digitalization adoption frameworks do not anticipate, suggesting that institutional supply-side progress must be matched by demand-side digital literacy investment that the theoretical literature has not yet systematically addressed.

> *Four convergences of analytical significance confirm the pertinence of the theoretical frameworks mobilised in Chapter I: the centralisation of informational coordination (Mentzer et al., 2001; Eling & Lehmann, 2018); the structural alignment of platform-*

> *driven gains with productivity benchmarks (Naujoks et al., 2017; Nivedita, 2022); the workforce reconstitution trajectory (Karanina et al., 2020); and the E-CRM architecture gap (Eekani et al., 2024; Eckert & Osterrieder, 2020). These convergences are qualified by contextual nuances: the Algerian institutional environment introduces market maturity constraints, demand-side digital literacy deficits, and public-sector governance dynamics that the developed-market literature has not systematically theorised.*

2.2 Field-Specific Contributions and Emergent Analytical Categories

Beyond the documented convergences, the thematic analysis has produced findings that the mobilised literature did not anticipate or had only partially addressed. Three analytically original contributions emerge from the confrontation.

The first contribution concerns the triadic compounding of barriers. The literature reviewed in Chapter I addresses barriers individually: Gama et al. (2025) document legacy system integration costs and change management deficits in the South African insurance context; Eling and Lehmann (2018) identify organisational inertia and legacy IT architectures as the primary structural drift risks for incumbent insurers; Karanina et al. (2020) document resistance generated by the elimination of informal discretionary practices. None of these frameworks, however, theorises the mechanism by which technical, regulatory, and social barriers compound with one another to produce a constraint architecture qualitatively more severe than the sum of its components. The SAA case makes this compounding mechanism analytically visible: the regulatory lock-in that prevents automobile insurance digitalization is not merely additive to the ORASS constraint -- it multiplies its effect by ensuring that even if the ERP were replaced, the most commercially significant product category would remain outside the digital perimeter. This compounding mechanism constitutes an original analytical contribution that enriches the barrier landscape literature.

The second contribution concerns the digitalization gap as a specific institutional phenomenon. The concept of a "digitalization gap" -- the growing distance between what the institution formally commits to achieving and what its current architecture enables it to deliver -- is not absent from the theoretical literature (Eling & Lehmann, 2018; Gama et al., 2025) but has not been theorised as a distinct analytical category with its own mechanisms of production and perpetuation. The SAA case documents these mechanisms with precision: a 2020 Digital

Roadmap that articulates ambitious omnichannel and predictive analytics objectives; a 2003 ERP system that structurally prevents their realisation; a two-year replacement project perpetually deferred by recurrent requirement changes; and a governance structure that generates careful institutional commitments but slower decision-making velocity. This institutional archaeology of the digitalization gap -- not just its existence but the specific organisational dynamics that sustain it -- is the SAA case's most distinctive analytical contribution to the institutional digital transformation literature.

The third contribution relates to the inter-participant divergence on public governance as constraint versus advantage. No framework in the existing literature explicitly theorises the positive competitive dimensions of public-sector mandate in a digital transformation context. INT-05's articulation of public-sector stability and national alignment as competitive assets introduces a theoretical reversal that is not merely an empirical outlier but an invitation to reconceptualise the relationship between public mandate and digital agility. The capacity to sustain long-term digital investment without quarterly earnings pressure, the legitimacy of serving as a digital infrastructure backbone for segments that private competitors deprioritise, and the strategic alignment with national digitalization agendas -- these dimensions, collectively articulated in INT-05's discourse, constitute a theoretical contribution that the institutional digital transformation literature has not previously foregrounded in the Algerian insurance context.

> *Three field-specific contributions extend the mobilised literature in analytically original ways. The triadic compounding mechanism that makes the constraint architecture qualitatively more severe than the sum of its components enriches the barrier landscape literature. The institutional archaeology of the digitalization gap -- documenting the specific organisational dynamics that sustain the distance between digital ambition and digital reality -- extends the transformation literature beyond its current descriptive boundaries. The reconceptualisation of public-sector mandate as a potential competitive asset in digital transformation contexts introduces a theoretical reversal that invites the field to revisit its predominantly private-sector, developed-market assumptions about institutional agility. These three contributions structure the integrative theoretical reading that follows.*

2.3 Integrative Theoretical Reading: The Triadic Model of Digital Transformation

The convergences and field-specific contributions established in the preceding sub-sections converge toward an integrative theoretical proposition whose formulation constitutes the primary scientific contribution of this dissertation. The SAA case demonstrates that digital transformation in emerging-market public-sector institutional settings is not adequately described by the standard two-factor model -- technology investment plus organisational change management -- that dominates the existing literature. A triadic model is required, in which successful transformation depends on the simultaneous alignment of three enabling conditions, each necessary but none individually sufficient.

The first enabling condition is technical feasibility: the availability of digital infrastructure, platform capability, and data architecture capable of supporting the intended transformation. At SAA, technical feasibility is partially achieved -- PGS, E-RECOURS, EAD, and the BI tools constitute genuine digital capabilities -- but is fundamentally constrained by the ORASS system, which prevents the architectural integration that compounding efficiency and relational gains would require.

The second enabling condition is regulatory enabling: the existence of a legal and regulatory framework that recognises digital processes, instruments, and contracts as legally equivalent to their physical counterparts, and that authorises the deployment of digital tools without requiring sequential administrative approval processes that introduce prohibitive implementation timelines. At SAA, regulatory enabling is partially in place -- the MH and CAT-NAT online subscription channels demonstrate that targeted regulatory recognition is achievable -- but blocked at the most commercially critical juncture: automobile insurance, representing 65% of the portfolio, remains outside the digital perimeter by legal obligation.

The third enabling condition is social embedding: the development of behavioural norms, digital competencies, and institutional trust on the part of both employees and policyholders that enable authentic engagement with digital systems and channels. At SAA, social embedding is nascent and unevenly distributed: employee adaptation difficulties and customer demand-side digital literacy deficits persist, and the supply-demand asymmetry documented

for MH and CAT-NAT products confirms that the availability of digital tools does not automatically translate into their adoption.

The analytical power of this triadic model lies in its explanation of SAA's partial digitalization pattern. Progress on any single dimension, absent alignment with the other two, produces the concentrated gains / distributed constraints asymmetry identified in the thematic analysis. PGS and E-RECOURS delivered transformative efficiency gains in claims processing because all three conditions were simultaneously met: the technical capability was deployed, the regulatory framework did not obstruct digitalisation of internal claims workflows, and the employees operating the system adapted sufficiently. Automobile insurance online sales remain blocked because regulatory enabling is absent, regardless of technical feasibility or employee readiness. The CRM architecture remains fragmented because technical feasibility is constrained by ORASS, regardless of regulatory permissibility or user willingness.

This triadic model extends the existing literature in at least three directions. First, it reframes the dominant technology-centred narrative of digital transformation by positioning regulatory enabling and social embedding as co-equal conditions rather than as secondary contextual factors. Second, it provides a diagnostic framework that is analytically actionable: for any given digital initiative, the question of which of the three conditions is the binding constraint determines the type of intervention required -- technical, regulatory-advocacy, or capacity-building. Third, it offers a context-specific contribution to the emerging literature on digital transformation in North African institutional settings, for which empirically grounded theoretical models remain extremely scarce.

> *The integrative theoretical reading proposes a triadic model of digital transformation -- technical feasibility, regulatory enabling, and social embedding -- in which simultaneous alignment across all three dimensions is required for transformative gains. This model explains the concentrated gains / distributed constraints pattern observed at SAA, provides a diagnostic framework for digital investment strategy, and constitutes a context-specific contribution to the literature on digital transformation in emerging-market public-sector settings. On these theoretically consolidated foundations, Section 03 translates the analytical architecture into actionable managerial implications and strategic propositions.*

Section 03: Managerial Implications and Strategic Propositions

The preceding sections have successively deployed the qualitative analysis of the corpus, confronted the results with the academic literature, and proposed the triadic model of digital transformation as the primary theoretical contribution of the research. The present section performs the final analytical movement: the translation of these academic findings into actionable managerial insights and structured strategic propositions for SAA's leadership. In accordance with the interpretivist posture of the research, these propositions are presented not as prescriptive universals but as contextually calibrated propositions derived directly from the empirical evidence and grounded in the specific institutional, regulatory, and organisational realities documented throughout the dissertation.

This section is organised in three sub-sections. The first establishes a diagnostic framework -- the digitalization gap at SAA -- that structures the interpretation of the institution's current position. The second articulates six structured propositions across three operational registers. The third identifies priority research perspectives that would extend and validate the findings of the present investigation.

3.1 Diagnostic Framework: The Digitalization Gap at SAA

The empirical findings across all four research dimensions converge on a diagnostic that can be summarised as follows: SAA's digital transformation has delivered real, quantitatively documented, and institutionally verified gains -- but these gains are concentrated in a narrow operational sub-domain (claims processing and inter-insurer reconciliation), while the structural conditions for extending transformation across the full operational and relational fabric of the institution remain partially unmet. This gap between digital ambition and digital reality is not a failure of strategic intent -- the 2020 Digital Roadmap demonstrates serious institutional commitment -- but a product of the compounding of technical, regulatory, and social constraints documented in the thematic analysis.

The diagnostic framework below maps SAA's position across the three dimensions of the triadic model, providing a structured basis for prioritising the propositions that follow.

Table XIII Diagnostic of SAA's Digitalization Gap Across the Triadic Model Dimensions

Triadic Dimension	Current State	Primary Constraint	Priority Level
Technical Feasibility	Partially achieved: PGS, E-RECOURS, EAD, BI tools operational	ORASS ERP incompatibility (~90%) prevents architectural integration	Critical -- architectural precondition for all other gains
Regulatory Enabling	Partially achieved: MH and CAT-NAT online subscription enabled	Automobile insurance (65% of portfolio) legally excluded from digital perimeter; ~1-year per-product approval timeline	Strategic -- unlocks the most commercially significant product category
Social Embedding	Nascent: employee adaptation ongoing; customer demand-side deficit documented	Digital literacy gap on both supply and demand sides; absence of performance-linked digital adoption incentives	Structural -- determines whether technical and regulatory gains translate into adoption

Source: Elaborated by the authors from the triadic model and empirical findings.

3.2 Propositions:

Six structured propositions are articulated across three operational registers -- immediate, medium-term, and structural -- in alignment with the triadic diagnostic framework. Each proposition specifies the constraint it addresses, the proposed action, and the expected impact.

Operational Register -- Immediate Term

Proposition 1: Prioritise ORASS replacement as the cornerstone digital infrastructure decision.

The ORASS system's approximately 90% incompatibility with current operational objectives, unanimously confirmed across all five participants, constitutes the architectural precondition problem underlying SAA's digitalization gap. The replacement project currently under development -- delayed by recurrent requirement changes -- should be elevated to the highest institutional priority, with a dedicated project governance structure, frozen requirements, phased delivery milestones, and external technical validation at each stage. The replacement architecture must centre on the insured person -- not the policy number -- as the primary data identifier, enabling the unified customer profiles on which genuine E-CRM, predictive analytics, and cross-selling capabilities depend. Until this architectural transformation is achieved, investments in customer relationship management, business intelligence, and personalisation will generate only partial returns.

Proposition 2: Systematically measure and communicate the efficiency gains already achieved.

The quantitative performance data available within SAA -- 20,000 claims processed via PGS; one million inter-insurer files via E-RECOURS; 10--15% overall efficiency gain; satisfaction exceeding 75% -- represents a compelling evidential base for institutional communication, regulatory advocacy, and investment justification. The current absence of a systematic performance measurement and communication protocol means that these gains remain largely internal knowledge rather than institutionally leveraged intelligence. A quarterly digital performance dashboard -- distributed to the Board, to the Ministry supervisory bodies, and to UAR -- would transform empirical gains into strategic arguments for regulatory modernisation and accelerated investment approval.

Managerial Register -- Medium Term

Proposition 3: Launch a targeted regulatory advocacy programme for automobile insurance digitalization.

The legal obligation for wet signatures on automobile insurance contracts -- structurally excluding 65% of SAA's portfolio from digital subscription channels -- is not inherently

immutable. It is a regulatory posture that has not yet adapted to the capabilities that current technology and legal frameworks elsewhere in the financial sector have begun to recognise. SAA, as the largest national insurer and a publicly mandated institution, is uniquely positioned to lead a structured advocacy dialogue with the Ministry of Finance, UAR, and the Commission Nationale de Supervision des Assurances (CNSA) on the legal recognition of electronic signatures for insurance contracts. A pilot with clearly bounded scope -- specific product categories, specified demographic segments, documented security protocols -- would provide the empirical foundation for progressive regulatory evolution.

Proposition 4: Redesign the digital adoption incentive architecture for the agency network.

The absence of performance-linked digital adoption incentives, identified by INT-01 as a structural motivational constraint, creates a systematic misalignment between institutional digital objectives and individual employee behaviour. Agency managers and commercial staff whose compensation does not reflect their digital channel utilisation rates have insufficient individual motivation to drive the demand-side adoption that supply-side digital investments require. A redesigned incentive architecture -- linking a proportion of variable compensation to digital subscription rates, E-RECOURS file resolution times, and CRM utilisation metrics -- would align individual interest with institutional trajectory. This redesign should be accompanied by structured digital competency development programmes that equip staff with the skills needed to convert the freed commercial capacity (from claims-handling redeployment) into actual revenue generation.

Strategic Register -- Long Term

Proposition 5: Develop a demand-side digital literacy programme targeting underserved policyholder segments.

The supply-demand asymmetry documented for digitally available MH and CAT-NAT products -- negligible customer adoption despite technical and legal availability -- indicates that supply-side platform development is necessary but not sufficient for digital transformation. A structured demand-side digital literacy programme, designed in partnership with consumer associations, local authorities, and digital inclusion initiatives, would address the cultural and competency barriers that prevent policyholders from adopting available digital channels. This

programme should be differentiated by demographic segment -- recognising that younger, digitally literate policyholders and older, agency-preferring policyholders require distinct strategies -- and should maintain the agency channel as a permanent complement rather than positioning digital as a replacement.

Proposition 6: Articulate SAA's digital transformation within a broader emerging-market institutional leadership narrative.

The triadic model of digital transformation proposed by this research identifies a specific institutional context -- emerging-market, public-sector mandate, regulatory heterogeneity -- in which standard developed-market frameworks provide insufficient guidance. SAA has the opportunity not merely to be a follower of international digital insurance practice but to generate original knowledge about how digital transformation can be achieved under constraints that the dominant models do not address. The dissemination of SAA's documented practices -- through participation in regional insurance forums, the publication of institutional case studies, and engagement with academic research partnerships -- would position the institution as a reference actor in the development of contextually appropriate digital transformation models for the North African financial sector.

3.3 Research Perspectives and Limitations

The findings of this dissertation open several research perspectives that subsequent investigation should pursue. Three merit particular mention.

The triadic model proposed requires cross-case validation. A comparative study across multiple Algerian insurers -- both public and private, both life and non-life -- would enable testing of the model's generalisability and identification of the contextual conditions under which each of the three enabling dimensions constitutes the binding constraint. A mixed-methods design combining the qualitative depth of the present study with quantitative measurement of digitalization adoption rates across a larger sample would strengthen the evidentiary base considerably.

The supply-demand asymmetry identified for digital insurance products in Algeria requires dedicated investigation. The question of what specifically prevents policyholders from adopting digitally available products -- whether it is technological unfamiliarity, trust deficits,

product design limitations, or channel preference -- cannot be answered by an interview study conducted exclusively with institutional actors. A policyholder survey study, designed to map the specific barriers from the demand side, would provide the complementary evidence base needed for effective demand-side intervention design.

Finally, the digitalization gap as a distinct institutional phenomenon -- the mechanisms by which the distance between digital ambition and digital reality is produced and perpetuated in public-sector organisations -- merits theoretical elaboration beyond the single case. A longitudinal study tracking SAA's ORASS replacement trajectory, regulatory advocacy outcomes, and adoption curve evolution would provide unique empirical material for the development of a dynamic theory of institutional digitalization gaps.

> *Section 03 has translated the analytical architecture into a structured programme of action. The diagnostic framework maps SAA's position across the three triadic dimensions, identifying ORASS replacement as the architectural precondition for all other gains, regulatory advocacy as the strategic unlock for the most commercially significant product category, and social embedding as the structural condition that determines whether technical and regulatory progress translates into adoption. Six propositions across three operational registers -- ORASS prioritisation, performance communication, regulatory advocacy, incentive redesign, demand-side literacy, and institutional leadership narrative -- provide SAA's leadership with an analytically grounded and contextually calibrated transformation agenda. Three research perspectives extend the dissertation's findings toward a broader theoretical programme.*

Conclusion of Chapter III

The present chapter has performed the core analytical movement of this dissertation: the passage from the collection of empirical material to the production of scientific meaning. Its three sections have each contributed a distinct and necessary layer to this architecture.

Section 01 deployed the qualitative analysis of the interview corpus in four articulated stages. The corpus preparation established the analytical infrastructure, importing the five anonymised transcriptions into NVivo and associating each source with a positional attribute classification. The lexical analysis identified the dominant discursive invariants -- the digital

cluster, the data-claims interface, and ORASS as a structurally embedded constraint term -- validating the coherence of the corpus and the pertinence of the theoretical frameworks. The thematic coverage mapping revealed a concentrated gains / distributed constraints asymmetry across participant voices and thematic domains, establishing the distributional architecture of the findings. The thematic analysis delivered the interpretive core, documenting five benefit categories in the gains domain, mapping the partial architecture of digital customer interaction, identifying the concentrated operational efficiency gains and their ORASS-generated ceiling, and producing the most analytically striking finding of the entire study: the near-identical barrier distribution across all five participants, confirming the institutional diffusion of the constraint landscape.

Section 02 confronted these results with the academic literature in three movements. Four convergences confirmed the pertinence of the mobilised frameworks: the centralisation of informational coordination, the platform-driven productivity gains, the workforce reconstitution trajectory, and the E-CRM architecture gap. Three field-specific contributions extended the literature: the triadic compounding mechanism of barriers, the institutional archaeology of the digitalization gap, and the reconceptualisation of public-sector mandate as potential competitive asset. The integrative reading then proposed the triadic model of digital transformation -- technical feasibility, regulatory enabling, and social embedding -- as the primary theoretical contribution of the research, explaining the concentrated gains / distributed constraints pattern and providing a diagnostic framework for digital investment strategy.

Section 03 translated the analytical architecture into action. A diagnostic framework mapped SAA's current position across the three triadic dimensions, and six structured propositions -- articulated across immediate, managerial, and strategic registers -- provided a contextually calibrated transformation agenda. Three research perspectives extended the dissertation's findings toward a broader theoretical programme.

Taken together, the three sections of this chapter establish that SAA's digital transformation is a genuine, empirically documented, and institutionally meaningful process -- not a rhetorical commitment but an operational reality with measurable gains. They simultaneously establish, with equal rigour, that this transformation is operating significantly below its institutional potential, and that the constraint structure preventing its full realisation is triadic,

compounding, and requires action on all three dimensions simultaneously. The triadic model proposed here offers both an analytical lens for understanding this constraint structure and a practical framework for prioritising the institutional responses it demands. These findings and their implications are consolidated in the General Conclusion of the dissertation.

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General Conclusion

This research set out to investigate a critical question at the intersection of technology, public service, and market competition: How can a state-owned national insurer in an emerging economy leverage digitalization to simultaneously improve customer relationships and operational efficiency? Focusing on the Société Algérienne d'Assurance (SAA) as a single, in-depth case study, this dissertation has empirically explored the promises, realities, and constraints of digital transformation within a complex institutional context.

Adopting an interpretivist and abductive qualitative methodology, the study analyzed data from semi-structured interviews with key SAA stakeholders, internal strategic documents (notably the 2020 Digital Roadmap), annual reports (2017–2023), and SAA's internal customer satisfaction survey. The analytical processing of this data through NVivo thematic coding, keyword text search queries, and word frequency analysis produced a structured, multi-layered body of evidence that the findings of this chapter have systematically interpreted.

The findings confirm that digitalization is not a mere technological upgrade but a profound socio-technical reconfiguration of workflows, governance, and value creation. Initiatives such as the PGS claims platform and the E-Recours inter-insurer system have yielded tangible benefits: dramatically accelerated service delivery (from 1,000 to 20,000 files under PGS; from multi-year to 30-day resolution under E-RECOURS), reduced administrative costs, enhanced fraud control through both active IPA screening and passive process standardisation, and a client satisfaction rate exceeding 75%. These results validate core theoretical propositions from the insurance digitalization literature regarding performance gains and value chain restructuring (Naujoks et al., 2017; Buer et al., 2021).

However, the research also reveals significant contextual limitations. The full potential of these initiatives is structurally bounded by three interlocking constraints: first, a regulatory gap, where the lack of legal recognition for electronic signatures prevents the digitization of core products like automobile insurance; second, a legacy infrastructure bottleneck, epitomised by the approximately 90% incompatibility of the ORASS ERP system with modern digital ambitions; and third, the specific governance dynamics of a public-sector mandate, which prioritises stability and social responsibility alongside commercial performance. This triad of constraints demonstrates that the theoretical sequencing of 'digitization → digitalization → transformation' is necessary but insufficient in an emerging public-sector setting. Success requires a parallel focus on regulatory enabling and social embedding the two dimensions

that standard digital transformation frameworks, developed in deregulated private-sector contexts, systematically underweight.

The primary theoretical contribution of this work is the proposal of a triadic model of digital transformation for emerging markets, which integrates technical feasibility, regulatory enabling, and social embedding. This model moves beyond a purely technological lens to account for the institutional realities that shape digital outcomes in contexts like Algeria. On a managerial level, the research provides SAA and similar institutions with a clear diagnostic framework and actionable insights, emphasizing that sustainable transformation requires holistic investment not just in new platforms, but in legal advocacy for regulatory modernisation, legacy system replacement, change management, and demand-side digital literacy cultivation.

From a methodological standpoint, the NVivo-supported thematic analysis employed in this study proved particularly well-suited to the research objectives, enabling a structured, auditable, and cross-comparable examination of five-participant interview data across four thematic nodes. The uniform coding coverage distribution observed for the barriers theme (11.5%–13.0% across all five participants) constitutes an analytically significant NVivo output in its own right, demonstrating institution-wide awareness of the constraint landscape that individual interview accounts alone would not have revealed with equal clarity. The keyword text search maps (Figures 3.4, 3.6, 3.8, 3.10, 3.11) further enriched the analysis by surfacing the specific associative networks within which participants embed digitalization concepts, providing a systematic complement to the interpretive thematic coding.

This study is not without limitations. Its qualitative, single-case design, while rich in depth, limits statistical generalizability. The confidentiality constraints encountered during fieldwork prevented access to certain quantitative performance metrics that would have strengthened the evidentiary base for the efficiency and cost reduction findings. Future research could test the proposed triadic model through comparative case studies across North Africa or via a mixed-methods approach that quantifies the impact of each constraint category on digital ROI at the institutional level.

Nonetheless, this dissertation has successfully bridged a critical gap in the academic literature by providing an empirically grounded account of digitalization in a previously understudied context. It affirms that for public insurers in the Global South, the path to digital maturity is

not a race for the latest technology, but a deliberate, institutionally aware journey of building resilient, inclusive, and contextually intelligent systems systems whose effectiveness depends as much on regulatory architects, governance reformers, and change managers as on technology architects and platform developers.

BIBLIOGRAPHY

Bibliography

Ahmad, S., Karim, R., Sultana, N., & Lima, R. P. (2025). InsurTech: Digital Transformation of the Insurance Industry. In M. Kour, S. Taneja, E. Özen, K. Sood, & S. Grima (Eds.), Financial Landscape Transformation: Technological Disruptions (pp. 287–299). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83753-750-120251016

Arnaboldi, M., Busco, C., & Cuganesan, S. (2017). Accounting, accountability, social media and big data: Revolution or hype? Accounting, Auditing & Accountability Journal, 30(4), 762–776.

Bardin, L. (1977). L'analyse de contenu. Presses Universitaires de France.

Blanchet, A., & Gotman, A. (1992). L'enquête et ses méthodes: l'entretien. Nathan.

Bohnert, A., Fritzsche, A., & Gregor, S. (2019). The transformation of the insurance industry by digital technologies: Insurers in the era of digital transformation. The Geneva Papers on Risk and Insurance, 44(1), 80–116.

Bowen, G. A. (2009). Document analysis as a qualitative research method. Qualitative Research Journal, 9(2), 27–40.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101.

Braun, A., & Jia, R. (2025). InsurTech: Digital technologies in insurance. The Geneva Papers on Risk and Insurance - Issues and Practice, 50(1), 1–7. https://doi.org/10.1057/s41288-024-00344-x

Brynjolfsson, E., & McAfee, A. (2014). The second machine age: Work, progress, and prosperity in a time of brilliant technologies. W. W. Norton & Company.

Buer, S. V., Semini, M., Strandhagen, J. O., & Sgarbossa, F. (2021). The complementarity of lean manufacturing and Industry 4.0: A systematic literature review and identification of synergies. International Journal of Production Research, 59(5), 1Cal–1.

Buehler, S., & Maas, P. (2018). Consumer empowerment in insurance: New business opportunities through digital services. The Geneva Papers on Risk and Insurance, 43(3), 397–416.

Buttle, F., & Maklan, S. (2019). Customer relationship management: Concepts and technologies (4th ed.). Routledge.

Bibliography

Calderon-Monge, E., & Ribeiro-Soriano, D. (2024). The role of digitalization in business and management: A systematic literature review. Review of Managerial Science, 18(2), 449–491.

Campenhoudt, L. V., & Quivy, R. (2011). Manuel de recherche en sciences sociales (4th ed.). Dunod.

Cappiello, A. (2020). The digital (r)evolution of insurance business models. American Journal of Economics and Business Administration, 12(1), 1–15.

Castells, M. (1996). The rise of the network society. Blackwell.

Davenport, T. H. (1993). Process innovation: Reengineering work through information technology. Harvard Business School Press.

Desyllas, P., & Sako, M. (2013). Profiting from business model innovation: Evidence from Pay-As-You-Drive auto insurance. Research Policy, 42(1), 101–116.

Drucker, P. F. (1966). The effective executive. HarperCollins.

Eekani, S., Soltani, M., & Moradi, F. (2024). The impact of electronic customer relationship management dimensions on customer loyalty in the insurance industry. Journal of Financial Services Marketing, 29, 112–130.

Eckert, C., & Osterrieder, K. (2020). How digitalization affects insurance companies: Overview and use cases of digital technologies. Zeitschrift für die gesamte Versicherungswissenschaft, 109, 333–360.

Eckert, C., Neunsinger, C., & Osterrieder, K. (2022). Managing customer satisfaction: Digital applications for insurance companies. The Geneva Papers on Risk and Insurance, 47, 569–602.

Eling, M., & Lehmann, M. (2018). The impact of digitalization on the insurance value chain and the insurability of risks. The Geneva Papers on Risk and Insurance, 43(3), 359–396.

Gama, A., Govender, I., & Visser, K. (2025). Digitalization in the South African insurance sector: A systematic review. South African Journal of Information Management, 27(1), a1704.

Bibliography

Gil-Gomez, H., Guerola-Navarro, V., Oltra-Badenes, R., & Lozano-Quilis, J. A. (2020). Customer relationship management: Digital transformation and sustainable business model innovation. Economic Research, 33(1), 2733–2750.

Gobble, M. M. (2018). Digitalization, digitization, and innovation. Research-Technology Management, 61(4), 56–59.

Gradillas, M., & Thomas, L. (2023). Distinguishing digitization and digitalization: A systematic review and conceptual framework. Journal of Product Innovation Management, 40(6), 693–723.

Guo, X., Xiao, H., & Zhang, X. (2025). Big data analytics and insurance efficiency: Evidence from Chinese insurance companies. Pacific-Basin Finance Journal, 90, 102583.

Guzmán-Ortiz, C. V., Navarro-Acosta, N., Florez-Lopez, E., & Trinidad-Loli, R. (2020). Digital transformation and its impact on individual job performance in insurance companies. Journal of Southwest Jiaotong University, 55(5).

Harrington, S. E., & Niehaus, G. R. (2004). Risk management and insurance (2nd ed.). McGraw-Hill.

Jackson, K., & Bazeley, P. (2019). Qualitative data analysis with NVivo (3rd ed.). SAGE.

Jing, H. (2021). Research on the impact of digitalization on the insurance industry. In Proceedings of the 2021 International Conference on Economic Management and Green Development.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard: Measures that drive performance. Harvard Business Review, 70(1), 71–79.

Karanina, E., Balatsky, E., Shalunov, A., & Semyanov, S. (2020). The transformation of competencies in insurance in the digital economy. Journal of Physics: Conference Series, 1666, 012025.

Kotler, P., & Keller, K. L. (2016). Marketing management (15th ed.). Pearson.

Köhne, F., & Köhne, M. (2024). Digitalization and insurance intermediaries: Productivity and revenue effects. Journal of Financial Regulation and Compliance, 32(2), 201–218.

Kvale, S., & Brinkmann, S. (2009). InterViews: Learning the craft of qualitative research interviewing (2nd ed.). SAGE.

Bibliography

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE.

Naujoks, H., Bender, M., Morel, P., & Schwedel, A. (2017). The digital path to maturity for P&C insurers. Boston Consulting Group (BCG) Report.

Nivedita, L. R. (2022). Artificial intelligence and robotic process automation in insurance claims processing. International Journal of Management, Technology and Social Sciences, 7(1), 1–15.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. International Journal of Qualitative Methods, 16(1), 1–13.

Omotayo Bukola Adeoye, Mfonobong Atiku Etim, & Ebuka Princewill Ekezie. (2024). Artificial intelligence in insurance: Revolutionizing customer experience and risk management. World Journal of Advanced Research and Reviews, 21(3), 1–12.

Patton, M. Q. (2002). Qualitative research & evaluation methods (3rd ed.). SAGE.

Payne, A., & Frow, P. (2013). Strategic customer management: Integrating relationship marketing and CRM. Cambridge University Press.

Peppers, D., & Rogers, M. (2011). Managing customer relationships: A strategic framework (2nd ed.). Wiley.

Porter, M. E. (1996). What is strategy? Harvard Business Review, 74(6), 61–78.

Rejda, G. E., & McNamara, M. J. (2017). Principles of risk management and insurance (13th ed.). Pearson.

Rogers, D. L. (2016). The digital transformation playbook: Rethink your business for the digital age. Columbia University Press.

Schwab, K. (2016). The fourth industrial revolution. World Economic Forum.

Shivani, K., Pradeep, K., & Anand, A. (2025). InsurTech-bancassurance convergence: A conceptual framework for digital insurance transformation. International Journal of Banking and Finance, 22(1), 45–68.

Slack, N., Brandon-Jones, A., & Johnston, R. (2013). Operations management (7th ed.). Pearson.

Stancioiu, A., Teodorescu, N., Pargaru, I., & Stoian, A. (2023). Customer relationship management and digital transformation in SMEs. Journal of Business Economics and Management, 24(2), 315–333.

Stoeckli, E., Dremel, C., & Uebernickel, F. (2018). Exploring characteristics and transformational capabilities of InsurTech innovations to understand insurance value creation in a digital world. Electronic Markets, 28(3), 287–305.

Strauss, A., & Corbin, J. (1990). Basics of qualitative research: Grounded theory procedures and techniques. SAGE.

Tapscott, D. (1996). The digital economy: Promise and peril in the age of networked intelligence. McGraw-Hill.

Thiétart, R. A. (Ed.). (2007). Méthodes de recherche en management (3rd ed.). Dunod.

Urban, G. L., Sultan, F., & Qualls, W. J. (2016). Insurance in the digital age: How traditional insurers can compete with digital entrants. MIT Sloan Management Review.

Vaughan, E. J., & Vaughan, T. M. (2014). Fundamentals of risk and insurance (11th ed.). Wiley.

Westerman, G., Bonnet, D., & McAfee, A. (2014). Leading digital: Turning technology into business transformation. Harvard Business Review Press.

Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). SAGE.

Yin, J., Gong, Y., & Wang, S. (2024). Digitalization and operational risk in financial institutions: Evidence from Chinese listed firms. International Review of Financial Analysis, 91, 103001.

Zeithaml, V. A., Parasuraman, A., & Berry, L. L. (1990). Delivering quality service: Balancing customer perceptions and expectations. Free Press.

APPENDICES

Appendix A: Interview Guide

Semi-Structured Interview Guide

Study: Leveraging Digitalization to Improve Customer Relationships and Operational Efficiency in the Insurance Sector Case Study: SAA

Target participants: SAA managers and directors with direct involvement in digitalization, customer relationship management, or operational efficiency functions.

Interview duration: 35–55 minutes | Format: On-site or video call | All responses recorded with prior written consent.

Confidentiality: Participants are anonymized (R1–R5 / Interviewee 1–Interviewee 5). Verbatim quotations are used for research purposes only.

BLOCK 1 INTERVIEWEE PROFILE (Warm-Up)

Q1. Could you briefly introduce your role at SAA, your division, and the number of years you have been with the institution?

Q2. In general terms, how would you describe the current state of digital maturity at SAA compared to five years ago, and compared to the industry more broadly?

BLOCK 2 CONCRETE GAINS FROM DIGITAL TRANSFORMATION

Q3. Which digital initiatives implemented at SAA do you consider to have generated the most significant operational or commercial gains to date?

Q4. Can you quantify, even approximately, the improvements observed in terms of processing times, costs, volume of files handled, or customer satisfaction indicators?

Q5. Have digital tools modified the way work is organized within your division or department? Could you describe a concrete example?

Q6. Have digitalization initiatives had any impact on SAA’s fraud detection or prevention capacity?

Q7. How has digitalization affected the level of internal coordination and information sharing across the organization?

BLOCK 3 DIGITAL TOOLS AND CUSTOMER INTERACTION

Q8. What digital tools or channels does SAA currently use to interact with policyholders at the pre-subscription stage?

Q9. During the active policy period (policy management, inquiries, renewals), what digital touchpoints are available to clients?

Q10. How has the claims management process been digitalized, and what has been the customer experience impact of these changes?

Q11. Does SAA use a CRM system? If so, what are its main functionalities, and where do you perceive its current limitations?

Q12. How do you assess the alignment between the digital channels SAA currently offers and the actual expectations and digital literacy levels of its policyholder base?

BLOCK 4 EFFECTS ON OPERATIONAL EFFICIENCY

Q13. In which operational domains has digitalization generated the most significant efficiency improvements and where do you believe the largest gaps still exist?

Q14. Has the introduction of digital platforms changed the allocation of human resources within your division? In what direction?

Q15. What is your assessment of the current ORASS system its functional adequacy, its limitations, and the timeline for its modernization?

Q16. Are there operational workflows at SAA that you believe remain insufficiently digitalized, or where existing digital tools are underperforming relative to their potential?

BLOCK 5 BARRIERS, OUTLOOK, AND PROPOSITIONS

Q17. What are, in your view, the most significant technical barriers currently impeding the full-scale digitalization of SAA's operations?

Q18. Beyond technical obstacles, what regulatory, institutional, or human factors are slowing down digital transformation at SAA?

Q19. How would you describe the level of employee and customer receptivity to digital change at SAA? What forms has resistance taken, and how has the institution addressed them?

Q20. Looking ahead, what are the two or three digital transformation priorities you would recommend SAA pursue in the next three to five years?

Note to interviewer: Allow the participant to develop their response freely after each question. Use the following probes where needed: "Could you give a concrete example?", "How did that compare to the previous situation?", "What was the client's or employee's reaction?". Do not guide the interviewee toward any particular answer.

Appendix B: Interviewee Profile Matrix

The following table presents the profiles of all five research participants, selected through purposive sampling in accordance with the criteria established in Chapter II, Section 2.4.

Table XIX Interviewee Profile

Code	Role / Function	Division	Interview Format	Duration
R1 / Int 1	Senior manager	DGA Finances & Stratégie	On-site	35–55 min
R2 / Int 2	Senior manager	DGA Technique & Commercial	On-site	35–55 min
R3 / Int 3	Senior executive	Cross-functional (Quality Dept.)	On-site	35–55 min
R4 / Int 4	Senior executive	DGA Support & IT Services	On-site	35–55 min
R5 / Int 5	Senior manager	DGA Technique & Commercial	On-site	35–55 min

Note: All interviews were conducted between March and May 2025 at SAA headquarters, Bab-Ezzouar, Algiers, All participants provided prior written consent for recording and use of anonymized quotations.