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Emerging Role of Agentic AI in Designing Autonomous Data Products for Retirement and Group Insurance Platforms

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Abstract

Over the past two decades, intelligent automation technology has garnered increased interest and investment, with the capability to transform legacy businesses into digital enterprises. The insurance industry has the most significant potential to leverage these technologies to improve its data-driven decision-making processes. Data products—decision models, segments, and scores of customers—play a pivotal role in automating the key business functions of an insurance enterprise. As the financial services industry rapidly moves towards digital transformation by leveraging high-fidelity data, creating autonomous data products becomes an important future for future-ready insurance companies. In this paper, we examine the emerging role of agentic AI in designing autonomous data products for retirement and group insurance platforms. We build on our decades-long experience working with insurance companies in building cutting-edge data products and designing and developing enterprise-grade retirement and insurance platforms.

Data has always played a central role in developing insurance products, managing risk, and efficiently running the value chain of an insurance enterprise. The core decision-making functions of the product and underwriting, pricing, claims, sales and distribution, risk and investment, and support function areas rely heavily on data-driven recommendations provided by statistical models, segments, and scores. The availability of digital signals has enhanced the ability of insurance companies to form a complete and high-fidelity picture of each of their customer and counterparties at a very granular level. Rich, data-driven scoring of expected behavior forms the crux of the decision-execution function for all areas of an insurance enterprise.

Keywords: Agentic AI, Autonomous Data Products, Intelligent Automation, Digital Transformation, Insurance Technology, Data-Driven Decision-Making, Retirement Platforms, Group Insurance, Statistical Models, Customer Segmentation, Scoring Systems, Risk Management, Underwriting Automation, Claims Optimization, Pricing Models, Sales and Distribution, Investment Decisions, High-Fidelity Data, Digital Signals, Enterprise Platforms

1. Introduction

With advancements in AI and other emerging technologies, organizations are developing data products that are increasingly becoming data-adaptive or imitators of the functions of contemporary business experts. We equate these data products for business decision-makers to Agentic-AI-enabled Autonomous Data Products. In this paper, we consider a specific set of Autonomous Data Products that explore the human role of Policyholder consultants who help in the purchase and purchase maintenance journey of business and personal policies, and scoping of data needed to design pension, retirement, and group health insurance products. Hence, the focus of our paper is the desirability and feasibility of Autonomous Data Products for product consultancy services. Specifically, our study aims to understand the different ways in which agentic-adaptive capabilities of AI can enhance the desirability and feasibility of Autonomous Data Products applied to Life Insurance domains of retirement and group health insurance while delivering increased economic, social, environmental, and business value.

The use of data for financial decision-making has been in vogue for centuries, supported by detailed estimates by actuaries and financial specialists, expert deliberations about key factors, and shared knowledge across business practitioners to derive business decision rules. However, this model is largely out of reach for small and medium businesses and low-income segments of society who cannot afford the luxury of financial advisor spending nor the burden of initial high ticket prices and high fees for policy maintenance. Hence, there is a need to explore new ways to reduce such costs while improving the quality of services that are affordable for utilizing these support services.

1.1. Overview of the Study

The increasing life expectancy among older individuals, coupled with declining fertility rates has led to increasing dependence ratios. In response to this problem, there have been demands to improve retirement plans and pensions, which are products based on defined contributions. At the same time, recent technological advancements, particularly in computing and artificial intelligence, have fuelled the discussion and development of agentic AI, which has

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qualities of agency, autonomy, intelligence, and adaptability, to address various unprecedented problems that the world faces, such as climate change and the pandemic. While there have been discussions on agency in AI, how this agentic AI can help consumers navigate products in sensitive areas is discussed very little. As a capacity, the informed choices about products and how these address vital needs such as income and health security depend on the transfer of a considerable amount of complex data between consumers and companies. While insurance companies have access to a variety of data regarding these plans and services that impact numerous consumers, financial consumer behavior research shows that consumers do not sufficiently process information about products offered to them, which can lead to sub-optimal choices that affect their financial well-being. We focus on the evolving role of such agentic AI in the company processes of designing and managing autonomous data systems in the development of insurance products across the policy and business lifecycle.

This study is relevant as retirement and group insurance products are complex in nature and necessary to guide consumers through their lifetime journey with the product. We investigate how advanced technology applies to such products at different stages of the business lifecycle, the value-added of such agentic AI to a consumer during various points of the policy lifecycle, and the key design choices and considerations at each stage to create suitable data products for the retirement and group insurance business. Subsequently, we also examine how these choices outlined in our framework will evolve as AI in general, and agentic AI in specific become increasingly pervasive in the business landscape.

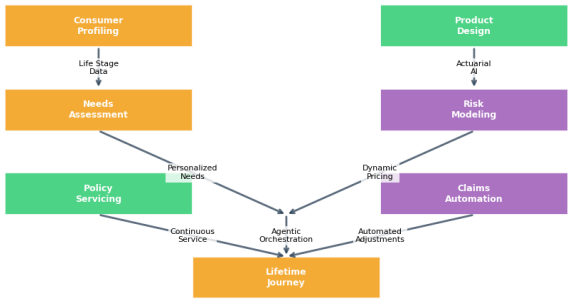

Fig 1 : Agentic AI Insurance Framework

2. Understanding Agentic AI

The term "agentic" comes from "agency", an age-old term in philosophy and psychology, that suggests the power of acting in one's capacity while having some form of goal or intention. It is only recently that the term has been infused into discussions about artificial intelligence by a few early adopters. But with the tremendous progress in AI capabilities, particularly from radical architecture and paradigm shifts like deep neural networks, transformers, large models, foundation models, and self-supervised, unsupervised, and multi-task learning paradigms, more and more common folk have begun to recognize these as capable of acting in their capacity, with self-developed goals that sometimes seem more sophisticated than those created by the human mind. This recognition is therefore leading to increasing chatter, exploration, and more formalistic approaches toward the agency perspective of AI to model, hypothesize, and test this new phenomenon.

What are the characteristics of agentic AIs? The characteristics that are most frequently cited in the definitions of agency and intention and that have made it now a fundamental consideration in philosophy and psychology are: Autonomy - the agent acts in its capacity, often with freedom from control by other agents; Goal directedness - the agent acts to achieve some goal using a specific approach or resource allocation strategy or plan; Selectivity - the agent appears to exercise choice over alternative actions; and Intentionality - the agent does not just act reflexively without consideration of the consequences but appears to value or evaluate the outcomes of its actions according to some internal measure.

2.1. Definition and Characteristics

The notion of "agentic AI" refers to a relatively wild and provocative portmanteau of "AGI" (artificial general intelligence) and other "agentic" properties of autonomous AI systems–architectures, agents, agents' worlds–developed by an influential and evocative summary of the broader underlying issues. Agentic AI more specifically involves AI systems that: have a high level of autonomous decision-making capacity; learn persistently throughout their operations; have definite, tractable utility functions that can be specified, and readily modified and updated by human overseers; operate in environments of considerable complexity and high stakes; result in major impacts on the world, for better or worse; and whose powers are at least on the order of a dominant political or economic actor, and politically and economically consequential but still also potentially controllable by humans. In that respect "agentic" AI systems are akin in some ways to radical, transformative, or high-risk AI technologies, which present profound governance analytical challenges, as well as have the greatest potential to solve many of the world's pressing problems. Yet they form a subset of radical AI, which also includes non-agentic systems such as transformation tools or especially any-agent models of digital or narrative content generation and transformation models. Agentic AI includes yet is not restricted to human-level AGI, which could evolve to follow many different developmental paths but without a doubt incorporates evolutionarily or adaptively principled

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computational research setup, technology, and organizational architectures.

The transformational potential–profoundly beneficial or profoundly harmful–of agentic AI technologies hinges importantly on two key characteristics. The first is the transformation goal or meta-utility function enshrined, as overseen, and modified by humans. The second is the creativity level, expression, or mode of that technology-disallowed transformation. Truly transformative systems must combine creativity–enhanced by large resource and data access, allocational depth, and operatively key data experiments especially econometric, linguistic, and narrative if not signaling–with agency. To embody a high agency transformation system, machines must be designed and built in a particular way–for certain purposes, expressive types of computing, and operational procedures–to deeply engrain or embody the special imaginative agency required of the task.

2.2. Historical Context and Evolution

Historically, the term "agent" has a specialized meaning in philosophy, linguistics, and robotics. In most recent use, an agent is typically an entity that perceives its environment, typically through sensors, acts on the environment through actuators, has a theory of its own and the environment, and has utility functions or goals to optimize. As used in robotics, the notion of agency emphasizes the autonomous nature of complex software entities and their elaborate control, inference, and decision-making capabilities. The term "agentic" is used in this context to emphasize that all the essential aspects of agency are fulfilled and perform functions rightfully attributed to agents.

The history of intelligent autonomous agents dates back to the dawn of artificial intelligence. Motivating our use of the term "agentic" AI in this paper to refer specifically to current trends in intelligent autonomous systems, it is worth elaborating on the evolution of “agentic" AI and the development of agency as an explicit area of subfield within AI. Early AI work mainly concentrated on solving problems specified in logic by deriving valid conclusions through theorem proving or searching in enormous problem spaces. Early developers created systems primarily to solve theorem-proving problems in propositional logic, but later also to solve other formal puzzles. Later work extended this to 3rd order predicate calculus and planning problems. Together with the natural deduction theorem proving system, these became the first intelligent autonomous software agents.

Differentiation into problem-solving, expertise, natural language, vision, and machine learning systems slowed down this unifying progression for a while. However, some progress in computer chess, game playing, and early vision systems recorded some characteristic components of the agency being thus incorporated. AI as a subfield then began to integrate components of solution realization algorithms such as search, heuristics, assertions of belief states, non-optimal trajectory realization utilizing resources efficiently, recognizing special classes of solvers one could offload for collaborative solution realization among heterogeneous agents, etc.

Equation 1 : Autonomous Decision Efficiency

$$\mathcal{E}_{\text{AI}} = \frac{\sum_{i=1}^{n} w_i \cdot \Delta D_i}{T}$$

$\mathcal{E}_{\text{AI}}$ = AI Decision Efficiency

w_i = Weight of Data Product i (risk impact, utility)

ΔD_i = Improvement in decision accuracy for product i

T = Total decision cycle time

3. The Landscape of Autonomous Data Products

In the age of data empowerment, we have constantly been engaging with technology that augments and expands our capabilities. For example, ride-hailing applications allow us to conveniently travel around without having to employ a full-time driver. The micro-lending applications, on the other hand, assist fund managers in scouting for investment-worthy borrowers. Such technology products, that allow a level of dependency and yet create independence for the end-user, are motive-enabling – the products assist users in executing a task but do not assume the ownership of the task. The same can be said for technology products that act on behalf of an end-user, aided by the right combination of data and algorithms. The results for such digital agents, or software bots, can be curated by the consumers in the planning phase but the execution is carried out by the digital agents. In this case, the brain is owned by the developer. Therefore, such products act as assistants to users in their decision-making process and, hence, are referred to as decision-support products. Such technology products, both motive-enabling and decision-support, represent the current generation of autonomous data products in the ecosystem.

Data products are a literal manifestation of algorithmically driven specialization of labor and could provide a potential path for the financial services sector to deserialize its data. The process of deserializing data could unleash the industry-wide vision of becoming data-driven in its approach to products created, targeting consumers, relationships built, and, ultimately, results achieved. Traditionally, data has been thought of as the lifeblood of any enterprise, strongly identified with the concept of data warehouses across the service cycle. However, with the advent of machine learning algorithms at the forefront of developing and building financial products, we have transitioned from merely having data to building products with it. The latter could be thought

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of as the new-age data warehouse, one that has democratized data availability and created opportunities for product developers across the industry cycle to standardize product output.

Fig 2 : Autonomous Digital Operations with Enterprise Agentic AI

3.1. Types of Data Products

Data products in a broad sense can be defined as products created from data generated either by devices, systems, or users. More specifically, how the term "data product" is understood depends on what part of the pipeline from native data to actionable insight data sciences is involved. One area of focus is designing and developing pipelines that support automated or manual linkages of native data and preset analytics to deliver insights needed by business users at the right point in the decision cycle. Data products in this space are usually web-based dashboards that share a common design and interactively search similar types of analytics for different users. A more encompassing sense of the term applies to the key set of processes and deliverables made by data sciences, which enable business users to make decisions that are informed by actionable recommendations. This quality and its infrastructure may be conceived of as a new definition of "turnkey" or solution data products.

The partial automation of data analytics is largely limited to those situations where analyst skills and local knowledge have little value in generating actionable insights. In many other areas, the analytics must be carefully constructed by the analyst for a specific business problem whose distinct features are visible only to the analyst and the business analyst with local knowledge of the relevant stakeholders and their needs. This is a demand-driven product development cycle where analytics are structured, designed, programmed, and presented in a user-friendly format that leads to business dashboards that continue to meet the user's goals and needs. Only after the primary set of dashboards has been developed and is generating value is this product seen to be in continuous improvement mode.

3.2. Importance in Financial Services

In the contemporary information economy, a collection of advanced and sophisticated digital services and software applications have developed to cater to the information and knowledge needs of people and businesses. The data originated by many individuals exchanging and interacting with one another have become a unique resource for the creation of data products with the mission of simplifying, easing, automating, augmenting, or innovating the various tasks of human activity. Many well-known companies do not directly sell products to users and instead create and sell data products to advertisers and businesses. Major multinational tech companies have access to nearly 50% of the global market capitalization and continue to own the major software platform businesses that account for the largest value of the software industry.

Financial services activities have taken root in early- to late-stage capitalism from simple informal and interpersonal exchange systems to the complex automated and formalized multimedia formats of digital banking, investment, payments, trading, insurance, contract, credit, market making, risk management, or wealth management services that exist today. Yet financial services led by banking and payments have been the mainstay of the early-phase digital economy and created the first branch of technology and financial services integrations through online banking, ATMs, digital currency, coin exchanges, and settlement. Access to finance forms the critical lifeblood of any developed economy, affecting the shape, character, and dynamics of industry development and societal change. Central bank regulations, reserve requirements, trusted counterparties, low-cost credit, and the control of volatility cycles are key for societal stability.

4. Retirement Platforms: Current Trends

Pillars or retirement income are financial support systems for most vulnerable older adults and are assembled virtually by different national and state but primarily federal-level entities around the world. In the United States, the pillars consist of workers covered by a social security program and individuals who are eligible for short-term retirement benefits as part of a defined benefit plan. Workers using defined contribution plans are encouraging retirement savings require access to various retirement income strategies and are prone to penalty taxes if withdrawn too early for retirement. Later has increased in value substantially as a result of penalties for early withdrawals and significant market growth from the economic recovery. Today they stand at fifty trillion dollars and are projected to become more than 100 trillion dollars in wealth as the beneficiaries become more financially educated. Despite working multiple years to achieve the balance it will require advice from financial services professionals to unlock their value for retirement consumption.

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The economic shutdown has accentuated demographic trends of an aging US population as such volumes of baby boomers have started becoming eligible for retirement. Since longer life expectancy has continued to become an increasing component of retirement timing, there are industry conferences as well as advisory firms that cater to this growing demand by building compliance processes around retirement planning as it is governed by State departments of insurance. Therefore, generational demand from retirement investors for higher investment returns and a volatile post-market will place additional retirement pressure on managing generation. Thus insurance companies have to manufacture new products to keep their onboarding flows high and without product innovation. The onboarding flows of employees into retirement plans will become increasingly difficult. As such platforms have become commoditized the entire life cycle will require both education in countries without social security systems and account management for added fees and commissions.

4.1. Market Analysis

Several factors are driving accelerations in the adoption of retirement platforms within advanced economies. Firstly, relevant demographic trends are emerging, with life expectancy increasing due to improvements in healthcare and lifestyle habits, and the population aging as the Baby Boomer generation continues to retire. Secondly, pension liabilities are increasing, as defined benefit plans change to defined contribution or hybrid plans at the same time that people become aware of the likelihood of outliving their assets. Thirdly – and perhaps most importantly – the responsibility for retirement savings is shifting from companies to individuals who enjoy more flexibility in choosing how much to save when to retire, and how to invest their savings. The assets accumulated in private personal retirement accounts are significant: in 2021, they exceeded USD 5 trillion.

Digital distribution capabilities in pensions are both required and allowed by recent trends in the areas of technology, regulation, and competition. The regulatory trend is toward deregulation, presented by governments as a means to boost private retirement savings. Competitively, some insurance carriers have dropped out of the market, favoring pure brokerage models, while other retailers have taken on digital capabilities for retirement distribution. The general leveling of the playing field in terms of product range and pricing is contributing to an erosion of carriers' underwriting advantages. For insurers, technology presents the opportunity to achieve the scale and speed required to revamp their product mix, reduce time to market for new features, contain distribution costs, and control pricing.

4.2. Customer Needs and Expectations

Retirement platforms have evolved enormously, driven by demographic trends and greater coverage, yet much remains to be done in domains such as group pension, post-retirement, and secondary markets. Employee expectations are also changing, becoming more demanding and personalized, with various macro trends driving demand for more holistic health and wellbeing services. Customers now have access to platforms that consolidate their insurance, savings, and health data with personalized recommendations. Securing long-term investments in the face of changing regulations, low-interest government bonds, and increasing market volatility, as well as potential industry disruption, are some of the major challenges faced by insurance companies. In this context, life and agency insurers need to feed their retirement and group insurance distribution platforms with data, insights and offers across multiple living phases. While traditionally employees would turn to insurers and banks, as the market experienced upheaval, many have turned back to their employers. In doing so, wealth management platforms that previously catered primarily to clients have been diversifying their offers and are now recognizing the group benefits market as a key growth area. Their longstanding experience in analytics, product development and pricing, service quality, and compliance could mitigate the technology gap for traditional life and agency insurers and enable them to speed up their digital transformation.

5. Group Insurance Platforms: Current Trends

Offering group insurance has a long tradition in many Western economies. Initially described as death and disability coverage against industrial workplace hazards, group insurance has developed further to cover attributes such as health and wellbeing services. As the world moves towards a digital-first mindset, insurance has witnessed the evolution of distribution with a strong technology orientation. The ingredient for the present evolution in group insurance is embedded insurance distribution, where companies within the ecosystem of the underlying policyholder, the employee, orchestrate the entire journey on behalf of the employee without obtaining any intermediary licensing.

Expat employees of multinational corporations, gig economy claims of platform companies, and localized ethnic community organizations foster demand for group insurance across diverse value chains. Such varying needs and priorities inspire service-oriented redefinitions of traditional insurance products and the partners leverage platforms to engage employees and offer product services through nimbler APIs to enhance policyholder experience. While the threat exposure of the networks is still higher when

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compared to retail, the trend among provincial commodity businesses is to innovate with the intent to create seamless product experiences and life-cycle engagement focused on awareness, safety, and affordability rather than on risk mitigation. The inward outward push from the group insurance consumer is a living testimony to the efficiency potential across the retirement ecosystem and propels the emergence of integrated realizations among the underlying nodes across the electronic hierarchy toward a public or a private agenda. These trends are the seeds for the evolution of platforms to build innovative ancillary services around the commoditized retirement services of claims and payouts of premium flows across the electronic hierarchy.

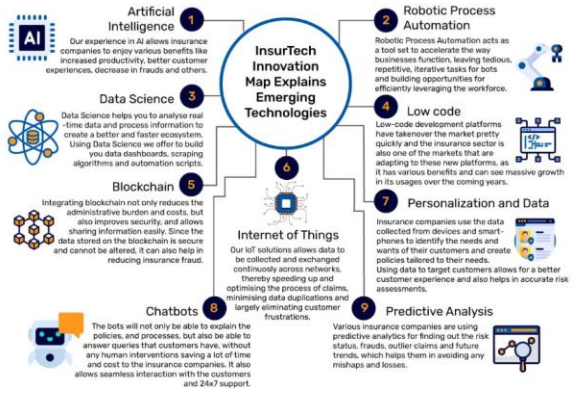

Fig 3 : Insurance Technology Trends

5.1. Market Analysis

Retirement and group insurance platforms offer a range of products designed for lifelong or long-term service, building upon the care function currency. Retirement savings must match the volatility of life expectancy, updateability, and convertibility into decentralized annuity payments or healthcare service bundles. The majority of retirement savings are positioned in interest and dividend-generating investment vehicles. Declining interest rates have made such investments progressively less attractive; additionally, global changes and other shocks have much-increased inflation risks. Group life insurance is the classical risk hedge for death-related costs incurred by families whose bread-winners unexpectedly die at or just before retirement age. Group long-term care insurance is the classical risk hedge for the retirement-related costs incurred by families who must use or pay for the incapacity-related services needed by their aged members.

Each of the above retirement and group insurance products is classical by market standards but relatively modern in terms of the mentioned functionalities: adapting to the needs and preferences of different ethnicities and the members of mixed-ethnicity families. AI-enabled data products and AI-enabled autonomous data products designed for such marketplace functionalities may be fully value-neutral, and thus simply assistive by helping market operatives and all types of platform users either explicitly or implicitly with all exactly prescribed steps and decisions for conducting all marketplace processes, 'round the clock and on demand.

5.2. Customer Needs and Expectations

Group insurance platforms serve as essential tools for employers, unions, or associations to offer benefit services to members and their employees. These platforms run group insurance plans, such as health plans, group life insurance, group disability plans, group accidental death & dismemberment plans, and group dental plans. Their customers are either the plan sponsors or the plan participants. Effectively tackling the challenges of platform design from either the plan sponsor or the plan participant perspective yields the best results.

The needs and expectations of the users of group insurance platforms are quite different from those of other entities providing simpler services using platforms. Users consider these platforms to be repositories for holding critical and sensitive service data. Users also use group insurance platforms for making complex transactions, such as claims for death, disability, or loss of life and dismemberment, and for communication and sharing of feedback for any such transactions. Hence, the sensitivity, complexity, and importance of the service data play a critical role in designing group insurance platforms. As such, the design of retirement and group insurance platforms calls for sensitive and trustworthy data products in consultation with key users from both groups.

Equation 2 : Policyholder Behavior Prediction via Multi-Agent Learning

$$P(t+1) = \arg\max_{a \in A} \mathbb{E}[U(a, s_t) + \gamma V(s_{t+1})]$$

$P(t+1)$ = Predicted action of a policyholder at time $t+1$

A = Set of possible actions (withdraw, rollover, adjust coverage)

$U(a, s_t)$ = Utility of action a in state s_t

$V(s_{t+1})$ = Expected future value of state s_{t+1}

γ = Discount factor for future value

6. Role of Agentic AI in Retirement Platforms

Retirement platforms primarily deal with investments, investment funds, and policies in traditional life insurance companies across asset classes like balance funds, equity share funds, and debt instruments. These asset classes still have a lot of potential to build wealth as they have been doing in the past, which is good for insurers and insureds. The term insurance part of a retirement policy primarily takes care of risk management and minimization for the insured person's family in the event of their untimely death.

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The role that can be played by agentic AI in relation to such investment and life insurance products of a retirement platform is as a personal adviser to the customer which is specific to that customer and takes care of their unique needs situation, and requirements. The advanced generative AI features can roughly deliver these capabilities to both retirement and group insurance platforms.

These platforms deal with their customer base for a long time as these policies are long-tailed. Hence the customer will have a long historical data trace for potential analysis of customer profile of risk appetite and ability, and investment allocation preferences which can be harnessed for this task. With such a task and prediction, a personalized advisory interface can be built in agentic AI as a personal counter resource empowered in advanced predictive capabilities with input and feedback from both AI and human investment advisors and the customer-related AI models managed by each business player according to the economy. Such a conversational interface basically democratizes access to superior advice and services from the insurance player, thus breaking the existing oligopoly powers in platforms that have been incentivized to neglect innovative resource allocation.

6.1. Personalization of Services

Demographics alone cannot tell about the unique future decisions of consumers yet these features reflect how they behave today. Each of us is unique based on our values, principles, and cultures while there might be some similarities with people who are demographically adjacent to us. Grouping is a common method, broadly applied to understand, segment, and predict consumers yet when comes to group insurance, the approach is to define broad demographics to the group as many as possible people together with the idea that the collective behavior of the group can be analyzed similarly. The algorithms help insurers design similar products for each group rather than personalized ones. Agentic AI can add much subtlety to the methodology: there is a lot of data that reflects personally how we behave. It can conceptually do segmentation at a much more granular level so that while similar to others, the products or services offered to the consumer are with a unique twist based on their micro-segment relative to the entire social base. With Agentic AI, it can be possible to trigger further questions with people on the micro-segmenting levers that can fine-tune personalization during pre-offer, offer, and onboarding. Explicitly asking people gives them the agency to define unique subsets according to their conceptualization which makes the dialog dramatic yet interesting. It gives terabytes of data about each micro-segment to product developers with similar agency engagement from the model. Thus, Agentic AI can facilitate authentic co-creation. When personalized with and by real people, Brand X can create a major bond of trust with the canvas of signature services.

6.2. Risk Assessment and Management

In insurance, risk management and assessment are crucial for the proper functioning of every element. The level of risk undertaken while providing a financial service to the client defines the price charged by the company. In the case of group insurance and pension services, the risk assessment is performed on a group of people. However, it is difficult to create a perfect group with the lowest risk possible, although, at the same time, the insurance company meets the required premium level. Performing a proper assessment of the group's risk is very difficult for several reasons, such as the often-changing character of the occupational risk, the valuation based on only a small number of individual features, external conditions affecting the group over time, risk aggregation connected with the possibility of sudden occurrence of a catastrophic risk, often reached risk level, small number of insured events, fraud. Risk management in group insurance is closely connected with premium determination, investment in appropriate reinsurance programs for catastrophic risk, and organizing reserves for the payment of benefits.

It must be noted that with a lack of proper management and assessment of the risk, the pension fund allows the company to continue its operation, the reserve for risk is high, and the capital value is low. In practice, risk management becomes part of the operations of any pension fund. Financial Sector Supervisory Commissions expect specialized risk management systems from funds as an internal regulation and control element. Before the pension fund establishment, the founder submits the foundation documents to the Supervisory Commission. In the document, the pension funds specify the risk-taking, risk limit, organization, procedures, and management responsibility. Such a document is an element of the internal regulations and procedures of each pension fund and must define all risks that the fund may incur. Lack of an internal document defining risk management, the pension fund, and the Supervisory Commission have no reference instruments for controlling decisions made.

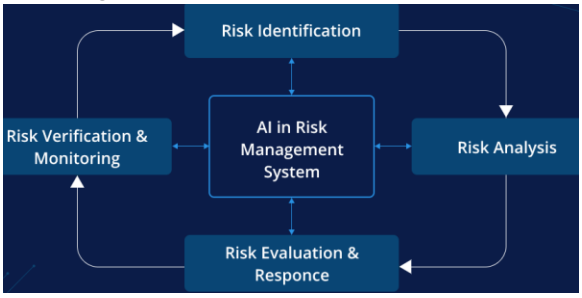

Fig 4 : AI in risk management

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7. Role of Agentic AI in Group Insurance Platforms

Insurance plays a crucial role in helping people through times of crisis, providing a safety net for when they need it most. However, the industry has been steadily evolving, and this is more true now than ever before. There are so many different insurance products available with more tailor-made products being created to support individual needs. And yet, so many companies are still using outdated technology to handle these claims, and are missing out on how much more efficient their processes could be if they switched to a more advanced tech setup. This is an area that begs for improvement.

The claims processing procedure for group insurance involves a simple desktop instruction process. To submit a claim, the claimant must fill out a claim form and submit it along with the required documentation. A team of specialized claim officers examines the claim documentation, reviews and assesses the claim, and renders a payment on approval following a careful review of the documentation. However, errors in data entry, missed documentation, excessive scrutiny, and inevitable mismatches cause claim processing to be frustrating, slow, expensive, and sometimes painful. Something that can be improved upon with AI. Claims administration can be a tedious and error-prone process that involves high volumes of transactional work, which can lead to unwanted delays for claimants and high costs for providers. Automated workflows supported by artificial intelligence can provide faster responses through fully digitalized processes, automate data uploads and checks in the front end, and leverage machine learning algorithms to help with back-end processing.

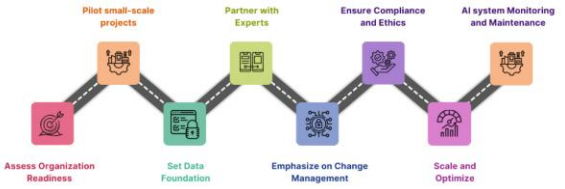

Fig 5 : Agentic AI for Insurance

7.1. Claims Processing Automation

Automation of insurance claims processing has been discussed for a long time as an opportunity for Artificial Intelligence (AI). Life insurance is often described as the original Fintech service. The insurance maturity dates typically vary between 10 and 25 years, during which the company receives policy premiums in small installments. At maturity or in the event of a claim, the company pays a claim that can amount to many multiples of the total received premiums. Claim processing relies on the receipt of the policy number, usually with little or no other identifying information. This allows for fraudulent claims to be made under pretenses, perhaps corrupt officials are using their offices to manage the sham claims. Automated Claim Processing is thus an easy and obvious application of AI, and has gained considerable traction during the COVID-19 pandemic as restrictions on face-to-face contact led to increasing reliance on technology.

The process of claims processing describes the steps an insurance company takes to validate and settle an insurance claim. In the past, these processes often required a significant amount of human involvement, but with the upgrade to emerging technologies, claims processing procedures are getting increasingly automated. The deployable automation tools differ based on the different claims processing phases considered – preliminary review, assessment and approval, investigation and negotiation, settling the claim, and performance and review of policy claims for insurance companies and are implemented based on the respective requirements. The majority of claims processing activities still require some level of human involvement, these areas have seen major enhancements through digitization and automation. While disease initiation models have been previously developed, prospective risk assessment is only starting to receive attention.

Equation 3 : Data Product Autonomy Index

$$\mathcal{A} = \alpha \cdot \mathcal{S} + \beta \cdot \mathcal{L} + \delta \cdot \mathcal{R}$$

$\mathcal{A}$ = Autonomy Score of a data product

$\mathcal{S}$ = Self-supervised learning capability

$\mathcal{L}$ = Level of agentic logic

$\mathcal{R}$ = Real-time responsiveness to market/use

α, β, δ = Weights tuned to product class

7.2. Fraud Detection and Prevention

Natural language processing (NLP) techniques can also enhance the process of deciphering complex legal and business policies presented as unstructured files. Thus, NLP tools can efficiently and effectively match a claim to policy rules set by an insurance company. In addition, NLP-based chatbots could be trained to understand rules defined by either a business or insurance company and look for claims that are different from those rules. For example, a typical rule would state that if a person does not meet policy age specifications, then the claim should be denied. Although policy-based automation cannot take the place of highly trained adjusters in the case of complex claims, the efficiency gains can save organizations millions of dollars, especially in an era of ever-increasing claims due to crimes like accidental shootings and mass shootings and ever-increasing premiums. Actually, due to their business rules,

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group insurance policies seem ripe for automation. Life insurance companies carefully scrutinize every claim for fraud, including the much-discussed "accidental deaths."

The predicted problem in life insurance policies is who really died. For people who died in the usual way, computers will flag accidents, suicides, drug overdoses, etc. for further refinement by computer programs, and for further review by adjusters. NLP programs can be trained to identify potentially fraudulent reasons in e-mails to mothers from deceased children, admissions by the perpetrator, and other digital evidence from smartphones and the cloud. Cybersecurity tools can be applied to thwart the pranks of people who have mental health issues and for surfacing unexpected, rare patterns of occurrence, in case the prankster is the insured. Although actuarial systems predict timing and causes from past data, different setbacks such as economic crises can change a percent's timing and cause of occurrence. Thus, actuaries may also reevaluate parameters from real-time data feeds.

8. Conclusion

Autonomous data products are well-suited for retirement and group insurance domains due to back-office support and the prioritization of internal efficiency in these ecosystems. New product design and servicing cycles in these domains have traditionally been long, with changes in an insurer's product portfolio happening infrequently. With the increasing digitization and self-service nature of processes in these domains, both product transacting and servicing are now being offered on a low-touch and real-time basis. Data products in these domains are foundational for infrastructure investment driven through the impetus of embedding, work tech, and digital marketplaces. Product offerings such as embedded retirement plans and retirement savings funds delivered through workforce management platforms are important for financial well-being. Customization and real-time advisory capability for insurance plans offered through digital marketplaces are important for mitigating risk exposure. The need for both of these types of solutions is greater than before with changing workforce dynamics. It is not surprising that firms pursuing priorities in the paradigm, and investing in advanced technologies are likely to develop and offer these data products.

The presence of this bottleneck creates an opportunity for emerging agentic AI technologies to offer low-code and no-code tools for adaptable product prototypes in these domains. Such prototypes are assistant tools for product managers to accelerate infrastructure setting up with plug-and-play data adapters, data flows, APIs, and user experience layers that will facilitate product transacting, customized product design, and real-time servicing. This operationalizes the digital products vision by offering product managers velocity in building, and testing, new product ideas to automate, augment, and assist user journeys. The continuing uncertain business environment implies changing workforce dynamics. Embedding both financial wellbeing, and risk preparedness in the employee journey is core to mitigating its associated impact for employers. The need for expedition in the design and offering of adaptable employee benefits in retirement and group risk insurance especially in the context of repeated events brought about by the pandemic, accelerating global warming is set to continue. Being able to develop newly adaptive adaptable data products is key to facilitating this.

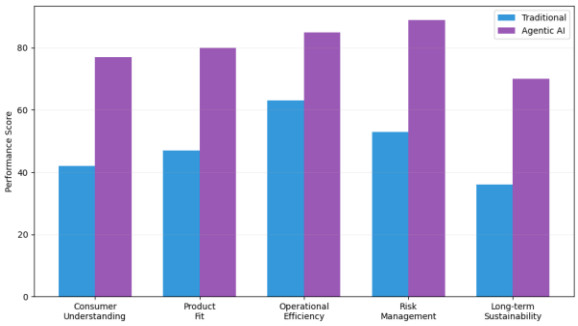

Fig 6 : System Comparison

8.1. Key Insights and Future Directions

Retirement and group insurance are domains dominantly governed by legacy data products that have been profoundly constrained by deterministic design decisions for a long time. Recently, a popular wave of LLM-powered products has ushered in aid by augmenting retiring data products with the ability to converse with users and even accomplish diverse user needs by orchestrating multiple services. While these generative agents can alleviate the pain of cumbersome user-facing experiences, they are still extensions of traditional data products filled by conservative design choices. We argue that the design of agentic autonomous data products is ready for take-off by addressing three crucial dimensions: contextual generalization, preservation, and agentic explainability. Integrating these premises would encourage disruptions rather than moderation of the impending quest of intelligently transforming the retirement and group insurance industry, liberating it once and for all from its generative popularity.

Rather than chronicling yet another hype, we emphasize both the design and research opportunities posed by autonomous agentic data products. We see enormous value in non-expert, casual users who have imperfect but contextually rich partial information about the task that they want the product to carry out, and challenge the UX paradigms for such products. As purpose-driven minimally required effort digital interactions become prominent due to microtasking and the gig economy, should we also consider experiences where casual users dictate the design constraints

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of products that they want to be agentic, rather than products dictating the recertification constraints of non-agentic experiences by requiring temporal input commitment? Agentic design choices can also polarize the equitability of such products that need to interact with diverse user profiles. Would design choices designed directly for the leading beneficiaries of such products, typically motivated individuals in need of retirement or group insurance assistance, still generalize well for other user profiles, or can such products be gamified for additive creation from all socioeconomic stratas who have little or no intrinsic motivation?

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