

DIGITALIZATION AND TRANSFORMING IN HEALTH INSURANCE CLAIMS SETTLEMENT

Deepika J. Sharma*

ABSTRACT

This paper attempts to examine- the digitalization and significant transformation in claim management of health insurance companies in India. The paper delves into the model shift lead about by digitalization and transformation in the domain of Health Insurance claims settlement pre and post Covid. The research explores the integration of advanced technologies, particularly online based platform for claim processes including - artificial intelligence, machine learning, internet of things, block chain and different data analytical efficiency and overall effectiveness in processing of health insurance claims. This study aims to provide a comprehensive understanding of the impact of digital transformation on health insurance claims settlement ratio by taking note through trends of insurance premium in general and health insurance companies, segment and sector wise. A study explores the significance of digitalization by taking recent trends of selected five companies CSR of selected period from 2017-18 to 2021-22.

Keywords: Claim Settlement, Digitalization, Health Insurance, Artificial Intelligence, Premium, CSR.

Introduction

Digital technology is a new face that is driving a gigantic change in the insurance sector. For insurance industries, the changing outlook of insurance has led to a deluged of technological advancements in the health insurance industry as well¹. The fact that the insurance industry facing several challenges, specifically, where automated IT systems are yet lack, finding a lengthy claims settlement process, taking more than a few days or even months².

Digitalization and transforming in health insurance claims adjudication is a procedure of automating the claims processing system by using digital technologies. It includes the use of Block chain, Artificial Intelligence, Machine Learning and other digital devices to streamline the claims process, improve customer experience and reduce costs³. According to a white paper by Tata Consultancy Services, insurers must transform claims operations by increasing process automation, adopting AI-powered decision, and moving to connected digital platforms for seamless processing with limited or no human intervention³.

While digitalization has brought about many benefits the healthcare payers, face some unique challenges when it comes to digitalization, the costs and complexity of claims management continues to grow as population and chronic diseases increase, the number of claims that payers must process continues to grow rapidly.

Powered by digitization, the insurance sector grew 17 per cent in April-May on year 2021 compared to a nine per cent growth in 2020-2021 through digitization. After the brutal second Covid wave in April- May, insurance companies have settled about 80%, or above 15.39 lakh, health claims. Over 19.11 lakh Covid health claims have been reported as of June 22,2021. In March, 2021 health insurance companies in the non- life insurance sector grew 41 per cent, driven by rising demand for health insurance products among the Covid flow. Health insurance demand has prominently grown this year,

* Teaching Assistant, Department of Banking and Insurance, Faculty of Commerce, The Maharaja Sayajirao University of Vadodara, Gujarat, India.

The paper was presented in the National Multidisciplinary Conference organised by Maharani Shree Nandkuberba Mahila College, Bhavnagar, Gujarat on 21st January, 2024.

where consumers have been more inclined towards the use of digital in health insurance. Health insurance grew by 24.4 per cent in the first half 2023-2024 (H1FY24), driving growth of the over all non-life insurance industry⁴. The insurance industry is embracing digital to improve customer experience, faster settling the claims and launching innovative products⁴.

The main aim of this paper is to collect and analyze the selected studies have been done (mostly post pandemic) that explore the utilization of the technologies mainly: blockchain, artificial intelligence as a part of digital era has been employed in each study. It will provide the complete solution and streamline the claim process that blockchain and other technologies presents the clear alternative to the existing paper system. It will raise awareness to the stakeholders and insurance industry regarding the solutions. This paper contains seven sections. Section II covers a brief review of extent literatures on the domain of technologies solution of claim adjudication in health insurance sector. The next section highlights the objective the study. Later, section start with the fundamental meaning of the Artificial intelligence, blockchain and its benefit. Section IV and Section V portray data and research methodology respectively. In the next section, data analysis and interpretation of main findings are discussed. The last section concludes.

Comparison between Digital Insurance and Traditional Insurance

Factors	Traditional Insurance	Digital Insurance
Pricing	High operating cost due to several branches and offline procedures.	Low operating cost due to online mechanisms which are cost-effective and faster.
Buying procedure	Multi-step procedure and complicated. Require paperwork to initiate the process.	Paperless mode of transactions through online. Simple and easy to buy insurance online.
Communication	Complicated terms and conditions or jargon to understand.	Easy to read and accessible through several mediums such as social media, apps, websites, emails, texts, etc.
Claims	Requires several paperwork to establish the extent of liabilities.	Customer-friendly and hassle-free claims. Raise claims online through the website, apps or by phone.
Paperwork	Required for all forms of transacting such as buying, renewing, raising claims or queries.	A fully digital process that requires almost nil paperwork.

Source: Digital Insurance: Insights on Digital Trends in Insurance Industry, acko¹

Literature Review

This section gives brief review of literature on the relevant issues in claims settlement under the impact of digitalisation. However, for emerging trends in technologies played a vital role in claim settlement.

Wael El, S.et al. (2023) evaluated the Transforming Health Insurance Claims with blockchain-based solutions. The study highlighted the essentiality of the Blockchain technology for the health insurance claim adjudication. The major findings the potential benefits and challenges of implementing a blockchain solution.

David, A.(2019) studied Blockchain for Insurance and Claims Fraud Detection, paper analysed the importance of blockchain is not restricted to cryptocurrencies, but it has features in insurance sector also for the practical solution in data storage, record sharing for validation and interoperability. It has defined the traditional claim process, changes after introduction of blockchain and fraud detection in insurance.

Volker, T. J. et al.(2006) have concluded healthcare will expected dramatic changes in the healthcare and the digitalization with large scale data analytics will be among key technologies. Electronic health record will be on potential for providing quality data in future.

Godwin, A and D, Dwomoh. (2023) have evaluated the impact of Digital Health Technology (DTH) in reducing the claim rejection rate of health insurance claims presented by health facilities to the National Health Insurance Authority in Ghana. The study used longitudinal data on monthly basis adjustment due to errors from paper-based and claims submitted using different DHT systems from 2010 to 2019. The paper concluded Digital Health Technology reduced the claim rejection rate to 1.31.percentage of health claims compared to paper based system.

In the recent article, **ET Healthworld (2023)economic times**, persuade that the interaction of technology and health insurance claims has marked a remarkable transformation. Along with the

transition of claim settlement process to digital era with advent tools the experience of customer is progressive. Added, digitalization is rapidly amping up claims assistance to generate seamless experience.

The Times of India (2023), evaluate about the transforming health insurance with integration of technology is changing the scenario of the insurance industry, with the adoption of automation, Artificial intelligence (AI) and Machine learning (ML), digital tools for cost reducing along with digital health records these trends aim to democratize health insurance, lessen costs and improve overall health sector.

Bhojani, C. (2020) has analysed that with the emerging technologies like: Virtual Insurance Advisor, Smart Underwriting and Digital Claims Adjuster now becoming increasingly all important for insurers to increase their skills in understanding these newer risks as more efficiently than the traditional skills of underwriting and claims with the new skills of artificial intelligence and machine learning.

In **Health Works Collective (2022)**, have discuss about the process of claim adjudication with several steps have to follow and if it will referred to as auto- adjudication if its's automatically done using software from automation service providers like Smart data solutions. And concluded that theirs is no denying that automating claims are not only improves efficiency but also help to reduce costs, generally required for manual adjudication.

Health Insurance- Significance, Claims Settlement & Technology

The concept of 'Health Insurance' was proposed by Hugh Chamberlen in 1694. The term 'Health Insurance' relates to a type of insurance that essentially covers the medical expenses. A health insurance policy like other policies is a contract between an insurer and an individual/group in which the insurer agrees to provide specified health insurance cover at a particular "premium" subject to terms and conditions specified in the policy. Health insurance is a product of general insurance that covers the expenses related to pre and post hospitalization, critical illness, medication which could be in group or individual. It also includes insurance covering disability or long-term nursing or custodial care needs. It is different from life insurance policy. Health insurance may be procured in to *protect* the group or individuals from high or unexpected health care expenses. There has been a change in the Indian economy with the rise of digitalization new digital technique for business, policies and may reforms have been introduced in claim settlement in health insurance industry.

- **Claim Settlement Ratio:** The ratio between the number of claims resolved and the total number of claims in a financial year is known as Claim Settlement Ratio. It helps to determine whether insurance company can settle the claims of the customers. For example, if 100 claims were filed during the financial year and 98 of those claims could be settled, then the claim settlement ratio for that particular year for that health insurance company would be 98 percent¹³.

Claim Settlement Ratio = (Total claims settled/ total claims filed) multiplied by 100.

Technology and its benefits in health insurance industry

Area	Details	Benefits
AI	A chatbot powered by AI might assist a potential client in navigating a website and selecting a purchase.	<ul style="list-style-type: none"> • Decision based on Clinical Observation • Increase in Accessibility • Saves Time and Costs
ML	Insurance businesses acquire massive volumes of data, which may be leveraged to extract useful information about consumers and their needs using machine learning.	<ul style="list-style-type: none"> • Faster Insurance Claims • Reduction in the burden of electronic health records. • Access to healthcare in developing or underserved countries.
IoT	Devices that support the Internet of Things may be used to gather data and analyse risks using that data. Insurance firms may even consider giving potential consumers discounts for utilising such gadgets.	<ul style="list-style-type: none"> • Remote medical assistance • Data assortment & analysis • Tracking & Alerts
Smartphone Apps	Insurance applications (created for people and organisations) can aid in expediting the policy-selection process to make things simpler for clients and the insurer.	<ul style="list-style-type: none"> • Give patients faster access to providers and care. • Leads to more appointments • Reduces the spread of disease
Drones	Drones can be used to conduct airborne surveys to evaluate properties in high-risk areas, such as	<ul style="list-style-type: none"> • Create safer and more reliable deliveries

	those prone to earthquakes, liquefaction, erosion, or storm damage. Furthermore, they can be used to investigate and document construction or automobile crash sites.	<ul style="list-style-type: none"> Enhance sustainability & lower operational costs Ensure faster and more frequent deliveries
Blockchain Technology	Blockchain technology increases data security standards and fosters confidence between insurers and insureds, all while lowering transactional costs. With the use of this technology, claims may be processed more rapidly and with better quality data being gathered.	<ul style="list-style-type: none"> Efficient claims processing Cost savings Transparency Enhanced data security

Source: India brand equity foundation [IBEF]

Objective of the Study, Data and Research Methodology

The main objectives of the paper as follows:

- To see the impact of digitalization on health insurance firm's operations.
- To find out the role of digitalization on trends in insurance premium and claim settlement.

Data and Methodology

The study includes considering a detailed analysis of different technologies, claim settlement ratio of five companies of health insurance. The data has been collected using the secondary sources-IRDAI for the select period of study. Descriptive statistics will be employed the claims settlement in health insurance policies and the progress of applications of technology in the health insurance claim management, particularly in the post COVID scenario in India.

The Framework

In this section, we'll explore show the digitalization improve the business operation of health insurance firms by taking the trend of health insurance premium, trends in net incurred claim ratio and the claim settlement ratio of five emerging health insurance companies. By using data from IRDAI of all the trends we come to know about the overall impact of the digitalization.

Data Analysis and Discussion

Table 1: Trend in Health Insurance Premium [in crore]

Insurer	2017-18	2018-19	2019-20	2020-21	2021-22
Public Sector	21509	23536 (9.43)	24632 (4.66)	27228 (10.54)	32943 (20.99)
Private Sector	7830	10681 (36.41)	13736 (28.60)	15135 (10.18)	20001 (32.15)
Stand-alone Health	7689	10655 (38.57)	12391 (16.29)	15875 (28.12)	20107 (26.66)

Source: Annual Report of Insurance Regulatory Development Authority 2021-22.

Table 1 depicts insight into the trends of premium in health insurance sector in India since pre COVID-19 to the latest data available on IRDAI annual report. During the year 2021-22, health insurance companies collected rupees. 73,052 crore as health (excluding Personal Accident and Travel), the health insurance companies registering a growth in premium of about 25 percent over the previous years. As along with percentage form we can see the rapid growth of premium after pandemic.

Table 2: Trend in Incurred Claim Ratio under Health Insurance: Sector wise & Segment wise (in percent)

Year	Sector Wise				Year	Segment wise			
	Public Sector	Privatesector	Stand-alone sector	Industry		Govt. Businesses	Group Business	Individual Business	Industry
2017-18	108	80	62	94	2017-18	115	107	71	94
2018-19	105	84	63	91	2018-19	90	105	72	91
2019-20	102	82	66	88	2019-20	92	99	73	88
2020-21	104	83	78	94	2020-21	120	98	85	94
2021-22	126	105	81	109	2021-22	120	119	96	109

Source: Annual Report of Insurance Regulatory Development Authority 2021-22.

Table 2 Shows the net incurred claims under the health insurance business general and health insurers stood at rupees. 63,631 crore in 2021-22 it reported the raise od about 56 percent from previous

year. And it also depicts the increase in Incurred Claims Ratio (ICR) of health business insurers from 94 per cent to 109 percent in 2021-22, increase is the witnessed among all the classes of health insurance business.

Table 3: Claims paid under Health Insurance Business of General and Health Insurers (2020-22)

Mode of Claim Settlement	TPA		In-House		Total	
	No. (lakhs)	Amount (crore)	No. (lakhs)	Amount (crore)	No. (lakhs)	Amount (crore)
Only Cashless	106.12 (63.69)	24,974.66 (58.25)	23.69 (45.63)	14,544.49 (54.67)	129.81 (59.40)	39,529.15 (56.88)
Only Reimbursement	58.19 (34.93)	17,030.01 (39.72)	25.78 (49.66)	10,703.86 (40.21)	83.97 (38.43)	27,733.88 (39.91)
Both Cashless and Reimbursement	2.05 (1.23)	832.67 (1.94)	0.99 (1.91)	445.35 (1.67)	3.04 (1.39)	1,278.02 (1.84)
Benefit Based	0.24 (0.15)	4.032 (0.09)	1.45 (2.80)	917.11 (3.45)	1.70 (0.78)	957.43 (1.38)
Total	166.61	42,877.67	51.91	26620.81	218.52	69,498.48

Source: Annual Report of Insurance Regulatory Development Authority 2021-22.

Table 3 shows that, general and health insurers have settled 2.19 crore health insurance claims and paid rupees. 69,498 crore towards settlement of claims. In terms of claims settled, 76 per cent of the claims were settled through Third Party Administrators and remain 24 per cent of the claims were settled through in-house mechanism. Around 59 per cent of total claims were settled through cashless mode and other 38 per cent through reimbursement mode and 2 per cent through both cashless and reimbursement mode.

Table 4: Claim settlement ratio of emerging five health insurance companies (in percent)

Health Insurance Companies	2020	2021	2022
Acko General Insurance Ltd.	93.49	93.65	97.20
Aditya Birla Health Insurance Co. Ltd	99.36	99.73	99.41
Care Health Insurance Co. Ltd	100.00	100.00	100.00
The Oriental Health Insurance Plans	92.71	91.22	90.18
HDFC ERGO General Insurance Co. Ltd	99.8	98.36	98.49

Source: (2020-2021) data taken from PolicyX.com, (2022) The Economic Times [of less than 3 months]

Health Insurance Claim Settlement Ratio is a claim paid in a financial year in comparison of claim applied by the policyholder. A key lesson has taught by the pandemic that insurance save us a lot of financial trouble. The figure above depicts the Health Insurance companies that have settled the highest number of claims in last three years. The digitalization throws light on the progress of the health insurance companies, that conclude the faster settlement through different technologies along with the customer satisfaction.

Findings and Discussion

The use of modern technologies mostly affects the functioning of the insurance companies in the economy. Despite, the fact that digitalization processes in the insurance sector is not only at the initial stage of development but can also see the certain trends have already emerged:

- Reduce gap between Insurer and Customer
- The use of artificial intelligence in company
- Rise in innovation of new solutions for claim settlement
- Increase number of interactions

Base on our study, we found that digitalization has the potential to transform the claim settlement process in health insurance. Our analysis revealed that digitalization can lead to faster and more accurate claim processing, reduced fraud and improved customer satisfaction. Therefore, our study also identified several challenges associated with digitalization, including data privacy concerns and the need for significant investment in technology and infrastructure. Further, research is needed to explore these challenges and develop strategies to overcome

References

1. Digital Insurance: Insights in Digital Trends in Insurance Industry. Digital Insurance: Digital Trends in Insurance Industry (acko.com)
2. Samad, W. Atieh, M & Adda, M. (2023). "Transforming Health Insurance Claims Adjudication with Blockchain-based Solutions," *Procedia Computer Science*, vol.224, pp. 147-154.
3. Digital Transformation: A Key Aspect in the Future of Insurance Claims
4. How the insurance sector has performed in 2023- CXOToday.com.
5. Technology and Health Insurance Claims: How Digital Tools Are Streamlining Settlements. Technology and Health Insurance Claims: How Digital Tools Are Streamlining Settlements (indiatimes.com)
6. Technology and Health Insurance Claims: How Digital Tools Are Streamlining Settlements. Technology and Health Insurance Claims: How Digital Tools Are Streamlining Settlements, ET HealthWorld (indiatimes.com)
7. Transforming health insurance with technology: A look into India's digital healthcare future. Transforming health insurance with technology: A look into India's digital healthcare future (indiatimes.com)
8. Bhojani, C. (2020). "Emerging Technologies in Insurance & Adoption strategies by various stakeholders", *IRDAI*, pp.26-28.
9. Medical Claims Adjudication: What You Need To Know About It. Medical Claims Adjudication: What You Need To Know About It (healthworkscollective.com)
10. Consider These Points When Making Health Insurance Reimbursement Claims Bayzat Blog (2015) <https://www.bayzat.com/blog/consider-these-points-when-making-health-insurance-reimbursement-claims/>
11. C.L. -Chen, Y.Y. Deng, W.J. Tsaur, C.T. Li, C.C. Lee, C.M. Wu. *A traceable online insurance claims system based on blockchain and smart contract technology*. *Sustainability*, 13 (16) (2021), p. 9386
12. Excellence In Insurance With Technology Driven Data. Excellence in Insurance with Technology Driven Data | IBEF
13. Health Insurance Claim Settlement Ratio. www.renebuy.com
14. Annual report of Insurance Regulatory Development Authority, 2021-22. <https://irdai.gov.in>
15. The Economic Times, Quickinsor and Policy X.com.
16. Godwin, A and D, Dwomoh. (2023) "Impact of digital health technology on health insurance claims rejection rate in Ghana: a quasi- experimental study". *BMC Digital Health*. DOI:10.1186/s44247-023-00006-3
17. David,A.(2019). "Blockchain for Insurance and Claims Fraud Detection". <https://doi.org/10.1109/bia48344.2019.8967468>.

