Chapter 2

Review of Literature

2.1 Insurance

2.2 Insurance needs

2.3 Insurance need determination

2.4 Risk management

2.5 Insurance penetration

2.6 Performance of Insurance services in India

2.7 Insurance Gaps

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The review of literature for this research has been conducted covering various aspects such as Insurance, Insurance needs, Insurance need determination, Risk management, Insurance penetration, Performance of Insurance services in India, Gaps in insurance and Data mining etc. These were useful in deriving the objective of the research and in turn led to the hypotheses for further investigation. Some of the important contents from the review are being shown here.

2.1 Insurance

Insurance service in India offers varieties of insurance services/ products specially in the non-life insurance sector.
According to a published information by the Insurance Regulatory and Development Authority of India (IRDAI), there were 109 non-life insurance products/add-ons offered by various non-life insurance companies in India during financial year 2014-15.

Hughes and Cornah (1994), explained the concept of general average in marine insurance as “That which has been sacrificed for the benefit of all shall be made good by the contribution of all”. This is one of the most basic concept of insurance.

The below figure has been taken from the Annual Report published by Insurance Regulatory and Development Authority of India for the year 2015-16. This shows the distribution of premium underwritten by Non-life insurers in India during 2014-15 and 2015-16. Motor insurance has the biggest share followed by health insurance. Health insurance share increased marginally in the year 2015-16 at the cost of marine insurance and other insurance.

Figure 2.1: Premium Underwritten by Non-life Insurers in India in 2014-15 and 2015-16 (Source – IRDAI Annual Report 2015-16).
2.2 Insurance needs

Insurance needs are plenty in nature and in spite of having hundreds of insurance products, there seems to be gaps offering huge opportunities for insurance companies.

According to Roy (2012), Indian census 2011 has listed over 310 million concretised houses as places of dwelling. And a back of the cover calculation based on IRDA data about policies issued by COB shows that around 45 million householders’ insurance policies were issued in Indian market. This shows a wide gap and sea of opportunities.

Consumer trust in financial services is of utmost importance as suggested by Atchinson (2205) by mentioning “In today’s challenging business climate, a variety of constituencies in the financial services industries are looking to professional standard setting organizations to establish and promote Best Practices in the market place. Such organizations working with the financial services companies and regulators, can accomplish a great deal to promote consumer trust.

2.3 Insurance need determination

There are new types of risks emerging with time and advancements that make the insurance need determination quite challenging and necessary.

“Disruptive technologies will bring great benefits to society. However, this disruption will create losers as well as winners.” According to a joint report by CII and Cicero, emerging technologies bring a set of emerging risks, including the internet of things, automation, big data, cyber warfare, drones, driverless cars and artificial intelligence. These make the insurance need assessment even more challenging.
Harrington and Niehans (2011) wrote in their book that risk aversion is the fundamental force that induces people to purchase insurance. Some of the other factors that influence people’s decisions about insurance purchases are premium loading, income and wealth, information (about loss distribution), other sources of Indemnity, Non-monetary losses etc.

They further mentioned that some of the benefits of increased risk retention by a firm are

- savings on premium loading
- reducing exposure to insurance market
- volatility
- reducing moral hazard
- avoiding high premiums that may accompany asymmetric information and
- avoiding implicit taxes that arise from insurance price regulation.

According to Cummins (2005), “one of the most significant economic developments of the past decade has been the convergence of the previously segments of the financial service industry – particularly the banking and the insurance sectors. Convergence has been driven by increasing globalization of the financial service sector, the deregulation of financial markets, and advances in computer and modelling technologies. The shift in focus towards enterprise wide corporate risk management solutions has created a growing demand for new risk management products.”

Knowledge from the crowd can be quite valuable in certain businesses. Boudreau and Lakhani (2013) suggested that crowd can outperform any company for certain types of problems. They are energized by intrinsic motivations, such as the desire to learn or to burnish one’s reputation in a community of peers.
Present day sophisticated online crowdsourcing platforms are making it simpler to manage, support and use knowledge from crowd. Thus, crowd has become such resource that is available on demand.

2.4 Risk management

Dolly Sunny and Marina Bertha Pereira (2016), through their case study on “Financial inclusion through SHG-Bank linkage in Thane district” highlighted that formation of self-help groups with initial outside support is fast becoming an effective way of achieving financial inclusion. As part of financial inclusion, the banking and insurance services reach to the unreached, thus broadening the need and scope of risk management.

The benefits of expansionary monetary policies are declining, according to the Global insurance review 2016 and outlook 2017/18 published by Swiss Re in November 2016. The monetary policies in many markets remain expansionary but the marginal benefits are decreasing. At the same time, the associated risks are rising. This indicates about changing complexities in risk and associated risk management techniques.

Harrington and Nichaus (2004), writes in his book that pooling arrangements reduce risk for each participant when the losses are not positively correlated. With uncorrelated losses, there is a relatively high probability that a high loss experienced by one person will be offset by low loss or no loss of other participants of the pool. As the losses get positively correlated the reduction in risk by pooling arrangements is not that effective.

Individuals or businesses can reduce their risk by forming a pooling arrangement. However, managing the pooling arrangement too has its cost. Insurers act as managers of risk pooling arrangements.
They further added that risk identification and measurement are done by evaluating the frequency and severity of losses. Basic concepts from probability and statistics are useful in this.

Thus, risk management by pooling arrangements works best when the losses of different participants in the pooling arrangement are not mutually dependent and use of quantitative approaches help in identifying and measuring the risk by evaluating the frequency and severity of losses.

McNeil, Frey and Embrechts (2015), wrote in his book, “In recent decades the field of financial risk management has developed rapidly in response to both the increasing complexity of financial instruments and markets and the increasing regulations of the financial service industry”.

They further added, “although risk management has been described as one of the most important developments of the 20th century and most of the examples related to this are relatively modern, some of the concepts used in modern risk management, and in derivatives in particular, have been around for much longer”.

According to Vaughan and Vaughan (1999), consideration of alternatives and selection of the risk treatment device are steps integrated to the process by which the risk managers achieve the risk management goal. Accordingly, there can be various methods of handling risk such as

- Risk may be avoided
- Risk may be retained
- Risk may be transferred
- Risk may be shared
- Risk may be reduced.
They said, “Although some companies had already made progress in the development of a professional approach to insurance buying, it was not until 1929 that much consideration was given to the importance of the management of pure risk in business. In that year, corporate insurance buyers met informally in Boston to discuss problem of mutual interests.”

### 2.5 Insurance penetration

Insurance penetration in India has risen to 3.4% in financial year 2015-16 compared to 3.3% in the financial year 2014-15. Insurance penetration is computed as premium as per cent of GDP.

Figure 2.2 given below shows the data related to insurance penetration in 20 countries for non-life insurance, life insurance and total in the year 2015. Average of these data for the world is also shown in the same figure. Countries like Hongkong and Taiwan have highest insurance penetration whereas India has much lower than the world average.
Figure 2.2: Insurance Penetration in the Year 2015 in Selected Countries for Comparison Purpose.

Below Figure 2.3 shows how the insurance penetration changed from the year 2001 to 2015 for the life insurance, nonlife insurance and combined. The insurance penetration for the nonlife insurance remained almost similar throughout but for the life insurance it varied touching a peak during 2009-10. The fluctuation in overall insurance penetration in India over this period has been mainly due to the fluctuation in life insurance penetration.
2.6 Performance of Insurance services in India

The per cent of life insurance premium from first year premiums, renewal premiums and single premiums were 52.34%, 25.33% and 16.56% respectively for private sector life insurers of India up to quarter 2 of financial year 2016-17. Corresponding figures for public sector life insurers were 47.66%, 74.67% and 83.44% respectively. This trend indicates about the discontinuation of life insurance policies after one year.

According to Handbook of Indian Insurance Statistics 2015-16 published by Insurance Regulatory and Development Authority of India, the incurred claim ratio in insurance sectors like Fire, Marine, Motor, Health, others and total (all segments) were 74.47, 72.05, 81.18, 98.43, 75.94 and 85.05 respectively in the financial year 2015-16. The incurred claim ratio is
the ratio of total claim paid and the total premium collected in the same financial year presented as percent.

Foster (2010), in his study found that business failure is normal and trying to emulate successful companies from the past is probably a waste of time. Openness to external sources of information and innovative practices may be a right strategy for success of business. This applies to insurance service as well.

Insurance density is the ratio of insurance premium to the population of the country. It is an indicator of how much insurance premium is paid per person in the country. Below Figure 2.4 shows that India is among such countries that has lowest insurance density in the world whereas countries like Hongkong and Switzerland are among the top. These figures are for the year 2015.

Figure 2.4: Insurance Density in the Year 2015 in Selected Countries
The Figure 2.5 below shows the variation in insurance density in India over a period of 2001 to 2015. It touched a peak in 2010. Life insurance has sharp variation whereas nonlife insurance density has increased slowly during this period.

Figure 2.5: Insurance Density in India from 2001 to 2015

2.7 Insurance Gaps

Protection gap for Indian household had been estimated as 92% in the year 2014 according to a study on Asia Pacific mortality protection gap by Swiss Re. Protection gap is the difference between resources needed and resources available for dependents to maintain the living standard when the main earning member is not able to support the family. Hence, a typical Indian household has only 8% of the saving and insurance in place to face the future.
Health protection gap in India is projected to increase by 12.3% annually to USD 214 Billion by the year 2020, a report by Swiss Re suggests. India has one of the biggest gap in health protection among Asian countries. Health protection gap is the difference between expected healthcare cost and available cover for that cost assuming that society’s total healthcare expenditure as per cent of GDP remains unchanged.

According to the annual report for the year 2015-16 published by IRDAI, the duration wise breakup of pending claims in individual policies is given in the below Figure 2.6. This shows the relative percent for various durations for public sector, private sector and the total.

![Figure 2.6: Duration Wise Breakup of Claims Pending in Individual Policies (Source – IRDAI Annual Report 2015-16)](image-url)
2.8 Data Mining

One of the earliest definition of data mining by Frawley et al in 1991 defines it as “The non-trivial extraction of implicit, previously unknown, and potentially useful information from data”.

According to Jiawei Han and Micheline Kamber, “Apriori is a seminal algorithm proposed by R Agrawal and R Srikant in 1994 for mining frequent item sets for Boolean association rules. The name of the algorithm is based on the fact that the algorithm uses prior knowledge of frequent item set properties. Apriori employs an iterative approach known as a level-wise search, where k-itemsets are used to explore (k+1)-itemsets.”

Tom Soukup and Ian Davidson (2002) elaborate, “Functionally, unsupervised learning techniques take as input a collection of records and attempt to find patterns within and amongst them. The types of patterns and the search process to find them differ from tool to tool. Association rules look for patterns in the form of combinations of column values that frequently occur in the data.”

Banerjee, Bandhopadhyay and Acharya (2013), mentioned the three constituents of an Analytic Process as Information Resources, Process Capability and Business Acumen. There has to be a right mix of these for an effective analytic.