



## “A study on history of actuaries and actuarial entrepreneurship today”

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**Abstract:** *The world is developing at a faster pace in every field. This is possible through integration and globalization. These developments gave opportunities to the entrepreneurs. But these opportunities are not in isolation from challenges and competition. An entrepreneur should be ready to handle risk. Taking up risk requires proper estimation and management. To do this particular work we have professionals called actuaries. The present paper is exploratory research with secondary data being major source of information. The objective of the paper is to take the research from roots (history) of actuaries to present; actuaries as entrepreneurs. The paper is divided into three sections. The first, introductory section includes, introduction, objectives and methodology. The second part details on history of actuaries, skill set of actuaries, discussion on ‘can actuary be called as profession?’, and how actuaries are widening their scope of operation towards becoming entrepreneurs and handling Enterprise Risk Management(ERM). The concluding section discusses on major findings of the study.*

**Key Words:** *Actuary, Entrepreneur, risk, insurance, profession.*

### 1. INTRODUCTION

The world is developing and moving forward at a very faster pace in every identified field, whether it may be medicine, artificial intelligence, engineering, marketing, infrastructure, accounting, insurance or investments and etc. Especially in India this development can be witnessed majorly after implementation of ‘The New Economic Policy – 1991’, Liberalization, Privatization and Globalization (LPG). LPG promised most competitive environment and Indian economic growth through modifying trade policies, removing trade barriers and removing restrictions on growth of firms. Even if not achieved 100% since implementation of LPG, India is now a fast-developing country. All this development is possible in India and the globe at large is only because of integration and multidisciplinary contributions among the various fields. As a result, directly or indirectly these developments have given various opportunities to the young, and budding entrepreneurs to come on lime light and prove themselves. But these opportunities are not in isolation from challenges and competition. The one bearing most of the risk and enjoying all the rewards in creating a new business is called as an entrepreneur. An entrepreneur can face challenges and compete with peers only if he is ready to take up risk. Risk refers to deviation from expected or anticipated earnings and outcome, as a result of uncertain situations. Taking up risk is not as simple as it is told. It requires proper calculation, estimation and management. Identifying, assessing, estimating and controlling risk is called as risk management. Risk management helps an entrepreneur in either completely nullifying the risk to zero or minimize its negative impact on business operation. Risk management cannot be done by an entrepreneur alone, as it needs expertise knowledge and experience. To do this particular work we have professionals called actuaries.

The term actuary seems to be new, but it has age old history. Actuaries and actuarial science were created more than 300 years ago. The professionals specially trained to use their statistical, mathematical, economical, and financial skills in measuring the risk of future events and assist in management of skills are called as actuaries. They are considered as problem solvers and strategic thinkers. Traditionally, actuary’s associations were pre-dominantly with insurance (life as well as general) and pension plans. But today along with insurance the scope of actuaries widened to various other fields like banking, finance, investment, research, technology and climate change. All this change what



we observe is because actuaries deal in minimizing the impact of uncertain and unpredictable situations either in the business or in an individual's life. Apart from working for someone, at present one can observe that actuaries coming forward to become entrepreneurs. Hence, the main moto of this paper is to take the research from roots i.e. history of actuaries to present; actuaries as entrepreneurs.

With these introductory lines, this section being the first section of present article is entitled introduction and is framed to give a keynote of the entire article. It throws light on the aspects of what is researched, why is it researched and how is it researched. The next and second sub section of this first section is review of literature on history of actuaries and skill set of actuaries. Based on review conducted the research gap is identified and stated. Moving forward the objectives of the present study are listed in the sub section three of this section one based on research gap identified in the second subsection. Methodology adopted to conduct the research is described in the last sub section i.e., fourth sub section.

## 1.2 Review of Literature

Review of previous theoretical and empirical works related to the study helps the researcher to build trust and rapport among the readers. There are high probabilities of research being repetitive if the researcher fails to do this ground work. Hence review of literature is important and acts like a basement for any kind of research.

Ogborn, M. E. (1956) in his article, with title "*The Professional Name of Actuary*", stated that the term actuary is derived from Latin word 'actuarius', which means a short hand writer or one who writes accounts. During that time the so called actuaries were doing the job of short handers, rather than the roles performed by today's actuaries. In the article titled 'The Actuary: The Role and Limitations of the Profession since the mid-19<sup>th</sup> century', written by Bühlmann, H. (1997), it is stated that Actuary is one of the oldest professions in the financial world along with accountants, underwriters, statisticians, demographers, operations researchers and financial engineers. They were majorly rooted up with Life insurance sector, and gradually expanded towards non-life insurance. Though there are many other professions, which seems to be overlapping actuaries, actuarial work remains unique. This is because of their sill set and abundant knowledge. Lewin, C. (2001), in his article titled 'The Creation of Actuarial Science', he quotes that actuarial science was created more than 300 years ago. Actuarial science and techniques are adopted these days across various fields, hence the author proposed to introduce the concept of actuaries (as part of syllabus) to the students from their schooling itself. 'An actuary is defined as an expert in insurance who evaluates insurance risk, charge fair price to insurance products and compute reserves to meet claims and expenses as and when they occur', is quoted by Akshatha B. G in her article titled 'Actuaries Role in the fixation of Premium in Insurance Business'. Lillevoid & Eyland, n.d., (2014), in their article on 'Actuary', provide the definition of Actuary as given by IAA (International Actuarial Association). "Actuaries are multiskilled strategic thinkers, trained in the theory and application of mathematics, statistics, economics, probability and finance". They even provide information that Actuarial science is not self-contained, it is built on several fields like – pure mathematics, probability, mathematical statistics, computer science, economics, finance, and investments.

Jim Daniel (2006), in his work he puts forth his opinion that qualifying as an actuary is very difficult. Therefore, the passing percentage of exams conducted by Society of Actuaries (SOA), America was just 55% to 60% during the year 2006. But once a person is qualified as an actuary, he can earn lump sum. International Actuarial Association (2013), identifies the various fields actuaries are associated with; life insurance, health insurance, non-life insurance (general insurance), enterprise risk management, private pensions and employee benefits, financial services, education and other roles for social welfare life. D'ARCY, S. P., (2005), made a study on "On Becoming an Actuary of the fourth kind". In his study, he divides the history of actuaries associated various fields into four generations. First kind of actuary (17<sup>th</sup> century) – Life Assurance actuaries, second kind of actuary (early 20<sup>th</sup> century) – Casualty actuaries, third kind of actuary (during 1980's) – Investment actuaries and the present fourth kind of actuary (2005 onwards) – Enterprise Risk management Actuaries.

O'Brien, C. D., et al., (2016), examined the role of actuaries in UK life offices and skill set they hold. The primary skill set they hold includes Mathematical, Financial, Statistical and economical. They secondary skill set they hold is leadership styles, strategic thinking, communication and decision making (personality development skills). Ethics became more important in the resent age of insurance. And therefore, to actuaries also as they are associated with insurance. Marais, A. F. (2015), in their study entitled 'Teaching Ethics to Actuaries', evidenced that Education of ethics in various fields and professions like Engineering, Accounting, Medical, Auditing is found to 10 lecture hours on an average, expect in Actuarial profession in South Africa. Ethics education helps actuaries have the knowledge and capability to meet their professional promise.

**RESEARCH GAP:** Though Actuary seems to an unheard term, there a few goods number of articles over it. We can find articles explaining history of actuaries, in England and other western countries. We can even trace down a



few articles briefing on the role of actuaries and the skills of actuaries. The concentration of major articles reviewed are from western countries. Hence, geographical gap in the study can be identified. One can find no article comprehensively dealing with or detailing on history, roles and work area of actuaries with special reference to India. As well one can find very countable articles dealing combination of actuaries and entrepreneurship, both in western and eastern part of the world. Hence, the present study “A study on history of actuaries and actuarial entrepreneurship today”, remains unique as it evaluates flow of actuarial profession from its begin till toady, and can actuary become an entrepreneur.

### 1.3 Objectives of Study

1. To know the history of Actuarial science and actuarial profession across the globe in general and in India in particular.
2. To identify the skills set that actuaries should hold to fulfill their traditional as well as non-traditional roles.
3. To evaluate if an actuary can go beyond traditional limits and apply techniques to be an entrepreneur.

### 1.4 Methodology adopted

The current study mainly focuses on describing the characteristics of the population i.e., actuaries. Therefore, Basic research (the paper directed towards providing greater understanding of actuary) and Descriptive research (the paper concentrates on describing an actuary to the fullest) are the methodologies adopted for current study. The article is framed in such a way that, if somebody reads in between the first and last of the whole article of any section of the article will be able to get the at least a brief idea of the study. The relevant and required data is collected from secondary sources like publications made by various actuarial associations and journals across the globe and official data (data base) published by IRDA (Insurance Regulatory and Development Authority Of India) and actuarial associations.

The present research work is subdivided into three sections. The present section i.e., first section, being introductory section includes, topic introduction, objectives of study and research methodology. The next and second part being crux of the paper details on history of actuaries, skill set of actuaries, discussion on ‘can actuary be called as profession?’, and how actuaries are widening their scope of operation from traditional fields like insurance and pension to becoming entrepreneurs and handling Enterprise Risk Management (ERM). The last section being concluding section discusses on major findings of the study.

## 2. HISTORY OF ACTUARY TO THE ACTUARY AS AN ENTREPRENEUR TODAY.

The second section being the crux of the paper, describes on certain characteristic aspects related to actuaries. The first sub section of section two describes one phase of global history of actuaries and briefs on India history of actuaries. The second sub section of section two throws light on crucial skills set an actuary should develop in himself to serve his best in his profession. Can Actuary be called as a Profession? This question is answered in the following third sub section. The fourth and last sub section of this second section discusses on actuarial entrepreneurship, which is the burning topic right now in the field of actuaries.

### 2.1 History of Actuaries

Actuarial science handles with answering uncertainties pertaining to the future with application of quantitative and statistical techniques. The uncertainty might relate to any field where there is probability of injury and loss. Finance and insurance are the major areas where we find their application. Professional skilled to perform this are called as actuaries. Or we can describe an actuary as a person holding a mathematical crystal ball to peep into the future. Peeping into future requires various models, observations and past experience. So, from when did need to look into future and handle loss and injury actually arise? To know this, we will have to study the origin and history of actuary, which is discussed as follows.

It is told that actuarial science was created more than 300 years ago. There are various influences which traced down development of this new profession. Insurance is the prominent influencing factor for emergence of actuarial profession. Hence, before looking into the history of actuaries, there is a small story of insurance to be heard, which laid pathway for actuary. Marine insurance is the first among all types of insurance. History of marine insurance ways back to 4<sup>th</sup> century, where the loss of cargo due to sea travel was guaranteed, in a handwritten document. And then in 14<sup>th</sup> century, in a contract of shipment of wheat at Sicily, the 1<sup>st</sup> record of marine insurance was traced. In the beginning of 17<sup>th</sup> century in England, friendly associations were made, to afford the expenses of cremation, burial and monuments. On the weekly basis a small amount of money was paid into the communal fund and the fund would cover the expenses of various rites and burial upon the death of a member of the association. This came out to be called as burial insurance.



All these assurances against cargo and burial expenses involved the concept called risk management. Development of a rough and more scientific basis for risk management was seen during the 17<sup>th</sup> century. In the year 1662, John Graunt from London showed other than following to that of a single individual, there were predictable patterns of longevity and deaths as recorded for a group of people. This became the basis for life table. Combination of life table, compound interest, and annuity gave way to create life insurance and pension schemes to group of people. But this further required in depth understanding and one's ability to see through future occurrences and set funds aside to meet the same. In life insurance the quantum and value of further coming liability was known but the timing was unpredictable. So, this posed the major difficulty to figure out what the present value of future liability would be, where time in future is unknown. To tackle this a liner model was formulated, based on past experiences, learnings and events to answer the question, when the future liability would be due to come. And this part of work can be performed only by the individuals who are experts in finance, statistics, economics and mathematics. These experts were identified and called as Actuary.

The term Actuary is derived from Latin word 'actuarius', which gave two meanings, one is shorthand writer and the other is one who writes accounts. But these definitions very scarcely do justice to the roles and duties performed by the actuaries today. With the financial development and in response to the demand for person with requisite mathematical skill to solve problems with life contingencies, especially in connection with life insurance office, provident funds, and pension schemes, the actuarial role and duties changed and the profession grew abundantly.

### 2.1.1 History of Actuaries in India

With the establishment of 'Erstwhile Actuarial Society of India (ASI)', in September 1944, the journey of actuarial profession started in India. Fostering the growth of actuarial profession in the country was the main objective of this institute. The institute helped the government to frame policies regarding insurance, pension plans and provident funds. Actuarial services were imported by Indian offices till the establishment of this institute. No actuarial examinations were conducted in India till 1989, even though the ASI was established.

From the year 1989, ASI started conducting Associate level examination as it got registered under literary, Scientific and Charitable Society Act XXI of 1860 and also under Bombay Charitable Trust Act, 1950. It started conducting fellowship level exams from the year 1991, which lead to professional qualification of an actuary. Later Institute of Actuaries of India (IAI) was established in the year 2006, under The Actuaries Act, 2006, for Actuarial regulation in the country.

## 2.2 Skills Set of an Actuary

Actuarial profession is a high paid profession. This is because of education, degree of specialization and skills set necessary to fulfill the job requirements as demanded by the employers. Therefore, an actuary who enter into the field with right set of skills can excel and build a very prosperous career. Actuaries will need a extensive range of skills to be successful. The most important five of are listed below.

### 1. Analytical and problem solving skills

Examining complex data, identifying the patterns and trends, to determine which factor is responsible for specific outcome, is the first task of every actuary. After evaluating and weighing factors, they look out for alternatives to reduce the impact of an undesirable outcome or reduce the cost of realization of undesirable outcome. Henceforth, analytical problem solving will have to be priority skill to the actuaries.

### 2. Numerical and mathematical skills

Being able to do quick and correct basic math is a definite requirement for an actuary as they all time deal with numbers. But the mathematics associated with actuarial science is much more complex, as it requires knowledge of statistics, probability and calculus, to assess risk and determine probable likelihood of unpredictable events.

### 3. Technical and computer skills

Apart from knowledge of Microsoft office and basic computer skills, very important is being able to program in statistical programming language. Because actuaries use various models and huge tables to examine large data. Hence, the tools of actuarial practice are computers and variety of statistical modelling software.

### 4. Finance and business knowledge

As actuaries are usually responsible for examining and pricing insurance, pension plans, advising businesses on how to limit exposure to financial risk and helping banks with expert opinions on maximizing the returns for various investment products; insurance companies, financial institutions, businesses and banking companies are the usual employers of actuaries. So, actuaries need sound understanding of financial concepts and business strategies.

### 5. Interpersonal and communication skills





Programmers, financials, accountants and senior managers are the various personnel, actuaries will often have to collaborate with. Henceforth, to simplify and convey, technical and statistical details to diverse audience, actuaries will need strong hold on oral communication. Often actuaries lead teams over various projects, hence they must be able to manage with interpersonal skills too.

Apart from these professional skills, actuaries should even have personal characteristics to tolerate the pressure they being an actuary. An actuary should possess the following skills; self-motivation, creativity, independence, ambition and ability to work with others (superiors, same cadre colleagues and subordinates).

### **2.3 Can Actuary be called as a profession?**

Australian Council of Professions defines Profession as “A profession is a disciplined group of individuals who adhere to ethical standards and who hold themselves out as, and are accepted by the public as possessing special knowledge and skills in a widely recognized body of learning derived from research, education and training at a high level, and who are prepared to apply this knowledge and exercise these skills in the interest of others”.

The actuary satisfies every parameter of the above stated profession definition. An actuary possesses special knowledge and skill of problem solving. They are learned, educated and well trained with statistics, mathematics, economics and finance for risk identification, assessment and management. They serve the best interest of insurance companies, policy holders, government, pension funding, banking and other businesses in accurate estimation and management of risk. Actuaries abide to the roles and their ethics, laid down by government authorized governing bodies or actuarial bodies of respective country. Hence, an actuary can be called as a profession.

### **2.4 Actuary as an Entrepreneur**

Entrepreneur defined by oxford dictionary is as follows – “A person who takes up a business or businesses, accepting and taking on financial risk in the hope of profit-making is called as an entrepreneur. A business is set up by an entrepreneur combining three key elements – idea, capital and expertise. It is not the job of entrepreneur to be goods in all the three elements. His role is to seek out and combine these key elements to form the business.

On evaluating the entrepreneur skills, the following can be grouped – passion, vision, willingness to take risk, tenacity, hard work, analytical problem solving, determined, hard work, adaptable/flexible, networking and communication. On consideration of these skills, it can be observed that few are inherently owned by actuaries. Actuaries are trained analytical problem solvers, as they are expert in risk assessment and management, and they are thought to consider big picture and complex concepts and convert them to simple solutions. By taking decision of being an actuary, they are ready for hard work, they are determined and they are being focused. The other characteristics which are not in the spoon of actuaries are soft skills – visionary, flexibility, communication and networking. But these can be inhabited into them through some training and development programs and supportive mentoring and monitoring.

On consideration of all above benefits and limitations for an actuary to be an entrepreneur, it is optimal for an actuarial entrepreneur to partner with an expert from the chosen field of business. And combine actuarial approach with entrepreneurial instincts in assessing opportunities, risk taking and managing and conducting of business. This partnership would serve them a win-win situation; where the entrepreneur is supported with professional risk assessor i.e., actuary and can confidently take risks; and the actuary is associated with a tactful businessman where he can apply his full potential and use his partners insights in successful conducting of the business.

## **3 FINDINGS AND CONCLUSION**

The third and the last section of the study i.e. conclusion, is framed in a such way to give gist of whole article in one glance to the reader or any other user of this article. The article is divided into three main sections, the first being the introduction. The prefatory note of this sections gives background study of business, entrepreneur and actuaries. Based on background the related literature is surveyed later and research gap is identified. Based on gap identified the objectives of study are framed – to now the history of actuaries, to identify the skill set of actuaries and to find out if actuaries can act as entrepreneurs.

Considering the objectives in the second section, being the main part of the study, is subdivided into four sections. The first sub-section details the origin of actuaries across the globe in general and India in particular. Insurance is the main root for origin of actuaries, because in insurance the future liability is known but the timing is unknown. Gradually from insurance the application of actuarial science expanded to other fields like, pension, gratuity, provident fund, banks, investments and government policies. Today its application has expanded to non-traditional fields too like – climate change, ERM (enterprise risk management), business analytics, data mining and etc. The second sub section of section two deals with skills set that an actuary holds. It states that an actuary should hold both professional as well



as personality skills. Professional skills like math knowledge, technical knowledge, problem solving skill and good sense of accounting, finance, economics, math and statistics. Personality skills like self-motivation, creativity, ambition, independence, and communication. The third sub section justifies that an actuary can be called as profession, as it satisfies all the conditions to be called as profession. The last and fourth sub section of second section details that an actuary can be an entrepreneur with the support of training and partnering with experts of non-traditional actuarial fields.

The present and the last section being concluding section gives concluding comments. Though the term actuary seems to be unfamiliar but it has its history back 300 years ago, since trade being started between the countries. But it remains unfamiliar due to lack of awareness. The scope of an actuary today has expanded from insurance, pension and financial investments to various other non-traditional fields. With help of actuaries, risk management become simpler. If actuaries themselves turn up to become entrepreneurs it would lead to overall economic development. The current supply of actuary is less than the actual demand, therefore they are very highly paid for the services they render. To eradicate this shortfall the learned suggest that, awareness of actuarial science and actuarial profession should be created among the students from their schooling itself, by introducing actuary to students on including it as part of their syllabus. So, that the number actuaries would increase and with their rich skill set they would help development of insurance in particular and the economy on the whole.

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