**Introduction**

The classical foundation of probability theory was put together by Abraham De Moivre and Jacob Bernoulli. This theory continued till early twentieth century. This time evolved theories surrounding the Classical calculus including Geometric probability, Relative probability, Cournot’s principle, and Bertrand’s paradoxes.

Andrei Kolmogorov established modern probability theory’s axiomatic basis in 1933. Kolmogorov enhanced classical probability by adding countable additivity to it. The theory started with measurability of sets of real numbers. Theories of measure progressed with early contributions from Borel and Lebesgue who defined the foundation. Kolmogorov then worked with Fr´echet’s integral which was discussed with Markov processes. Followed by J.L. Doob’s contribution on Martingale theory.

Each of the above-mentioned contributions are detailed in below sections:

**Conclusion**

This report shows how the development and progress happened over time in the analysis and understanding of stochastic processes.

Kolmogorov contributed to a mathematical theory which has evolved over 8 decades. Kolmogorov’s theories helped development of sophisticated statistical methodology. Kolmogrov proposed three axioms of probability that generalized probability beyond existing empirical definitions. These axioms provided the pioneer for dealing with events independent of their nature – based on their relative properties and set arithmetic.

Markov’s work gave a way to a novel branch of probability theory and preempted the theory of stochastic processes. Markov’s approach to random walks provided a strong foundation to generalized group of stochastic processes. Random walk can be observed in gambling or finance.

J.L. Doob primarily developed two theorems of stochastic process which can be used to prove the validity of the method of maximum likelihood. Doob introduced Martingale theory, in discrete and continuous time. The popular name in development of martingale theory is of Doob, who proved many fundamental inequalities, the first limit theorems, and linked martingales with the “stopping times” these random variables that represent the “first time” that we observe a phenomenon.

Thus, analysis of stochastic process has progressed over time by work building upon exiting foundation and by multiplying branches of mathematics.  This defines why it is integral to lay foundations to stochastic processes before jumping over its applications.