

## The Convergence of Artificial Intelligence and Bio-Informatics: Shaping the Future of Social Science Research

**Dr. Suresha K C**  
Associate Professor  
Department of Studies and Research  
in Public Administration  
Tumkur University  
Tumakuru

**Abstract:** The growth of technology especially in the field of Artificial Intelligence and Bio-Informatics is changing the landscape of many subjects, especially social science. Social Science being primarily concerned with the study of human relations in society is completely ill prepared to receive the jolt of this new technology. This paper tries to understand the impact of Artificial Intelligence and Bio-Informatics on Social Science, especially in areas like: Natural Disaster Management; Security and Managing virtual Economy.

**Key Words:** Artificial Intelligence; Bio-Informatics; Natural Disaster Management; Security and Managing Virtual Economy.

**Introduction:** Present day social science knowledge followed across the world is the gift of Modernism. Modernism was a child of industrial revolution it was based on two basic factors economy and technology. So, Modern social science is also shaped by the influence of economy and the technology. We can trace out the influence of economy and technology on social science in three phases:

- 1) **First Phase:** Adam Smith's "Wealth of Nations" to 1929 Great Depression in America. During this period Market was given freedom and the state supported the economy. The knowledge of social science was revolving around these issues.
- 2) **Second Phase:** 1930's to 1970's (End of II<sup>nd</sup> World War), during this phase countries (specially western countries) realised that giving complete freedom to market will lead to economic crisis. So, as suggested by the economist John Maynard Keynes, state took the active role in managing the economy. Moreover, twin disasters: a) Great Economic Depression of 1929 and b) II<sup>nd</sup> World War (which caused much damaged to the basic infrastructure in western countries) made private players reluctant partners in investment for rebuilding the economy of the country. So, it became inevitable on the part of state to play an active role and revive the economy. This process led to welfare state and its impact created a powerful State. It became so powerful that state became single point solution for all the problems of the people.
- 3) **Third Phase:** 1970's after wards countries like USA and UK's economy started facing financial crisis due to excessive spending on the welfare programmes. Because, in welfare programmes, state was investing in various social welfare schemes but at the same time could not fill its coffer in return in the form income through these welfare programmes. So, the Government in these countries decided to open-up the

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economy, wherein, the Government will manage basic minimum functions like security, currency, foreign relations, etc and in other sectors private players will be allowed to invest. This Process led to the birth of globalization, privatisation and liberation.

Above mentioned three phases had significant impact on the development of social science, First phase led to the development of theories like Classical Liberalism, Marxism, Socialism, etc. Second phase led to the development of Modern Liberalism, Environmentalism, Human Rights, Feminism, etc. Third phase led to the development of theories like Post Modernism, Neo- Liberalism, Deconstructionism, etc laid the foundation for the development of social science from 18<sup>th</sup> century to 21<sup>st</sup> century.

**Future of Social Science:** In a globalized world two important technological factors are going to shape future of Social Science, namely: a) Artificial Intelligence and b) Bio-informatics.

**a) Artificial Intelligence:** It is the ability of a computer or a robot controlled by a computer to do tasks that are done by humans, eg: speech recognition, decision- making and visual perception.

**b) Bio-informatics:** Application of tools of computation and analysis to capture and interpretation of biological data.

Further, innovation in these two technologies will provide enormous data about each human behaviour and needs, etc. with this, modern day Government which caters to the needs of general public through general policies and programmes, has to remodule itself with its mechanism to tackle the needs of each individual, whose information is available through Bio-informatics. To do that, the Government requires Artificial Intelligence, where in, the Government has to handle issues at general public level (present perception of general public will change as aggregated group to collection of each individuals) and at the level of individuals. Moreover, as we receive specific information about each individual thorough Bio-informatics, solutions provided also should be specific for which we require Artificial Intelligence.

**Future Problems:** In coming 30 years, we are going to encounter three major problems for which the Government as well as social science in general needs to prepare itself to address these problems by adopting Artificial Intelligence and Bio-Informatics. Otherwise, it will be detrimental to the survival of social science as a discipline. The problems are:

**A) Natural Disaster Management:** The major problems under natural disaster management are a) Climate Change and b) Pandemic.

**a) Climate Change:** Climate change is the one major issue which is going to impact the mankind in future. Disastrous Climate Change effects are like: Tsunami, earthquake, rising of sea level & temperature, etc. Adoption of Artificial Intelligence provides us exact information about when, how and to what extent, climate disaster will have impact on us. Adding to this,

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Bio-informatics will provide information about climatic disasters impact on each individual in terms of health, social and economic factors.

**b) Pandemic:** Globalization being order of the day has increased economic and technological inter-dependence of countries across the world. This, interdependence helps pandemic to easily spread and create havoc across the world. Handling pandemic has both a) internal aspect and b) external aspect of it:

**i) Internal Aspect:** Pandemic like Corona requires enormous amount of involvement by the State machinery from health sector to police and local bodies, etc not only these departments need to work together, but also require real time information about pandemic affected individuals and their contacts as well as preventing other individuals from coming into contact with the virus effected individual. In this Situation, Bio-Informatics provides information about effected individual and their contacts and also of viral load. Artificial Intelligence provides information in real time to supporting agencies like police and local body institutions, etc. to take precautionary measures in short time.

**ii) External Aspect:** Three aspects are important namely: a) Each country needs information about the virus variant and its possible impact on its people; b) Handling pandemic requires global coordination in terms of innovation of antivirus dose and its distribution across the globe; c) Managing economic goods import and export activity during pandemic as well as maintenance of economy. All these aspects require information about individuals and communities across the globe and this massive data will be provided by the Bio-Informatics supported by the Artificial intelligence.

**B) Security:** In future resource management will become the at most important security issue and any lacunae in the management will lead to disastrous results.

**i) Resource Management:** Land, water and mines etc resources management will be the important security issue in future. Innovation of technology will not only help in using these resources but also poses a threat to its security, for eg: Haiti group attack on Saudi oil reserve, border dispute between India and Pakistan and India and China, etc. This requires modernisation of military and security forces, in modern days it means updated technological warfare and protection weapons. So, in this aspect Artificial Intelligence Technology will play a very crucial role. Countries like Israel are using Artificial Intelligence Technology to manage borders than using uniform men.

In the same way, externally managing resources is having cooperative relationship with other countries in terms of export and import. In this aspect also Artificial intelligence can help in providing information about availability resources across the globe and also upgradation of technology in military production helps countries to export the same to other countries.

**C) Managing virtual Economy:** Innovation of Digital Currency like Bitcoin and other such types of currencies are challenging the Economic Sovereignty of the State. State is not in

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control of these currencies neither it can ban it completely, as it exists in the public domain through dark data. for eg: According to one estimate there are 10 lakh bitcoin users in India.

This type of unmanaged virtual currency can create lawlessness or in other words detrimental to the existence to the State and its bureaucracy, because the State and bureaucracy cannot survive without the economy. To manage virtual currency you require high end Artificial Intelligence and Bio-informatics, to trace out the origin of a transaction and for what purpose and who has used it. Once, this is done virtual currencies can be managed by the State and bureaucracy in efficient manner.

**In conclusion**, in future Artificial Intelligence and Bio- Informatics are going to completely change the understanding of social science. Even there is threat of replacement of social science knowledge being taken over by the knowledge system of science and technology. But, the reality is that the impact of Artificial Intelligence and Bio-Informatics on Society, Individual and the State Machinery needs to be closely observed by the social scientists and deeper understanding of this aspect will help social scientists to build a society being protected by the negative impact of Artificial Intelligence and Bio-Informatics, not only that it will help the social scientists to sustain the subject and make it more relevant to the society.

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