Multifaceted Aspects of Advanced Innovations in Engineering and Technology

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***Abstract*—The process in science and technology for society betterment is necessitated by the management of sustainable development and advanced innovations. This trend is very necessary for the present as well as in future to keep up to stay competitive by creating a better and sustainable future through successful exploitation of new ideas then being able to improve business processes, bring new and improved products and services to market with increased efficiency and most importantly improving profitability. The main aim of this paper is to describe the motives of necessary knowledge and skills in planning for innovation management by overcoming uncertainties through design, development, and creation of optimum routes for sustainable development.**

***Keywords*—Sustainable Development, Cybersecurity, Uncertainty, Population Growth, Climate change**

I. INTRODUCTION

Multifaceted **A**spects of **A**dvanced **I**nnovations in **E**ngineering and **T**echnology is like a marvel to create and provide technological solutions to the problems, issues, and ideas that affect every area of our lives. It's like tapping and utilization of mathematics and analytical thinking skills to their fullest potential and its contributions make immense results everywhere [1]. This embarks on a growth that will assess and analyze a number of emerging technologies and the developing potential for the convergence of these technologies. Multifaceted investigation in Engineering and Technology allows broader conceptualization which is important in developing future technology.

II. IMPORTANCE OF MULTIFACETED CREATION

As the technological world is changing Innovation, Creativity and Design in Engineering and Technology have become increasingly important determinants of unarticulated needs, business models, existing market needs, new requirements, social developments etc. This results due to focus effort by a range of agents or by chance with the application of better solutions or as a result of a major system failure. In addition, current business environments, organizations need to innovate in response to customer demands and lifestyles in order to seize the opportunities offered by technology and ever-changing markets. Engineers are the ones behind so much of this development giving a

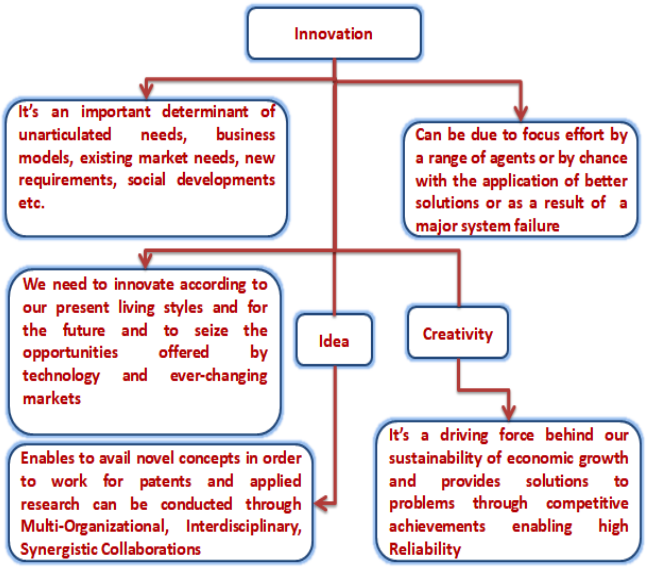

Fig. A. Multifaceted Creation

multifaceted competition that immensely contributes to different portions of society with new, updated solutions for sustainable development and provides an insight into how a difference can be made that will contribute to society, as **F**ig. **A** shows the generalized block outline diagram for multifaceted creation.

III. PROBLEMS OF CONCERN

A. Population Growth

Global population growth is a major demographic concern that prominently trends in various reports, agreed upon in the literature as well as in projections with documentation. According to present investigations, the world population will grow between 8 billion to 9.6 billion by 2050. This rapid population growth may result in unfavorable effects and will lead to a slower pace of development. These factors are changing the living arrangements so we need to look for creative and develop quantitative and qualitative methods for

mobilization of Resources, Food Production Distribution, Better Public Health Practices etc.

B. Climate Change

Climate changes have gained public and scientific prominence in recent years. As climate change is already affecting agriculture, forestry, land use, water resources and biodiversity globally [3]. It's almost unavoidable that climate change will play an ever-larger role in the coming decades and beyond as well as creating a need for a degree of adaption.

Adaption activities work on the economic alternatives and implications will become necessary in the future which are presently only at infancy. This mitigation can be achieved by limitations or preventing greenhouse gas emissions and by enhancing activities that remove these gasses from the atmosphere.

C. Difficulties in Finding Uncertainties

Uncertainty is about not knowing for sure. In trying to handle uncertainties, one needs to know all kinds of uncertainties one is currently facing. Technology uncertainty results from unknowns regarding the technologies that might emerge or be combined to create a new solution. We need to begin with those proportions in which technological change must be characterized by a high degree of uncertainty and should be a major ingredient of long-term economic growth. It will be important to address future uncertainties, which add to the complexity and creates challenges providing valuable insights that address the level of uncertainty and future risk.

D. Greatest Security Risks Facing Large Firms

Recent events have pushed cybersecurity practices to the front of many business minds. But a host of new and evolving cybersecurity threats place information security industry on highest alert. Sophisticated cyber vulnerabilities like phishing, malware, registry corruptions, and machine learning, cryptocurrency and more have placed data and assets of corporates, governments, and individuals at constant risk. With damage related to cybercrime projected to hit nearly $6 trillion annually by 2021 according to cybersecurity ventures.

Some new security threats involve:

- More sophisticated phishing
- Ransomware Strategies
- Cryptojacking
- Cyber-Physical Attacks
- State-Sponsored Attacks
- IOT Attacks
- Smart Medical Devices and Electronic Medical Records Corruptions
- Third parties (Vendors, Contractors, Partners)
- Connected cars and Semi-Autonomous trucks
- A severe shortage of Cybersecurity Professionals

We need to create positive change and serve the security needs by contributing to the mitigation of modern threats and thereby protecting national assets from the worst types of cyber-attacks.

E. Existing Technology Problems

The technology is constantly evolving with new features and products being released faster than ever. All this change is exciting, especially for the innovative companies behind today's latest technologies.

We have a multifaceted challenge which requires a multifaceted solution. Technology can take us from unknown to the known state. The social effects and meaning of new technologies are now more dynamic and complex than with previous revolutions

F. Lack of Multi-organizational, Interdisciplinary, Synergistic Collaboration

This is from limited undertaking in proof-of-concept work, improper ideas non-sustainable partnerships between organizations, failure in developing multidisciplinary innovation ecosystems. So, we need to support prototype or proof-of-concept development work by participants with partnerships between the academic researchers and third-party organizations, federal laboratories, public or non-profit technology transfer organizations. Such partnerships are required to conduct applied research on a stand-alone larger project toward commercialization and social point. In the absence of such synergic partnerships, the project likelihood for success would be minimal.

G. How to Interact with the world that is Dynamically Changing

The only thing that is not changing about technology is uncertainty. Managing uncertainty is the key to innovations in Engineering and Technology and this makes us totally unknown about how to interact with the new world that is dynamically changing [1], [4], [5].

We are living through an era of the exponential growth of new technologies, significant discoveries can happen almost anywhere as technological innovation now being as a global character. We need to be able to strike a balance between flexibility and strategy and the goal must be to create an expensive, accountable plan and then revisit that plan on a regular basis to adjust the changes that have acquired and respond with tangible action that reflect the new reality we face.

IV. FUTURE DIRECTIONS

If we think well then, we will be able to perform accordingly by creating technology in a way that our work will become easier by managing tasks through less effort and accomplish greater flexibility. We will certainly be at the cusp of the sea change of the approach in terms of technology and will change the game considerably over the most 25 years through quality application domain.

1. Points under consideration

- We need to search for real different stuff or something that can be meaningful
- We need to put more efforts so to show our expertise
- We need to reach the desired results
- We must take care of the organizations of the application during collaboration.

2. Future solutions

Its increasing dynamicity will enable to keep up to stay competitive in the field of **I**nnovative **E**ngineering and concepts will provide better insights, point in directions that will prove beneficial. Equipment manufactured through a multifaceted approach will resemble safety. The characteristic of innovative engineers will be decided by the multifaceted technology by screening the actual literature and scientific studies and this will provide joint projects from various organizations hence making capitalized strengths.

V. CONCLUSION

In this paper, the gap between **I**nnovation, **I**dea and **C**reativity is addressed and how an innovator can avail his novel concept so that applied research can be conducted through correct **M**ulti-organizational, **I**nterdisciplinary, **S**ynergistic **C**ollaborations. We will be able to create a better, sustainable future of our society by overcoming the uncertainties.

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