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Disruptive Intelligent System in Engineering Education for Sustainable Development

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Abstract

Intelligent Systems in Engineering Education for Sustainable Development is the order of the day in the field of construction, operation, maintenance and retirement of the product development. Always we are talking about multi-disciplinary engineering fields. As per the future needs the technology may replace all the existing fields and interdisciplinary and intra-disciplinary will come into the force with new shape called Intelligent Systems. The reason behind this proposal strictly speaking, there always the need of connective fields with the facts and reasoning. As per the Engineering Education System the main theme will be focused on developing a product the product to solve the problems faced by society. That means the intention should be serving the needs in an effective way. According to this system, it needs to assist and manage the people needs to provide an effective solution as per standards. Hence, the current work will show a path how engineers will collaborate together with disruptive intelligent systems.

Keywords: Intelligent System; Engineering Education; Sustainable Development;

1. Introduction

1.1 The Human

Is a person having the power of thinking, reasoning, applying knowledge to the situation for better living with the help of sense of organs gifted with the supreme power. The human is good at usage of available infrastructure in an effective manner to solve the social issues to overcome the inequalities.

1.2 The Education

The theme of education is to build person with character. To learn in life skills - how to live in society, how to attain a social status with help of skills learned, how to communicate with others and develop inter/intra-personal relationships.

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1.3 The Engineer

The role of the engineering profession is to provide public safety in an ethical manner to their activities with respect to social, economic, cultural, environmental, health, legal and sustainable.

1.4 The Engineering Education

Engineering graduates would benefit by gaining complete knowledge & critical awareness on industrial practices with more holistic understanding of sustainable development and can play a vital role for social & economic objects while optimizing the resource, in order to construct a product as per the IPR act or organizational behavior and standards by sustaining all stakeholders' desires [17] & [18].

2. Disruptive Technologies

Right from the inception of engineering education, the business of change & adopting a more dynamic approach to uncertainty. When we think about technology, we often think about physical devices that are electrical or digital. In fact technology encompasses far more than that.

Table 1. Disruptive Technologies to cater day-to-day needs

Disruptive Technology Trends	**Domain Knowledge**	**Focus on**
Mobile-First to AI-First	Business Thinking	Artificial Intelligence
Personalization & Customization	Business	Aviation, LS, FS
Meatless meats	Food Technology	Diet – Plant
Personal data value platforms	Personal Data	Economic Asset
As-a-service	Consumer Needs	IT Infrastructure
Voice based virtual assistants	Conversational Interfaces	Familiarizing Consumers
Industry 4. O	Smart Sensors - Factory	Data Analytics
Prescriptive Analytics	Smart Data	Machine Learning – Decision Making
CRISPR	Battling Disease	DNA Research
Convergence	Automotive Companies	Business Model
Commercial Drones & UAVs	Surveying	Welfare Applications
Digital Twins	Data Scientists	IOT, Twin Technology
Augmented Reality	Mobile AR	Commercial Applications
Renewable & Clean Energy	Tipping Point	Wind turbines & Solar Panels
Cross Sector innovation	Industries	Business Model
::::::::::::::::::::	::::::::::	::::::::::::::::::

As shown in the Table 1 more emphasis is required on disruptive intelligent systems, also introduces the need in most of the countries by Higher Education Institutions (HEIs). In this article author analyzed of the role and need of disruptive technologies in an innovative way. HEIs require lots of attention in teaching & learning these technologies' must be an adoptable and acceptable way by the world forum [1]. The Author has explored in this article about the induction and impact of AI in HEs teaching & the learning process with respect to present engineering disciplines more employable [2]. Author reviewed an analytics of the educational innovation in the United States of America. It was defined innovation taxonomy, innovation difficulties and ways to growth novelty rate in education system [3]. The engineering skill developers with various ideas on the use of digital technology

were discussed in the 2nd GEI summit [4]. As per the IPR act every intellectual property need is highly appreciated. In this connection, more awareness is required at engineering education level. Hence, the innovations on business-driven was analyzed with education-related patents [5].

2.1. Occupational Structure for Engineers

Ensure that the knowledge gained in Engineering Education to cater the needs of primary actives: It includes Agriculture, Animal Husbandry, Forestry, Fishing, Mining and Quarrying etc. Also, secondary activities include Manufacturing Industry, Building and Construction work for Infrastructure developer. Besides the Transportation, Communication, Economics and Commerce, Administration & Governance play a vital role. Expert Systems and Intelligent system implementation change the life style of the human being. Hence the proposal on engineering programs and accreditation by AACSB for knowledge-based computer programs [6]. Of course, Political Economy & Economic Policy will lead the engineering that creates the market for education.

Table 2. Various Engineering fields as per day-to-day needs.

Faculty of Engineering	**Need of the DIS**	**Employability**
Aeronautical Engineering	Yes	Low
Computer Science and Engineering	Yes	Very High
Information Technology	Yes	High
Software Engineering	Yes	Very High
Electronics and Communication Engineering	Yes	Very High
Electrical and Electronics Engineering	Yes	High
Civil Engineering	Yes	High
Mechanical Engineering	Yes	High
Chemical Engineering	Yes	High
Automobile Engineering	Yes	High
Fashion Technology	Yes	Moderate
Artificial Intelligence	Yes	Very High
Machine Learning	Yes	Very High
Knowledge Base Systems	Yes	Moderate
Embedded Systems	Yes	Moderate
Electronics and Computers Engineering	Yes	Moderate
Cyber Physical Systems	Yes	Very High
Block Chain Technology	Yes	Very High
Gaming Technology	Yes	Very High
Nano Technology	Yes	Moderate
Marine Engineering	Yes	Moderate
Bio Technology	Yes	Moderate
Space Engineering	Yes	Moderate
Data Science	Yes	Very Moderate
Business Intelligence	Yes	Very Moderate
…	…	…

2.2. Engineering Construction with Intelligent System

Many constituencies have emphasized on the primary accreditation policy for ensuring quality in higher education. All most all government bodies involved deeply in the overall development of institutions. But, critics say that the present institute's heads or presidents compromised with accreditors during the institutional peer review process [8]. Any new technology concentrates on "next big things" produces ever lengthier. However, certain tools do in circumstance have the prospective to disrupt the position quo, alter the way societies living and effort, reorganize worth groups, and central to completely novel goods and amenities [9]. In most engineering projects, a good estimate does not stop when the total cost or schedule is calculated: both management and engineering team need to know the details in terms of resource allocations [11]. In software cost estimation, the estimator must provide effort and schedule breakdowns among the primary software life-cycle activities: specification, design, implementation, testing, etc. Such effort distribution is important for many reasons, for instance:

- Before the project kicks off, we need to know what types of personnel are needed at what time.
- When designing the project plan, we need to plan ahead the assignments and responsibilities with respect to team members.

When overseeing the project's progress, we need to make sure that the right amount of effort is being allocated to different activities [12].

The perseverance in contemporary intelligent systems approach is to specify the stakeholder requirements, design the project and execute the system as per the proposed model with an extra feature called intelligence. Decision Making is the key element in this process to simulate the human skill. This system has an ability to get exposer with the observation on decision making to handle uncertainty like an expert human being with the help of supervised or unsupervised learning strategy. The ultimate goal is to react in a specific situation without causing any damage.

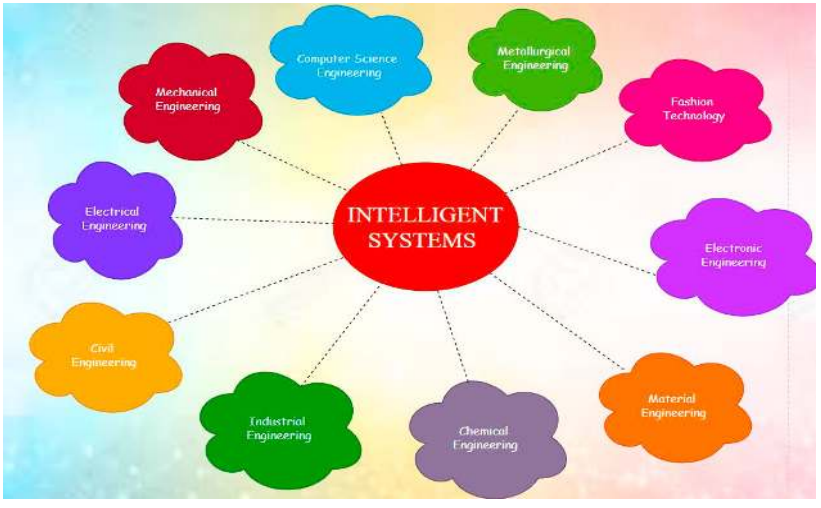

Fig. 1 DIS need with current Engineering fields

3. Intelligent System Need in Engineering Education

The Intelligent Systems offer a hypothetical and organizational structure for the study of "Information Engineering," an emerging field that includes artificial intelligence, robotics, communication, "smart" machines, and human-computer symbiosis.

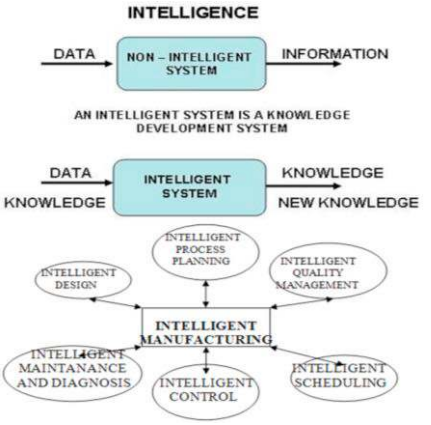

Fig. 2 Intelligent systems

Fig. 2 presented evidence the Intelligent System how it's depending on process planning, design, quality, scheduling, control, maintenance & diagnosis of Intelligent Manufacturing. A framework has been developed by structural AI Systems & implementation of a multi-agent AI.

5 phases for emerging administrative AIS familiarity:

- Extracting and Collecting
- Curating
- Ingesting
- Training and Testing
- Analyzing and Predicting were identified, the ability to establish recursive & a reflexive relation to initiate a dialogue between different actors for knowledge systems with AI [7].

4. DIS similarities in Human-System

Generally, it is outstanding how proposed intelligent systems have lined the gap with intelligences in expressions of their likely for many of the crucial tasks that our nervous classification has.

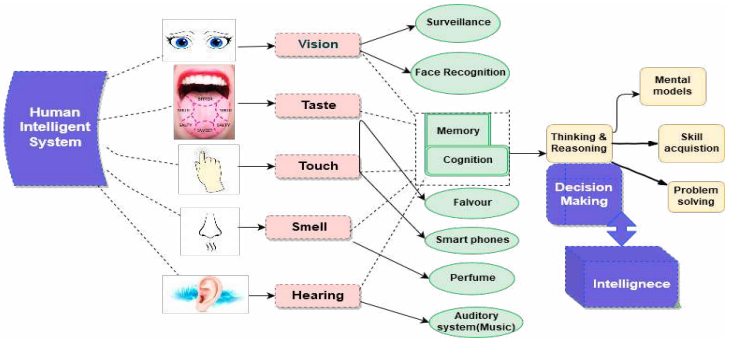

Fig. 3 DIS similarities in Human-system

As shown in the Fig. 3 the Process of acquiring knowledge & understanding experience through the senses. The five senses, i.e., vision, hear, smell, taste and touch. To see we use our eyes, to hear we use our ears, to smell we use our nose, to taste, we use our tongue, and we touch with the help of skin. The latest technologies pertaining the smooth running of day-to-day activities like surveillance system, face recognition, bio-metric, image processing all will connected as a single better system. At this point product manufacturing/engineering/development with originality also a passion and understanding for planning & decision-making perseverance and perception itself the key features of the intelligent systems. So that it is easy for engineering such systems.

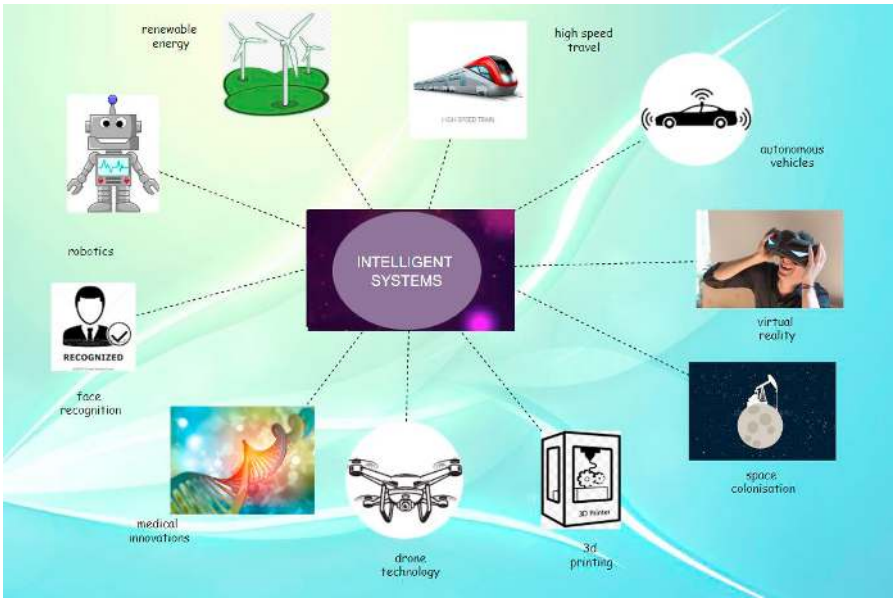

Fig. 4 Intelligent Systems in Engineering for Sustainable Development

Organizations that anticipate ways to power AI will profit much. For many of the students and faculty who are associated with the experience of AI and tools with latest technology needs more attention on querying Google homes [13]. Currently, all the business needs and product development associated with Internet-of-Things. Hence, the rapid developed of IoT creates new products and services with a novel business model. The new methodology opens many opportunities with IoT technology [14]. In any corporate the business promotion strategies in decision making with respect to quality of AI & Expert System computer activities like social events are constructed with the knowledge, accuracy, teaching and awareness [15]. Existing education must be triggered and provided to evaluate and some sort of strategy in order to maintain relevance of operational standards with MOOCs [16].

Last, but not least the thing is to focus on how intelligent systems need is more on any project will summarize with a small example. As per the Fig. 4 assume that we need to acquire knowledge of building construction intelligent systems for sustainable development project So Civil Engineers knowledge is more required. Also Electrical Engineers should collaborate with Civil Engineers. Also Transportation of goods will play a vital role. With respect to construction type of soil and materials management – resource optimization is required. That is Building construction methodology is different in Chennai vs. Japan vs. India vs. USA. The Engineer should have a deep knowledge on disasters & natural calamities such as landfalls, soil erosions, cyclone, tsunami, and earth-cake, etc. Also Data Science knowledge must be available for getting raw material and labor availability with respect to the seasons. Say in the rain season sand may not be available. Also in summer daytime construction may delay the process in certain locations. These reasons must be analyzed before fixing the schedule or plan of action to deploy

the project. Hence, we can estimate properly without schedule overruns and within the budget limit the project will complete on-time.

5. Conclusion

In this article, the author's intention is to bring the need of Intelligent System to develop any Engineering product in an effective way such that it has its own life forever. Of course, as per the need we can maintain the system and resolve the problems. The main theme of the proposed work is to cater the needs of the society. Though we can bring the laboratory ides to land with the disruptive intelligent system in order to fix the problems.

6. Future Work

Since change remains constant in the universe, no can give guarantee on a particular product that system features always evergreen. So there is no standard approach in the engineering field. Keep on changing as per the demand and supply principle with respect to product maintenance. Hence, the author's need to conclude that this approach may apply for few areas and fit up to some extent. But, as per the future needs lots of changes are required to incorporate.

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