**CSE4059 Cognitive Systems**

**DA-2**

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Cognitive apps or Applications developed around the core principles of cognition and Cognitive System Architecture, are said to be the future of automation and automated workplaces. Along with the increasing complexity of work that need to be automated, there is a rising need of products which are smart enough to learn from mistakes and grow and adapt to any scenario.

Some of the various areas to apply Cognitive Applications in the Practical field would be

1. **Healthcare**Healthcare is a major field which would benefit greatly from cognitive systems. The major reason why, despite of being so many ML and CNN solutions in the market, the Healthcare sector is majorly manual and personal in nature, is due to the unpredictable nature of diseases.  
   Normal Learning models are not able to adapt to compound symptoms or even different set of symptoms for the same disease. A static model could predict a small tumour as cancer or even vice-versa. This is where Cognitive systems come in and can fill for this flaw and even grow as more cases are handled/fed to the algorithm. In this case, the system would benefit the most from being a **Cognitive system** which is able to grow and learn rapidly from Doctor’s Instructions and are able to pass on knowledge easily.
2. **Education**Education is another important field, which has yet been mostly untouched by technology. We can see that technology has highly modified Learning, but Education is still untouched. This again is due to the fact that there is no uniform Education algorithm for every individual as they are all unique and require different approaches. Here we can use an **Emergent System** to make them first learn basic knowledge and then also allow them to learn and adapt to the different learning types of students. This will allow a massive positive gain to the education environment and may even allow individual growth and holistic development.
3. **Supply Chain**Supply chain automation is a major part of the industry. It is often times, highly crucial for a product-based company for them to deliver on promises and goods. Introducing a **Cognitive System** as a scheduling and maintenance intermediary to the mix will undoubtedly increase production and delivery chain. This method is already in research by major aggregators like Amazon and Flipkart.
4. **Manufacturing**Manufacturing is another major step for product companies. Many companies like Siemens, General Electric and Others are already working on pioneering this field via a **Cognitive System** based Digital Twin technology. Which involves simulating a virtual copy of our machine as well as assembly and manufacturing unit to predict and simulate any flaws or gaps in our process.
5. **Automobile/Unmanned Vehicle Industry**This industry is generally involved in creating **Cognitive Systems** for predicting traffic flow, navigation control and resource management for remote unmanned vehicles. This technology is already used by major Companies like Tesla and BMW as well as Research Groups like ISRO and DRDO.
6. **Security**As we approach towards the end of Industry 3.0, we can already see the dire need of Cyber Security for our networks. This problem will be solved by an **Emergent System** based cognitive application. This app will, theoretically, grow as it fends off cyber attacks and gradually will form a intelligent security layer over our Local Security applications.
7. **Energy**As we move towards sustainable energy goals and plans, we can also see the growing applications and implementations for smart Energy Grids as well as Smart Energy Consumption plans. All this will be made possible via **Cognitive Systems** and would allow for a massive leap towards a sustainable future.
8. **Research**Research has moved on greatly since the early 90’s. We have now moved on to more difficult to test avenues of research like controllable nuclear fusion and mars surface simulations. Using a **Cognitive System** for simulation of these environments would allow more precise results as well as less margin for failure.
9. **Decentralized Governance**As we move towards web3.0 which involves Blockchain and Decentralized Identity, we need a unbiased and Decentralized governance to maintain order and properly manage identities. Using an **Emergent Architecture** base Cognition system will allow us to create such a system and make Blockchain technology more viable.
10. **Marketing Policies  
    Cognitive System** based predictive models will allow us to study market and properly predict how to market ideas as well as properly manage mob mentality.