



WHY ARTIFICIAL INTELLIGENCE WILL NOT UPEND INTUITION

A Conceptual Paper on Why Decision Makers Cannot Replace Intuition with AI

Julie Sunil, Ph. D.

Visiting Management Faculty
Bangalore, Karnataka

Abstract : This paper is based on scientific findings from the field of Psychology, Sociology and Biology. It aims to determine if decision making will rely extensively on Artificial Intelligence owing to its pervasiveness and popularity in all fields. Human brain is five hundred million years old and in the last couple of million years it has undergone dramatic change – which rendered it with the unique gift to imagine its future based on the present. The brain also has a strong intuitive capability which it uses automatically under acute conditions. It continues to guide decisions in a way that makes it unique and without the synthetic similarity that comes from using AI. The benefits of AI are many and it will continue in its path to becoming highly sophisticated support system. But, this ubiquitous nature of AI will not replace intuition. This paper discusses why it is so and how educators will have to ensure that students build their intuitive skills with real life experiences in their chosen field rather than depending on technology to do such thinking.

IndexTerms – Artificial Intelligence, Intuition, Decision Making, mind, happiness

I. INTRODUCTION

Often there are dystopian predictions that the human race will be redundant and replaced completely with the new and powerful technology namely – the Artificial Intelligence (AI). It is capable of seamlessly aggregating all available knowledge of experts into one powerful program- that can run from anywhere, anytime and with predictable accuracy. Much debate revolves around the ability of AI to replace human skills at several levels (and in any field) and the impending change in skill requirements for those joining the job market of the future. This paper looks at expert arguments and research findings on both sides of the issue and aims to understand what human skills technology will not be able to reproduce or replace and whether human decision making abilities will be redundant.

An understanding of the superiority of technology and its limitations will enable the market to select the better of the two options thereby ensuring market efficiencies. The field of education should then replace the age old syllabus with a new one where learning concentrates on not the ability to do what a machine can do but what a machine will never be able to do.

II. METHODOLOGY

A three part approach was taken to understand the usage of AI and Intuition in decision making. For the first part, search for arguments that support the superiority of the human mind was done. This required review of literature from the field of evolutionary science, sociology, anthropology, neuroscience and cognitive psychology. Likewise, the second part searched for arguments from published research on why technology is an answer to overcoming human biases. A study of the proof of the recent reported developments and application of AI was done. Projects where AI replaced human capital became a key focus of the study in order to determine if AI can indeed take the role of a decision maker because of its accuracy, efficiency and reliability. Finally, comparing the reports and experiments a realistic expectation from technology interventions emerged and this led to the conclusion on how power of mind and machine is poised to be leveraged for far reaching impact on the quality of human decision making. Any attempt to

use one over the other will have to be done without compromising individual happiness – a factor that is central to all innovations and interventions.

III. SUPERIORITY OF HUMAN INTELLIGENCE

Psychologist, Daniel Gilbert in his book on *Stumbling on Happiness* (2007) wrote that artefacts like the Great Pyramid of Giza, although among of the wonders of the world, cannot be called a great achievement because technology can do anything that requires knowledge, logic and patience – and this can be said of all fantastic creations made by man. But conscious experience is one thing that no sophisticated machinery has achieved till date. Seeing (to see the world as it is), remembering (to experience the world as it was) and imagining (to experience the world as it might be). In other words the human brain differs from most sophisticated technology in its ability to imagine beyond the realm of reality. In certain elements of imagination human brain is not unique, other animals can make reasonable predictions about the immediate, personal, local and future. But human beings have the rare ability to connect the past with the present and to make a prediction about the future. Computers can do this too, in a limited way. The algorithm, popularly known as ‘Suggestion Engine’ that offers useful recommendations make use of the past and present to generate a list from which a person will find their most preferred option. It’s neat and prudence requires that human effort is not dispensed on something that a machine can do just as well, or even better.

Human brain is constantly predicting the sequence and movement of things based on the principles of logic, motion, gravity, word and syntax. When this chain is broken with the introduction of a surprise element the brain swerves and halts. Computers, on the other hand, will give an error message. The human mind will seek closure and continuity and in doing so will be able to fix the gap, satisfactorily. Intuition is the way the human mind aggregates experience into predictable actions. Guidance and feedback are useful to build a better intuitive brain. AI is programmed to capture human behaviour and predict patterns about their next course of action. The one drawback of the human mind is that it is not easy to arrive at the most pragmatic solution with accuracy and consistency because the brain is prone to come up with noisy responses based on their stable subjective preferences and context (occasion).

IV. DIFFICULTY IN SUBSTITUTING HUMAN INTUITION

Gary Klein in his book the Power of Intuition wrote that every natural setting calls for the *power of intuition* (to understand and size up the situation quickly), *mental simulation* (to determine the course of action and how it will pan out), *metaphor* (helps to link the current situation with something similar encountered earlier), and *storytelling* (consolidating the components of the experience into a useful narration to help oneself and others who may likely face a similar situation in the future).

Intuition is critical under time-pressure, i.e. situations that require split second decisions that too under conditions that hold high stakes. Often decisions have to be made under uncertainly because there is not enough information or time available to take a calculated step. There are times when the exact goal to be accomplished is unclear; example - should the doctor wait for the test results or should she go ahead with the operation when life is ebbing out and chances of rescue reduces with every lost second.

Areas that AI cannot easily replace lies in the space of intuition.

I predict that no one will ever build a humanlike robot – and I mean really humanlike robot – unless they pack it with computational systems tailored to different problems (Steven Pinker, 2015).

When faced with unique situations that reveal the presence of unmet demands and change from the current level of effort then a person undergoes *cognitive strain*. Intuition is useful in handling situations that puts strain on our cognitive abilities as much as it does when dealing with situations that are similar and routine i.e. situations that offer cognitive ease.

Sources of Cognitive Ease ((Daniel Kahneman, 2011, p. 60)

1. Repeated Experience
2. Clear Display
3. Primed Idea
4. Good Mood
5. Feels Familiar

6. Feels True
7. Feels Good
8. Feels Effortless

When the situation is unfamiliar then a person learns from trial and error. However, what happens if you don't survive the error? In such cases human beings have developed a unique capacity to imagine and simulate the situation into the future to help pick one that will pose the least risk. Life simulator is a recent development in the brain and it is not very powerful yet. The brain is more than 500 million years old but only in the last two million years did the human brain see unprecedented growth that more than doubled its mass and size. Evolution increased the size of the brain from its one-and-a-quarter pound brain to nearly three pound brain – this made man uniquely gifted to think about the future (Daniel Gilbert, 2007). The change was caused by the addition of the frontal lobe, which allows human beings to escape into the future – an imaginary tomorrow. The reason such a system was evolved by nature was to gift humans with the unique ability to control their future by choosing a course of action from the options that they can see for their future. In our thoughts about the future we conjure up happy images and these in itself are a source of joy. Like Albert Camus said, 'Life is the sum of all your choices.'

But Gary Klein found that humans do not imagine all the possible outcomes – they just pick one favored outcome and stack up evidence to confirm why the one choice they made was superior to all others they could have thought of. He argues that while a systematic method of decision making is desirable (where options are carefully weighed) it's not possible to do so under the constraints of time and resources. Often, even if the process is scrupulously followed it becomes a shallow activity because the decision is already made in the mind and other evidences although considered, do very less to replace the one chosen earlier. Intuition is based on patterns that the brain chunks and uses to draw quick inferences whenever it spots similar situations that match closely with the patterns the person had experienced before. Researchers in psychology have consistently found that the ability of the brain to figure out patterns helps them to take effective decisions. However when faced with time constraints and absence of information to compare options a person may take a chance that's 'satisficing'. Intuition works when the solution one needs is not expected to be perfect or even good but just 'good enough'.

When faced with a given situation one generates cues that leads to checking for pattern and once that is matched, the mind generates possible action steps to be taken which will help deal with the situation (Gary Klein, 2003).

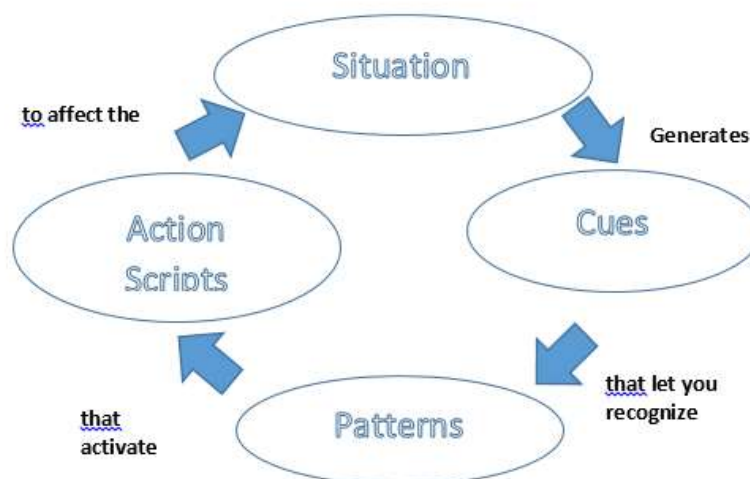


Figure 1 Pattern Recognition Process behind Intuitive Thinking

Source: (Gary Klein, 2003)

Is it possible that by depending on technology to take the decisions that's taken intuitively we forego the chance to experience the new and thereby also forego our ability to add to the existing knowledge? This ability to imagine the next is something the human brain does a lot during the day

(according to researchers who study consciousness, they found that a person spends nearly 12 per cent of their thoughts on the future). Thinking of the future is a source of pleasure and a way to prevent pain – and what it gives us is a measure of control of what is going to take place. This ability to change, manoeuvre, influence, to make things happen makes for a great sense of self-worth and something that every individual desires. It gives us the power to plan and execute for a desired outcome. If this control is given to machines which might do the task of prediction better it will fundamentally rob mankind of this pleasure that nature was too kind to provide. In other words it will make the human race unhappy, depressed, helpless, and hopeless. Experience builds intuition and mental simulation helps to determine which experience to opt for and thereby what kind of intuition will be stronger (Daniel Gilbert, 2007).

Daniel Gilbert explains that experience cannot be transferred because it is unique to the person experiencing it. He uses the analogy of an attempt to explain the colour yellow to an alien who lacks the machinery for seeing colours. With the most clever examples, metaphors, analogies, one will still not be able to ignite the alien's brain with an understanding of colours because the alien simply lacks the apparatus to decipher colours.

The 'Unknowable Variable' – the other people and their actions make all effort to predict the outcome of a decision a very risky adventure. AI with the benefit of the large data available on every individual will be able to profile and predict behaviour but this is not without its own percentage of error. Techniques such as derivatives, scenario planning, business forecasting are all short of complete accuracy.

Professor P. Soelberg extensively trained his students in decision making steps which involved identifying options, evaluation of the options, identifying the dimensions to weigh the options, rating the options and selecting the one with the highest rating. Incidentally, Soelberg found that his students rarely used the formal and classical five step decision making process in identifying the job offers they must accept. Instead they went by their gut and when forced to follow the steps to ensure sound analysis with deliberate weighing of options, they engineered their responses to select their intuitively preferred option.

No two events will be exactly alike and therefore decisions will have to vary keeping issues of lack of information and the urgency to make quick decisions. Gary Klein call the ability to go with the gut as the decision based on a skill. One knows without comparing options and the first option that their mind gives them is the one they would prefer even after deliberate and time consuming analysis.

Happiness comes from getting what one wants and that includes all the stages of experiencing it. A control that comes to the mind after isolating its preference from other options is an innate human desire. If using AI is going to reduce the ability to experience life for real and the ability to control outcome or to make mistakes and to learn from it then, it spoils the joy which comes when we get things right. The purpose of human life is the pursuit of happiness and happiness means to get what one wants without the clutter of technology suggestions. It is not important to judge the merit or value of what every individual wants because some may want to become the prime minister while another may want to play the prime minister in a Spielberg movie. Even when one can see any part of the world, buy things and sleep under the stars, feel its weather and people almost as if one was there using the power of virtual reality, it would still fail to be a source of happiness because such fake creations would not appeal to our sophisticated senses.

V. Humans can Fill in the Blanks *But* AI will return an 'error'

Computers work on inputs that should follow a pre-coded syntax and order – any change from this will frustrate the user and the dumb machine will not autocorrect until one of its suggestions is accepted or until the user comes back with a correct instruction code of the software. Humans, however, can fill the remaining pieces of the information even when the syntax is jumbled; even if there is no before and after information provided. Auto associations in the human brain uses the information that is consistent to fill a gap or to ignore the inconsistent piece in the puzzle as an aberration or error (Steven Pinker, 2015, p. 105).

For a computer to acquire all the neural connections that a human brain does in seconds will take a lot of work and will still not be guaranteed because the ability of the program will be proportional to the ability of the programming team and the funding organization. Philosophers like John Locke, David Hume, John Stuart Mill proposed two laws that are known to govern thoughts: Continuity (Frequently occurring ideas will be associated together) and Resemblance (based on similarity, the association of one is transferred to the other). The brain then uses its predictive capacity with its ability to put events in a sequence and categorize events that are similar into one chunk.

Another aspect about human nature is its ability to make moral judgments and behave in a way that makes consciousness and conscience work in tandem. Human beings experience consciousness and label it – example, something is pleasant or unpleasant. The freedom and flexibility of the human brain is not available in a programmed machine with in-built limitations. Instinct works to move the mind from a loop of distressing permutations and combinations to the action stage where the mind intuitively takes the decision

because that's the purpose of human experience and the fact that mind comes with a programming that has been passed from generation to generation and is efficient even in a new born baby makes it superior in dealing with real world challenges. Human ability to exchange knowledge coupled with their gift of language makes them able to process new information and adapt to new conditions in a very short time; all supported with their scientific knowledge of the environment.

Machine learning algorithms are now able to read faces, recognize voices, translate languages and read medical reports. Steven Pinker argues that while this is being done the accuracy of the system is far from perfect and the dependence on it will only frustrate the user and not bother the machine – the machine may become heated though.

Who isn't tempted to throw a shoe through the computer screen when it responds to the command print file with the error message print: command not found? (Steven Pinker, 2015, p. 105)

The ability of the machine to comprehend language of the speaker and translate it into instruction for action will require the machine to understand change in accent and pronunciation and be able to judge from the string of words what the person may have meant. Clearly machines have a serious constraint and it would be very tedious to incorporate all possible ways a word may be spoken into the program so that when running it will make intelligent and accurate interpretations.

VI. AI and Decision Making

Computational capabilities has made it possible for drivers to reach unfamiliar locations and destinations purely from the guidance received from AI. It can forecast the decision of a judge based on the knowledge of the judge's behaviour and background; it can indicate the probability of which defendant will jump bail etc. According to Daniel Kahneman the superiority of the machines (using simple to the most advanced computing technology) is that it will be free of noise.

To overcome individual bias, one can turn to the wisdom of the crowd as long as there is no compulsion for consensus. The more diverse the opinion the better the chance to explore the possibilities and therefore consider the options. Decisions made after group deliberations can have problems, too, because a lot depends on the ability of the group to mix options, identify assumptions and ponder difficult questions. Fatigue and impatience might force the group to pick the one option with fewer objections and this would be at the cost of better options that failed to garner votes – a pattern common in cohesive groups that celebrate consensus over dissent. The quality of a group decision is the ability of the group to voice their concerns and thrash out differences because a decision made too quickly is often suspect. A better way, according to Daniel Khaneman would be to de-correlate the results i.e. several independent judgments when averaged will result in a new judgment which will be less noisy and therefore more usable (Daniel Kahneman, Olivier Sibony, Cass R. Sunstein, 2021, p. 84).

There are situations that call for consistency and accuracy in decisions but the human mind is often distracted by other happenings of the day. These distractions can be caused by feeling of anxiety or pleasure which in turn result in outcomes that are separate from objective reasoning. The presence of Noise can be understood from the difference in opinion of experts – the more different each one is from the other, the more is noise and, a noisy background rarely is a source of sound judgment. Noise can be dangerous in many situations such as in the field of medicine, child custody, HR (recruiting), bail, patents apart from many others (Daniel Kahneman, Olivier Sibony, Cass R. Sunstein, 2021, p. 25). Diversity of opinion is useful when it is about difference in tastes and preferences. However, in matters of judgment that can impact the life of another person or members of a group – noise can be costly. Therefore where variability is undesirable there is potential use of AI which will churn out the same result no matter what time of day or night one is consulting it.

An understanding of human behaviour and the support of technology (built to act better than humans), has made decision making more stable and acceptable. The Decision Support Systems (DSS) were supplying the managers with information but was otherwise not sophisticated enough to support strategic decision making. With the advent of Executive Support Systems (ESS) and Management Information systems (MIS) it is now possible to use computing technology to guide high level decisions with superior outcomes. The supply of critical information aided the decision making process but the decisions were made by the top executives using their own experience. The use of computers whether by business executives or their customers the information gathered and supported by AI will depend on the pattern of search and preference made by its user.

VII. Conclusion

Intuition remains a strong factor in matters of decision making and no one will ever be able to replace it with AI. For all the sophistication of AI it can only come so far as to become a great sword in the hands of a war hero. Certain decisions require courage and conviction which a computer will not provide

and this is all the difference one needs to be convinced that AI will never make decisions for a person unless the suggestion coincides with what the person already decided in his gut. Data can support or discourage a decision but gut can still be free of the shackle of data; it is free to figure out a new path on the go. Research indicates that decision makers use their intuition and analytical skills equally but often success has come because they went with their intuitions. According to Daniel Kahneman there are two major components of Noise that people are prone to: (a) pattern noise where the person's attitude, philosophy and values will determine their choices with remarkable consistency and; (b) there is noise resulting because of within person variability i.e. different decision by the same person based on what time of the day or under what circumstance the person is taking a decision. But this very variability can become a reason for powerful and successful decision making. A machine will throw the same result each time it is consulted but an individual because of their personality and experience might take a completely unknown decision and that may make for remarkable success although the fear of these factors influencing worse decisions is also equally true.

Intuition has evolved over millions of years and is coded into the genetic makeup of the individual. It is sharpened with experience and analysis. The fact that intuition can make people take wrong decisions is an argument that cannot be ignored but individuals can be trained to use their guts in a more informed way and that can make a big difference. Education must enable individuals to master their industry with experience. AI cannot replace human instinct for safety but it can serve as the weapon that will empower them.

REFERENCES

- Daniel Gilbert. (2007). *Stumbling on Happiness*. Vintage Books.
- Daniel Kahneman. (2011). *Thinking, Fast and Slow*. Penguin Random House UK.
- Daniel Kahneman, Olivier Sibony, Cass R. Sunstein. (2021). *Noise-A Flaw in Human Judgement*.
- Gary Klein. (2003). *Intuition at Work*. Currency and Doubleday.
- Steven Pinker. (2015). *How the Mind Works*. Penguin Random House UK.

