“A PETREL FOR THE DIGITAL STORM”

Research Paper

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“Abstract”

The world we live in today is fascinating, we are at the cusp of the fourth and fifth industrial revolution. It took us almost three centuries to get here since the first industrial revolution, the good part is that we will not have to wait for an equal period to experience the subsequent industrial revolutions. The pace and intensity of change is unprecedented and gives one the feeling of being in a sci-fi movie. Vectors shaping the future of work are complex, nuanced and multi-dimensional requiring us to adopt varied strategies so as to thrive in the current order. It requires us to transcend into higher maturity levels of change navigation continuum - to become change architects for our personal selves. Being a change architect would amplify the vector qualities required to sense-make the future. It would help optimise the efforts and energy required to thrive in the future through materiality, intentionality and directionality. This paper takes inspiration from nature, our biggest teacher on how humans can become better change architects to thrive in the future.

Keywords: Thriving, Future of work, age of AI, Change architects, Storm Petrels, Metacognition, Crafting the future

1 Introduction

Almost 300 years - that is the time it has taken for us to evolve from the first Industrial revolution that started in mid - late 1700s to the fourth Industrial revolution or 4IR (around 2010s). However, in just 15 years, we are already said to be heading towards fifth industrial revolution. The gap between IRs is reducing and at the same time, the intensity and pace of change is increasing.

4IR saw the melange of technologies in terms of Internet of Things (IoT), Augmented Reality, Virtual Reality, Quantum Computing, Nanotechnology, and even advanced biology (Aurik, 2017). Era of 5IR can be envisaged as a period where machines develop cognitive intelligence giving them the power to perform tasks that not only match human ability but do so with higher accuracy and efficiency. In March 2025, Microsoft published a research article stating that their AI system was a step closer to ‘Artificial General Intelligence’ which meant that a machine could perform everything a human brain performs (Griffin, 2024).

We are yet to realise the full potential of Quantum computing - emerging fields like tech powered Quantum sensing, Quantum networking and cloud computing, Cybersecurity, Cryptography hold immense promise. As of the time of writing this paper, there were reports that researchers have successfully produced random numbers certified by quantum mechanics and which classical randomness cannot fake (Shanbhag, 2025), the future is here and now.

While the melange of technologies by itself is extremely impressive, what makes it even more fascinating is the 'convergence' of multiple fields made possible by tech advancement. Immediate future will also see the emergence of bio-based economy fuelled by technology. World Economic Forum predicts that this would become possible by convergence across various fields – red biotechnology (pharmaceutical field), green (agricultural field), white biotechnology (industrial field) and blue (ocean) biotechnology (Alok Medikepura Anil, 2025).

One of the remarkable inventions that we remember in recent times is DNA sequencing. The last five decades or so have been spent in interpreting sequence information. Application of computer processing and automated sequencing platforms have been making the sequencing techniques get better continuously. It is said that by 2008, speed of DNA sequencing began to surpass Moore's law, a trend that continues today (Groff-Vindman *et al.*, 2025). Huang Jenson from Nvidia mentions that their computer chips are advancing faster than historical rates set by Moore's law (Griffin, 2025c). These are just some samples of what future holds for us, made possible by technological advancements.

It can be said that the current phase a cusp between 4IR and 5IR is perhaps the most interesting moment to live, experience and enjoy all the transformation happening around us with great pace and intensity. This also means that the imperatives that got us till here may or may not get us to the future and we may require a whole new rule book to face the future.

2. Literature Review

2.1 Future of work

In the 2025 Griffin Annual Emerging Technology Starburst study, Mathew Griffin tracks the development of 167 of world's most promising emerging technologies over next 50 years. In the report, he mentions that each could have a market value of over $500 Billion spread across 13 categories. He also mentions about how he replaced 53 technologies that figured in 2024 due to slow development of some emerging technology categories and a rapid acceleration of some others. This is a testament to how fast and intense the changes are year on year (Griffin, 2025a).

Increasingly studies are focusing on understanding and deepening advancements around Brain-Machine interfaces (BMI) and Brain Computer Interfaces (BCI). Connectome projects that attempt at mapping the neural connections in brain have been ongoing for some time now by multiple researchers, they are more focused on smaller organisms now as mammalian brain is more intense. These studies have revolutionised neuroscience and gives us the ability to advance brain-inspired AI systems resulting in human like capabilities including enhanced learnability, human like creativity and curiosity (Griffin, 2025b).

However, as is the case with any improvement, there are always areas to watch out for. AI also can come with a price, already there are claims of similar AI systems becoming sentient and some others saying that the systems are coming up with humanlike answers and ideas that weren't programmed into it (Griffin, 2024). While these are just claims as of now, it is quite possible that they will become reality soon.

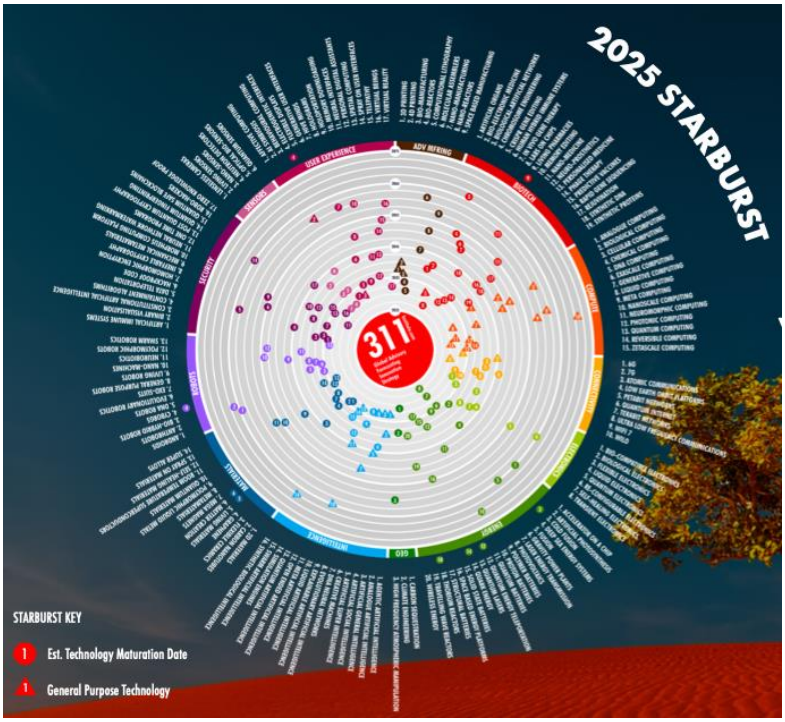

Figure 1. *Emerging Technology Starburst* (Source: 311 institute, Mathew Griffin, 2025)

2.2 Vectors that shape the future of work

If technology advancements alone don't look sci-fi, there are other vectors that shape the future of work. In combination, one can only imagine what possibilities lie in store for all of us. Changing demographics, Societal and Environmental changes and Glocal play are some of the important vectors (Beno, 2020 cited in Rajagopal and Provodnikova, 2023) that will have a huge bearing on the future of work. Role of intersectionality which is amalgamation of multiple dimensions of diversity in a single person also needs to be factored in as well.

2.2.1 Changing demographics and intersectionality

A key vector of change is the intersection of various dimensions of diversity. This concept is called Intersectionality and has a bearing on macro and micro economic factors (Rajagopal and Provodnikova, 2022). Intersectionality uncovers inequities in workplace which can lead to inequities in society. They can manifest in the form of a micro inequality like bias, aggression, passive aggression, exclusion which can have a bearing on career advancement, role disparity. Additionally, there could be wage gap, hiring discrimination signs of macro inequality. For the first time, there are multiple generations in workplace today. For first time we have Baby Boomers, Gen X, Millennials and Gen Z at the same time. Disparate factors like family structures, decision on retirement age, birthing process, retirement age all have a bearing on the future of work (Rajagopal and Provodnikova, 2022)

2.2.2 Societal and environmental changes

Similarly, it is said that environment, changing climate, weather conditions will have a shift of human power, economy and its implications are not fully understood. In an article on sustainability, Soans &

Kostadinovic 2022 (cited in Rajagopal and Provodnikova, 2023) mention the importance of Environmental Equity in the valuation of organizations among other parameters.

2.2.3 Glocal play

Glocal play, a linguistic hybrid of Globalization and Localization has obliterated trade barriers and increased collaboration among countries (Rajagopal and Provodnikova, 2023). They also mention that it is not just movement of goods and services that is measured in trade, it is also the flow of students, patents, research collaborations to name a few that needs to be considered.

2.3 Readiness to face the future of work

2.3.1 Readiness: The 'skill' perspective

McKinsey in their report mention that 75 million to 375 million may need to switch occupational categories and learn new skills (Manyika *et al.*, 2017) Their report further states that around 50% of current work activities are technically automatable by adapting current demonstrated technologies and almost 6 out of 10 current occupations have more than 30% of activities that are technically automatable.

World Economic Forum report also reveals that net 78 million jobs will be created in next five years. This is on account of around 170 million new roles getting created and around 92 million getting obliterated (Zahidi *et al.*, 2025).

Disruption to skills – Evolution in the share of workers' core skills

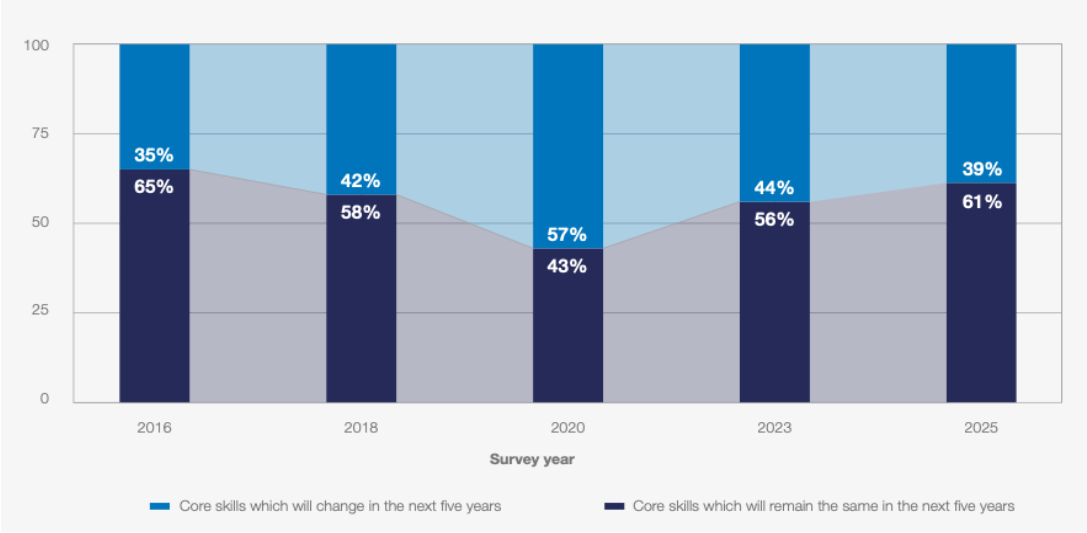

Figure 2. *Future of jobs* (Source: World Economic Forum report 2025).

According to World Economic Forum report, employers expect 39% core skills to change by 2030 (Zahidi *et al.*, 2025). Due to the changes in the core skills, the scale of workforce upskilling and reskilling expected is huge and skill gapes are considered the biggest barrier to business transformation.

Also not all employees will be upskilled or reskilled. There would be 10% of workforce which would be unlikely to receive the reskilling or upskilling needed, leaving their employment prospects increasingly at risk (Zahidi *et al.*, 2025).

2.3.2 Readiness: The 'will' perspective

In a recent study, PWC mentions that change is all pervasive. 6 out of 10 respondents have indicated that they have experienced some kind of a change in the last year compared to a similar prior period (*Global Workforce Hopes and Fears Survey: PWC*, 2024).

While there are positive sentiments indicating optimism and engagement in facing the future, there is also huge anxiety from respondents. This could also be attributed to multiple reasons including current day work pressures, financial stress, job security etc. In addition, almost half the respondents have indicated that there is just too much change happening at once.

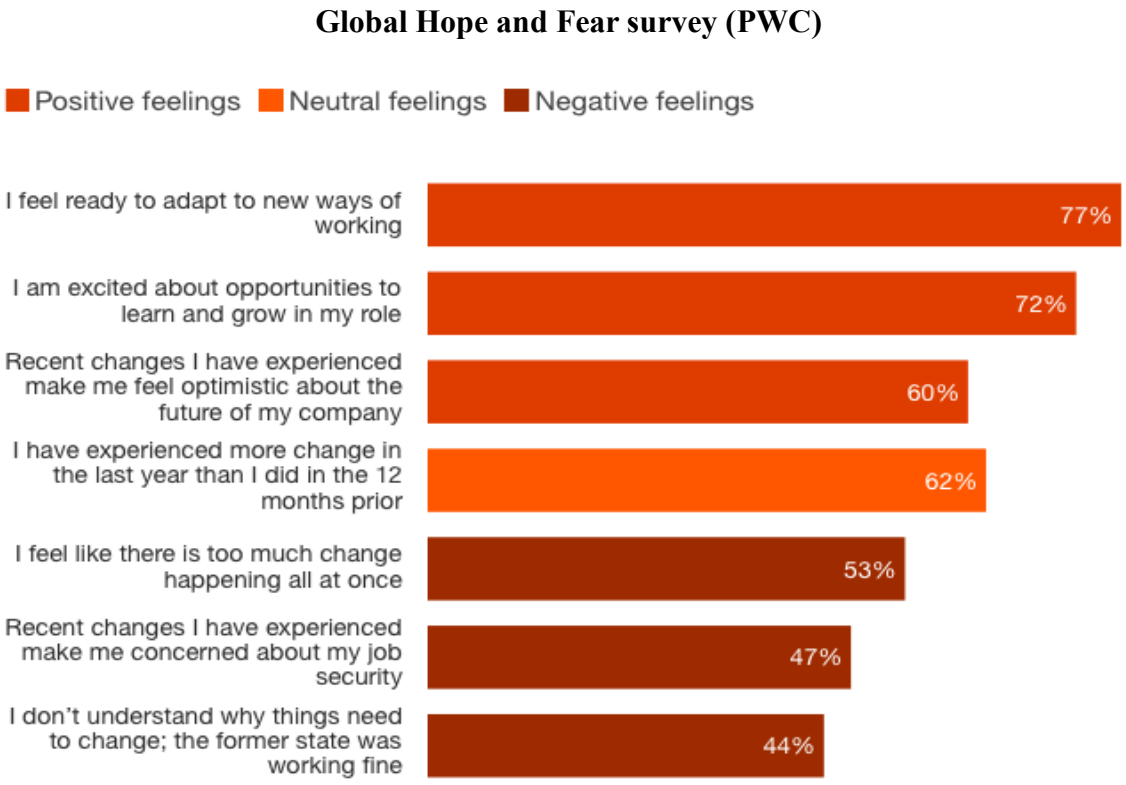

Figure 3. *Global Workforce Hopes and Fears Survey* (Source: PWC, 2024).

Even those who have mentioned that they are excited about the future have mentioned they feel the frequency and intensity of change is too high. Almost 44% have mentioned they are not aware of the reason for the change (*Global Workforce Hopes and Fears Survey: PWC*, 2024). Positive change can also be stressful, especially when the rate of transformation is intense.

3. Discussion

From the Literature Review, following can be inferred:

3.1 An impending digital storm

Interesting times are ahead of us as the pace and intensity of change is intense.

- We are in 4th Industrial Revolution (4IR) which is a melange of technologies, the pace and intensity of change is unprecedented.

- Experts say that we are close to 5th IR which could see a convergence of multiple fields and tech advancements could enable emergence of bio-economy (Alok Medikepura Anil, 2025). Increasingly focus on BMI, BCI studies which will give us ability to advance brain-inspired AI systems.

- Apart from technological advancements, Changing demographics, social, environmental changes and glocal play are key vectors of change (Beno, 2020 cited in Rajagopal and Provodnikova, 2023).

- Advancements come with a price with potential for systems to become sentient and possibility to develop deep Artificial General Intelligence (Griffin, 2024).

3.2 Readiness to face digital storm

The 'Skill' perspective

- There is immense potential in the number of jobs getting created while many others may get obliterated.

- There will be significant changes in the current organizational categories due to advancements in technology and other vectors of change. There is acknowledgement that huge upskilling, reskilling efforts required along with large scale re deployment is required.

The 'Will' perspective

- In a research report published by PWC, almost 4 out of 10 respondents do not know why there is change as the current state is fine. Sense making of current situation and what it entails to face and be ready for future of work is suspect.

- Even those who have had a positive change can find it stressful due to rapid phase of transformation (*Global Workforce Hopes and Fears Survey: PWC*, 2024).

4. Problem Statement

From the above, two key themes emerge

- The pace and intensity of change is unprecedented and is not going to slow down. There will be a digital storm propelled by myriad vectors including technical advancements, societal, environmental, Glocal play and changing demographics to name a few.

- There is a significant gap both in 'skill' and the 'will' in facing the future. There is more awareness and appreciation that a skill gap exists. However it is harder to identify the 'will' gap and it needs to be addressed at an individual level.

In view of this, the need of the hour is for us to approach the problem differently. Not as a change navigator or as a change leader but more as a change architect for ourselves.

In an organizational context, a change architect is able to visualise the future, conceptualise what is required to change, sense makes the key elements and leads large transformative initiatives holistically and at a strategic level. This end-to-end cycle can involve multiple steps and the effort, impact and feasibility could be humungous. There is intentionality, directionality and materiality while leading change at unit or organizational level for the right reasons.

However, when it comes to individual level, it may not be so structured. More often, individual change at a personal level lacks vector qualities and individuals may tend to operate as personal change agents, seldom as change architects for themselves.

They may or may not be able to visualise, conceptualise or sense make the future and the efforts and energy required to move towards the future in a structured fashion may be lacking. A common example could be preparing for future through merely learning a particular skill. In a scenario where we do not even know what skills to learn for in future, it would be myopic and lacking if one were to merely learn a particular skill. (Rajagopal and Provodnikova, 2023) talk about how 'learning to learn' is a skill for future and not merely learning a skill.

In a nutshell the problem statement ahead of us is how to get ready and face the future, the digital storm by being better change architects for ourselves?

5. Approach

From the above problem statement, there is an urgent need to get ready and face the future by being better change architects for ourselves. If we have to use an analogy, the future of work or rapid transformation that is in store for us could be thought of as a storm, a hurricane or a tornado or a cyclone due to the intensity and speed of change. Those of us who are facing this storm have multiple options.

- Option 1: Wait in the shade and allow the storm to pass. This could be a safe option, however as in any safe option, there could be a huge opportunity lost. There is always a possibility that the storm could gobble us up, destroy the lives and livelihoods even if we are in the shade.

- Option 2: Run away, run far from the storm so as to escape the ill effects. Always an option, but we don't know what opportunities the storm may present and what we would miss by running away. Also, one cannot perennially keep running from things, that wouldn't do.

- Option 3: We could prepare ourselves to dart into the storm to unearth the hidden opportunities and make the best out of them. We could have a huge competitive edge as not many would brave the storm. This is a unique perspective and perhaps the most rewarding of options. But this option does not come easy.

As in the scenario of storm, one's reaction towards facing future of work or transformation is the same. Like we have the option of taking refuge from the storm or run away from the storm, we can also avoid facing future transformation either by watching the transformation from the sidelines or running away from it. One needs to realise that both these options may deprive us of the opportunities that the transformative era may bring.

The third option that is darting into the storm is a kind of road less travelled. It is the most difficult of options to exercise and requires considerable amount of grit, determination, tenacity to practice. The results however can be deeply enriching. The larger question is how to go about darting into the storm, it is not a habit we perform every day.

There could be many research articles, books and other lived experience that may well provide us the answer. However, nature which is the biggest teacher has an inspiration from a totally unexpected quarter.

Our source of inspiration is a bird called Petrel, Desertas petrel which is the size of a pigeon and weighs just a few hundred grams. A recent article by BBC Future Earth mentions the speciality about Petrels. Petrels are agile marine seabirds that seek out the most powerful storms and dart straight into the storm to find their prey. They dare to flying into a storm with bands of air reaching upto 200kms of eye of the storm, harsh conditions, which one can only imagine (Latham, 2025). The BBC article quotes the stellar work done by Francesco Ventura, a biologist and postdoctoral investigator at US ocean research organisation Woods Hole Oceanographic Institution around Petrels.

There is a lot to learn from this small seabird as one is starring at a digital storm, intense changes coming our way.

5.1 Petrel inspired change architecture - 3C framework

5.1.1 Crafting the future

During a storm, we are familiar with the happenings in the land. However, it will be hard to visualise what happens in ocean. During hurricane or cyclones, the storm churns up many organisms from the deep ocean to the top surface (Latham, 2025).

Petrel knows this and hence seizes the wonderful opportunity to forage for their prey at this time. The result of their dashing into the storm results in delicious array of food like squid, cuttlefish, octopus which emerge on surface as a result of the storms (Latham, 2025). The article further mentions how Petrel puts themselves exactly in the right place at the right time to be run over by a hurricane which calls for a lot of precision among other things.

It would have been a safe bet to avoid the storm and stay in the nest, but this seabird does not do it. It teaches us a pivotal lesson – to turn an adverse situation to our advantage.

As the saying goes, fortune favours the brave, Petrel makes that a reality. Their ability to craft an opportunity even in the most extreme of situations reminds us of the task ahead of us. While we see the change storm facing us, how can we convert the uncertain future, a future riddled with intense and fast change into our advantage. Sitting on the sideline would mean that one is letting great opportunities slip through one's fingers or through the wings as Petrels would say.

The questions we can ask ourselves to 'Craft the Future'

- How can we unpack the future in terms of 'what is in it for us, what could be the potential hidden opportunities that we can leverage on?
- How can we stay abreast of the changes that will be coming our way and get to hear or read the work of futurists in this space?
- If we were to read a headline about ourselves in the next 15-20 years, what would it be and how do we craft that from today rather than waiting for it for another time?

5.1.2 Cognition : mastery of self

Petrel that weighs few grams faces winds upto 100 km/h or even more along with gigantic waves reaching upto 8 meters (Latham, 2025). Further the article by BBC mentions Ventura's research on how Petrels align their movement trajectory along the wake of the tornado and that they are masters of energy conservation, they practice a concept called 'dynamic soaring' to climb upward and then descend again – they do this for thousands of miles (Latham, 2025).

Just hearing this may sound fantastic and seem to defy nature. However, Petrels know what they are good at. They understand what they can do and what they cannot do. This supreme understanding of their strengths and limitations makes the impossible happen, namely darting into a storm.

The learning for us from Petrel here is the need for us to understand our Strengths, what we bring to the table. This understanding will help us leverage and hone our strengths to perfection. Out of the 54 skills of future, McKinsey research lists 'our ability to understand our strengths as one of the most important attributes under Cognitive Skills that we need to build extensively (Dondi *et al.*, 2021).

The act of thinking about one's own mental processes is called Metacognition, in simpler terms this is referred to as 'thinking about thinking' (Rajagopal and Provodnikova, 2024). Thinking about thinking or Metacognition is a great way to understand our Strengths and can be visualised in three stages in the Metacognition Maturity Model.

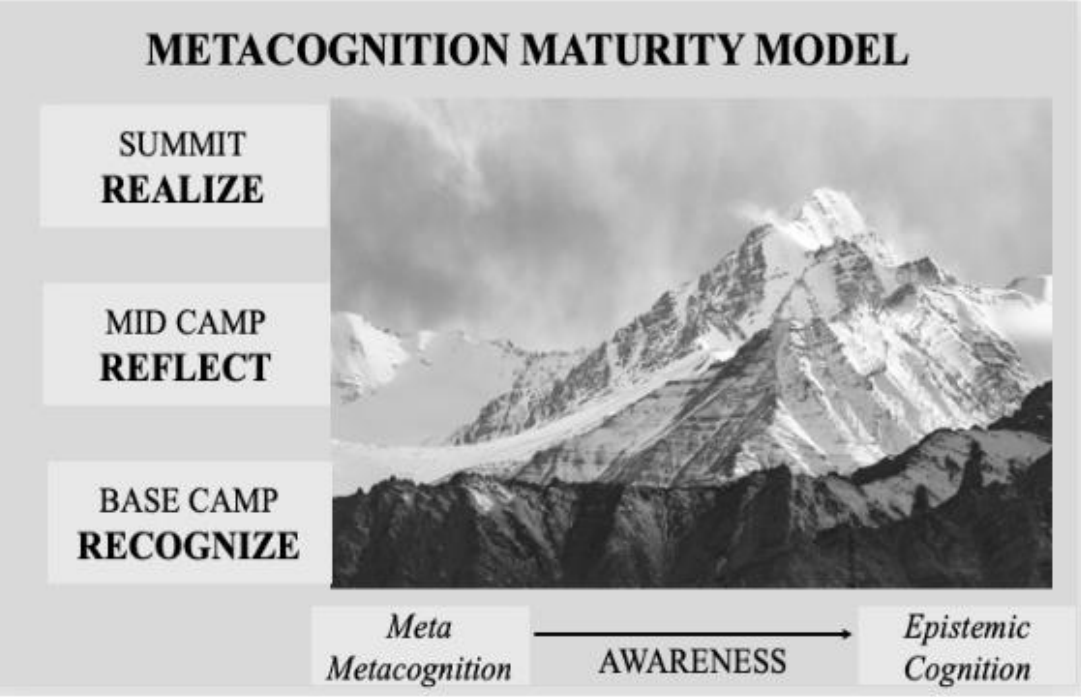

Figure 4. *Create Metacognitive strategies to unlock potential* (Source: Rajagopal and Provodnikova, 2024)

The base camp or Recognize is the fundamental realisation that a concept called Metacognition exists. The summit is the 'Realize' phase where Metacognition is embedded deep into the DNA and those embarking on this journey will be at a transformational point in their lives (Rajagopal and Provodnikova, 2024).

In order to deepen the Cognition, the questions one can ask oneself is:

- Awareness: What are the Strengths we bring to the table. Are there any blind spots that may come in the way of us realising our potential?
- Honing the Strengths: Creating an action plan to intentionally hone the Strengths. How do we leverage the strengths to thrive in the future state?

5.1.3 Courage and conviction for long term success

It would be easiest for Petrels or any birds to avoid the storm or seek the calm eye of the storm. Petrel does neither, they dart into the bands of the storm. They also know how to leverage the bands of air to their advantage. In addition, they hold the record for making some of the longest foraging trips. (Latham, 2025) in the BBC report quotes Ventura and mentions that Petrels travel as far as around 7500 miles - all way from Africa to New England coast and back again.

Petrels teach us to have courage and conviction in ourselves. They teach us how to rise above others and distinguish ourselves with courage and conviction. The courage and conviction to do the impossible needs to be backed by Cognition, the mastery of self. This helps them go far, akin to us facing the future.

Courage may sound very abstract, Zhang (2024) in their research talk about comprehensive courage intervention method that deeply explores the central role of courage in individual success. They also mention that courage has a significant role to plan in an individual's holistic well-being and social success, not just a tool to cope with life's myriad challenges.

The key to success is also the realisation that not every opportunity to display courage is worth taking (Detert, 2018). In the Harvard Business Review article, they mention that one needs to ask two questions: 1) Is this really important and 2) Is this the right time. (Detert, 2018) also mentions that those who are competently courageous are masters at good timing, they observe what is going on around them and if timing is not right, they wait patiently. These behaviours are very similar to what is observed in Petrels. They get the timing right and they know it is important for them. It is said that competent courageous behaviours can be learned with effort and practice (Detert, 2018).

Questions we can ask ourselves:

- What are some effective habits, tools that one can leverage for active courage cultivation?
- How can one leverage their own Strengths and complement the ones they do not have towards effective courage cultivation?

Petrel inspired change architecture - 3C framework

Figure 5. Petrel inspired change architecture (Source: authors' own representation)

6. Conclusion

We are in an interesting era – the phase that is on the cusp of 4IR and 5IR. The intensity and pace of change can be equated to an impending unstoppable storm.

There is both 'skill' gap and 'will' gap in our readiness to face the future. To address this, it is important that we become the change architects for ourselves. In order to do that, one can take inspiration from a small agile seabird called Petrel which darts into a hurricane in order to take the opportunities to prey on the organisms churned up by the storm.

Taking a leaf from the life of Petrel, one can say that there are three main steps in becoming the change architects to face the future. The 3C change architecture framework inspired by Petrel is as below:

- Crafting the Future
- Cognition – Mastery of self
- Courage and Conviction for long term success

We cannot stop the changes that is coming our way. Nor can we wish to remain safe on the sidelines or attempt to run away. Both these options are not tenable. Therefore, we need to prepare ourselves to face the proverbial digital storm by being the change architects for ourselves. At this juncture, Robert Frost's poem seems very apt - "Two roads diverged in a wood and I took the one less travelled by and that has made all the difference" (Frost, 1995).

The road we choose is pivotal – sustenance of human race may well hinge on it.

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