



DIGITAL TRANSFORMATION AND SOLUTION DESIGNING WITH QUADRENNIUM OF THINKING



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Introduction

Drones are flying, aircrafts are carrying passengers and rockets are racing up to space because someone asked a simple question and continued to think till the answer was found. Readers by now might have guessed both the question and the person who asked it. The byword goes like this, '*Millions saw the apple falling, someone asked why*'. That event, of an apple falling on ground and not going up or moving laterally, ignited a young man's mind with certain intriguing questions. That someone was Sir Isaac Newton, one of the most cerebral mathematicians, physicists, and dominant inventors in known human history.

He asked the question which none could answer. What he thought through was the crucible for some of the greatest discoveries in history of mankind.

Quadrennium of Thinking

One can debate on a point whether Sir Newton was driven only by his own inquisitive mind. Did he use the process of critical thinking, radical thinking, design thinking and/or combinations of those three? Did he also resort to strategic thinking to find applications of the answers to some other activities for generation of values in tangible terms? Borrowed fundamentals from etymology prompts the author to postulate that these four types of thinking and reasoning can collectively be rechristened as the 'Quadrennium of Thinking' or four bedrocks of thinking and reasoning.

Irrespective of the nature and process of thinking Sir Newton did undergo readers would agree that he was an agile observer, too sharp-witted and choosy in picking up issues which deserve enquiries. Probably he was encouraged by a thought that if the reasons behind the apple falling on ground and not moving in any other direction is understood, many problems of humanity could be solved irrespective of value to be generated in economic terms. That keenness to serve humanity, powered by empathy and emotional intelligence, could be what made him to think more. If that is termed as strategic purpose, let that be the most significant example for all scientists for all times in any field.

Image Source: <https://bookboon.com/blog/2012/02/logical-thinking-how-to-use-your-brain-to-your-advantage/>



Sir Isaac Newton (1643-1727)

Source: <https://www.eatmy.news/2021/03/biography-sir-isaac-newton.html>

Sir Newton endured with thinking and relentlessly experimented till he proved and recorded the laws of gravity. Finally in 1686 he presented the ‘Three Laws of Motion’ in his book “Principia Mathematica”. His theories helped scientists to understand how birds fly and come down to perch which ultimately led to the physics of an aircraft’s operations and hundreds of more such usages.

He did not stop with only laws of gravitation. He continued with his ‘innovative’ mind in quest of many more discoveries. The result was two more major creations, viz., a reflecting telescope coupled with the theory of colour that “*a prism separates white light into the colours of the visible spectrum.*”. So much was accomplished by this son of a rancher who lost father when he was a baby of three months and brought up by grandmother as his mother remarried.

Objective

The author has spoken at many fora and written about humane and ethical dimensions of digital transformation during last about eight years. However, did not formally enquire and study about the processes of thinking which drives a scientist or an inventor, albeit having some personal experience. Readers may know about one invention of the present author, supported by his colleagues, which was circulated by patent registration authority of the USA¹. The primary driver for this invention was to find a solution for certain critical problems that were being faced by this author and the organisation he used to serve in corporate life. Unknowingly the author has undergone several processes of thinking during many sleepless nights.

Objective of this article, therefore, is to write about the said four types of thinking, which creators of history like Sir Newton might have undergone. Thinking is not by itself equal to innovation and or creation. But thinking is at the core of ideating and doing anything. It provides the womb in which the embryo of innovation is created. Again, the old axiom also teaches that thinking time reduces doing time. The fundamental objective of this article is, therefore, to put together and develop understanding about various types, processes and purposes of thinking and reasoning which can help digital scientists, solution designers, hackathoners,

startupians, aspiring entrepreneurs, etc. in innovating and developing products with application and integration of digital technologies. Objective of this paper is also to remind all concerned that while doing so one must consciously apply emotional intelligence, morality, and ethics which are essential for ultimately serving the causes humanity.

Newton and Startupians - The Common Points

Perhaps there is no digital scientist, solution designer and product creation in present Industry 4.0 era who is not inspired by Sir Newton. Stories of most of the founders and product developers of successful startups and unicorns are similar on several counts. They have also gone through processes for enquiry and exploration particularly when the matters relate to keenly watching the problems being faced by business entities, society and humanity in general that needs solution. They have also detected, observed, and analysed issues, gaps, lack of versatilities, suboptimalities, operating inefficiencies, ineffectiveness, avoidable costs etc., of existing products and services that needs resolution.

Having understood what society needs, solution designers withstand the labour pain of ideating and crafting solutions, try that out, and then scale up for mass delivery at costs which the target users can afford and be satisfied with value for money. In present era of ever emerging digital technologies and their evolutions in a short span of time, solution designers’ challenges are further complex. They must beat the legacy products which may not even be two/three years in use and offer solutions and products with enhanced power, smartness, and operating efficiencies at an affordable cost for all.

Questions can, therefore, arise in people’s mind as to how thinking can be of four types. Even if there be so, whether such startupians undergo the same quadrennium, viz., critical thinking, radical thinking, design thinking, strategic thinking and/or combinations of those. They might have not even appreciated whether such types of thinking are essential for innovation. However, one point can be concluded without much of debates that startupians, who also are entrepreneurs, must undergo the process of strategic thinking but for which their objective of commercialising the resultant product and/or services would not be possible. The other side of the argument is equally forceful if one says that when the product and/or the service is of such order that would be accepted by users without much of marketing efforts, an aspiring entrepreneur need not spend much time for crafting business strategies. For this the quadrennium of thinking is a must.

Digital Transformation - Revisited

The author in his book on digital transformation² has explained the multidimensional aspects of digital transformation (DT) in details. However, it would be useful in the context of this article to revisit the fundamental tasks of digital transformation. Readers may refer those chapters for detailed inputs. In common parlance DT involves the following simple steps:

- ① **Innovation:** Exploration and cerebral ideation of new and improved processes for crafting new/better products and generating tangible values by conducting activities in an improved way; finding new business

models and revenue models by meeting latent demands of society, and serving hitherto unserved customers across income levels and geographies.

- ⊙ **Digitisation:** Convert relevant analogue information and physical processes into digital format and platform for meaningful use across the value chain and safe storage thereof for subsequent analyses and interpretation with reduced human intervention.
- ⊙ **Digitalisation:** Use digital technologies for end-to-end ethical and empathetic reorientation of digitised systems, policies, and processes with the objectives to add tangible value and generate new business opportunities by expansion, and diversification of business activities.
- ⊙ **Digital Transformation:** Manage strategically planned multidimensional changes of business activities by leveraging digital technologies to stay ahead of competition in relevance with contemporary business and technological ecosystem for sustainable growth and prosperity.

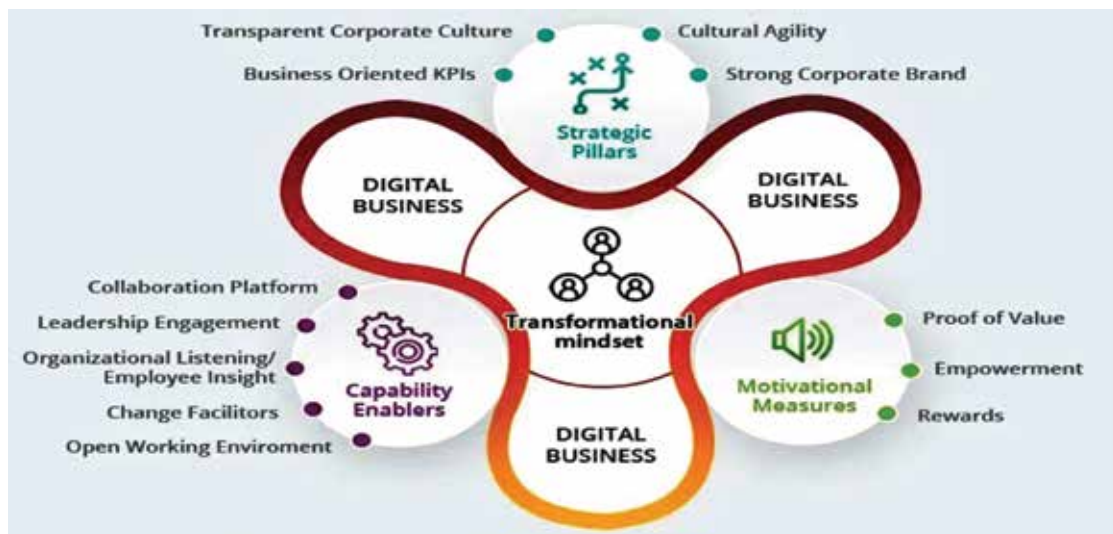
Digital transformation is not a one-time activity like lipstick syndrome of decorating the business. It is neither a destination. It is a never-ending journey with ever evolving technology as the driver. This process of transformation can be elucidated with the help of a bank's operating activities for lending. When a bank introduces a portal or platform for customers to submit loan applications and upload required documents, one should not feel that it is a case of digital transformation. It is just a case of digitisation, i. e., converting an analogue or physical process into a digital one.

The next task is digitalisation. The bank applies digital technologies to get rid of the traditional movement of physical files to processing and approving officers. Instead, they are provided task-specific access to the portal containing those

data and documents, submitted by the borrower, for further processing, sanctioning and disbursement subject controls configured in the ICT system. Now the bank and customers are seamlessly connected through one single interface of a digitalized lending platform through intranet and internet. This platform can be made more versatile to track and monitor charging of interest on loan and recovery of equated monthly instalments. Blockchain could be the ideal technology for this purpose.

In the third step of digital transformation the bank must find ways and means to use such a newly created digital platform to expand business by attracting new customers without resorting to traditional marketing activities. It should also change business model(s) befitting the change in other allied businesses and technology ecosystems. It must change customers' value proposition' by innovative and unique means and processes for working. For this it can safely integrate its own platform with that of other business entities.

One of the examples could be like this - When a buyer checks out from an eCommerce site after booking/buying a consumer durable, say car or an expensive phone, a message can pop up on her/his computer/phone screen asking whether she/he would prefer to take collateralised loan against EMI. This auto prompt is generated by integrating the banking platform with the operating platform of the eCommerce player. If the customer opts for loan, the system would auto-shift her/him to the banking platform for further processing. The loan is sanctioned using robotic process automation (RPA) with minimum or without any human intervention. At this step it would be possible to digitally execute a soft hypothecation deed. This step can be considered as innovation for introducing new business model and revenue model. Digital transformation. therefore, is equal to business transformation with better process, improved efficiency, and effectiveness for higher ROI.



Source: <https://twitter.com/antgrasso/status/1565640698275176449/photo/1>

Digital Transformation, therefore, needs a transformation of mindset which is stimulated by thinking and reasoning. As is evident from the above graphics, transformational mindset can create digital business when there are:

- ⊙ **Capability Enablers:** Environment for innovation supported by technologies and trained human resources, business insights, collaboration change facilitator, leadership, etc.
- ⊙ **Strategic Pillars:** Strong corporate brand image, transparent corporate environment, cultural agility, appropriate controlling, and monitoring mechanisms with KPIs and KRAs, etc.
- ⊙ **Motivational Measures:** Empowerment and free atmosphere to innovate and even make mistakes without fear of penalty, proof of concepts, realised ROI, incentivisation of contributors for success and so on.

There seems to be no scope of doubt that an entity can continue with successful digital transformation only if there is an ever-evolving process for observing the stakeholders' ecosystem, thinking and exploring for generating new enquiries, appreciating and analysing existing problems in search of finding better solutions. Readers may know more about digital transformation of banking institutions from the research-based publication in Chapter 11 jointly written by this author with another and published in the book titled Indian Banking and Finance Report, 2021.³

Digital Transformation & Quadrennium of Thinking

The author admits that, even being a habitual user of dictionary, there is a deep sense of perplexity for him to decide the meaning or meanings of the word 'Think'. That meaning must be appropriate for doing justice to the word itself in the context of this article on digital transformation. He picked up from Oxford Dictionary the following four meanings which may be considered appropriate for prefixing to the words 'Critical', 'Design', 'Radical' and 'Strategic'. It is for readers to stretch their imagination and decide whether the meaning of the resultant four twins of words, viz., 'Critical Thinking', 'Design Thinking', 'Radical Thinking' and 'Strategic Thinking' are in order. The author is taking liberty to pick up the following meanings for the word 'Think' from the said dictionary:

- ⊙ "Direct one's mind towards someone or something,
- ⊙ Use one's mind actively to form connected ideas,
- ⊙ Have a particular mental attitude or approach, and
- ⊙ Imagine or expect an actual or possible situation,"



Source: Assembled by author using icons freely available from internet

The axiom says that "A problem is a frame of mind. Getting to the solution begins with how you think about the problem". In the context of what Sir Newton had undergone and presently the startupians/scientists are now going through for digital solution designing, the meanings of the four twins of words, of which the word thinking is common, may have to be blended into one collective sense of understanding. Let these further be analysed in the following paragraphs and linked to the process of digital transformation in general.



Critical Thinking (CT)

In a report to the World Economic Forum way back in 2016 on human capital CT was reported to be one of the most important skills to be employable in the emerging business ecosystem. Oxford dictionary has defined CT as "The objective analysis and evaluation of an issue in order to form a judgement." Richard Paul has said "Critical thinking is thinking about your thinking, while you are thinking, in order to make thinking better."⁴

According to a blog published in Bright Concept,

- ⊙ "Critical Thinking is a cognitive competence, resulting from the combination of cognitive skills and dispositions.
- ⊙ It is defined by the ability to analyse and evaluate existing information on a given subject, trying to clarify the veracity of the information and arrive at a justified idea about it, ignoring possible external biases.
- ⊙ It implies having the ability to make complex choices and solve problems in innovative ways, integrating existing thinking with new knowledge and applying it in different contexts."⁴

It may be observed that the three kinds of abilities that have been summarised in the above narrative about CT are important for an innovator. Any business entity engaged with digital technologies must have human capital bestowed with the power of critical thinking to achieve success in digital transformation.



Radical Thinking (RD)

Lexicon connects the word radical with root. That is why perhaps its iconic expression is implied by the square root sign of mathematics. It indicates that process of thinking in which the task of thinking digs into the root, or historical origin of the problem/issue being thought through and/or reasoned out. RD also searches for the basic principles and foundation of the subject/issue from which the problem has germinated. This in turn reveals the secret for change. For enabling innovative thinking and crafting of unique design of solutions radical thinking:

- ⊙ Considers that change is fundamental,
- ⊙ Includes purposes and plans for the innovation,

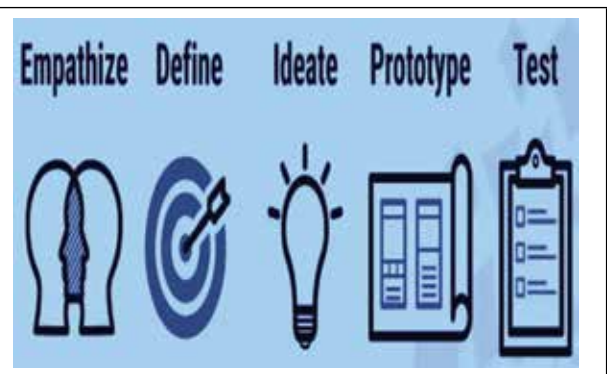
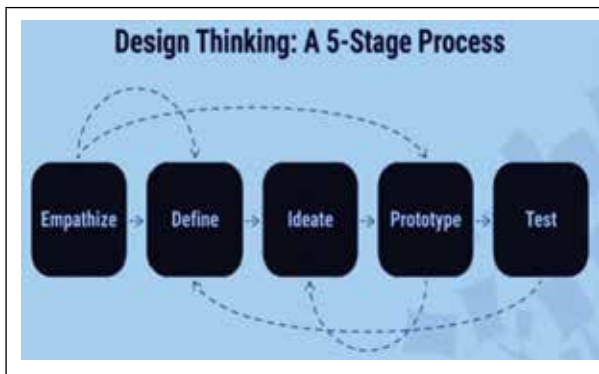
- Is not only a drawing to show how something looks,
- Argues out that old and legacy things are not only shinier,
- Is the deliberate process for purposefully creating the new, and
- Is a comprehensive retune of customers' experience for a new business model.

The aforesaid brief narrative perhaps could convince the reader that RD is essential for ideating and designing the most effective, empathetic, and ethical solution for the problem being solved. And that should be the overarching objective of digital transformation.



Design Thinking (DT)

The Hasso Plattner Institute of Design, Stanford, USA has described DT as a process consisting of five stages. The process of thinking may not follow any specific order, may run simultaneously and/or can repeat out of turn and sequence if so required to arrive at the answer or solution being searched for. The objective of DT is to identify strategic options and probable resolutions which were not prima facie evident at the initial phase of thinking. Each phase of DT has a specific purpose to serve for finally selecting the most appropriate solution. The following are those five stages collectively called as EDIPT:



Source: <https://canvas.unl.edu/courses/73802/pages/5-stages-of-design-thinking#:~:text=Design%20thinking%20is%20a%20non,are%20ill%2Ddefined%20or%20unknown.>

- **Empathise:** To conduct research of the associated issues for empathetically appreciating and understanding the problem taken up for resolution. Empathy brings humane centrality to DT that drives the process of thinking and reasoning towards the needs of target users instead of being misdirected by personal egos of designer(s) and organisational policy bias. This also helps adopting the appropriate digital technologies to be applied and/or integrated.
- **Define:** At this stage all the information and observations gathered during the first phase of empathetic research would be analysed, critically thought through for articulating the exact definition of the problem(s) of target users to be solved. This is also called crafting the 'Problem Statement' for which humane centric solution is to be built.
- **Ideate:** This is the stage for thinking *hatke*, i. e., out of the box or in a non-traditional manner getting out of the trap of legacies. Brainstorming is a useful process when a team of innovators is collectively trying to solve the problem. This is the stage for '*Innovation*' which is a combination of three tasks viz., innovation, invention, and creation. Cost-benefit analysis with an eye on value for money to the users is an important consideration for this stage.
- **Prototype:** This is the stage for debating with results for experimentations done and giving shape to a scaled down version of the final solution decided to be adopted for solving the identified problem with empathetic and humane approach.
- **Test:** Generally, a separate set of human resources, other than the team which has worked for the above four tasks, for testing the prototype assessing its veracity before clearing for commercial implementation. Even external experts may be invited to reinforce the team at this stage. The predominant objective is to take a dispassionate and impartial view while assessing efficiency, effectiveness, desirability, and estimated ROI from the solution.

Design thinking, therefore, is one of the most important tasks for digital transformation. Contributions from this group of tasks assumes higher significance and priority particularly keeping in view that the organisation must have to reorient its policies, systems, and procedures as well as organisational culture simultaneously with adoption and applications of digital technologies which were hitherto not practised. Moreover, the organisation would also have to add newly crafted business models and revenue models to complete the third task after digitisation and digitalisation which is finally digital transformation of the way business is conducted.



Strategic Thinking (ST)

Strategic thinking is the process for approaching the fundamental drivers for creating values for an organisation's stakeholders by challenging the conventional ways of dealing with the problems being faced and anticipated in foreseeable future. It focuses on finding and developing unique opportunities to generate monetary gains. At this stage it would be useful to understand what a strategy is. Drawing themes from various literature of Harvard Business School strategy can be defined as *"An integrated set of choices for actions which positions a firm in an industry so as to generate superior financial returns over the long run."* It is, therefore, is an intentional and rational process of thinking that focuses on analyses of critical factors and variables which influence long-term success of a business.

ST includes the task of proactive, careful, and deliberate anticipation of threats and vulnerabilities for framing and implementing mitigation measures against risks. The objective is to uninterruptedly pursue the opportunities for realisation of financial returns. It involves hardcore analyses internal organisational realities before articulating a clear set of goals and plans required to survive in a competitive and ever-changing business ecosystem driven by powerful technologies.

ST also involves alignment of the newly defined set of goals with the vision and mission of the organisation. However, there will be a challenge to manage cultural changes that are warranted for migrating from the legacies of traditional management to a digitally transformed organisation. Accordingly, formulation of strategies for digital transformation will also involve redefining balance score card of each functional group and realignment of goals of individual employees with that of the organisation, coupled with a discreetly crafted scheme of incentivization.

ST must take into consideration economic realities, market forces, and availability of resources. It also involves requires research, analytical thinking, innovation, problem-solving skills, and communication. Again, success of ST depends upon decisive leadership for dealing with the vulnerabilities, uncertainties, complexities, ambiguities, fear of unknown and unprecedentedness (VUCAFU) of emerging business environment. All these essential elements and features of ST as the last bedrock of the quadrennium are essential for an organisation embarking on a journey of digital transformation to march ahead with sustainable goals towards prosperity.

Role of Right Brain for Thinking Quadrennium

It would be useful to borrow some knowledge from medical science about the role of brain for thinking to further appreciate the importance of quadrennium of thinking. Human brain is divided into two segments, viz., right and the left brain. One would appreciate from the respective functions of left brain and right brain, as quoted in the graphic given below, that left brain makes a person to think in a structured, logical manner and perhaps in a bit mechanical way. Whereas functions of right brain relate to the soft humane qualities, viz., creativity,

empathy, ethics, morality, emotional intelligence, etc.

Thinking Quadrennium Needs More Application of Right Brain



Source of brain graphic: Unknown

Let the author not get into the task of writing analytical narratives on each function of two sides of human brain. It is not difficult to conclude without much of debate that the role of right brain would be more in designing solutions with applications and integration of technologies. Therefore, while training employees before embarking on the journey for digital transformation it will be advisable for every organisation to make them consciously aware of the above functions of brain. They must be put into a workshop and given real life case studies for analysis and interpretation. The objective should be to make them realise what kind of suboptimal results can come out if the right brain is not used while functioning with the help of quadrennium of thinking.

Conclusion

This article has been written with the objective of bringing out the importance of thinking as a task and habit for digital transformation. Four types of thinking covered in this article has their individual importance. Business managers, in the rush of their day-to-day activities at times lose sight of the thinking processes they should follow. The author would consider his efforts in writing this article useful if professionals and leadership team members of any organisation find learning points from this paper useful in their journey with digital transformation/ **MA**

Bibliography and Webliography

All these websites have been accessed during August and September 2022.

1. <https://patents.google.com/patent/US20130179313A1/en>
2. Paritosh Basu, *Digital Transformation – A Prismatic View, First Edition, March 2022, Chapters 4 to 8, pp 18-43 pp 244-254*
3. Dr Deepankar Roy and Dr. Paritosh Basu, *'Digital Transformation of Banking Institution, Chapter 11 of India Banking and Finance Report, published by NIBM, Pune, pp 163-178.*
https://spectrum.sagepub.in/book/india-banking-and-finance-report-2021-partha-ray-9789354793035/15?fbclid=IwAR2FDfN0JCUYqCxlOGLOLpvIjerOnR_q1xXUUjzea4r9tdXMAgCghscyPw4
4. <https://www.brightconcept-consulting.com/en/blog/leadership/how-to-develop-the-7-skills-of-critical-thinking>