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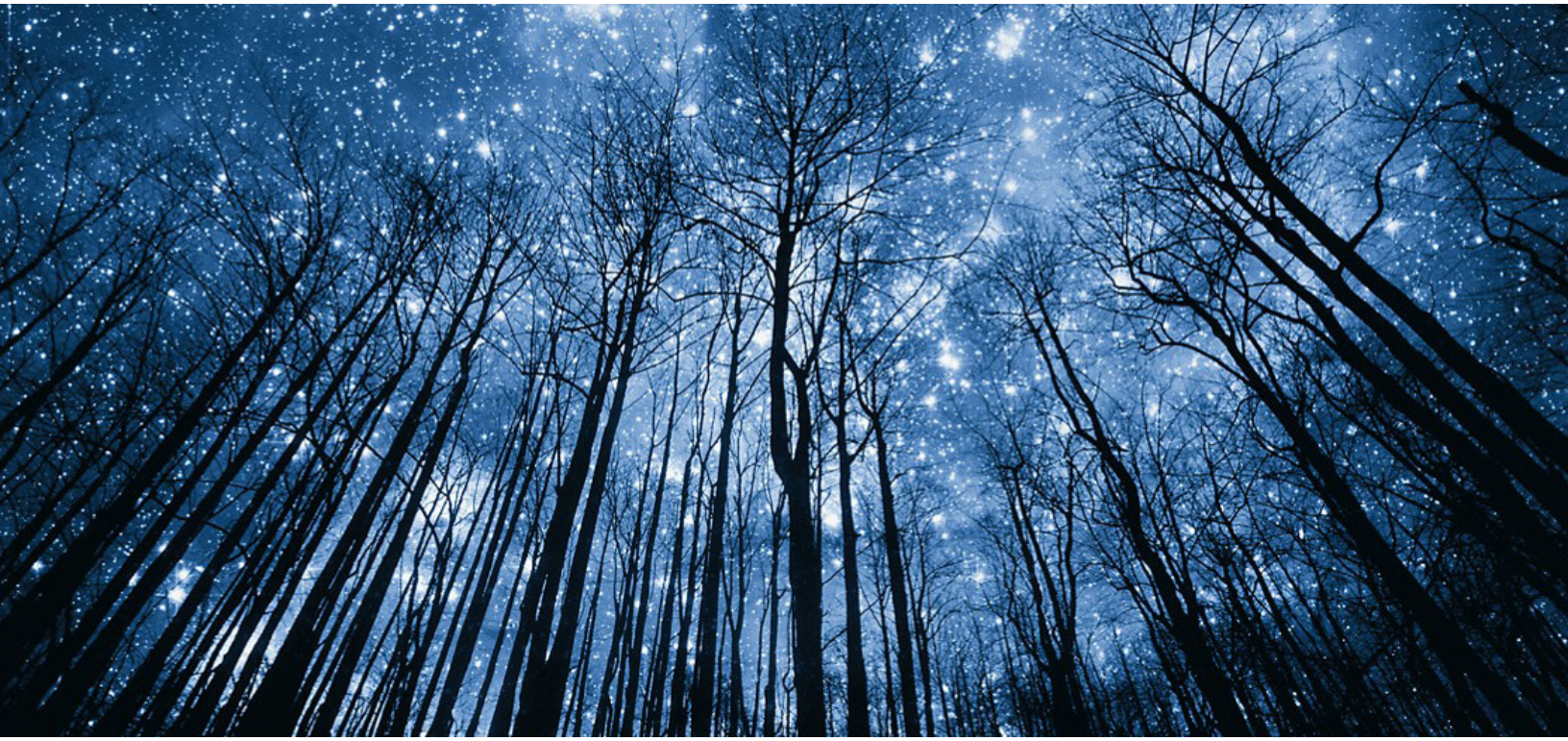
TECHNOLOGY ADOPTION CURVE



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Abstract

For all the time, effort and funds invested in innovating technology and tools, organizations still find it problematic to bridge the gap between the purpose of the technology and its ability to be absorbed effectively. Introducing innovative technologies often becomes a challenge and the genuine value to be gained can be obscured.

To implement an innovative technology, it becomes crucial to deploy it in the right implementation site, utilize a team to take overall responsibility including the internal markets and stakeholders, and use an appropriate method of communication to diffuse the innovation. When the organization gets larger the standardization of the tools and technologies also becomes a grave concern. Therefore, in this paper we use the Technology Adoption curve to explore and understand the technology adoption patterns of a global IT company employee. From the employees' perspective we want to understand what is in it for them and how easy or hard it is to adapt to the changes.

To analyze this a survey was prepared, which took a mixed approach where both qualitative and quantitative strategies were used. A dataset comprising of responses from employees to the questions in the survey was used. The resultant adoption rates were plotted on Moore's technology adoption curve. The results indicated that we belong to an early market. The study thus concluded that we are in the infancy stage of the Maturity model adoption curve and inside Moore's chasm on the technology adoption curve.

Introduction

Transformation is at the front and core of the Tech-World. Technology must not only be transformed the right way but also at the right time to make a promising difference. It is crucial to transform not just to satisfy the customers but also to fulfil the needs of the employees. Industry's need then led to the coining of the term - "Workforce Transformation".

Workforce transformation has been an admired and well accepted rule of thumb at an IT company. Transforming tools, technologies, and even the way of work to improve their comfort and all-round experience is believed to boost employees' productivity and hence the overall revenue to the company. That is why it is a great deal for organizations to know if their internal work transformation is taking the right turn or the wrong turn or is simply stagnant. Organizations put in frequent efforts to research new ways of innovating and transforming internal tools. But not all openly embrace this change in technology. With a growing workforce, flexible work locations and having everything digitized and automated, it becomes almost unpredictable how and why the employees adopt new tools or not.

The pandemic year has made IT families grow. IT companies have seen immense growth in their team member's count. There have been constant efforts put in by the Leadership to train and educate the team

members about new tools and technologies. The adaptability of the technology by the users depends on numerous factors like how complex it is, how it is advertised or how the users perceive it.

Through this paper we have surveyed and researched how well the team members of an IT company accept and welcome the change in technology. By depicting a simple graph of technology adoption, we will know where the team stands with respect to embracing innovative technologies. The results from the research will help the Leadership of the company coordinate between the increasing rate of technology change and inability of workers to utilize these new capabilities.

Literature Review

Through time, well past the industrial revolution and through the silicon revolution, technology is now defined as the development and utilization of newer tools, advanced machines, and processes. This helps in solving human problems and proceeding efficiently.

As a textbook definition, innovation is an idea, practice or object that is perceived new by an individual. Keeping in mind the context of technology, Innovation has long been synonymous with the terminology of technology and has an undertone of novelty and modernity.

Diffusion of Innovation

Diffusion is the process of propagation of innovation wherein it is communicated through certain channels over time among various members of a social system. There are four main elements in diffusion of innovation that provides a concrete hold on the process:

1. Innovation

2. Communication channels

3. Time

4. Social setting/System

We have discussed the definition of innovation and well defined the context as well. So, the attributes of innovation come as follows:

a. Relative advantage: What would qualify something as an innovation is the advantage of it being superior to the idea at hand.

b. Compatibility: Being consistent with existing values, sound concepts and past experiences.

c. Complexity: The degree to which the innovation is perceived as difficult to understand and use. In most cases, ideas that are simple to understand are more readily adopted but as we know, there can be various expectations.

d. Trialability: An innovation that is trailable represents less uncertainty to the individual who is considering it for adoption, as it is possible to learn by doing.

e. Observability: If the results or outcomes of innovation are obscure, it is less likely to be adopted by individuals.

Communication channels play an integral role in the diffusion and eventual adoption of innovation as they are the true means of propagation for an idea. Thus, it proves useful for understanding the various classifications of channels:

a. Interpersonal channels - It would refer to communication between peers or between two individuals.

b. Mass media channels - The use of various media outlets to inform the social system in a short amount of time.

c. Localized channels - This is a channel restricted to an area or domain such as within an organization.

Time goes hand in hand with the communication process and plays an integral role in the diffusion model. The time dimension is involved in diffusion

(i) in the innovation - decision process,

(ii) in the innovativeness of an individual or other unit of adoption, and

(iii) innovation's rate of adoption in a system.

A social system is a unit engaged in joint problem solving to accomplish a shared goal. The members of this unit can be individuals, informal groups, organizations. This social system forms a boundary within which innovation diffuses and propagates.

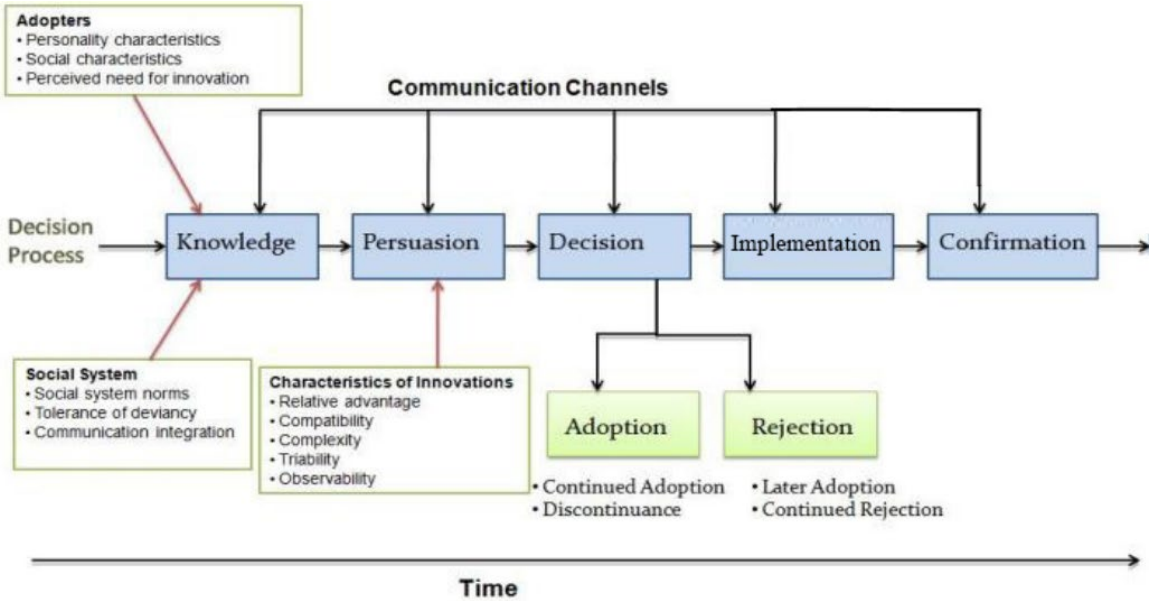
Therefore, the adoption/diffusion rate is the relative speed with which an innovation is adopted by members of a social system and is measured by the number of individuals who adopt the innovation in a specified period, such as each year. Why it is important to know this is because this rate of adoption is a numerical indicator of the steepness of the adoption curve for an innovation.

Innovation – Decision Process

The "Innovation - Decision Process" tells us about the process through which an individual passes from first knowledge of an innovation, to forming an attitude towards the innovation to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.

Figure 1

This process consists of a series of actions and choices over time through which an individual or an organization evaluates a new idea and decides whether to incorporate the new idea into ongoing practice.



When we begin this decision process, the individual learns about the existence of innovation. This is known as the knowledge stage, and it includes becoming aware of innovation through communication via the media and interpersonal interactions. If we look at it from an organizational perspective, an example of this would be learning about a tool in a training session. The individual also learns how to use innovation correctly and the underlying principles describing how and why the innovation works.

As we move on from the knowledge stage, the individual develops an opinion (either positive or negative attitude) about the innovation through evaluations of others like colleagues and peers (social

reinforcement). At the persuasion stage, we often look towards our peers to see how well they are perceiving innovation. This is also often determined by the attributes and characteristics of the innovation, which we discussed earlier on namely, relative advantage, compatibility, complexity, and observability.

Once we cross the persuasion state, the organization chooses to either adopt or reject the innovation. In this case, adoption would mean fully utilizing the innovation as the best course of action available and rejection would mean not adopting the innovation at all. According to Rogers there are two types of adoption, that is, continued adoption or active acceptance where there is continued and sustained use and discontinuance or passive acceptance where the innovation is initially accepted and then discontinued. Rogers also identified two types of rejection, that is, later adoption or active rejection which is rejecting an innovation but eventually adopting it later and continued rejection or passive rejection which is straight non-adoption where the individual does not think about adopting the innovation at all.

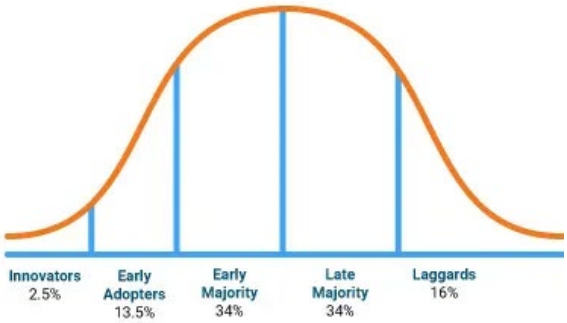
After we decide to adopt the innovation, we move onto the implementation stage wherein processing and decision-making end, but the behavioral change that comes with adopting an innovation begins.

And at the very end, the organization looks for support for their decision. This is where the level of satisfaction and the level of support should be high for the use of the innovation to continue. If the level of satisfaction is low and there is inadequate support, it is likely that the innovation will, even at this stage, be rejected.

Roger's Adopters Curve

The categories of adopters are the classifications of the members of a social process or methodology based on the potential of innovativeness. When we look at the curve, adoption refers to continuous use. The rate of adoption is measured via means of the relative duration of time required for a sure of the participants of a process to undertake an innovation. Roger's Adopters Curve (1995) mentioned Innovators, Early Adopters, Early Majority, Late Majority and Laggards as innovation brackets as shown in the mild bell-fashioned curve.

Figure 2



The bell curve usually explains how contemporary thoughts or ideas spread and for what duration. This is mostly used in marketing to identify a trend but has also been used in agriculture, healthcare, criminal justice, and IT development.

Now when we talk about these brackets each mark different attributes about users to elucidate if they will try something new or will they be hesitant.

1.1. Innovators: They make up 2.5% of the environment. They are emboldened and willing to expertise innovative ideas. They usually belong to new generations, have terribly best social class, and have good monetary perspicuity. Being social they have direct contact with scientific sources and interactions with co-innovators. They are risk-tolerant and love to remain in trend be it the newest app or

lifestyle habit. They are ready to agitate unprofitable and unsuccessful innovations and have a precise level of uncertainty about the innovation. Their backup financial resources help them go through any failure. They accept that it is tough but irresistible at the same time. They are the gatekeeper's conveyance the innovation in from out of the box. They are tech savvy and have strong expertise.

1.2. Early Adopters: They kind 13.5% of the environment. They are also tech savvy, young, have the next social status, financially clear, more educated, and more socially progressive than the late early majority. However, their behavior is not the same "go first and show it" drive that gives innovators thrill. The reason behind this is that they are a little restricted. They have leadership roles within the social organization and alternative members of society return to them to induce recommendation or information concerning innovation. Therefore, adopting innovation as a role model reduces uncertainty concerning the innovation within the diffusion process. So, early adopters place their stamp of approval on a new strategy by adopting it. Early Adopters have higher expectations for ease of use and user support than innovators.

1.3. Early Majority: They type 34% of the system. They need to be on top of average position and have a median quantity of information on technology and have even higher expectations for ease of use than innovators and early adopters. The early majority are on good terms with other team and industry members but do not have a leadership role. However, the kind of bonds they have in their interpersonal networks remain necessary within their innovation-diffusion process. The early majority consciously adopt an innovation and are not the early arrivals or the late comers. Therefore, innovation takes longer to get to the target i.e., taking longer to welcome new stuff into their day-to-day use.

1.4. Late Majority: Like early majority, late majority conjointly type 34% of the environment. They have below-average social status, low financial lucidity and less opinionated in a leadership. They may lack some of the technical concepts required to use the product and they have high expectations for ease of use and user support. They are skeptical concerning the innovation and its results, as well as its financial necessity, and hence will wait for colleagues to adopt the innovation. To cut back the uncertainty of innovation, social networks of shut peers coax the late majority to adopt it and later believe it is secure. We can say that this population tends to accept innovative technology because of peer pressure because the majority population has already upgraded.

1.5. Laggards: Laggards represent 16% of the society in question. They need the bottom rank likewise because of the least monetary lucidity. This population is often averse to vary and alter agents. If they have started using an innovation there needs to be study documentation. Laggards have a conventional read and are more skeptical towards innovation and alter than the late majority. Being the most limited cluster of the social network chiefly comprises of family and close friends. Thanks to the restricted resources and lack of awareness or information about an innovation, they initially need to form positive that associate in nursing innovation works before they adopt. Thus, laggards tend to choose once gazing whether the innovation is with success adopted by different members of the structure within the past. All due to these attributes, laggards' innovation-decision amount is comparatively long.

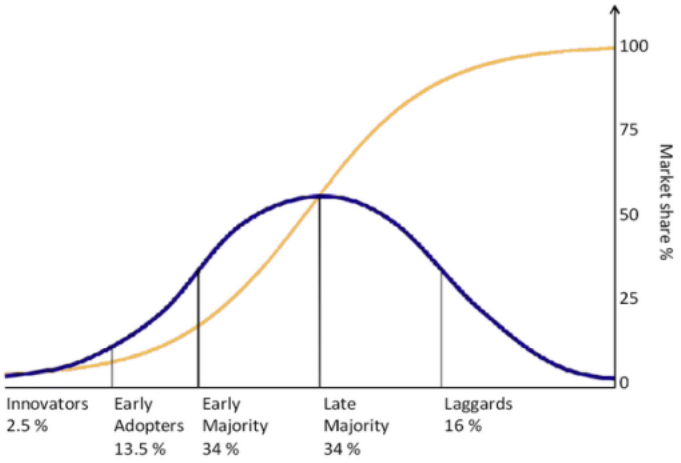


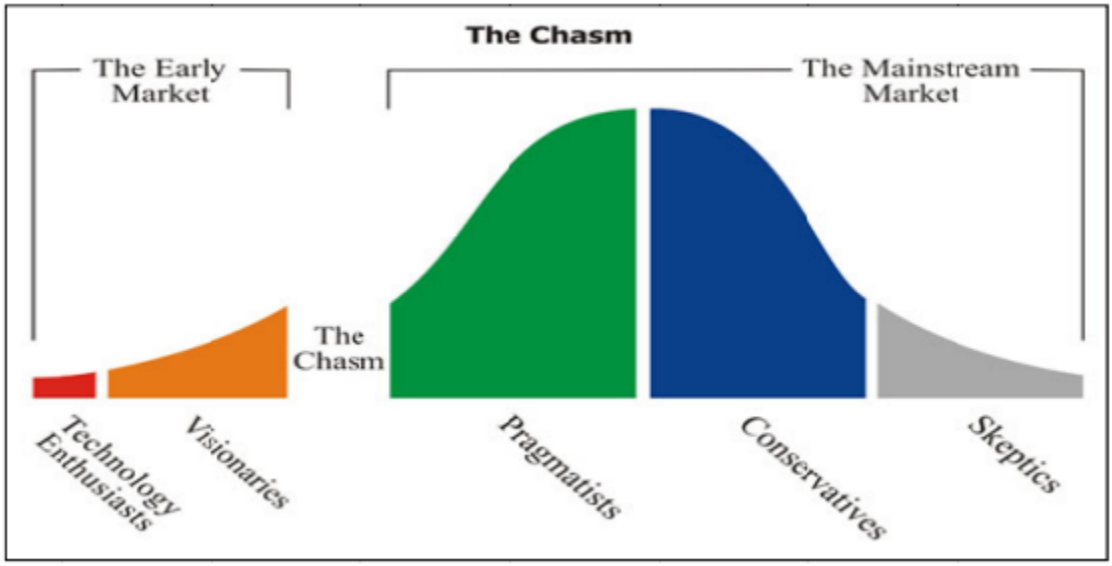
Figure 3

According to Roger, bell shaped graph exhibits the businesses of users adopting a brand-new technology and the S curve represents the marketplace percentage that reaches 100% when fully implemented. This is the factor of marketplace saturation.

Moore's Technology Adoption Curve

Figure 4

In 1991 Moore's Technology Adoption Curve turned into tailored from Roger's Adoption Categories. Moore replaced Rogers Adoption Stages with new stages, i.e., Technology Enthusiasts at the start of the curve (invasion stage), Visionaries, Pragmatists, Conservatives and Skeptics (at the end of the curve)



respectively.

According to the Technology adoption curve Technology enthusiasts, like innovators, adopt strategies immediately since they are interested in disruptive innovation in step, they need to strive out new matters and spot how they paint.

Visionaries (early adopters) leapfrog their opposition via way of being the primary to leverage the brand-new power. They are inclined to take greater dangers to get a primary advantage.

The pragmatists (the early majority) are interested in the productivity enhancements being promised, however, to need to attend till the innovation is mature to paint reliably without much effort. They appear to be quite different to get the sign of while it is far secure to leap at the bandwagon.

The conservatives (late majority) now no longer like disruption in any respect and need to look it very well domesticated and appreciably price decreased earlier than they do not forget adopting a brand-new generation.

The skeptics (laggards) absolutely need to have as little to do with disruptive improvements as possible.

The Chasm

In 2003 Moore discovered that there may be a mental gap between 'Early markets' and the 'Mainstream markets', what he calls the chasm. He brings out that the users withinside the first organization are visionaries, and the latter are pragmatists.

Visionaries need to be the primary to attempt a brand-new era. They are willing to put technology to the test if it is promising and unique.

Pragmatists will only engage if it has been tried and proven to be risk-free. Moore explains that the chasm version represents a sample in era adoption that is primarily based totally on the tendency of pragmatic clients and companies to undertake a new era once they see different humans like them doing the same. He mentions that the tendency may be very deep-rooted and persistent. According to Moore, while a brand-new product method is the chasm, it typically is ready 80% of what the complete finished product could appear like and this is appropriate for visionaries, however pragmatists will in no way be snug with it. Pragmatists will not receive much less than a 100% completed product. According to Moore, a 'Chasm Crisis' is a chain of bad choices and moves because of not achieving revenues, objectives and different commitments. Moore states that many technologies did not pass the chasm due to lack of advertising focus.

The Maturity Model Adoption Curve

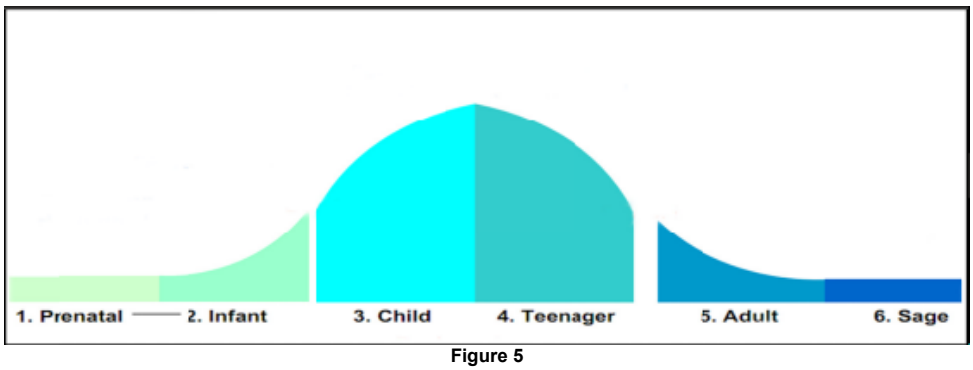


Figure 5

Moore's adoption curve is compared to the maturity stages of a human being where an innovation grows in its adoption by users. Unlike Roger's technology adopter categories and Moore's technology adoption cycle, that have 5 stages, the maturity adoption curve has 6 stages. At the beginning, prenatal stage, only the innovators or technology enthusiasts accept and use the innovation. At the next stage i.e., 'Infants' is when early adopters, or visionaries use it. Stage 3, 'Child' is when the innovation is accepted by early majority or the pragmatists and at the stage 4 i.e., 'Teenager', it is adopted by late majority or conservatives. The innovation is accepted by an 'Adult' namely laggards or skeptics at stage 5. When we arrive at stage 6 that means the entire system has accepted the innovation and there is little requirement for highlighting as it drives the market. As a rule, at this stage, promoting endeavors would have moved from it and they would be centered around the latest items coming into the market at the pre-birth stage.

Positioning of the Chasm on the Technology Adoption Curve

In 2011, Johnston extended Roger and Moore's Adoption Models by identifying the location of chasm on the technology adoption curve regarding the market share percentages displayed in the S curve. According to him, the chasm exists at 16% value but can happen any place between 10 to 40%.

Lehman and Wiedmeryer also stated that early adopters are self-roused to use innovative technologies and hence make extremist changes while shifting from old to new, while the ones belonging to early majority must be convinced and won over to remain inside the chasm partition.

Result

To understand and analyze the Technology Adoption Curve of a leading IT organization, a questionnaire was distributed to its members. Along with a return rate of 70%, background information was also gathered that the members are in a range of 22-32. The organization focuses on providing creative technical solutions and strategies to their customers. Digital Transformation is at the core of this organization. Apart from transforming their solutions to the customers, they have been experimenting with and upgrading their internal tools and technology. This questionnaire focused on getting the employees' perspective on the technology they use in the form of tools or for research.

They were asked when it comes to technology what predefined term described them best. 3.3% described themselves as skeptical about using innovative technologies and only using them if the external

environment compels them to do so. Following suit, 1.1% considered them one of the last people to use innovative technologies. A staggering 41% usually use innovative technologies when they feel like it is tried and tested ("use innovative technologies when most people I know do"). 16% of the employees use technology in its most underrated stage whereas 38.6% of the employees often consider themselves to be the first to experiment with the usage of new tools.

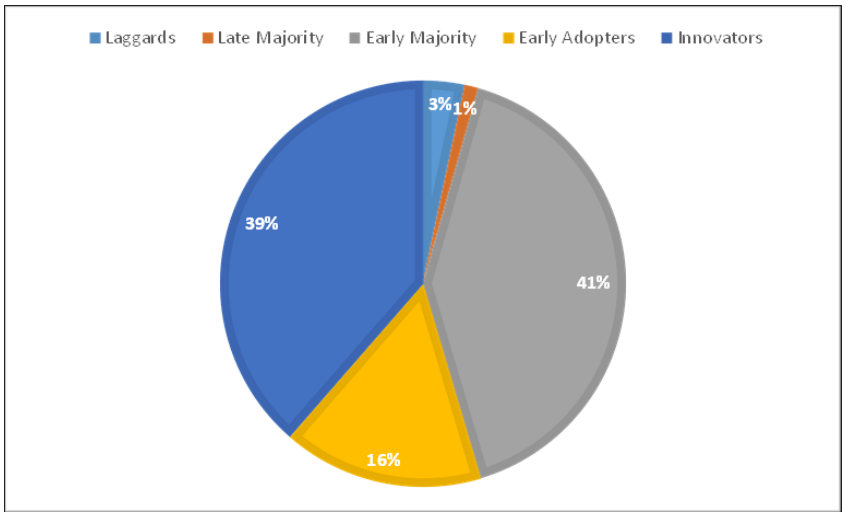


Figure 6: Analysis of how employees perceive their relationship with new tools and systems

From the onset it is visible that the majority consider themselves as early majority or those who have even higher expectations for ease-of-use in newer technology.

As previously discussed, diffusion and adoption of technology go hand in hand where communication plays a crucial role in the process of propagation of innovation. From the knowledge process we can see that initially it is the knowledge stage that includes becoming aware of innovation through communication via the media and interpersonal interactions. Being social they have direct contact with scientific sources and interactions with co-innovators. They are risk-tolerant and love to remain in trend be it the newest app or lifestyle habit. They are ready to agitate unprofitable and unsuccessful innovations.

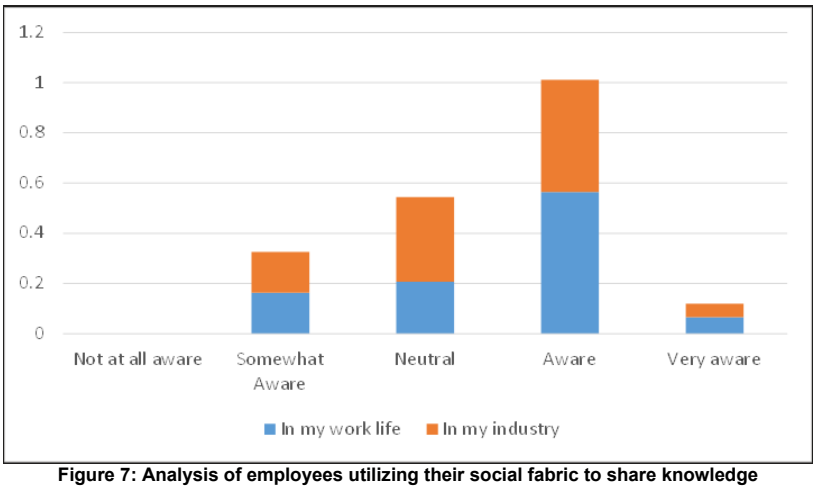


Figure 7: Analysis of employees utilizing their social fabric to share knowledge

56.4% of the employees are aware of new digital tools and technology for gathering and sharing news and information in their organization and 33.7% are aware of these tools within the industry. Only a small portion, 6.5% to be precise, are very aware of all the tools that are required to share information about the tools within the organization and even a smaller percentage (5.4%) are aware of similar tools to share

information within the industry. 20.7% take a neutral stance when it comes to new tools for sharing information within their organization and 33.7% take the same stance when it comes to sharing information in their industry. From our understanding, the individuals who are "very aware" (5.4%) and "aware" (56.5%) of new digital tools and technology within the organization are geared towards having an innovator and early adopters' mindset.

Thus, it ties back to how quickly the innovators and early adopters become aware of the innovation, explore it, and share knowledge within the environment.

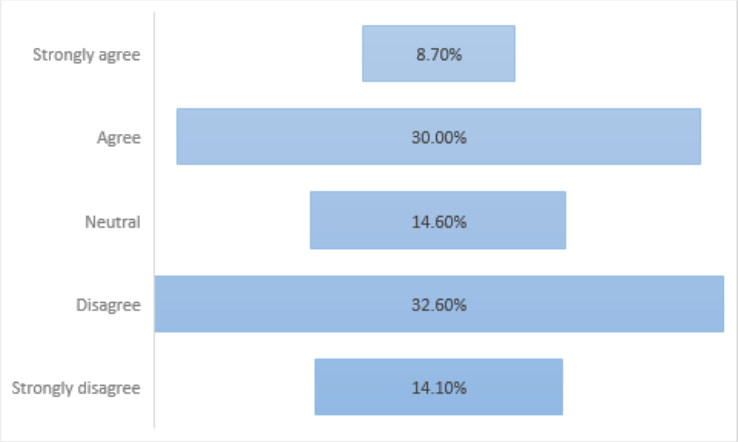


Figure 8: Analysis of employees' viewpoint on the ever-changing pace of technologies

Individuals usually dislike change and change agents. Innovative technologies are created and take a while to diffuse into the existing environment. A clear differentiator of individuals that fall before the chasm or after the chasm, is the need for exploration. Is one able to explore a process and test its boundaries to identify if the system/technology can help them? For the ones that fall after the chasm, it is essential that for them to start to use the product, the documentation should be robust.

The majority (32.6%) of the employees disagree with the statement "it is tough to keep up with the fast-changing technologies". 14.1% strongly disagree with the statement categorizing as innovators. 30% of the employees feel that the ever-changing technology is tough to keep up with and 8.7% strongly feel that the hectic pace makes it difficult to create documentation and have clear directives to follow the innovative technologies.

As the data shows laggards, the late majority, and early majority show hints of needing robust documentation and have high expectations for ease of use and consumer support. Thus, the innovators and early adopters are usually the ones that coax them to infuse innovative technologies in the process.

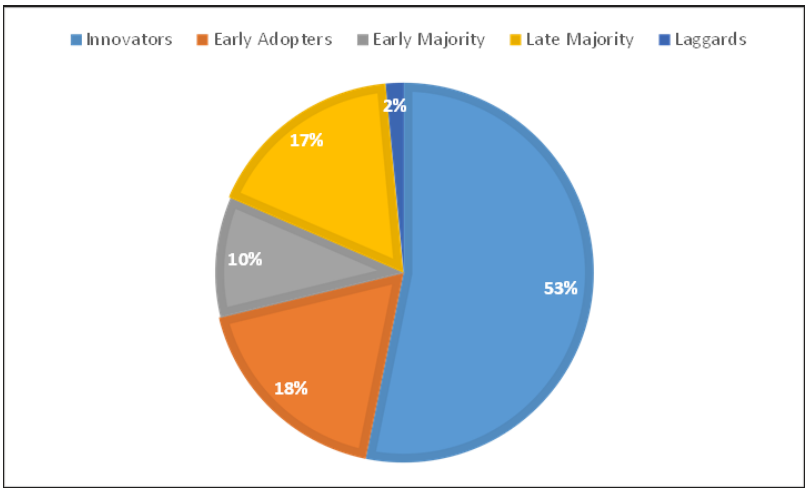


Figure 9: Analysis on support organization must provide to existing/new employees to leverage new tools

The key differentiator between distinct categories of technology adopters, from innovators to laggards, is the desire to explore, experiment and push boundaries to achieve growth. When faced with the requirement of new tools and technology, innovators see a learning and experimenting opportunity while laggards are more averse to exploring them. The following is the reaction of employees on coming across a new tool in their work environment:

53.2% of the employees think they would be the first ones to try and test the new tool before everybody else, hence categorizing it as innovators. 18% of the employees, who fall under the early adopter's category, think they require proper documentation guides to start exploring the tool's usefulness. 10.3% of the employees would use the tool only after most of their peers have tried and tested the tool. They are users who fall under the Early Majority category and need guaranteed ease of use. The next 17% of the employees require training to understand the importance and uses of a tool before trying their hand at exploring it. The remaining 1.5% of the employees chose to not learn about the tool at all until using it is the only choice left.

This is a good mindset for employees to have as this ability to study and investigate new tools by oneself helps the company spend less resources, like time and training resources which can be utilized towards various business objectives.

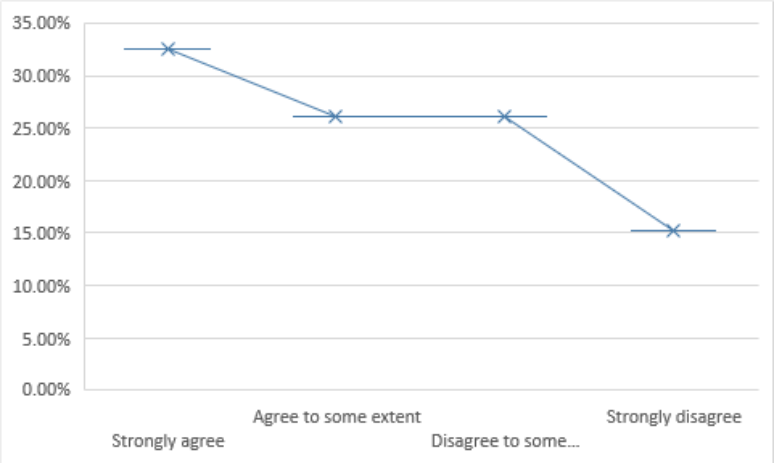


Figure 10: Analysis of employees' reactions when they come across challenges in new tools

Rate of Technology Adoption is always challenged by how quickly the change in Technology occurs every time. Put simply, an employee can welcome a new tool or technology in his work-life easily only if he keeps up with innovative technology trends in his industry. An employee who shows a lack of interest in these innovative technology trends sticks to using familiar tools instead of exploring the new ones.

Following is a review on how likely the employees are going back to the familiar tools or facing issues their current use of innovative technology. 32.6% of the employees think they are highly likely to shift back to tools they are comfortable using already. 26.1% of the employees or the Late Majority find it quite challenging to use tools that are unfamiliar. The next 26.1% of the employees moderately disagree

with shifting back to old yet familiar tools and fall under the Early Majority category. 15.2% of the employees that comprise of Innovators and Early Adopters are reluctant to fall back to older tools and technology.

From cross tabulation of all the questions, we found a visible pattern amongst the questions. All the employees that were comfortable making a shift to different technology are innovators and early majorities. About 39% of people answered "I like innovative technologies and use them before most people I know" in a previous question also showed that they were comfortable making a shift to an innovative technology. Similarly,

54% of people who answered that they like to explore tools rather than be given documentation were also the majority that answered that they were confident making shift to a new tool. Another key insight is that

53% of people who were reluctant to make a shift back to the old technologies once they faced an obstacle were again the majority who answered that they were comfortable making a shift to an innovative technology.

This shows that innovators and the early majority like innovative technologies and are mostly secure when it comes to making a shift to new processes. This adaptability plays a crucial role in any IT organization as these tend to be robust environments which continually transform themselves.

Conclusion

The study set out to explore the current extent of adoption of online technological platforms in an IT organization.

The study sought to find out where the IT organization adoption of new tools and technological processes within the organization lies in the Technology adoption curve.

The paper thus concludes that the IT organization is in the early market (innovators or technology enthusiasts and the early adopters or the visionaries) and has been penetrated on Moore's chasm in the Technology Adoption Curve. The current employees are categorized majorly as Visionaries (early adopters), and they leapfrog their opposition via way of means of being the primary to leverage the brand-new power. They tend to be responsive to current information. They are more likely to suggest or implement improvements to the work process. This goes hand in hand with the current IT goal of Digital Transformation as disruptive technologies also means disrupting current processes in place. To keep up with the ever-changing pace of the world, it is not only crucial to upgrade products or solutions but also to create a flexible and adaptable process for employees to follow. Additionally, it is crucial to have a workforce adaptable enough to make these changes in an agile and efficient manner.

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