Question 1

a) Software vendors and implementation partners are accustomed to working with traditional manufacturers and distributors with traditional manufacturing and distribution business models. A growing eCommerce business finds itself in the difficult position of navigating software that was not primarily developed for their business model when undergoing a digital transformation. Simply buying a best-in-class ERP to integrate with their eCommerce site will not solve their inventory, order, and accounting woes.

The typical software ecosystem for an eCommerce company minimally includes the following business processes:

- eCommerce orders
- Purchasing
- Inventory system
- Order fulfillment
- Third-party logistics
- Accounting

Depending on whether the eCommerce company is serving consumers, businesses, or both adds an additional layer of complexity into the ecosystem; wholesale businesses may involve a variety of scenarios for order and inventory management. Managing the flow of data out of the eCommerce site is not necessarily as simple as setting up an integration platform to the new ERP or order management tool.

Be upfront when considering which digital transformation route will provide the best outcome for your business. This involves setting a clear strategy by coordinating with all key stakeholders. If you don't do this, one of two things may happen: you might pay magnitudes more than you actually need for software; or conversely, you may vastly underestimate the technology underpinnings to successfully transform disjointed inventory, order, and accounting processes and lose your job for buying technology your company cannot afford to deploy.

b)

Blockchain technology

Traditionally, businesses rely on centrally-administered databases for digital bookkeeping. However, distributed ledger technology (DLT), more commonly known as blockchain technology, is a public digital ledger system shared openly among various users. This open ledger system creates a tamperproof record (a block) of users' transactions, and each block is time-stamped and coupled with the previous block.

This chain of blocks, or blockchain, can only be updated with the consensus among the users in the system. In addition, each record in the blockchain has a unique cryptographic hash that helps track that specific bl

ock and others in the chain. As a result, the recorded data cannot be modified or erased, turning the blockc hain into a perfect bookkeeping and auditing system.

The blockchain system contains a transparent, authentic, and verifiable record of every transaction among the users in the system. Therefore, the technology is well suited to disseminate security policies and identi ty access management in an enterprise.

Since the introduction of Bitcoin, the financial services industry has jumped on board the blockchain band wagon. Statista estimated the market size for blockchain solutions for banking and financial institutions at $0.28 billion in 2018. But during the subsequent years, the implementation of blockchain technology in th e financial sector witnessed a rapid rise and is expected to cross $20 billion in 2026.

Other industries such as healthcare have also swiftly followed suit. For example, IBM Watson Health and t he U.S. Food and Drug Administration are tapping the potential of blockchain technology to secure patient data exchange, including sensitive electronic medical records (EMRs), clinical trials, and data collected fro m the Internet of Things (IoT) devices.

The Metaverse

The concept of the metaverse is not new, at least to the world of technology. Still, it has gripped the popula r imagination since the CEO of Facebook, Mark Zuckerberg, rebranded his parent company as Meta on Oct ober 28, 2021. The rebranding maneuver reflects Zuckerberg's commitment and monetary interest in the concept of the metaverse.

On November 2, 2021, Softbank Group's Vision Fund 2 invested $93 million into Sandbox, a metaverse ga ming platform. On the same day, Microsoft announced the launch of Mesh for Microsoft Teams, an online meeting platform where you can send your digital avatar.

All these recent developments in the tech world are signs that something bigger is brewing on the other sid e of the world. In reality, we witness the dawn of a new virtual world called metaverse. In simpler terms, it i s an extension of the existing digital applications and platforms with an immersive yet real-world user experience.

The metaverse heralds an existence of life in the parallel digital universe—an opportunity to use immersive digital tools to experience life in a virtual world. In a decentralized digital universe like the metaverse, people have more control over their assets and the freedom to follow their o wn rules and create their own world.

c) he CIO has ownership of IT and as such has responsibility for the key delivery requirements that fall to th e technology department. So, in addition to contributing to the organization's overall IT strategy, the CIO's responsibilities include:

- establishes, maintains and oversees at the highest level the technology architecture and technolo gy choices that power the organization, ensuring that the systems are available and reliable;
- establishes and maintains the technology infrastructure in a way that aligns with the resources (i.e ., budget) made available to IT for that task;
- evaluates, purchases and deploys technologies;
- sets parameters for when, where and how others within the organization can purchase, implemen t and deploy technology;
- optimizes technology resources -- software, hardware, staff and spending -- to deliver the best value and highest returns on investment to the organization;
- collaborates with the chief information security officer and the CISO's team to ensure systems me et the organization's established cybersecurity frameworks; and
- researches and evaluates existing and emerging technologies to understand where new systems c an be used to achieve organizational objectives and plan for how the organization will utilize syste ms for its gain in the near- and far-term future.

d) as follows :

Step #1: Identify the current state of your department.

Step #2: Identify where you want to be with your department.

This future goal is sometimes called a desired state, future target, or stretch goal. In order to accomplish th is, you'll want to think about how you are doing today in your current state (from step one) and where you really want to be within a reasonable timeframe. If you are doing a gap analysis within the context of your s trategic plan, take a look at the targets on your plan. These targets may be three to five years out, which is i deal. Where are you with them? To answer that, go back to your current state areas of focus.

Step #3: Identify the gaps in your department.

Now that you've recognized where your organization is currently and where you want it to be in the future , it's time to bridge the gap.

Step #4: Devise improvements to close the gaps in your department.

Base all improvements on the information you discovered while identifying the gaps. For example, if your t eam is too busy doing custom work, it will be difficult for them to step back and devise a new product offeri ng. Perhaps if you stop taking on custom work for a few weeks, that will free up your team to create a scala ble product for your new target clients.

Consider the cost of implementation for each solution. Perhaps you don't have the capability to stop worki ng with your current customers. Can you outsource the development of a new offering? Maybe partner wi th another organization?

E) There is growing interest in the development dimension of e-
commerce. The United Nations General Assembly has committed to harnessing the potential of informatio n and communications technologies (ICTs) to advance the 2030 Agenda for Sustainable Development and achieve other internationally agreed development goals In doing so, they note that this could accelerate pr ogress across all 17 Sustainable Development Goals (SDGs). The digitalization of trade is of direct relevance to several of these goals. For example, digital trade can be leveraged to promote the empowerment of wo men as entrepreneurs and traders . E-
commerce and digital trade can support productive activities, decent job creation, entrepreneurship, crea tivity and innovation. They can encourage the formalization and growth of micro, small and medium enter prises (MSMEs) in developing countries, including through access to ICT-
enabled financial services such as online and mobile payments. They can also promote the integration of MSMEs into value chains and markets (e.g. by leveraging virtual marketplaces) in support of SDG Target 9. 3. Moreover, digital trade can help to significantly increase the exports of developing countries , in particul ar with a view to doubling the least developed countries' share of global exports by 2020. Yet as the rapid u ptake of ICTs and e-
commerce is transformational, it creates both opportunities and challenges for developing countries, inclu ding the LDCs.

Question 2

a) USING VIRTUAL EXPERIMENTS ON STUDENTS' LEARNING in labs :
Laboratory courses constitute a compulsory part of any bachelor program in physics and in science in general. They allow students to develop their practical skills, give them a feel of the complexity of the natural phenomena, and help them to understand how difficult it is to get secure knowledg e about it . In the digital age, technology enhanced physics learning environments offer opportunit ies to increase students' engagement, motivation, and positive attitudes toward science . One for m of those environments is the virtual lab. Virtual labs enable students to carry out experiments in an online environment and they can be used alone or in combination with other real hands-
on labs . Instructional design of virtual labs may involve the use of animation and simulation tools a nd instructional videos as well as interactive presentations. The theoretical perspective behind thi s instructional design is to provide a constructive learning environment, in which students can inte ract with online learning content in any time and place where internet is available and according to their pace of learning. Within the virtual lab, students can perform online experiments several tim es with less costs and safer conditions than in physical labs . In addition, visualization of data and p henomena helps students to understand abstract physical concepts and ideas. According to the co gnitive theory of multimedia learning, CTML, the use of multimedia representation of concepts in both visual and verbal format allows learners to use both information processing channels at the s ame time and thus allows them to build their own mental representations and schemes.

b) AS follows :

Curriculum Based Testing

This is the most common and tested way to keep your students in check. Every subject has a certain gui delines within which it operates and is taught to students. Over the time period that the course was ta ught students were probably taught from a book or provided materials which proved to be the source of their information on the topic. It is this material that teachers will be testing in the assessments that they design. Learning should not be tested by simply demanding the student to reproduce what he stu died but ask him question that require him to critically analyze what he read and then reproduce his op inion on an exam paper. Definitely this method is more appropriately used with writing and reading ori entated subjects. Courses such as mathematics would be harder to adjudge on the same criteria but th e point of these assessments should be to only test their ability to apply what they learned.

Observation and interaction

Observation of students and judging their behavior in class while keenly interacting with them is anoth er way of keeping in touch with their learning ability. Observing the response of your students will give you an insight of what they are learning from the said lecture. This interaction with students will also al low teachers to motivate and encourage students to move in the right direction. This may also help bo ost the student's confidence and help him achieve an even new limit.

Frequent Evaluations

Highlighting the areas of weakness more frequently is very beneficial for students as school going kids are very fast learners and the more quickly their mistakes are highlighted the more they would be flexi ble to make changes. Moreover, it will increase their participation in class to get more constructive fee dback. Thus giving them an opportunity to grow even more with every evaluation.

Formative assessment

Formative assessment is utilized to screen the students learning procedures to give progressing input t hat can be utilized by educators or instructors to improve their instructing and by students to improve their learning.

c) 1. Augmented Reality (AR) & Simulations :

Augmented Reality and Simulations have left a mark in the world of visuals. Today, it's great impact ha s started to control the way students learn and collaborate with their teachers.

2. Adaptive Learning

as the name implies, adaptive learning is a technology that provides learning activities to students, bas ed on their needs and learning style/behavior. Consider adaptive learning as a piece of tech which ada pts to every students' needs in a short time. It helps students to adapt to unique learning paths that ar e entirely based on their interests and learning ability.

3. Education Technologies Based on Artificial Intelligence (AI)

Artificial Intelligence is very well regarded as one of the most discussed technology trends in the world. Du e to its smart approach towards various systems, the world has come to trust its technology in its develop

ment. Although used in various fields, AI is not limited to the field of education. In more detail, its existence has helped the world evolve, and luckily by 2022, education is set to experience more levels of evolution fr om it.

4. Usage of 5G Technologies in Education

5G is the fifth generation of wireless technology. Through its improved enhancements, just about anyone using it can get high speed and low latency wireless technology. Students are more likely to benefit from th is unique innovation, as this promises them quick downloads of student files and resources and more pow erful networks.

d) As follow :
   - Ineffective Time Management.
   - Lack of Instant Communication.
   - Not Receiving Timely Feedback.
   - Not Receiving Clear Instructions or Expectations.
   - Share Time Management Apps and Resources for Students.
   - Utilize Educational Technology ("EdTech")
   - Increase Peer Review.

     It can be easy to get frustrated due to the lack of human contact, not being able to raise co ncerns immediately, the absence of a teacher, only remote learning from online teaching, and an inability to discuss problems with classmates. Sometimes, the online world, no mat ter how enriching it may be, can become too small, and you need a physical space where y ou can resolve your queries and practice with real tools.

     If this is the problem, one solution is to foster personal interaction within the online cours e as much as possible. For example, you can organize webinars, group work, or forums wh ere students can discuss and resolve their queries.

e) In the SDGs we will Deal with small and medium enetrpise to actively implement it easily

Question 3

A) To mitigate staffing shortages by using digital transformation , hospitals must become more at tractive employers. The process starts in the analog world. As in many other industry sectors, t he workforce of the future is no longer just focused on the compensation. Employees also wan t their work to be rewarding and purposeful. Today, workers seek employment that supports a better work-
life balance, allowing time for family and leisure. Concerns about climate change also increase expectations of employers to foster sustainable business practices.

If these actions create an attractive employer brand, effective marketing can then showcase the b usiness for the digital space. However, hospitals that are still driven by mostly analog processes m ust first restructure and embrace digital transformation. "This includes consistency in digital mark eting, which goes hand in hand with digital employee recruitment. It also fosters a perception of a

uthenticity in terms of the mission statement," says Prof. Konrad Obermann from the University F aculty of Medicine in Mannheim in a MEDICA-tradefair.com interview.

However, "many healthcare facilities are not yet ready for digital recruiting. Human resources ma nagers and upper management know they should use digital channels –
but they struggle with consistent implementation," Obermann sums up one of the biggest issues. This is partly owing to differences in age and mindset between those in leadership positions and yo ung professionals. Only when these obstacles have been overcome can the core values of a hospit al reach potential job candidates on the channels they use. The latter are primarily social networki ng sites and no longer the traditional job advertising models. That being said, the possibilities to di gitize the recruitment process do not just end with the job application process.

Hospital workforce planning also directly affects the quality of patient care: If you have enough sta ff in wards, it is less likely that the welfare of patients is compromised. The "KI-
PEPS" project was completed in December 2021 and has researched the issue: It studies how artifi cial intelligence can support healthcare workforce planning. This strategy can help ease the burde n on staff and promote more effective deployment, but it also implies a hospital continues its digiti zation efforts and moves toward becoming a smart hospital.

b) 1. Virtual reality.

Virtual reality uptake is pacing quite well, according to Gordon Meyer, director of marketing for Yo uVisit, a company that creates interactive virtual reality experiences.

“Right now what’s happening is that consumers are increasingly understanding the various use cas es for the technology,” Meyer told CMO.com. “I think at the moment video games for VR is roughl y half the market. The other half of the pie gets cut up among a number of industries, some of whic h are for enterprise business use.”

Travel brands, in particular, are highly interested in this technology because of its ability to convey a sense of space in fine, rich detail that can “present various locations in a new light,” he said. Ther e’s a great retail use case as well, Meyer added, where consumers are able to explore a product, en gage with a brand, and make a purchase at the same time, all while within the experience.
So implement VR in dealing with patients while keep both staff and patient safe is great in soft and mild cases.
2. Voice.

That brings us to voice. Google says 20% of mobile queries are voice searches. Additionally, Amazo n’s Alexa is now embedded into non-
Amazon devices, such as smart home hubs, cars, and banking interfaces. It’s safe to say, “now we’r e talking,” as voice technology grows in adoption by both consumers and brands.

“We are moving toward a reality where we have a digital assistant with us at every moment,” said Douglas Stephens, a retail futurist and author of “Reengineering Retail: The Future of Selling in a P

ost Digital World," in a previous interview with CMO.com. "That goes well beyond omnichannel to the notion of omnipresence."
So using voice assistance in Health app related to hospital to answer simple and repeated question will provide the patient experience.

3.machine learning
When people think about digital transformation in health care, they tend to focus on the idea of e mploying analytics to improve clinical decision-
making. For example, with advances in computational science and machine learning, it's become p ossible to deliver precision medicine, where therapies and interventions are tailored to each patie nt based on the individual's genetic profile. Artificial intelligence (AI) algorithms are increasingly b eing used to improve the visual detection of signs of disease in fields such as radiology, dermatolog y, gastroenterology, ophthalmology, and pathology.

C- Advantages OF cloud soultion:

Public cloud models are popular for a reason –
they offer several advantages for users like you, including:

Convenience. When you choose a public cloud deployment model, the service provider is resp onsible for infrastructure setup and use, as well as the vast majority of the everyday concerns of its management. In short, you won't need to worry about developing, maintaining, or upgra ding your software – the service provider will do it for you.
Reliability. Unlike on-site infrastructure owned by a small enterprise, third-
party service providers often have a large network of servers at your disposal, ensuring 24/7 o peration and practically eliminating downtime.
Scalability. Most public cloud service providers allow you to easily scale your usage up or dow n as your needs require.
Cost-
effectiveness. Due to advanced scalability and reliability, you'll only use as many resources as you need, reducing your cost and eliminating costly downtimes. In addition, there's no need t o invest in your own hardware.
disadvantages OF cloud solution:
Potential security issues. Perhaps the number one concern regarding public cloud models is t he data security and privacy issues that arise when a public third-
party controls data storage. While users can easily access their own data, concerns remain reg arding who else has access and where that particular data is kept.
Simplicity. Many public cloud service providers rely on scalability and offer only the most basic service plans. While simple service agreements are beneficial for many users, if you require m ore customized service plans that fit your business, it may be difficult to find one to meet your needs.
Potential diminished reliability. Reliability is often considered a strong suit of a public cloud m odel; however, there is still a potential for service outages with such wide-ranging networks.

d-

ensuring primary health care as first point of contact for most health care needs; functioning multidisciplinary care teams; vertical integration of services; horizontal integration of services ; advanced information and communication technology; integrated clinical pathways and func tioning dual referral systems; measurement standards and feedback; and certification .

The second key principle of design is to build high-quality primary care services . First contacts with health care, and a person's regular point of e ntry into the health system, must be continuous and comprehensive . No physical or mental h ealth issue should be excluded from the oversight and coordination functions of primary care. If individuals and families in a geographically (or otherwise defined) community are formally r egistered with a named primary care provider, this enables creation of community health prof iles, as well as surveillance of needs and delivery of preventive care. Registration also creates a structure for proactive care amongst people with chronic conditions. Primary care is also fund amental to health system resilience, and is pivotal in surveillance of communicable diseases or other hazards, and in the delivery of front-line care in the case of outbreaks.

Third, engagement with patients, families and communities needs to be designed into health s ystems, rather than bolted on as an afterthought. A review of randomized controlled studies o f integrated care programmes for the frail elderly, for example, showed that the most benefit was derived from those in which the elderly person was directly involved in care planning . If p atient groups are encouraged to engage in collective action, people benefit hugely from the su pport of others with similar health problems. The WHO Patients for Patient Safety programme illustrates this well. The programme has empowered a global network of patient advocates th at aims to foster collaborations between patients, families, communities, health care provider s and policy-makers to make health care safer through the insights and experiences of patients themselves .

e-

it will contributes to all SDGs but especially to SDG 9, helping to build resilient infrastructure, p romoting inclusive and sustainable industrialization, and fostering innovation. Efficient and aff ordable ICT infrastructure and services help countries to engage in the digital economy and bo ost their economic competitiveness and well-being. Most of the world's 42 least developed countries (LDCs) are making impressive progres s towards SDG 9, with significant impact in financial inclusion, poverty reduction and improved health.

ICTs provide the means to deliver high-quality goods and services in health care, education, finance, commerce, governance, agricult ure, and other vital areas. They can help to reduce poverty and hunger, boost health, create n ew jobs, help mitigate climate change, improve energy efficiency, and make cities and commu nities more sustainable as well as healthcare side.

Question 4

a) Offensive strategies An offensive strategy consists of a company's actions directed against the mar ket leaders to secure competitive advantage. Offensive business strategies involve taking proactiv e, often aggressive action in the market. This action can be focused directly at competitors or aime d at securing market share regardless of the existing competition. Offensive strategies include a dr amatic reduction of price, a highly creative and imaginative advertising campaign, or a uniquely de signed new product that suddenly attracts customers substantially. An offensive competitive strat egy is a type of corporate strategy that consists of actively trying to pursue changes within the indu stry. Companies that go on the offensive generally invest heavily in research and development (R& D) and technology in an effort to stay ahead of the competition. They will also challenge competito rs by cutting off new or underserved markets, or by going head-to-
head with them. Six types of offensive strategies Most companies go on offensive strategy to impr ove its market position. They usually are motivated by a desire to win sales and market share at th e expense of other companies in the industry. There are six basic types of offensive strategy.

1. Frontal attack or Initiatives to match competitor's strength.
2. Flank attack or Initiatives to capitalize on competitor weakness.
3. Encirclement attack or Immediate initiatives on many fronts.
4. By pass attack or Leap frog strategy or End run offensive.
5. Guerrilla offensive.
6. Preemptive strikes.

1. Frontal attack: A frontal attack is attacking a competitor ahead on by producing similar products with similar quality and price; it is highly risky unless the attacker has a clear advantage. In the fron tal attack, firms concentrate on competitor's strengths rather than weaknesses.

2. Flank attack: Flank attack is less risky when compared to that of frontal attack in which firms atta cking at the competitor's weak point or blind spot. In this strategy firms follow the path of least res istance where the competitor is incapable of defending.

3. Encirclement attack: It is the combination of both frontal and flank attacks. Here the challenging firm attacks the competitor firm on its entire major fronts i.e. strengths and weaknesses. There ar e two strategies that can be used under the encirclement attack. 1.Product encirclement: In this st rategy, the challenger firm introduces different types of products with varied features, quality and price. 2.Market encirclement: In market encirclement strategy the challenger firm introduces the products into the new market segments which are left untapped by the competitor's firms.

4. Bypass attack: Bypass attack is the most indirect form of marketing strategy in which challengin g firms produce next generation products to occupy the competitor's market share. Challengers m ay diversify into unrelated products with new technology or may enter into new geographical mar kets. The challenger firm performs a thorough research and produces next generation products in order to attract the more customers this strategy is also called as leapfrogging strategy

5. Guerrilla attack:

- The guerrilla attack is expensive, but it is less than the frontal, flank and encirclement attacks. In guerrilla warfare, the challenger firm applies strategies with an intention to demoralize and harass the competitor by the following strategies.
- Giving free samples to the customers
- Allowing the customers to pay in any form i.e. cash, credit or debit cards

- Attracting new customers by giving advertisements in social networks
- By using powerful advertisement strategies

6. Pre-
emptive strategy: A "preemptive strategy" is simply the natural advantage a company has when it i s the first to serve a particular marketplace or demographic. It can be exceptionally hard to unseat. Also known as "first-mover" advantage.

Defensive strategies

Defensive strategy is defined as a marketing tool that helps companies to retain valuable customer s that can be taken away by competitors. Competitors can be defined as other firms that are locate d in the same market category or sell similar products to the same segment of people. Defensive st rategies are only used by market leaders in strategic management Types of defensive strategies

1. Position Defense The position defense is the simplest defensive strategy. It simply involves tryin g to hold the current position in the market. To do this, business simply continue to invest in curre nt markets and attempt to build their brand name and customer loyalty. The problem with this str ategy is that it can make a target for new entrants to the market.

2. Mobile Defense The mobile defense involves making constant changes to business so that it is d ifficult for competitors to compete . This can involve introducing new products, entering new mark ets or simply making changes to existing products. This constant moving between strategies requir es a flexible business that can adjust to change.

3. Flanking Defense When a firm uses the flanking defense, it defends its market share by diversifyi ng into new markets and niche segments. The idea behind the strategy is that if business lose its m arket share in the existing market it can make up for it in these new markets. The danger of the flan king defense is that it can stretch business resources thin and pull attention away from main focus.

4. Counter-Offensive Defense The counter-
offensive defense is a retaliatory strategy. When a competitor attacks business, it strike back with own attack. For instance, if business operate a bakery that only produces gluten-
free products and a competitor who produces regular bread also begins producing gluten-
free products, it could hit back at it by introducing regular bread products.

5. Contraction Defense The contraction defense is the least desirable defense because it involves r etreating from markets. If a business don't believe it can successfully defend those markets, howe ver, then it can be the best option. This allows to redeploy the resources into other areas. For exa mple, imagine that you manufacture two products: liquid soap and bar soap. If you find that you ca n no longer compete in the bar soap market, then it makes sense to retreat from that market and f ocus on liquid soaps.

B) The COVID-
19 crisis has accelerated the digital transformation trends around the globe, as evidenced in the de velopment and expansion of digital infrastructure; the shift to digital delivery of services by firms a nd within organizations, for instance, in education, healthcare and retail; and increased implemen tation of digital technologies in manufacturing. Although the pandemic has had a negative impact on many businesses, it has also uncovered new opportunities for entrepreneurship. It has boosted

digital entrepreneurship, for instance, reflecting changing consumer behavior during and in the af termath of the pandemic.
The recession associated with the COVID-
19 pandemic is often referred to as a “shecession”, as it has taken a disproportionate toll on wome n in most countries. Although the pandemic has affected women around the world differently, it h as exposed previously overlooked gender biases, such as the gender-racial-
gap. Looking at health risk.
During the pandemic, consumers have moved dramatically toward online channels, and compani es and industries have responded in turn. The survey results confirm the rapid shift toward interac ting with customers through digital channels. They also show that rates of adoption are years ahea d of where they were when previous surveys were conducted—
and even more in developed Asia than in other regions (Exhibit 1). Respondents are three times lik elier now than before the crisis to say that at least 80 percent of their customer interactions are di gital in nature.
Across sectors, the results suggest that rates for developing digital products during the pandemic differ. Given the time frames for making manufacturing changes, the differences, not surprisingly, are more apparent between sectors with and without physical products than between B2B and B2 C companies. Respondents in consumer packaged goods (CPG) and automotive and assembly, for example, report relatively low levels of change in their digital-
product portfolios. By contrast, the reported increases are much more significant in healthcare an d pharma, financial services, and professional services, where executives report a jump nearly twic e as large as those reported in CPG companies.

The customer-
facing elements of organizational operating models are not the only ones that have been affected. Respondents report similar accelerations in the digitization of their core internal operations (such as back-
office, production, and R&D processes) and of interactions in their supply chains. Unlike customer-facing changes, the rate of adoption is consistent across regions.

Yet the speed with which respondents say their companies have responded to a range of COVID-
19-
related changes is, remarkably, even greater than their digitization across the business . We asked about 12 potential changes in respondents’ organizations and industries. For those that responde nts have seen, we asked how long it took to execute them and how long that would have taken bef ore the crisis. For many of these changes, respondents say, their companies acted 20 to 25 times fa ster than expected. In the case of remote working, respondents actually say their companies move d 40 times more quickly than they thought possible before the pandemic. Before then, respondent s say it would have taken more than a year to implement the level of remote working that took pla ce during the crisis. In actuality, it took an average of 11 days to implement a workable solution, an d nearly all of the companies have stood up workable solutions within a few months.
Where also The findings show an increase of people working from home offices and that many peo ple believe that digital transformation of work has accelerated in response to the COVID-
19 pandemic. People who noted this acceleration can imagine working digitally exclusively in the f

uture. Moreover, the importance of traditional jobs as a secure source of income has decreased, a nd digital forms of work as a secure source of income have increased because of the COVID-19 pandemic. Workers believe that digital work will play a more important role as a secure source of income in the future than traditional jobs.

C) Technical debt (also known as tech debt or code debt) describes what results when developmen t teams take actions to expedite the delivery of a piece of functionality or a project which later nee ds to be refactored. In other words, it's the result of prioritizing speedy delivery over perfect code.

Or we could say

"Technical debt is the result of the design or implementation decisions you make and how those d ecisions age over time if they aren't incrementally adjusted or improved. The longer you hold fast t o those designs and implementations without incremental adjustments or improvements, the larg er the debt, or effort, becomes to make those needed changes.

Other Definition :

"Technical debt is when the implementation – the code – for a product becomes unnecessarily complex, inconsistent, or otherwise difficult to understand. While there is no perfect code, code that contains technical debt [moves] farther [away] from a go od solution for the problem it solves. The more debt, the farther the code misses the target. Techn ical debt makes it harder to understand what the code does, which makes it harder to build upon, and ultimately results in poor productivity and defects in the product.

D)

1. focus on disruptors rather than disruption :

Almost two decades ago, the music industry threw its considerable weight at upstart music service Napster, and succeeded in shutting it down. It subsequently went back to the good-old-days of selling CDs for 20 Euros a pop, when buyers really only wanted 1 or 2 songs from the album . We all know what happened next: Apple appeared from outside the industry to capture the lion's share of the value.

What the music industry had failed to understand was that Napster had unleashed a key disruptio n – the disaggregation of songs from albums. By focusing on the disruptor (Napster), the industry incu mbents took their eyes off the disruption (content disaggregation).

This mistake is being repeated today. Netflix didn't kill Blockbuster – late fees and limited selection did. Uber didn't kill taxis – inconvenient access and bad service did. Airbnb isn't killing hotels – high costs and impersonal experiences are. You need to take the time to fully understand the disr uptions occurring in your industry, and not get too hung up on the disruptors.

2. build a digital strategy

On the surface, there isn't anything wrong with building a digital strategy. In reality, it can be extre mely dangerous for two reasons. First, a digital strategy typically places too much attention on 'dig

ital' as the objective, so that the main beneficiaries become consultants and technology vendors. Digital strategies often divert attention away from more important goals, such as reduced costs, hi gher revenues, increased customer satisfaction, and other measures of performance.

Second, pursuing a digital strategy means that you have two strategies – one digital and one organizational. At best this is confusing, at worst, it is value destroying. Separa te strategies inevitably lead to overlap and conflict.

A much better approach would be to consider how digital tools and technologies can support a sin gle organizational strategy, or better still, help existing strategy adapt to changing conditions.

3. pay too much attention to digital disruption

Yes, digital disruption exists, but it is not the only form of disruption out there. Plenty of disruption continues to come from traditional sources, like political, economic, and social shifts. This year, th e DBT Center at IMD launched a project to take a data-driven approach to measuring disruption across industries. We examined a number of industry ind icators, including change in profit, revenue, and share price, industry concentration ratios, and ven ture capital funding. Our objective was to see what the data could tell us about disruption.

What we found was surprising. Yes, there was disruption in digitally heavy industries, like telecom munications, media, retail, and financial services. Yet, the industry that had seen the most disrupti on over the past seven years was, wait for it, the energy industry, followed by technology products and services, and then transportation and logistics.

From a management standpoint, it doesn't matter what form the disruption comes in. The impact is similar. So, while leaders still need to keep a keen eye on digital disruption, this does not mean t hey can overlook more traditional forms of disruption.

4. **focus on digitizing silos**

We often hear that an organization is 'digitizing its supply chain' or its 'marketing' or whatever. Th ese projects to digitize silos normally end in disappointment for a couple of reasons. First, like the proverbial 'paving the cow paths,' taking something that is analog and simply making it digital ofte n perpetuates existing issues. Digital transformation is a good opportunity to review, revisit, and r edesign existing ways of doing things.

Second, silos are often part of the problem, not the solution. Digital tools and technologies can an d should work across silos. Indeed, we have found over and over again that successful transformati on requires a cross-functional approach. For example, ecommerce requires a tight integration between communicati ons, IT, marketing, and logistics, all of which necessitates some degree of digitization.

5. **pursue agility without knowing what it means**

'Agility' is a problematic word. It has so many definitions and interpretations that it becomes impo ssible to implement. Ask 10 people 'what is agility?' and you are likely to get at least ten answers. P

robably the most well-
defined use of agility relates to agile ways of working, like scrum, Kanban, and the like.
organizational agility is not a single thing, but made up of three distinct capabilities, each of which i s critical.
Hyper-
awareness: An advanced sensing capability to really understand what's going on externally (for ex ample, new competitors, technology or business models); and internally (what exactly is happenin g inside your organization).
Informed decision-making: Making decisions based on the evidence –
most companies are not as good at this as they think they are.
Fast execution: Putting those decisions into action quickly. This then creates new information that feeds hyperawareness.
To summarize, we hear a lot of executives tell us that they want to 'become a digital business'. This is almost certainly not the case. Instead, what they really should be focusing on is improving their performance by digitizing and transforming their existing business. In other words, to become a be tter, more agile version of themselves through digital.

e) Lights out manufacturing is a technique that uses fully-
automated technology to run a production factory with little or no human intervention. This requires the s upport of multiple technologies such as machine learning and high-frequency data collection.

It has been the dream of many manufacturers to use a set-it-and-forget-
it mindset for production. Simply show up to work, set the machines in motion, flip off the lights, and head out the door. No workers. No humans in the building at all. Just machines doing what they do best—accurate, repeated tasks at speeds far faster than their homo sapien counterparts.

This would drastically reduce workplace accidents, the cost to keep the facility well heated or cooled, and t he cost of the labor itself. Manufacturers would encounter fewer quality issues too, because—unlike humans—the machines can replicate their behaviors exactly, day-in and day-out.

These 24-
hour production facilities sound like pure fantasy, but they are a reality today in manufacturing facilities sp anning the globe. There is no question. Although most facilities are at the early stages of automating produ ction activities, automation solutions are being increasingly adopted across the industry.

Full automation can be of exceptional benefit, especially in hostile manufacturing environments such as th ose containing oils and lubricants, caustic chemicals, fumes, etc. After all, robots can be made of far more d urable components than that of their human counterparts.

While most manufacturers are not, at present, aiming for end-to-
end automation, most do currently or intend to use many of the processes underpinning full automation, a nd to great benefit. The core benefits of lights out manufacturing are reducing costs and driving greater eff iciency, but also include:

- Reduce accidents and increase worker safety
- Improve operational efficiency
- Reduce scrap and rework via greater production consistency
- Drive more advanced maintenance strategies

One could say that the other stages of Industry 4.0, as a vision, pave the way for 'dark' environments. You c an imagine that without loads of sensors and quite some IoT technologies (and the traditional supporting t echnologies, connectivity, and systems) lights-out factory setting wouldn't be possible.

You also need robots (advanced robotics essentially being about autonomous and collaborating industrial robots). Analytics, visualization, and automated decisions based on big data, leveraged in real-time. Artificial intelligence and machine learning, powering the systems, optimization, and other technolo gies. The vertical and horizontal data integration of Industry 4.0, which is the precondition for nearly full au tomation, and hard to realize. Digital twins. The list goes on.

Today, most companies have realized projects or pilots in the first stages of the industrial digital transform ation we've come to know as Industry 4.0. Yet, when a pandemic confronted us with ample manufacturing challenges, accelerated the call for a 'remote everything' approach, and increased the pace of automation, lights-out manufacturing experiments and projects come (back) in the picture more too.

If we do get there, it will just not happen without any human intervention and in specific circumstances wit h specific goals. The idea of factories where all is automated, and people are not needed is fiction and not e ven desirable. On the contrary, highly skilled people will be required. And even if some of the known and of ten mentioned examples of lights-out factory projects seem to show it is possible, times are seriously changing , according to all above we co uld indicated the relationship between both variables