Weekly Bytes on Innovation and New Trends

WILL TECHNOLOGY HELP US LIVE FOR 200 YEARS?

In last 7 decades, average lifespan in India has doubled from 32 years

Suresh Reddy

By knocking out two genes connected to aging, scientists were able to double the life expectancy of rats. Gene therapy shows a significant path to hack the aging process of cells and reverse it. Undoubtedly, this activity is not a purely academic exercise. Tech billionaires have heavily invested this space and have made it into a thriving area of technological innovation. You will be amazed to know that founders of tech giants like Google, PayPal, and Oracle have pumped in hundreds of millions of dollars into this death-defying exercise.

Increasing the lifespan has been one of the fascinating asks of humankind since the beginning of time. As per Hindu mythology, some heroes and rakshashas performed intense penance to seek the boon of immortality from the higher gods. It's been a fantasy for a lot of us to live forever. The question here is can technology help humanity achieve this or even extend their time on earth to 200 years.

Let's look at some statistics. The average lifespan in India during Independence time was about 32 years, which has more than doubled by now thanks to medical advances in combating common diseases in the last 70 years. As of 2015, there are more than three lakh people worldwide, who are older than 100. And about eighty of them even crossed 110 years. These super-centenarians may hold the secret to long life in their DNA. A French woman, Jeanne Calment, who lived for 122 years is considered to have lived the longest in recorded history.

Some scientists think that the human can only live to a maximum of 125 years as an upper limit. Others believe that world will reach a point where people will live until 500 to 1,000 years due to scientific advances. A few areas of new technology have begun to show serious promise. For instance:

'Replacement parts' technologies are developing robotic limbs, 3D printed organs such as pancreas, and durable tissues to replace worn out body parts and surfaces. 'Rejuvenation technologies' are allowing people to feel and look younger. Scientists are working on removing toxins from the body to eliminate aging problems. Tech-assisted early diagnosis and treatment can help in saving lives and extending human lifespans. Heart-attack detecting sensors, AI-supported custom treatment for cancer are a few such solutions.

FUTURE TECH

Drugs like metformin for diabetes turned out to show age-defying positive effects. Rapamycin is another drug, which treats rare cancers and helps in organ transplants, has shown great promise in extending the life of mice and guarding them from neurodegeneration. And there are compounds inspired by resveratrol, found in red wine, that have increased the longevity of the healthy lives of yeast cells.

We can also learn from the lives of other animals on earth. Some life-forms can continuously repair their body and live forever like the freshwater Hydra. Sponges and corals survive for a thousand years, whereas certain types of whales and sharks can live beyond 200 years. Researchers have mapped the genetic makeup of such mammals and are working to insert similar genes into human cells to increase our longevity.

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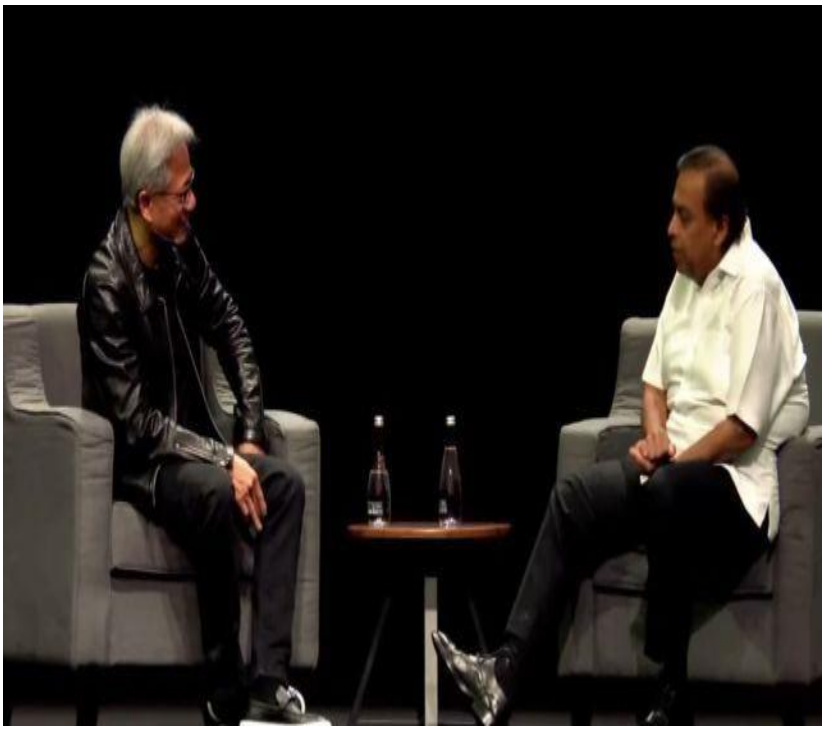
Undoubtedly, this activity is not a purely academic exercise. Tech billionaires have heavily funded this space and have made it into a thriving area of technological innovation. You will be amazed to know that the silicon-valley founders of tech giants like Google, PayPal, and Oracle have pumped in hundreds of millions of dollars into this death-defying exercise.

- Larry Ellison of Oracle has been at it for over a decade now giving about $45 million per year.
- Sergey Brin of Google contributed approximately $50 million towards research on old age diseases like Parkinson's.
- Peter Thiel of PayPal has donated $6 million to a research firm working on longevity.
- From a corporate angle, Google's parent Alphabet started the division, Calico, focused on extending the lifespans and invested approximately $730 million in R&D.

With all this enthusiasm from the likes of the Silicon Valley wizards to disrupt death, the technological and scientific work will inevitably add another 100 to 150 years to our lifespans. And in the process, treat some of the most dreaded illnesses, allowing us to live in dignity for the rest of our lives.

(The author is Chairman and Managing Director of Hyderabad-based Lycos Internet Ltd)

How will Reliance deal help NVIDIA tighten its grip of India's AI chip market?



NVIDIA reiterated its partnership with Reliance Industries to build state-of-the-art AI infrastructure in India on Thursday, October 24. Speaking at the chip giant's AI Summit held in Mumbai, NVIDIA CEO Jensen Huang said, "2024 will see 20 times growth in compute capacities in India."

Huang made these remarks in conversation with Mukesh Ambani, the chairman and managing director of Reliance Industries. "In order to lead in artificial intelligence, you need to have AI model tech and massive quantities of data, which India has," Huang said.

"When I met PM Modi, he asked me to address his Cabinet on AI. He told me that India should not export data to import intelligence, just as India should not export flour to import bread. We should add value to the data ourselves," Huang revealed about his interaction with the prime minister last year, adding that NVIDIA's partnership with Reliance would "start that journey".

- Meanwhile, Ambani underlined Reliance Jio's infrastructure as crucial to transforming India into a global AI hub."We have also been fortunate to have strong connectivity infrastructure. Today, apart from the US and China, India has some of the best digital connectivity, including 4G, 5G, and broadband networks. While our company initially did not operate in this domain, we have now become the largest data company in the world," he said, adding that the telecom major was ready for a "big scale-up" of its data centres at Jamnagar, Gujarat.

- Stressing that AI should be affordable and available, the Indian billionaire said that he was counting on NVIDIAso that Jio customers "don't have to change their phones" to use AI.

- Ambani also expressed "deep respect" for Meta CEO Mark Zuckerberg for "bringing open-source to the world of intelligence." Additionally, he mentioned using NVIDIA's enterprise and omni-bus AI tools to train "hundreds and thousands of developers" in India.

White House presses govt AI use with eye on security, guardrails

The Biden administration outlined plans on Thursday for the U.S. government to develop and use artificial intelligence to advance national security while managing its risks.

A White House memo directed federal agencies "to improve the security and diversity of chip supply chains … with AI in mind." It also prioritizes the collection of information on other countries' operations against the U.S. AI sector and passing that intelligence along quickly to AI developers to help keep their products secure.

- "We have to get this right, because there is probably no other technology that will be more critical to our nationalsecurity in the years ahead," White House national security adviser Jake Sullivan said in remarks at the National Defense University in Washington.

- "We have to be faster in deploying AI and our national security enterprise than America's rivals are in theirs," hesaid. "If we don't deploy AI more quickly and comprehensively to strengthen our national security, we risk squandering our hard-earned lead."

The effort intends to balance the need for fair competition and open markets, while protecting privacy, human rights and ensuring that AI systems do not undercut U.S. national security, Sullivan added, even as competitors are not bound by the same principles held by the United States.

NVIDIA rolls out Hindi-language AI model in India as CEO Huang visits

Hindi language, as it looks to tap into a growing market for AI technologies.

Chief Executive Jensen Huang is set to chat with the chairman of conglomerate Reliance Industries, Mukesh Ambani, who is also Asia's richest man, at a conference in the business capital of Mumbai, the California-based company said.

NVIDIA is rolling out its new small language model, dubbed Nemotron-4-Mini-Hindi-4B, with 4 billion parameters, for firms to use in developing their own AI models, the company said.

"The model was pruned, distilled and trained with a combination of real-world Hindi data, synthetic Hindi data and an equal amount of English data," it said in a statement."

Indian IT services and consulting company Tech Mahindra is the first to use the NVIDIA offering to develop a custom AI model called Indus 2.0, focused on Hindi and dozens of its dialects, the U.S. company said.

Just a tenth of the population of 1.4 billion speaks English in India, where the constituion recognises 22 languages, it added.From large companies to startups, businesses in India have focused on building AI models based on its diverse languages to grow consumer appeal and drive activities such as customer service AI assistants and content translation.

INTERVIEW: MIKE NEFKENS, CEO, HERE Technologies

Self-driving cars need special maps

Location tech can reduce fuel consumption of trucks, make EVs go the extra mile, help develop ADAS vehicles

VIKRAM CHAUDHARY

JUST THREE WEEKS into his job, Mike Nefkens feels at home at HERE Technologies. He is the former president & CEO of Resideo Technologies (a Honeywell spin-off), and long-time executive at Hewlett-Packard (served as president of HP Enterprise Services, responsible for a $20-billion P&L and 110,000 employees). An auto-tech person, HERE is just the right place for him.

"I am a huge car guy, and a map aficionado — as I've been a commercial pilot and pilots love to play with maps," he says. "HERE is about both cars and maps, so I couldn't be more excited."

Backed by Audi, BMW, Mercedes-Benz, Intel, Mitsubishi, NTT, Robert Bosch, Continental and Pioneer, HERE Technologies is a location tech platform, and was recently judged the world's best by Counterpoint, a market research firm.

"Though it's just my third week at HERE, I've been engaging with customers, team and shareholders for months, and I'm well ahead of the plan," he says. "We've had our best financial year, we grew our topline, our profits were the best ever, and we've been cash-flow positive, so 2023 was good. We're entering 2024 with a lot of momentum."

On autonomous driving

Starting March 2024, BMW's Personal Pilot Level 3 automated driving function will be available in Germany. The HERE HD Live Map plays a central role in that, providing info about the car's environment and its route ahead. The same maps helped Mercedes-Benz reach Level 3 autonomous driving in 2021. Also, earlier this month, Uber chose HERE maps to drive its mapping and geolocation functionalities, and improve pick-up and drop-off locations.

"It's a sign we're winning with OEMs and ride-sharing companies," Nefkens says.

On the Indian market

Of HERE's 6,500 employees, almost half (3,700) work in India. "All the data processing, crunching and managing happens in India," Nefkens says. "The country is our brain. Going forward, we will focus more on commercial market, challenging local players and providing Indians the finest maps."

On winning customers

Although HERE is backed by nine global corporations, Nefkens says they don't have any share in profits or any say in managerial appointments. "Last year, we set up an independent governance structure. We've four supervisory board members and everyone gets one vote. Our owners let us work as an independent company," he says. "Today, if I approach a Hyundai or a Nissan, the first question they will ask is why should they work with us as we are owned by their competitors? They still do, as we are the best mapping platform in the world, but keeping distance from our owners is a good thing."

On a HERE IPO?

Over time, HERE Technologies will be an independent company. Although Nefkens says an IPO (initial public offering) is not on the cards, the future of HERE is standalone. "I envision us as a standalone company, with the three Germans as our biggest customers, instead of owners," he says. "We aim to have a discussion on 'independence' over the next three years, and maybe towards the end of this decade we could reach that goal. But it's just not a priority right now."

He, however, added that despite Audi, BMW and Mercedes-Benz being owners of HERE, they don't get any preference over other customers. "A customer is a customer, and our quality will be high for everybody," he says.

On maps and sustainability

It's often argued that location technology can help corporations meet their net zero, sustainability goals. "That's correct. Location tech can help companies reduce fuel costs and save time, leading to sustainable transportation, and transportation is a big part of carbon emissions," he says. "An example of this is our new solution called EV Range Factors, which provides carmakers predictive data on EV range and the most efficient route EVs can take."

HERE EV Range Factors helps improve EV range in three ways:

- Provides road topography data to help EVs understand changes to upcoming road elevation, slope, curvature and roughness;
- Leverages predictive outside ambient temperature data and road surface temperature data that impact EV driving range;
- Incorporates predictive wind speed and direction near the road surface level.

"These may be small things, but we're incrementally helping the world reach net zero," Nefkens says. "For instance, the HERE ADAS Map, which powers Daimler Truck's Predictive Powertrain Control, delivers precise information about the road ahead to determine the most efficient driving style."

HERE vs Google

Most of us use Google Maps for daily navigation, and even Apple users tend to download Google Maps for their ubiquity. What can a HERE Technologies offer to a corporate that a Google cannot?

Nefkens says both HERE and Google have their strengths. "When you think Google, the first thing that comes to your mind is 'search'. Nobody can be better at search," he says. "When it comes to detailed mapping attributes that go beyond infotainment stuff, that's where we stand out."

Talking about 'bridge attributes', he says HERE maps can tell truckers where the bridges are, their height, what weight they can carry, the alternate routes if there is a low bridge on the way, what kind of trucks can pass under a bridge, and so on. "That's just one example of detailed mapping we can provide, and that's why we are able to solve more use cases than Google, even though they also have maps," he says. "When it comes to autonomous driving, ADAS or ISA maps, we are years ahead of anybody else."

3D maps

HERE is developing high-fidelity, 3D models of more than 100 cities, and also working on indoor mapping. Nefkens says it serves a major purpose. "For future use cases such as drone delivery, we're mapping heights of buildings and power lines. Our indoor maps will help you easily find your car in a parking lot or a restaurant inside a large hotel," he says. "Today there are no flying cars, but we are making routes for them."

On self-driving cars

Purists argue that self-driving cars can take the fun away from driving. "Driving is a human skill, and should remain so," they say. But Nefkens feels that technology intervention will only make driving more fun. "Do you know that planes hit autopilot as soon as they touch 1,000 feet, giving pilots more time to engage with other functions, and maybe stealing a glance at the beautiful world below," he says. "The same is with self-driving cars. You will have more fun driving, engaging with newer functionalities inside a car, and taking the control of the wheel when you feel like. It will make driving safer, and you will be a highly refreshed driver. Location tech plays a key role in self-driving cars."

FOR OUR HIGHLY-DETAILED MAPS, ALL THE DATA PROCESSING, CRUNCHING AND MANAGING TAKES PLACE IN INDIA. WE HAVE 3,700 EMPLOYEES HERE. THE COUNTRY IS OUR BRAIN

For future use cases such as drone delivery, HERE is mapping heights of buildings, as also indoor maps

'Make in India' gets ambitious, flying cars, e-nose on wishlist

Thinktank Lays Down Roadmap

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Mysore: India's technology thinktank under the ministry of science & technology has come out with 'Technology Vision 2035' here at the ongoing Indian Science Congress, identifying the challenges ahead and how they can be dealt with through technological interventions while realising the dream of a developed India by the year 2035.

The thinktank — Technology Information, Forecasting and Assessment Council (TIFAC) — in the vision document lists a technology roadmap for India, giving details of 12 sectors and technologies that in some cases exist but need to be deployed, some in the pilot stage that must be scaled up and technologies in R&D stage.

It, in fact, talks about many future technologies, ranging from flying cars, real time translation software, personalised medicine, wearable devices, e-sensing (e-nose and e-tongue) to 100% recyclable materials among others which may be used in different areas to solve day-to-day problems.

"The trajectories delineated as part of this 'Technology Vision 2035' along with its actualisation would not only lead to the desired quality of life for citizens but also boost our comprehensive national power", said Prime Minister Narendra Modi in his foreword to the document, while emphasising that the pressure on country's resources can only be solved through use of technology.

The document was released by the PM after he inaugurated the 103rd Indian Science Congress on Sunday where he promised that his government would "make it easier to do science and research" in India and envisioned a future in which innovation makes lives of people better.

Interestingly, the document also talks about technology which still dwells in the imagination, saying these may become real as "a result of curiosity driven, paradigm shattering research (called blue sky research)".

As part of those 'blue sky' research ideas, the government thinktank imagined the concept of virtual courts and digital evidence; complex real-time dynamic disaster management response systems; sensing devices to be able to feel the product on internet before buying it; machines\robots to connect all personal and emotional needs; intelligence vehicles to detect emergency situations and take over the control and inter-planetary communications systems.

"This is not a vision of technologies available in 2035 per se; rather, it is a vision where our country and compatriots should be in 2035 and how technology would bring this vision to fruition", said the document before elaborating on how the sector-wise 'future technologies' can bring change to the lives of people.

This is the second time the thinktank has come out with such a vision document. The first one — Technology Vision 2020 — had come under A P J Abdul Kalam in 1996 with a view to sketch the scenario as of the year 2020. "... it is important to repeat such an exercise to review the actual state of play and take into account new possibilities and challenges..." said the preamble of the 2035 Vision.

For the full report, log on to www.timesofindia.com

INDIA TECH VISION 2035

KEY SECTORS AND FUTURE TECHNOLOGIES

EDUCATION
- **3D printing:** To reduce material wastage and create complex objects
- **Artificial Intelligence:** Capability of a machine to imitate intelligent human behaviour
- **Real-time translation**
- **Gesture recognition**
- **Machine vision**

ENERGY
- **Renewable:** Pyrolysis, gasification, yeast/enzyme-based conversion to high-quality fuels
- **Nuclear energy:** Thorium-based power reactor
- **Rural energy technologies:** Micro wind turbines and micro grids for energy distribution
- **Energy storage:** Super capacitor, nickel battery and fuel cell
- **Coal:** Advanced cleaner technologies

HEALTH
- Personalised medicines
- Wearable devices
- Robotic surgical system
- Regenerative medicines
- Digital health delivery

TRANSPORTATION
- Flying cars
- Fuel cell drive train
- Fog vision system
- Flexible and folding vehicles
- Autonomous power train and vehicle train

FOOD AND AGRICULTURE
- Precision agriculture and robotic farming
- **Bio-fortification:** Process by which nutritional quality of food crops is improved
- **Hydroponics:** Method to grow plants using mineral nutrient solutions in water without soil
- **Vertical farming:** Cultivating food within a skyscraper greenhouse
- Biological control of pests & diseases

MANUFACTURING
- Water-less processes
- Zero-emission processes
- Noise- and odour-free production
- **Bio-concrete:** It is a self-healing concrete; it is a material which can successfully re-mediate cracks in concrete
- Precision manufacturing

Nobel laureates pitch for 'Invent in India'

Four of the five Nobel laureates attending the Indian Science Congress in Mysuru said that India must focus on discovering, inventing and making here and not just making. "I think your Prime Minister Narendra Modi's slogan must change to 'invent in India' from Make in India," American particle physicist and Nobel winner professor David J Gross said on Monday. "Making in India is obviously important for the country, but to make in India without dependence on others, you must invent in India, and to invent you must discover. Because it is discovery and inventions that lead to products that can be made," Gross said. Professor Dan Shechtman, echoing Gross, said there must be a strategic plan. While the need to innovate, discover and invent must be the first goal, there must be a simultaneous effort at enhancing entrepreneurship. "The inventions must be taken from the universities to startups," he said.

Chethan Kumar

For the full report, log on to www.timesofindia.com