HELLO TO HEALTHTECH PG.24

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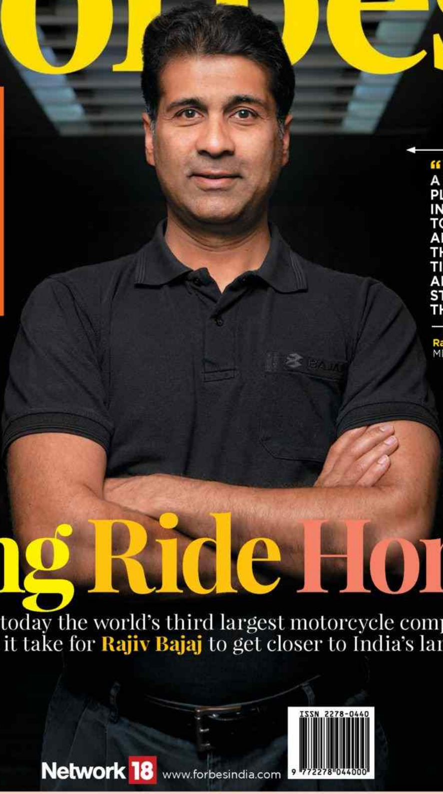

15.1 *Million*

INDIAN MOTORCYCLE SALES (DOMESTIC AND EXPORTS) IN FY18; A 15% INCREASE

"WE ARE A GLOBAL PLAYER, BUT IN INDIA WE NEED TO BE BETTER. AND THIS IS THE RIGHT TIME TO DO IT AND WE HAVE STEPPED ON THE GAS"

Rajiv Bajaj,
MD, Bajaj Auto

PLUS

THE OTHER MUTHOOT

HOW AIRBUS IS GIVING WINGS TO INDIAN STARTUPS

Long Ride Home

Bajaj Auto is today the world's third largest motorcycle company, but what will it take for **Rajiv Bajaj** to get closer to India's largest?

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Welcome to the

Forbes INDIA

Tablet Edition

The Strategy Paradox

An interview with Rajiv Bajaj invariably turns out to be a masterclass in strategy. The conversation tends to be as much about product as about product differentiation—via innovations and, sometimes, price, too. It's less about technology, because that is pretty much hygiene in the segments (entry-level and mid-market) that matter most in the product category that the managing director of Bajaj Auto lives and breathes—motorcycles.

What's also impressive about Bajaj's strategy is that he's lived by it for the past 17 years—ever since the Pune-based company made its first, fully-indigenous, successful motorcycle: The power-packed Pulsar. Along with opening up a new market, the Pulsar sent out a message loud and clear: That Bajaj could build powerful and stylish bikes. On its own.

Most Indians look at quality, fuel efficiency, and maintenance costs before buying a bike

The Bajaj Auto strategy can be summed up in two words. Globalisation—not only India as a market, but also the world; and specialisation—only motorcycles (along with, in a synergistic niche, an inherited and highly-profitable three-wheeler business, and a four-wheeler derived from it).

Has that strategy worked? The globalisation part, for sure, has, with Bajaj Auto exporting 40 percent of its production to more than 70 countries and emerging as the world's third largest motorcycle maker.

The narrow focus on motorcycles has worked to the extent that Bajaj Auto wouldn't have been half the company it is if Rajiv Bajaj and a bunch of enthusiastic engineers hadn't developed the Pulsar. But here's the spoiler: Why is Bajaj Auto a distant No 2 in motorcycles at home, the world's largest market? And how does he narrow the gap with numero uno Hero MotoCorp?

These are the questions *Forbes India*'s Rajiv Singh set out to answer in this fortnight's cover story. The short answer: Most Indian consumers look first at—before performance and style—price, quality, fuel efficiency, maintenance costs and resale value before buying a bike. And it's this market that Hero MotoCorp dominates. To make a dent here, says Singh, Bajaj has triggered two gambits: One, offer the same product (as that of the competitor) for a lower price; and, two, offer more products for the same price. For more on those strategies, turn to *page 16*. Don't miss the interview with Rajiv Bajaj, in which he delves into the triangular strategy of Bajaj Auto, where motorcyles is the main business, supplemented by superbikes, and the third that's a work in progress—electric vehicles. The interview, in which Bajaj relies often on his marketing gurus Jack Trout and Al Ries for context, is a must-read for every marketer. And perhaps for every reader, too. Particularly when it is peppered with advice like: "I always tell my people, whenever they are in trouble, the starting point should be to narrow one's focus. Do less. Doing more never works." That's on *page 21*.

Our other big package of the fortnight is on health technologies, and how they are helping take health care to underserved and unserved areas. Kathakali Chanda's brilliant research and analysis into how 3D printing is preparing doctors for complicated cases, and Ruchika Shah's deep dive into healthtech startups that are using artificial intelligence and machine learning to make health delivery more accessible and affordable are just two compelling features in this package. It begins on *page 24*.

▲ (Top) What will it take for Rajiv Bajaj to make Bajaj Auto India's largest motorcycle maker? (above) 3D printing is making advances in medical applications, although adoption has been slow

Best,

BRIAN CARVALHO
Editor, *Forbes India*

brian.carvalho@nw18.com

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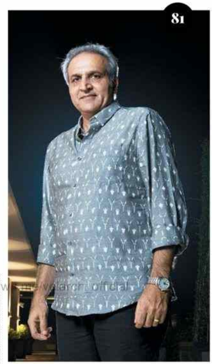

Fabindia CEO Viney Singh is a foodie who savours prawn and pork dumplings

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Forbes INDIA

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'It's An End To Extortion'
Petitioner Keshav Suri on why the move to scrap Section 377 means freedom for all **P/14**

Festivals And Record Sales
Etailers are expected to make a killing during the upcoming festive season **P/14**

Investor Euphoria
Big money is chasing sectoral leaders in India after a lull of two years **P/16**

EYE ON ECONOMY

The Growth Rider

An 8.2 percent GDP growth in the first quarter of the current fiscal might not be good news as rising oil prices and a weak currency are likely to spoil the celebrations

SHUTTERSTOCK

IF CELEBRATING INDIA'S return to a higher growth trajectory of 8.2 percent in the first quarter of the current fiscal is a cause for celebration, what lies ahead is probably enough to spook even the most optimistic India watchers. In the last quarter, a host of near-term and long-term risks have reared themselves even as the quality of the growth gives enough cause for concern.

Already, economists and brokerages have penciled in lower numbers for the rest of the year. "We doubt that India can sustain a growth trajectory above 8 percent for the rest of this fiscal," said a research note by DBS. The brokerage expects the full year growth to fall to 7.4 percent weighed down by tighter money supply.

Growth in the first quarter of FY18 was supported disproportionately by a rise in consumption spending which rose to 8.6 percent in the quarter from 6.7 in the March quarter. Powering consumption growth has been the rise in personal (unsecured) loans. According to the Reserve Bank of India (RBI), the liabilities of households went up from 2.4 percent of gross national disposable income in 2016-17 to 4 percent in 2017-18. With investment demand remaining low, a rise in consumption without an increase in capacity is likely to lead to higher prices.

For now, it is a mix of rising oil prices and a weaker currency that has spooked markets. "We remain cautious for the rest of the year for three reasons. Global growth is beginning to moderate, liquidity is getting tighter and the fiscal tailwind is not there," says Kapil Gupta, research analyst at Edelweiss Securities.

In early September the

Emerging Market Currency Woes

	August 5	September 5	%age change
Indian Rupee	68.55	71.52	-4.3
Turkish Lira	5.08	6.67	-31.2
Argentine Peso	27.27	38.96	-42.86
South African Rand	13.31	15.30	-14.95
Russian Ruble	63.32	68.03	-7.4
Chinese Yuan	6.83	6.83	0

Source: *xe.com/ucc* *Versus US dollar*

10-Year Government Bond Yields

Figures in %

Brent Crude Oil Prices

Source: *Bloomberg*

Figures in $/barrel

rupee shed further ground, breacing the 72 per dollar mark on September 6. While it has been among the best performing emerging market currencies, for now its fortunes are linked directly to rising oil prices that have resulted in a widening current account deficit. In the first quarter of FY17-18, the country likely had a 2.5 percent current account deficit, up from 1.5 percent in the same quarter the previous year.

A rising current account deficit (clocked at 2.4 percent of GDP in April-June 2018), and a falling rupee have also fuelled inflation fears prompting apprehensions of the RBI hiking rates. Bond yields have spiked to 8.12 percent pricing in two rate hikes for the year, which would lead to a hike in the cost of financing of home loans, vehicle loans and consumer durable loans.

> **"We doubt that India can sustain a growth trajectory above 8% for the rest of the fiscal."**
>
> **DBS Research**

Last, there's the fiscal deficit that the government has maintained it will hold at 3.3 percent of GDP. For now, the markets are assuming that the target will be breached due to spending in an election year as well as the rising prices of petroleum products that may prompt the government to explore ways to not pass on the entire hike to consumers.

—SAMAR SRIVASTAVA & SALIL PANCHAL

BLAME GAME

Is Rajan a Scapegoat?

Economists feel it was wrong of Niti Aayog's Rajiv Kumar to blame the former RBI governor for demonetisation

NITI AAYOG VICE CHAIRMAN Rajiv Kumar has blamed former RBI governor Raghuram Rajan's AQR (asset quality review) for demonetisation. Through AQR, Rajan had asked banks to recognise loans to about 150 companies to be marked as NPAs between 2015 and 2016. The exercise showed that almost all public sector banks had higher NPAs and hid bad assets under forbearance. The AQR fallout was that banks, whose balance sheets were already weak, became reluctant to lend more. This hurt credit flow, investments and in turn domestic growth. Here's what experts have to say:

—MANU BALACHANDRAN & SALIL PANCHAL

"NPAs were a malice to the banking system and there was a need to clean up the banking sector. As a result, the growth margin was affected and there was a slowdown. But it was the right decision; we needed a cleaner banking system. The collateral to the clean-up was growth. But to blame the clean-up of banks as the cause of a slowdown isn't fair. There are many alternative sources for credit such as ECBs and corporate bonds."

—Madan Sabnavis
Chief economist, Care Ratings

"Raghuram Rajan's AQR programme provided clarity on which loans had gone bad and to what extent. It was required. Nevertheless, I believe Rajiv Kumar has been misrepresented. What he possibly pointed towards was that the AQR probably fostered an environment where banks became more cautious and risk averse. The global economy, in terms of demand and headline growth, was worse at that point of time and also had an impact."

—Abheek Barua
Chief economist, HDFC Bank

"It is true that the clean-up led to a significant slowdown in the economy. By 2014, the investment rate, as a share of GDP, was around 24 percent in comparison to about 36-37 percent in 2008. While the global economic slowdown did have a role, AQR also affected growth adversely. Credit flow was deprived and banks didn't have the appetite which affected many small and medium enterprises (SMEs). A large number of projects were stalled. Demonetisation would have led to a loss of 0.5 percent of the GDP and was in effect a brake on a fast moving train, since it wasn't done properly."

—Pravakar Sahoo
Professor, Institute of Economic Growth, Delhi University

"A central banker is fundamentally responsible for setting standards that accurately reveal the health and stress of each bank. Rajan did exactly that and has to be commended for it. You can't point to an ex-RBI governor and claim that his more prudent income recognition norms ruined industrial growth. Instead, we need to ask how the companies that are now under bankruptcy could take such disproportionate amount of loans that were far beyond their ability to service. Unfortunately I don't agree with Rajiv Kumar's views."

—Omkar Goswami
Economist and Chairman, Cerg Advisory

ILLUSTRATION: CHAITANYA DINESH SURPUR

SHOP TILL YOU DROP

Festive Fervour to See Record Sales

Twenty million shoppers likely to generate $3 billion worth of sales in just five days of Diwali

THE BUSIEST TIME OF THE YEAR FOR etailers is fast approaching. The festive season (September to December) accounts for a majority of annual sales for ecommerce players, and this year is likely to see record numbers. The depreciating rupee is unlikely to play spoilsport.

"This festive season, the online shopping market is set for a mega clash of the titans—Amazon vs Walmart," says Anuj Puri, chairman of Anarock Property Consultants, which also runs a retail advisory unit. "Unlike earlier, when Flipkart competed with Amazon by offering deep discounts, this season will see the two US giants battle it out in the Indian market."

According to a report by market research firm RedSeer, the five days of Diwali are expected to fetch a gross merchandise volume of $2.5 billion to $3 billion, up from about $1.5 billion in 2017. Amazon has just introduced a Hindi interface, which will help it grab a greater slice of the tier-1 and tier-2 markets, the report adds. Flipkart recently introduced an independent platform for refurbished goods called 2GUD, which is likely to increase sales of returned mobiles, laptops and electronic accessories.

Shoppers in Five Festive Days

Source: *RedSeer Analysis*

The rundown to the festive season has already begun at Paytm Mall, says COO Amit Sinha. "We have had wonderful sales in the past few weeks and expect to have equally impressive results in the future."

—PANKTI MEHTA KADAKIA

HAPPY AND GAY

'It Means an End to Extortion'

Petitioner Keshav Suri on the SC's historic move to scrap Section 377

THE SUPREME COURT ON September 6 scrapped section 377 of the Indian Penal Code that criminalised homosexuality. In its judgment, a five-member bench said: "The right to live with dignity has been recognised. Sexual orientation is a natural phenomenon determined by biology and science. Any discrimination on this basis is unconstitutional."

To celebrate the historic moment, employees of Lalit Hotel in New Delhi performed a flash mob, wearing rainbow-coloured scarves around their necks and waists. Keshav Suri, executive director of Lalit Hotels, who was at the forefront of the legal battle, spoke with *Forbes India* about the fight. Excerpts:

Q What does the ruling mean for India and its LGBTQ community?
The judgment has put an end to discrimination and discriminatory policies against the community. That means equal opportunities for all and an end to practices such as extortion that the community was subjected to.

Q What is the way forward?
We have to come together and bring a strong community. Earlier, companies would use the law as an excuse to hire people from the community... we need to ensure the normalisation and their inclusion in companies. The society needs to be educated; we need better representation across government, parliament, movies and sport.

Q But it isn't going to be easy. There is a taboo across the country, and more so in the hinterlands...
Taboo exists everywhere, whether it is in the US or France. But we need to ensure that practices such as homophobia are done away with. The courts have said they will protect against such discrimination. That's important in helping the marginalised shed their fear. I am starting my own foundation in October which will make it easier for people to come out, share their stories and live a life of dignity.

Q Many corporates are yet to bring in policies that favour the community. How hopeful are you about that?
Soon after the judgment, we saw that a large number of companies had shared the rainbow logo on their social media pages. Perhaps that itself is a sign of change in mindset.

—MANU BALACHANDRAN

KESHAV: GETTY IMAGES; PHOTOGRAPHS: SHUTTERSTOCK

2009

The year in which Delhi High Court had decriminalised homosexuality

FLUSH WITH FUNDS

Startups Ride on Investor Euphoria

Big money is chasing sectoral leaders after a lull of two years; smaller companies, however, may see their growth plateau

IT IS RAINING MONEY, AT TIMES from the most unlikely quarters, for India's consumer internet bellwethers. For instance, take Berkshire Hathaway. Otherwise known to take long-term bets in hugely profitable companies, it recently invested in Paytm, which posted a loss of about ₹900 crore on revenue of ₹829 crore in FY17. The moat here, it is said, was Paytm's scale—1.3 billion transactions in the June quarter.

At a time when startups such as Oyo, Byju's, Swiggy, Zomato and Ola are gearing up for their next fund raise, investors have turned euphoric about Indian ventures after a protracted lull of about two years. Till 2015, a bunch of them led by Tiger Global Management flushed homegrown startups with unprecedented funds. A valuation bubble ensued and subsequently burst, leaving several companies in a quandary.

It seems big money is now chasing the biggest startups, which also hints at the fact that sectoral winners are gradually emerging in India. The likes of SoftBank, Alibaba, Tencent, Naspers and Berkshire Hathaway are rolling out the red carpet for potential winners, largely based on their user base and frequency of transactions, although they continue to bleed.

Take for instance foodtech startups, which were the major beneficiaries of the funding boom and the worst hit by the bust. Swiggy, the leader in the segment, is a product of those halcyon days, but survived. The food delivery segment has turned out to be a land grab between Swiggy and Zomato, who are spending about $15-20 million a month to wrest market share. The same holds good for Byju's, which launched its flagship mobile app about three years ago and became a breakout success among online education startups. Oyo is the biggest online hotel aggregator; its nearest competitors are Treebo and Fab Hotels. Similarly, Paytm, the most valuable homegrown consumer internet startup (after Flipkart was acquired by Walmart), once jostled with the likes of Freecharge, Mobikwik and Oxigen. It is the biggest in its segment with Flipkart's PhonePe, a relatively new entrant, being a formidable competitor.

Sectoral winners are gradually emerging in India

The sectoral bellwethers continue to bleed to incentivise consumers, but it is unlikely that an upstart will dethrone them. Most challengers have been weeded out and in most cases, it is a dual or at best, a tripartite race.

Where does it leave the smaller rivals? "New startups in areas where there are established players may struggle to raise funds. Another online marketplace or food delivery company is unlikely to strike a chord with investors. But there are new avenues; for instance vernacular content or consumer products, which will attract investors," says a venture capital executive. "Because well-funded startups undercutting smaller companies to gain market share is a given."

Sreedhar Prasad, partner and head, consumer markets and internet business-advisory, at KPMG India, says there is ample scope for multiple businesses to coexist. However, some smaller companies may struggle to scale beyond a point. "This isn't a situation where there is no room for growth because consumers in India are not loyal. The idea is to differentiate. There has to be a clear differentiation in two things—value proposition and customer experience," says Prasad.

Time will tell if the Davids will slay the Goliaths. For now, the battle is on.

—SAYAN CHAKRABORTY

LEADERBOARD

THE BIG PICTURE

Streaming Now: Netflix, Hathway Thriller

Tie-up between American streaming giant and Indian cable broadband provider looks like a net gain for both the partners

IN EARLY SEPTEMBER, WHEN American streaming service giant Netflix joined hands with cable broadband provider Hathway to provide consumers access to its content through the Hathway set-top box, it was billed as a win-win for both. However, dig a bit deeper into it, and it seems like Hathway might benefit more out of it. Reason: Impending disruption from Reliance's JioGiaFiber.

"For Hathway, the tie-up with Netflix gives it a much-needed boost to reinvent itself to fight Jio," says Abneesh Roy, senior vice president of institutional equities at Edelweiss Securities. Cable players in India, he lets on, are staring at a massive disruption that Jio is set to unleash through its aggressive broadband play. Though the tie-up is a move in the right direction, Hathway has to build more moats to fend off Jio. "Out of the 10 million subscribers, Hathway has only .8 million broadband users," says Roy. "So only a fraction would be able to get access to Netflix."

As far as Netflix is concerned, its sedate growth in India has to do with its inability to get the right pricing in the country. While globally, Netflix is priced less than DTH and cable players, in India it's not the case, informs Roy. "Another challenge for Netflix is lack of broadcaster content." Unless it beefs up its original content with regional languages, English users won't be of much help in giving them wide traction in India, he adds.

—RAJIV SINGH

STICKY AFFAIR

Quick Versus Kwik

Astral Poly Technik takes on Pidilite's adhesive brand Fevikwik with its similar sounding ResiQuick. Will the gambit and the name stick?

WHAT'S IN A NAME? A LOT IF you look at two recent examples. Xiaomi's blockbuster smartphone brand, Redmi, has got a matching (at least in name) rival in Realme, an online brand launched by Chinese rival Oppo. It's Mi versus Me. The slugfest is not restricted to the world of phone alone.

Back in India, consumers are getting glued to a riveting fight between an industry leader and another company. ResiQuick, an instant adhesive brand from Ahmedabad-based Astral Poly Technik, has roped in Bollywood actor Varun Dhawan to take on the might of market leader Fevikwik. It's Quick versus Kwik.

ResiQuick, according to several brand strategists, stands a strong chance to take on the adhesive brand from the Fevicol family. "The beauty of this space is that it's niche, one-use oriented and cheap," contends Harish Bijoor, founder of the eponymous brand consultancy firm. The category still doesn't have brand recall and preference as a Fevicol, which is a household name. So, it's largely driven by retailer push.

The fight, however, is now tilted more in favour of Fevikwik. Reason: The adhesive brand piggybacks on the mother equity of Fevicol, which is the mother of all generic brands today. "ResiQuick needs to think of inventing its own magic to battle the Fevi equity," adds Bijoor.

—RAJIV SINGH

IMAGING: CHAITANYA DINESH SURPUR; THE BIG PICTURE: SHUTTERSTOCK

$310 mln

The amount food delivery app Swiggy has raised so far this year

BEHIND THE SCENES

'Films are the Heart; not a Business for us'

Dharma Productions CEO Apoorva Mehta on movies being 'first love' and an imminent foray into the OTT space

APOORVA MEHTA, 45, TOOK CHARGE as CEO of Dharma Productions in 2005. His childhood friend Karan Johar asked him to assume the role following the demise of his father, Yash Johar, who had founded the company in 1976. As Dharma gears up for six big releases next year, including *Kalank*, *Student of the Year 2* and *Brahamastra*, Mehta speaks about the company's future plans. Excerpts:

Q What change did you bring about as CEO?
I brought a lot of structure in the company. I was able to define each employee's role and groom them to do more.

Q What has been your biggest learning?
It has been that you don't know the audience; it is smarter and evolving at a far more rapid pace than you are.

Q What are Dharma's plans for the future?
Movies are our first love. That will be an affair that will never stop. Also, to actively create more digital content to cater to a medium which will probably become the bigger medium over time.

Q Will Dharma get into the OTT space?
OTT as a medium is here to stay. We are setting up a team to look into it and will have an announcement in the next one year. There's a different beat to this format. It's about understanding that beat and making something that is unique.

Q What is the core philosophy of Dharma?
Films are the heart; it's not a business for us. We should be taking some harsh decisions, but I don't think we do that. That results in lesser profits, but also allows us the unique position of driving this business with passion.

—KUNAL PURANDARE

ANTI-TRUMP ADS

Just Doing It

Nike's new ad campaign has Colin Kaepernick, the NFL quarterback who knelt during the US national anthem to protest against racial inequality. Some other anti-Trump ads:

Airbnb: Ran ad against Donald Trump's anti-immigrant policies and dubbing Haiti, El Salvador and Africa 's**thole'. The ad read "we believe no matter where you are... we all belong."

Patagonia: Outdoor apparel company wrote on its homepage 'The President stole your land' to protest against Trump's plan to scale back allotment of protected land.

Dove: Poked fun with its campaign #AlternativeFacts, a reference to the term coined by the administration to explain false claims about presidential inauguration attendance. Among other things, the ad said, the new Dove antiperspirant "boosts your Wi-FI signal", "rhymes with orange", "raises your IQ by 40 points".

Smirnoff: Following the administration's collusion with the Vladimir Putin regime, vodka company starts ad campaign: "Made in America. But we'd be happy to talk about our ties to Russia under oath."

—KATHAKALI CHANDA

NEW LOOK

Thinking Outside the Box

Swiggy launches a marketplace for sustainable food packaging

SWIGGY HAS ANNOUNCED A marketplace for food packaging for partner restaurants called 'Swiggy Packaging Assist'. This e-store stocks a range of custom delivery containers, categorised for dry starters and snacks, gravy items, carry bags, paper and pizza boxes and cutlery. The focus is on providing partner restaurants with sustainable, eco-friendly and food-grade certified material.

The marketplace lists 30 products that serve different functions—leak-proof, sturdy, stackable and heat insulant, for instance. Many of these are made with paper or aluminium that is recyclable. Wooden cutlery is available too. "Packaging material for food delivery is fraught with challenges," Swiggy said in a statement. "With over 40,000 restaurants on the platform, we want to enable them to have seamless access to quality, eco-friendly material."

Swiggy launched a pilot phase in Bengaluru two months ago and in Maharashtra in August. So far, 300 partner restaurants have made purchases with the service. "We wanted to be environment-friendly, but the challenge was to source the right quality products at the right price," says Girish D Kulkarni, owner of Maharaja Wada, Pune, a restaurant that uses the platform. "We have received compliments from customers for our packaging, especially those that are sustainable options to plastic."

—PANKTI MEHTA KADAKIA

NEW LOOK: SHUTTERSTOCK

Perils of Driverless Cars

While they may bring several benefits, many issues need to be sorted out before they can become a reality

By **Vivek Kaul**

The writer is the author of the Easy Money *trilogy*

In early September, California's road driving authority confirmed that a self-driving car owned by Apple was involved in an accident on August 24. A BBC report on the accident said: "Humans were unhurt, but the machines suffered moderate damage." It also pointed out that Apple has 66 such cars on the roads.

Apple is not the only company trying to figure out self-driving cars. Recently, Japanese auto maker Toyota invested $500 million in Uber for the development of self-driving cars.

What is it about self-driving cars that companies like Apple, Toyota and Uber are interested in them? Yuval Noah Harari, author of bestselling books like *Sapiens: A Brief History of Humankind* and *Homo Deus: A Brief History of Tomorrow*, explains the phenomenon in his new book, *21 Lessons for the 21st Century*.

Close to 12.5 lakh people are killed in traffic accidents globally every year. This is twice the number of people killed because of war, crime and terrorism, added up. As Harari writes: "More than 90 percent of these accidents are caused by very human errors: Somebody drinking alcohol and driving, somebody texting a message while driving, somebody falling asleep at the wheel, somebody day dreaming instead of paying attention to the road."

Harari says the number of deaths and injuries

An unmanned car in Tianjin, China, before the World Intelligent Driving Challenge this May

VCG / VCG VIA GETTY IMAGES

due to road accidents can be reduced by 90 percent if cars driven by human beings are replaced by driverless cars. In the process, 10 lakh lives a year can be saved. And that is a big number.

The question is what advantages do driverless cars have over cars driven by human beings? Writes Harari: “Every vehicle is an autonomous entity; when two vehicles approach the same junction at the same time, the drivers might miscommunicate their intentions and collide.” On the other hand, all self-driving cars can be connected to one another, as part of a single algorithm. “When two such vehicles approach the same junction, they are really not two separate entities—they are a part of a single algorithm. The chances that they might miscommunicate and collide are therefore far smaller.”

Over and above this, if the transport authority changes any regulation, all self-driving cars can be updated for that, at the same time. The same cannot be said about human beings driving cars.

Self-driving cars will bring down the cost of taxis over a period of time. This will lead to fewer people buying cars. Eventually, it will be better for the global environment. Also, if fewer cars are bought, fewer parking slots will be needed.

People said that a driverless car that is about to run over pedestrians and kill them, should protect the pedestrians even if it kills the owner of the car. But the same people said that they would not buy such a car

As Hector MacDonald writes in *Truth: How the Many Sides to Every Story Shape Our Reality*: “[Driverless cars] don’t need to be parked in the city centre, so we can turn acres of premium city land currently devoted to parking spaces into profitable developments or amenities such as parks and playgrounds.”

While all this sounds terrific, it might take many years before the idea of self-driving cars becomes a reality. There are several reasons for this:

● On March 18, an Uber self-driving car killed a woman in Arizona, US. While self-driving cars may bring down the total number of accidents, accidents will still happen. The question is who will be blamed in such situations? As MacDonald writes, if driverless cars “lead to the deaths of a few hundred people on our streets, that may be politically unacceptable, even if the total number of road deaths is lower than before”. This will eventually become a political issue; how will politicians handle this?

● What will happen to the general insurance industry that sells insurance policies against car accidents? Writes MacDonald: “Motor insurance will have to shift from individual driver cover for human error to manufacturer cover for technical failure, potentially wreaking havoc in the general insurance industry.”

● The big question that nobody seems to be asking is, what happens to all the drivers out there? As Ruchir Sharma writes in *The Rise and Fall of Nations: Ten Rules of Change in the Post-Crisis World*: “The most common job for American men is driving, and one forecast has driverless smart cars and trucks replacing them all by 2020.”

What happens to these men? In the past, when such structural shifts happened, people were able to find other jobs, primarily because machines back then competed with the physical abilities of human beings, and not cognitive tasks. This allowed people to move from one sector to another, whenever there was an upheaval due to machines.

It’s different this time around. As Harari writes: “Many people might share the fate not of 19th century wagon drivers—who switched to driving taxis—but of 19th century horses, who were increasingly pushed out of the job market altogether.”

● The other issue that crops up here is that of human beings as consumers. People in jobs typically tend to specialise in one area, make money from it and use that to fulfil their needs. When they spend the money that they earn, other businesses benefit. These other businesses provide jobs to other people, who in turn spend the money they earn and create business for others.

If robots replace human beings, like they will do in case of driverless cars, how will the consumption dynamic continue to work? Also, will politicians keep mum as a huge multitude of human beings lose their jobs?

● Finally, there is a philosophical dimension to this. Human beings make decisions while driving. The algorithms that power driverless cars need to do the same. In a 2016 research paper titled *The Social Dilemma of Autonomous Vehicles*, Jean-François Bonnefon, Azim Shariff and Iyad Rahwan wrote: “Autonomous vehicles should reduce traffic accidents, but they will sometimes have to choose between two evils, such as running over pedestrians or sacrificing themselves and their passenger to save the pedestrians. Defining the algorithms that will help [driverless cars] make these moral decisions is a formidable challenge.”

In fact, in their research, the authors found that in a hypothetical scenario, people said that a driverless car that is about to run over pedestrians and kill them, should try and protect the pedestrians even if it comes at the cost of killing the owner of the car.

The people were also asked if they would want to buy a car that is so programmed. The answer, not surprisingly, was no. To conclude, many issues need to be sorted before a driverless car can become a reality across the world.

Rajiv Bajaj says as a motorcycle company, Bajaj Auto is still a teenager

It's Coming Home

Bajaj Auto is the world's third largest motorcycle company, but what will it take for Rajiv Bajaj to make it India's largest?

By **RAJIV SINGH**

August 2017. The room in Pravasi Bhartiya Kendra in New Delhi was packed to the rafters with political heavyweights, helmed by Prime Minister (PM) Narendra Modi and his entire cabinet, Niti Aayog CEO Amitabh Kant and over 300 business leaders from different industrial sectors. The head honchos were called in for a two-day brainstorming on the Make in India programme as a part of a government initiative called 'Champions of Change'.

The industrialists were divided into six to eight groups of 50 to 60 and, at the end of the second day, one from each group had to make a 10-minute presentation to the PM. Rajiv Bajaj, managing director of motorcycle maker Bajaj Auto, who led one group, chose to outline five initiatives to take the programme forward.

Make in India has, of course, been the government's effort to attract investments from across the globe to spur manufacturing in India. "Go and sell in any country of the world, but manufacture here," Modi had declared when he launched the programme in his maiden Independence Day speech in 2014.

Bajaj knows a thing or two about making in India and selling to the world. He's been doing that for more than a decade now. As of the first five months of fiscal year 2018 (April to August), over 40 percent of Bajaj's two- and three-wheeler production—some 0.71 million and 0.17 million, respectively—were sold in more than 70 countries. That's enough to make Bajaj Auto the third largest motorcycle maker in the world.

The third-generation entrepreneur—his grandfather Jamnalal Bajaj founded the company in the 1940s—likes to point out that Bajaj Auto may be 73 years old but, as a motorcycle company, it is still a teenager; the indigenously-developed Pulsar—Bajaj's first success in motorcycles, on its own—was launched in 2001. "We've gone from being a newcomer 17 years back to World No 3, which means we are ahead of the Yahamas, Suzukis, Kawasakis, and all European, Chinese and American (motorcycle) makers."

But here's the paradox. Bajaj Auto may be No 3 in the world, but in India it is still a distant No 2 in motorcycles—and a dismal No 4 in two-wheelers, if you include scooters. Bajaj is pretty clear that scooters are not a focus area, and that he cannot be bracketed with those who make them. "Why should we leave gaps in the motorcycle portfolio and think about scooters?" he asks.

To be sure, the gap with the leader, Hero MotoCorp in India, in motorcycles, is huge. "Unfortunately, India is the market where for a long time we have not been No 1," concedes Bajaj. Hero MotoCorp had over half of the motorcycle market in the bag as of August, with Bajaj Auto at a distant 18 percent. The biggest reason for this variance is the Pune-headquartered company's inability to make a dent in the segment that matters most: The commuter or executive or value-for-money segment, where Hero MotoCorp rules the roost, selling some 587,000 units in August—primarily Splendor, HF Deluxe Passion and Glamour; Bajaj Auto's August sales in this segment were a paltry 138,582 units.

For over a decade now, Bajaj Auto has been trying to gain share from Hero MotoCorp. With little success. The Discover 125, the first entrant into 125 cc, promised much—with peak monthly sales of 60,000 in FY12-13—but the decision to extend it into 100 cc territory proved disastrous. Discover sales as of August were down to a paltry 9,000.

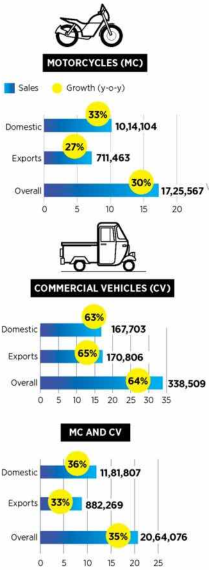
Another worry for Bajaj is V, which was launched with much fanfare, but is going the Discover way; from 6,332 units in January this year to 1,088 units now. The failures of Discover and V in the mid-segment of the motorcycle market have left Bajaj vulnerable.

PHOTOGRAPHS: NAYAN SHAH FOR FORBES INDIA

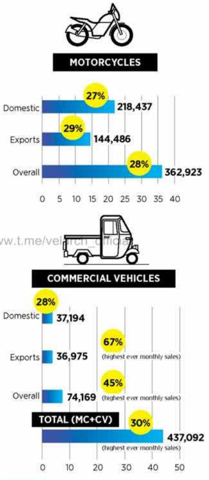
GROWTH IS BACK ON TRACK

The first five months of this fiscal started with a bang for Bajaj...

APRIL TO AUGUST 2018



...And August sales broke all records



Source: *Company data*

Market share has fallen from a high of 9 percent in the first quarter of fiscal 2015 to a paltry 1 percent in the first quarter of the present fiscal. Bajaj is candid about the gap in the 125 cc segment. "We are missing out on this (segment), which I think is about 2.5 lakh bikes a month. (But) we are not vacating the 125 segment. We are working on a new product and will cover it up," he points out. "This is the right time to do it and we have stepped on the gas."

It is the right time because, other than the mid-segment, Bajaj Auto is firing on all cylinders on other fronts. While domestic sales of motorcycles in August clocked 218,437 units, a jump of 27 percent over a year ago, exports of two-wheelers leapfrogged by 29 percent to 144,486 units. Exports are significant because of the fatter margins—20-30 percent on bikes vis-à-vis 10-15 percent on domestic sales, reckon auto analysts. They're also crucial because the growth comes after two consecutive years of decline; the fall in fiscal year 2017 was 16.5 percent.

What all this also means is that India's fourth biggest two-wheeler maker has reclaimed its throne of the second biggest motorcycle maker from arch rival Honda. While Bajaj Auto sold 10,14,104 motorcycles in the first five months of this fiscal, Honda managed 942,642 units between April and August. Bajaj Auto is slightly ahead of the Japanese rival in share with 16.9 percent as against Honda's 15.7 percent Honda (overall, in two-wheelers, though, Honda's share is 28 percent). The gap widened by a few points in August alone: 18.1 percent against 16.7 percent.

One reason for the spurt in growth in motorcycles is the cut in prices in the entry-level product, the CT100, by ₹3,000, a 20 percent drop from the earlier price. From 36,601 units in March, sales more than doubled to 82,424 units in August.

Kevin D'Sa, president (finance) of Bajaj Auto, defends the aggressive strategy of gaining volume market share at the cost of margins. "It's important for the company to get a share of 20-25 percent in the domestic market. Then only I can be a true global player," he says, explaining why analysts shouldn't read too much in a 2 percentage point drop in Ebitda margins to 18 percent. "The rest of the business will more than compensate for what we lose for the moment," adds Bajaj.

Bajaj Auto's other entry-level bike, the Platina 100, has also seen a jump in numbers: From 34,758 units in March to 45,921 units in August. At the sporty end, the company added two new variants to the blockbuster warhorse, the Pulsar. These helped boost sales of the Pulsar family—ranging from 150 cc to 220 cc—from 53,490 units in March to 70,051 in August. KTM and Avenger help Bajaj Auto dominate the top end of the market. Bajaj is now planning to expand its premium play in the 400-plus cc range with the Husqvarna—being developed with KTM—and an alliance with British bike maker Triumph is being finalised.

INFOGRAPHICS: SAMEER PAWAR

Bajaj believes customers are willing to change once they see a 20 percent advantage. In the CT100's case, it's 20 percent less on price. On other fronts—space, power, comfort and mileage—it's 20 percent more. He's now planning to use the 20 percent formula on the Platina, by offering "20 percent more" for the same price: Same money, more bike. The "more bike" will be courtesy of a "low-cost innovation", which company officials are keeping close to their chest.

Meantime, in three-wheelers—a niche business where globally the next competitor is Piaggio—Bajaj is a comfortable No 1. Margins, too, are attractive here, at 30-35 percent, according to auto analysts. And, as Bajaj says, the quadricycle, branded Qute, has been developed to defend the three-wheeler niche. The Qute is finally being rolled out after battling a string of public interest litigations in courts for the past six years.

All's well on the exports front, at the entry level, at the top end—except on the front that matters most at home, the mid-market. "I don't think we can do much with it (Discover) in the domestic market," acknowledges Bajaj. Once a brand, he lets on, falls out of favour with the consumers, there is no point pushing it. The failure, though, he insists has got nothing to do with its quality. "The fall of Discover is due to dilution in the positioning," he says. Though Discover was the country's first 125 cc motorcycle, the company later introduced a 100 cc version. That's when the problem started.

The logic of having a 100 cc was simple: The sales team reckoned that communicating 125 cc values would help push up the 100 cc cousin's numbers. The ploy didn't work.

Pradeep Shrivastava, executive director at Bajaj Auto, in charge of manufacturing, labour procurement and quality, and a core member of the team over the past 17 years—along with D'sa and chief technology officer Abraham Joseph—attributes the Discover debacle to too much experimentation. "We tried too many things with Discover and changed the variants very quickly," says Shrivastava, adding that at one point, Bajaj Auto had over seven variants of Discover. "I think that confused the customers," he says.

Bajaj is more candid. "In pursuit of numbers, we lost the positioning," he rues. When Merc makes an A class, it doesn't advertise it, the communication is always about the E class or the SUV. "The positioning is best or nothing." The Discover learning will stand the company in good stead with its other models—the Pulsar won't be taken down into the 125 cc segment and the Platina (100 cc) won't go up into that territory. "We would be making a Discover mistake if we do so," says Bajaj.

But if Bajaj Auto is planning to address its chink, the mid-market, which Hero MotoCorp has a stranglehold on, the leader is eyeing territory that belongs to Bajaj Auto—the sporty, high end segment. This September, Hero MotoCorp launched the Xtreme 200R, its first 200 cc bike.

Pawan Munjal, chairman and managing director of Hero MotoCorp, is upbeat on the prospects of striking it big in the premium segment. "For us, the Xtreme 200R is not just any other product launch. It will catapult us to where we have been earlier in the premium segment," he says, adding that it will help Hero consolidate its market leadership. "We will soon commence sales of the Xtreme 200R in our global markets." The company is planning another product in the premium segment: XPulse 200. "While Hero continues to be an unrivalled leader in the domestic

"We tried too many things with Discover. From 125 cc, we got it to 100 cc... at one point, we had 7-8 variants. I think that confused the customers."

PRADEEP SHRIVASTAVA, executive director, Bajaj Auto

"I am proud to be conservative because it means I don't borrow... I also stay focussed, and if that means conservative, then yes I am [conservative]."

KEVIN D'SA, president (finance), Bajaj Auto

"The Xtreme 200R is not just any other launch. It will catapult us to where we have been earlier in the premium segment."

PAWAN MUNJAL, chairman & managing director, Hero MotoCorp

motorcycle segment with an over 50 percent share, it's now focusing on the premium segment," asserts Sanjay Bhan, head of sales, customer care and parts business at Hero Moto.

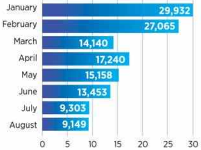
Suggestions of Hero playing the price card at the high end—just as Bajaj has at the entry level—evoke a smirk from Bajaj. For two reasons: In the 100 cc segment, it is a two-horse race between Hero and Bajaj Auto, who have 90 percent of the segment with them, says Bajaj; in the Pulsar segment, though, while Bajaj Auto is sitting pretty with 40 percent, Honda, TVS, Yamaha and Hero Moto are at the rear. "This whole idea amuses me. You are telling me this fellow who is last in this segment will launch a price war? A price war can happen if TVS or Honda do something, but not Hero. Hyundai can launch a price war against Maruti, but Tata can't."

AMIT VERMA

TARGET MID-SEGMENT

Bajaj has underperformed in the 125 cc to 150 cc segment that accounts for 22 percent of the motorcycle market. Along with 110 cc, it would be 50 percent

DISCOVER



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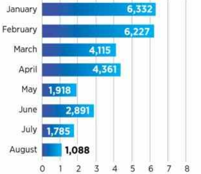
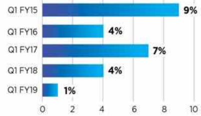


DOMESTIC MID-MARKET SHARE



Source: *Company data*

The battle at the top end, however, will still be smaller than the one for the segment that counts the most—the value-for-money mid-market: Where consumers look for an attractive price, mileage, quality, low maintenance and high resale value. Hero Moto has cracked that game. Bajaj Auto could wait for the market to evolve, with a majority of buyers preferring design, style, power and features over mileage and price. But Bajaj knows that won't happen. Not in a hurry. The choices to crack the market that lies below the Pulsar are clear: Give the same (product for) less. And give more (features) for the same price.

EPILOGUE

On September 7, Bajaj Auto participated in a Niti Aayog-organised global mobility summit at Vigyan Bhawan in Delhi where it showcased its electric three-wheeler to the PM. The PM was suitably impressed, Bajaj Auto officials told *Forbes India.*

What's keeping the core team at Bajaj Auto busy—besides taking on Hero MotoCorp—is urban mobility. "When we develop electric two-wheelers, whether bikes or scooters or mopeds or bicycles, it will be a Tesla-like business. This brand, whatever it will be called, should ideally be purely electric," says Bajaj. The best solution, he avers, is when the brand itself is electric. "Toyota is not an electric brand. It's a petrol, diesel brand also making electric vehicles. But with Tesla, it's not the case. You would be aghast if tomorrow Tesla launches a petrol Tesla. This urban mobility from us would be very disruptive," adds Bajaj.

He's launching new variants of motorcycles, new brands, even a new product, but Bajaj knows that the technology that goes into all of these is the same. Urban mobility is another ballgame. "It's completely new and a big learning. We will take small steps. First we have to be aspirational, (the products will) be expensive, will not sell millions but this is not something a company can miss out on. Nothing may happen for 10 years, but when it does, you would be left out. One has to start early."

Fixing the past, growing in the present, and beginning work on the future are all a work in progress for Rajiv Bajaj. As the wise man said: "The future depends on what you do today." F

'We Are a Global Player, but in India We Need to Do Better'

Edited excerpts from an exclusive interview with Rajiv Bajaj

On Bajaj's strategy of focusing only on motorcycles

Our strategy is about being a global company. Sometime around 1995, I remember I asked my father what do you want me to do here? Because I had done manufacturing (Bajaj has a master's in engineering from the University of Warwick), and I didn't know what else to do. He told me what his father had told him: Do what you think is best, but be best in what you do. I asked him what did that mean? What is the metric of best? He said to me best means being a global company. This was the first principle we acquired.

The second principle is what the sage Vasishtha said: Nothing is more powerful than doing the right thing at the present moment. I find that many people, when they speak of strategy, often forget that the context must be present. When I thought of Bajaj as a global player, what I observed is that people have two choices. First is that you can be market-focussed and say I am going to be an Indian player. The other good strategy is to be product- or segment-focussed. This means that I will just do one thing. How narrow or wide that is depends on what your scale is or capacity is.

I found that companies that come up in these competitive times, to use the wise words of marketing guru Al Ries, have to narrow their focus. I always tell my people, whenever they are in trouble—whether in their personal or professional life—and don't know what to do, the starting point should be to narrow their focus. Do less. Doing more never works.

The third thing is specialisation. What is right at the present moment for globalisation is specialisation. That's why we said we won't do scooters or mopeds. We will only do motorcycles.

On how the three-wheeler and the four-wheeler (Qute) are consistent with that strategy

There are two kinds of battles or opportunities: One is a mainstream battle or the large volume opportunity and the other is a niche opportunity. Niche is always safer and more rewarding. Like for Royal Enfield and Harley-Davidson. When you come into the mainstream like a Ford or General Motors, there is a bigger canvas, but the ocean is very red. So what we told ourselves is that, as far as the red ocean is concerned, we will only go with one product. So scooter no, motorcycles yes. Scooter can come tomorrow once we are in a strong position. But what do we get by being a motorcycle player? We get certain skills in design and engineering, manufacturing, purchasing, distribution, and we get a cost structure. With these, if we can build some niche business around it like satellite around the sun, there's nothing wrong in that. Three-wheelers is a niche business; it's a small business. Many people are of the opinion that we should not exist there. But it doesn't matter to us.

In a niche [segment], competitive intensity is low. Even in a mainstream motorcycle [business], from the Japanese to the European to the Indian to the Chinese to the American, I have to compete with 30 people. Who is there in three-wheelers? It's basically Piaggio. The rest of the players are insignificant. In three wheelers, Bajaj is the No 1 player (in the world). To defend that niche, we developed a quadricycle.

> **"We are not vacating the 125 segment. We are working on a new product and will cover it up... Why should we leave gaps in the motorcycle portfolio and think about scooters?"**

I don't see any conflict in having a niche business which is synergistic with the main business.

The second niche business that we started building from 2007 was superbikes. First with KTM, with our 48 percent stake; now within KTM we are building our second brand called Husqvarna. We are engaged with Triumph, and are hopeful of a partnership soon. If that happens, we would have at least three brands in that segment. This means that by far, we will be the biggest premium motorcycle maker in the world.

The third niche which we see for the future is this whole area of urban mobility, where people are talking about electric vehicles, zero emissions, less congestion, shared mobility and mobility as a service. Like every company, we are also doing our own work.

Our strategy is like a triangle, where the main business is the motorcycle business. Then we have one niche which is intra-city, which is our three-wheeler, four-wheeler businesses. Then there are superbikes or pro-biking. And there is an urbanite business or urban mobility business.

On how crucial the Indian market is for Bajaj

Unfortunately, yes, India is a market where for a long time we have not been No 1. But we are the second largest motorcycle company here. However, one has to concede that when it is your home market, which incidentally is the biggest market in the world, and you are a No 2—and there is a fair distance between you and No 1—one needs to improve. So that's the balance in my mind. Okay, you are a global player, unlike Hero, but in India you need to be better. And this is the right time to do it.

On whether price is something he will compete on to take on the leader

People have misunderstood us while talking about a price war in the entry segment with our CT 100. There is no price war. Nobody wins in a price war. The price that we have of ₹32,000 has been there for the last two years.

More than price, we will compete on product and promotion. For example, we have launched more variants of the Pulsar (two in 150 cc), which have done well since March. We also put in new variants of the CT, new Avengers and are now going to market with new Dominars.

So we have invested in product, communication and sales promotion. We have invested a lot of money across all the levers—brand, product, price, marketing. And we are growing by 30 percent, 40 percent, 50 percent. This is more than double the industry growth rate. While the motorcycle market share was typically around 15 percent in FY18, last month (July) our retail share was 21 percent.

On the elusive value for money segment

However simple it sounds, whether it is a 100 cc bike or a 1-litre car, the consumer wants only a few things. First is the price. Second, he wants good mileage and third, good quality, low maintenance and high resale value.

The problem is that unlike a Pulsar or Avenger or Dominar, where I can put in fuel injection, LED lamps, ABS, disc brakes, here I can't do anything because technology costs money. I can put in technology, but you need to pay me for that. So this becomes difficult.

NAYAN SHAH FOR FORBES INDIA

What does one do in such a situation? You have one or two choices. People are buying a 100 cc bike as it's value for money. And since there are two choices, we decided to sharply narrow our focus on two brands. The first choice is give me the same but give it to me cheaper.

So that is CT. It's as good a bike as (Hero MotoCorp's) Splendor. But the tricky part here is how much less. This is where most marketers fail because people don't change their opinion for ₹1,000 or ₹2,000,

We have learnt people will change if you give them a '20 percent more' advantage in anything. So for 20 percent less price, 20 percent more space, 20 percent more power, 20 percent more comfort, they will change. So the CT is priced 20 percent lower than Hero. Hero's margin is less than 20 percent; it means we are losing. But that's where the rest of the business will more than compensate for what we lose. That's one strategy: The same for less, 20 percent less. That's why our volumes for CT 100 have more than tripled.

The second game we have to play is: Same money, more bike. Somewhere you have to differentiate, either by money or by the benefit. We are already playing this game and will play it more intensely in the second half of the year with our brand called Platina, which has also grown to about 35,000 motorcycles a month. But the problem with same money more bike is that the offering has to be 20 percent more. So we are going to a launch a new Platina and go with a low-cost innovation, which is relevant to the consumer. So Platina is same money, but 20 percent more bike. In the first half of the year, our target was to play out CT. The next target is to play out Platina in the second half.

On the likelihood of a price war in the Pulsar segment

Unlike in the 100 cc segment where it is a two-horse race between Hero and Bajaj—who have 90 percent of the segment with them—in this segment, we have 40 percent market share, another 17-18 percent each is with TVS and Honda, while Yamaha has 15 percent. Some people pointed out that Hero will trigger a price war in the 150-220 cc segment (of Pulsar) after Bajaj did the same in the entry-level segment. This amuses me. First of all, there is no price war.

Second, the possibility of a price war cannot be ruled out in the 100 cc space as there are two strong players and each can try to jostle the other. But in the segment that people say Hero might trigger a price war, there is Bajaj, Honda, TVS, Yamaha, Suzuki... then comes Hero. It is the last. And you are telling me it will launch a price war? A price war can happen if TVS or Honda do something, not Hero.

On whether scooters can help play catch-up with Hero

We are missing out on the mid segment 125 cc; it's about 2.5 lakh bikes a month. It's not small. If you have 20 percent share there, it gives you a considerable number. We are missing out on a big slice and have to make up for that with a new brand which we are working on. But look at Hero... the sports segment is close to 200,000, and they are virtually zero. Exports are alone 200,000 bikes a month out of which we are 140,000. Hero might say they make scooters, but scooters are again 400,000. So to chase the 400,000 scooter segment, you have inadvertently or otherwise given up (on exports). TVS does well in the sports segment and exports as well. But they completely miss out on 100 cc, which is 700,000 a month. So they focus on scooters... Every company will miss out on something and every company has to ask itself how to cover it up. We are not vacating the 125 segment. We are working on a new product and will cover it up. But why should we leave gaps in the motorcycle portfolio and think about scooters?

On Bajaj's electric game plan

When we develop an electric two-wheeler, whether bikes or scooters or mopeds or bicycles, it will be a Tesla-like business. This brand will be purely electric. The best solution is when the brand itself is electric. Toyota is not an electric brand. It's a petrol, diesel brand also making electric vehicles. But with Tesla, it's not the case. You would be aghast if tomorrow Tesla launches a petrol Tesla.

"When we develop an electric two-wheeler, whether bikes or scooters or mopeds or bicycles, it will be a Tesla-like business. This brand should ideally be purely electric."

I think the most important thing in urban mobility is to create an urban mobility brand because people don't buy batteries. You buy an Apple or Samsung, you don't buy batteries. This urban mobility from us would definitely be disruptive. Quadricycle might be new as a product, but the technology that goes into it is the same. But this (urban mobility) is completely new. So it's a big learning for us. We will take small steps. First we have to be aspirational, have to be in the two-wheeler space; electric will be expensive, will not sell millions, but definitely this is not something that a company can miss out on. You can't just sit back and do nothing. In fact, nothing may happen for 10 years, but when it does, you would be left out. One has to start early.

Putting Health Back in Health Care

Technology can help break existing inefficient processes to improve access, quality and affordability

By HARICHANDAN ARAKALI

MACROVECTOR / SHUTTERSTOCK

"The changes are not so much in health care as in artificial intelligence," says Prashant Warier, CEO and co-founder of Mumbai's Qure.ai, which specialises in applying artificial intelligence (AI) and machine learning (ML) to interpret chest X-rays and head CT scans. "Health care in India has always been bad, especially for the masses or the poor." Warier thinks AI can change this, by making health care more accessible—using the internet and the cloud—and of improved quality in areas such as radiology. Qure.ai and others such as UE LifeSciences are partnering with hospitals to expand their reach, and helping patients access new technologies, such as non-invasive screenings for breast cancer.

At AddressHealth in Bengaluru, Anand Lakshman and Anoop Radhakrishnan, both doctors, are tackling another aspect of the health care sector. "We wanted to address health care delivery," says Lakshman. Their idea is that hospitals are meant for people who are really ill, and primary health care is best delivered elsewhere—at homes, schools, and workplaces. For the last eight years, much of their work has been in schools, with a focus on paediatrics. Operational in four cities, they offer annual health checkups, health education, and an app-based tool for parents to plan nutritious meals for their children.

Qure.ai and AddressHealth are part of a slow revolution taking place in India's health care sector, where private enterprise is rising to tackle large public problems and finding frugal, yet innovative, solutions that tackle quality, access, prevention and affordability. These startups are also breaking the hardwired pattern of how patients, doctors, diagnostic labs and hospitals interact.

"Overall we are at a point where patients will see improved access and affordability; hospitals will see growth. So the next few years should

"In health care, the innovation or the solution is being built in isolation."

GANAPATHY VENUGOPAL, co-founder and CEO, Axilor Ventures

be fairly positive," says Milind Shah, venture partner at Unitus Ventures, an early-stage impact investor that has funded AddressHealth.

Ganapathy Venugopal, co-founder and CEO of Bengaluru's Axilor Ventures, which has provided early-stage funding and support to several health care startups, explains that, for instance, there are about 10,000 radiologists in India, of whom two-thirds won't even be trained in the use of newer technologies. This is true of other diagnostic areas too. "What we have found is, if the patient-doctor-diagnostics-specialists interactions can be uncoupled, you can increase the throughput," he says. With the same capacity, you can cut costs, improve quality and reduce the dependence on additional infrastructure. "And the intersection of health care and AI is a potent convergence that is driving this."

Startups such as 5C Network and Neurosynaptic Communications are using data to break the hard-coded physical linkages of the old model. 5C Network's workflow allows any diagnostic lab to upload radiology images and get feedback from a specialist via the cloud. A large hospital may have a panel of radiologists, whereas small labs are at the mercy of consultants who give them limited time.

Neurosynaptic Communications has created a tool kit that can be used by those who have cleared Class 10 or 12 to administer 35 different tests in an identity-secure manner. If a city hospital has a catchment area of 50 villages around it, it doesn't have to depute doctors or nurses to conduct these tests. This also means that patients don't have to travel to the hospital to get these tests done.

In the last three-and-a-half years, the thrust had been on building capacity. Today, more companies are being funded, and there is more diversity among entrepreneurs entering the sector.

What is missing, says Ganapathy, is the acceptance and trust of doctors that can enable new technologies to go mainstream. Hospitals are wary of changing the existing standards, as they don't want to harm patients. Also, there aren't enough platforms to make this process seamless; an immersive environment in which entrepreneurs get feedback from clinicians.

In consumer technologies this feedback is almost real-time. In enterprise technologies too—such as business management software—feedback exists, although it takes longer. "In health care, the innovation or the solution is being built in isolation," Ganapathy says. Therefore there is a need to have a lot more sandboxes that create immersive environments where the solution builder gets immediate feedback, which reduces friction in the adoption process.

There are various positive changes that show this process has begun in earnest. "We definitely see hospitals being a lot hungrier for innovation," says Ganapathy. And exposure to more

BMAXIMAGE

TOP: WRIGHT STUDIO / SHUTTERSTOCK

HEALTH CARE FUNDING IN INDIA

Year	Investment rounds*	Funding ($ mln)
2018 (YTD)	8	63.2
2017	17	502

Healthtech

Year	Investment rounds*	Funding ($ mln)
2018 (YTD)	68	400
2017	131	340

** Excludes grant, debt and post IPO rounds*
Data as on September 4, 2018

Source: *Tracxn Technologies*

entrepreneurs is influencing this, with the promise of better quality solutions.

From the beginning of 2017 to date, $565.2 million has been invested in India's health care ventures in 25 rounds, according to data from Tracxn Technologies. In the same period, $730 million has been raised by health tech ventures in 199 rounds.

Consider Israel, says Shah of Unitus. It is a small country with not a big market of its own, but with a thriving startup ecosystem. There are some strong and complementary skills coming from academia, industry, venture capitalists, and the government. "When you have all of them collaborating to develop something, the chances of success are higher," he says. In India, this hasn't happened to the extent one would have liked, he adds.

Take, for example, the Stanford-India Biodesign Centre, which is a collaboration between Stanford University's Center for Biodesign, All India Institute of Medical Sciences, and Indian Institute of Technology (IIT), Delhi. They select 'Fellows' every year who work with doctors, surgeons and other specialists to see the kind of problems faced by health care providers. The Fellows can then develop solutions, work with doctors, and partner with IIT for engineering expertise. What's missing is the business mentoring needed to make the product saleable in India and abroad, Shah says. In Israel, for instance, its mature regulatory environment makes it easier to evaluate a new drug or medical tech product and receive approvals, or not. "We are getting a few accelerators in the country that could do the equivalent of Stanford Biodesign, and we need many more of them," he adds.

Another area is availability of data. While working with AI, the software has to be exposed to more data, and we need laws that allow the use of patients' data in an anonymised form.

"We will see improved access and affordability; hospitals will see growth."

MILIND SHAH, venture partner, Unitus Ventures

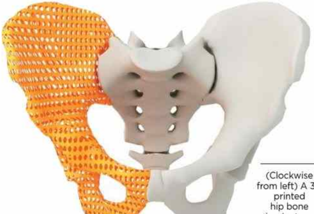
"If you look at digital technologies in India, they are one of the most evolved in sectors such as retail or services or logistics. But when you look at health care, it's probably at the 1970s' stage, because there is nothing there," says Shyatto Raha, founder and director at Gurugram-based InnoCirc Ventures; it has recently raised $2 million in funding. The two-year-old venture operates MyHealthCare, a platform that facilitates video consultations between patients and doctors within a custom-built out-patient-department module.

Raha adds that access to even basic health care is becoming increasingly difficult with the old physical infrastructure route. Hospitals are the biggest components of the ecosystem, Raha says, because of which MyHealthCare digitises their processes, making adoption a lot less difficult in comparison to asking hospitals to adopt something entirely new. InnoCirc counts Fortis Group, Cygnus Hospitals, and PH Siloam Hospitals in Mynmar among its customers. "Using AI and ML technologies, we should be able to improve accessibility to quality care via specialists and top hospitals," he says.

The 3D Fine Print

3D printing is making advances in health care by preparing doctors for complicated cases and customising solutions for patients. But there's a long way to go before it becomes the standard procedure for treatment

By KATHAKALI CHANDA



(Clockwise from left) A 3D printed hip bone implant; an artificial femur; a 3D printed spinal implant

In February 2015, Dr Swati Garekar, a paediatric cardiologist at Fortis Hospital in Mumbai's Mulund, was tied in knots over a 9-month-old with an abnormal hole in the heart. The child, the son of a policeman from Nagpur, had DORV (double outlet right ventricle), a congenital heart condition in which two big arteries emerged out of the right ventricle of the heart, instead of one each from the right and the left. It led to pure and impure blood getting mixed and required a complex surgical fix. But neither an echocardiogram nor a CT scan could give Garekar a detailed picture of the mess inside the heart that would barely be bigger than the baby's fist. "Which way would the surgeon go in? What should be the best procedure? Say, we open up the patient, put him on bypass, reach his heart and see that the insides are not what we thought?" asks Garekar.

The team, including paediatric cardiac and transplant surgeon Dr Vijay Agarwal and cardiac imaging consultant Dr Alpa Bharati, grappled with uncertainty over whether to hit the operation theatre blind. Garekar says she was reminded of some cases in European hospitals where the doctors took CT/MRI scans and printed them out in 3D. Imagine holding a replica of the heart, prising open its chambers, feeling its arteries and anomalies and charting out the path of blood flow, without having to cut open the patient. "I started flipping the Yellow Pages and found a company that can print a 3D model," says Garekar. In June, the baby was successfully operated upon, as Agarwal, confident of the anatomy after studying a 3D model in sandstone, channelled the artery from the right ventricle to the left through the hole in the heart.

While this infant's case is reported as a first for cardiac 3D printing in India, in the three years since, a lot more is being heard about how the medical fraternity is notching up milestones. Ever since his first surgery with a 3D print in 2015, Agarwal, now with Fortis Gurugram, has studied at least 50 such models before making

SHUTTERSTOCK

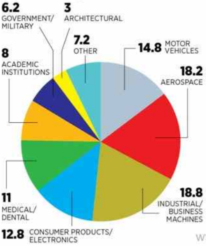
that nick on the chest. In February 2017, surgeons at Medanta-The Medicity in Gurugram replaced the second and the third vertebrae of a 32-year-old woman, damaged by tuberculosis of the spine, with a titanium 3D printed one. The surgery was the first of its kind in India and among the earliest in the world, with only China and Australia reporting a case each before. According to reports in the media, this April, doctors at AIIMS, Delhi, conducted an eight-hour surgery on a 40-year-old patient, to perform a complex hip replacement with a 3D printed implant. Says Firoza Kothari, the co-founder and CTO of Anatomiz3D, which 3D printed the heart model at Fortis, "In 2015, when we started, we would get about one print order a month. Now, it goes up to 40."

Health care apart, the country too can be seen warming up to 3D printing in general. According to a 2015 report by 6Wresearch, a global market research and consulting firm, India's 3D printing market is projected to be worth $79 million by 2021, with low cost of manufacturing, increasing penetration across various applications, and its Make in India initiative spurring the rise. While the automotive sector accounts for the largest revenue and volume share, medical is seen as an area exhibiting "promising growth". "In 2016, when we started our medical division, we got three to four cases a year. We had to run after doctors trying to understand the need and convince them about 3D printing. But since then, we've worked with over 50 doctors covering 100 specialisations," says Atit Kothari, part of the leadership team at Imaginarium, a 3D printing company based in Mumbai.

TAILOR-MADE SOLUTIONS

The input data for a 3D print is the CT/MRI image, which is essentially multiple X-rays stacked on top of each other. These images can be combined into a virtual 3D model using specific

3D PRINTING GLOBAL MARKET SHARE



Source: *Wohlers report 2017*

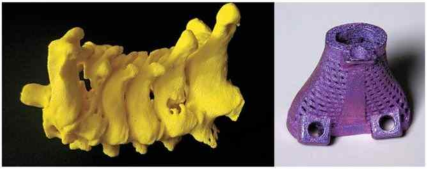
software. The region of interest (say a bone fracture zone) can be segmented in consultation with the doctor and saved as a computer file. This file is then sent to a 3D printer, which fabricates the corresponding physical model layer by layer. "I call the 3D printer a jalebi maker. Just like the jalebi batter is piped out, here the plastic or metal comes out in the shape of a particular object," says Dr Vaibhav Bagaria, an orthopaedic surgeon with Sir HN Reliance Foundation Hospital in Mumbai. Since one layer is added on top of another, 3D printing is often called additive manufacturing.

One of the reasons 3D printing is making rapid strides in medicine is that by letting doctors have a tactile feel of the anatomy and providing a spatial relationship between its constituents, it simplifies procedures and eliminates guesswork. For instance, studying the basal ganglia, the part of the brain that controls limb movements, posture etc, is now easier than doing it out of the textbook. Or the critical cranio-vertebral junction, where the skull joins the spine, with its intricate nerve structure. "India is a country that sees a lot of abnormalities in the area and each case is different. If I 3D print the area with the data of a patient, I can practise a mock-surgery and there wouldn't be any on-table planning. That reduces complications and makes us safer doctors," says Dr Vishwas HV, neurosurgeon and minimally invasive spine surgeon at Narayana Health City, Bengaluru.

3D printing also helps produce cutting jigs for surgeons that factor in a patient's anatomy to provide a 'stencil' for precise cuts and drills. For instance, for a mandibulectomy, a surgeon can place the jig, prepared with data from the patient's scan, on the jaw to get exact measurements of the two ends he needs to cut to remove a tumour. "When you know what to expect, it reduces surgery time by around 25 percent," says Dr Rajendra Nehete, a plastic surgeon at Vedant Hospital in Nashik.

3D printing also helps in rapid prototyping of tailor-made devices and implements. These can be evaluated by doctors and industry partners before they are put into final shape. Consider the reusable biopsy gun, the flexible laparoscopy instrument or the diabetic foot screener printed at IIT Bombay's Biomedical Engineering and Technology (incubation) Centre (BETiC). With 3D printing, the institute builds prototypes of cheaper materials, like paper and plastic, through multiple iterations before moving on to expensive metal to

> **"With 3D-printed models, I can practise mock-surgeries and there wouldn't be any on-table planning. That makes us safer doctors"**
>
> **DR VISHWAS HV**, NEUROSURGEON, Narayana Health City



A 3D printed model of a damaged spine (left); the metal implant that it was replaced with

manufacture the final product. "There are at least 30 bio-incubators in the country out of which six or seven are trying to develop medical devices. This is an exciting application for 3D printing in the years to come," says B Ravi, the institute chair professor of mechanical engineering in IIT Bombay who also heads BETiC. Even at BETiC, about 20 percent of the 100-odd researchers and their medical and industrial partners are dedicated to developing this vertical.

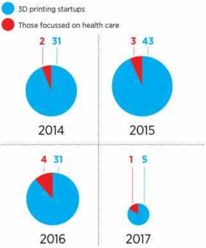
Another application that is now taking baby steps but may surge ahead are custom-made implants. The plate to be put in difficult joints like the pelvis, the titanium mesh to cover a part of the skull created by bone removal, or spinal interbody cages in a lattice structure that fuses the implant better with the bone. "Some examples have demonstrated that mechanical properties introduced by 3D printed lattice structures remove the need for biologics such as BMP [bone morphogenetic protein] that is normally used along with a traditionally made implant in a surgery," says Ajay Parikh, vice president & business head, Wipro 3D.

The use of implants is yet restricted to a handful of cases due to the limited availability of bio-compatible materials that won't trigger a reaction from the body. While titanium and acrylic are the current materials of choice, the development of bone cement, radio-opaque PEEK (polyether ether ketone) and hydroxyapatite (a bone-like substance that dissolves to let human bone grow over it) are opening newer avenues. But inserting something in a human body is a tortuous procedure with multiple clinical trials, so this is a vertical that is expected to flourish with a lag.

But once the implant business takes off, the printing companies can devise a revenue model around it, in which doctors buying implants would also end up taking anatomical models and surgical jigs to accompany the procedure of inserting those implants. Says Jitendra Singh of Imaginarium, "At present, anatomical models and surgical jigs complement each other, but once implants become more common in the industry, the rest would automatically follow."

FITS AND STARTUPS

The Indian health care space among 3D printing startups has been relatively quiet



* Includes deadpooled companies

Source: *Tracxn*

SLOW OFF THE BLOCKS

While the conversation around 3D printing has opened up in recent years, for nearly two decades now, India's medical fraternity has been dabbling with it under the radar. Bagaria of Sir HN Reliance Foundation Hospital remembers a case in Nagpur about 10 years ago, where he got an engineer friend to take CT images of a patient with a complex hip injury, turn them into mechanical drawings, feed those into a CAD software and take 3D prints. "At that time, we weren't even aware of the terminology of 3D printing, we used to call it rapid prototyping. Once it came out well, we filed a patent for converting Dicom images into a 3D printing format," says Bagaria.

But, according to IIT Bombay's Ravi, 3D printing made its debut with the medical fraternity even earlier, in 2002. He recalls the first time a doctor, ortho-oncologist Dr Manish Agarwal (now at Mumbai's PD Hinduja Hospital), approached him to 3D print the pelvic bone of a 50-year-old patient with a malignant tumour in that area. The institute had bought a 3D printer in 1997, one of the earliest ones in the country.

"The pelvic bone, of which Dr Agarwal had to remove a part, is where the hip joint sits. When you remove the bone, you can't put a normal hip joint, you need to put a custom implant. But the saddle portion of the implant has to match with the cut portion of the bone and you need to fix its shape and dimensions before the surgery. We got the CT scan images and reconstructed the 3D model on the computer. Based on Dr Agarwal's inputs, we worked with an implant maker to fabricate a matching prosthesis," says Ravi. The surgery was a success, but, surprisingly, 3D printing in health care didn't take off

SANJAY PATHAK

SHOW ME THE MONEY

Investments in Indian 3D printing startups are still small ($ mln)

* Excludes debt, grants, post-IPO
Source: *Tracxn*

with it. The IIT team, though, kept at it by taking up a few cases a year.

One of the principal impediments then was prohibitive costs. The 3D printer that IIT bought in 1997 cost about ₹30 lakh and the model it printed for Agarwal in 2002 came for over ₹50,000. Now, a printer with similar capabilities costs less than ₹10 lakh and the bone model less than ₹5,000. The drop in prices that has caused a spurt in 3D printing has been triggered by competition and expiry of patents. In 2009, the patent on a primitive form of 3D printing, fused deposition modelling, expired, as did patents on technologies like laser sintering in 2014, bringing down prices on 'hobby' desktop printers to as less as ₹20,000. Besides, more companies coming into the business brought in competition. According to the Wohlers Report 2018, the number of companies selling industrial 3D printing machines globally has risen to 135 in 2017 from 97 in 2016.

However, the drop in prices is still relative to the figures a decade ago. 3D printers that can prepare simple anatomical models start from ₹1 lakh and those printing implants with bio-compatible materials could go up to a few crores. And, says Sanjay Pathak, director of Global Healthcare, the Delhi company that made the spinal implant, there isn't much chance that price of implants, too, will plummet considerably. "Implant pricing globally is $30,000 to $35,000 for big anatomical parts like hips. In India, we do it for less than $10,000, the cheapest in the world, due to lower labour costs. Smaller implants are $10,000 to $15,000. But, in India, we do it in the range of $2,000 to $2,500."

Besides, due to the premium placed on customisations, 3D printed models, prosthetics or implants would still be more expensive than traditionally manufactured ones. While the cost of 3D printing is becoming more and more competitive for small production runs of standard implants and prosthetics—like a lightweight plastic brace costing up to ₹8,000 or the model of a simple fracture between ₹3,000 and ₹5,000—the 3D model of a heart would come for anything between ₹18,000 and ₹30,000 and a titanium cranial implant between ₹60,000 and ₹1.5 lakh.

3D printing has also come up short when it comes to matching mass-scaled prosthetics like the Jaipur Foot. The socket in the prosthetic knee on which the foot sits takes far longer to print than those manufactured traditionally, and does not have the strength to bear the weight of the amputee. "It's a great technology for prototyping, but has limited use for implants needing strength," says DR Mehta, founder and chief patron of the Bhagwan Mahaveer Viklang Sahayata Samiti, which makes the Jaipur Foot. Ravi admits that while a 3D printed socket fabrication did enhance accuracy, it takes close to 24 hours and turns out far more expensive. IIT-Bombay is now trying to evolve another method based on the CNC machining of sockets that would be faster than conventional methods and would be priced more competitively.

3D printed models, surgical jigs, braces and implants on display at the Imaginarium office

MEXY XAVIER

In some cases, doctors have found a way of going around the expenses. Garekar at Fortis and the consultant paediatric surgeon there, Dr Dhananjay Malankar, recall a case in which a three-year-old Nigerian with DORV was wheeled in. Neither Garekar nor Malankar were certain about the case even after an echocardiogram and the family didn't have enough money to pay for a 3D scan. So, she got Anatomiz3D to share pre-printed computer visuals, which were less expensive than a 3D printed model. "Usually, unless you are sure with DORV patients, you don't know what to open: The right atrium, the right ventricle, the pulmonary artery or the aorta. But the 3D view gave us a plan and we opened up the right atrium and the right ventricle. The surgery turned out to be good and the patient was discharged in a week, the time usually taken for routine cases," says Malankar.

This is the narrative that the 3D printing companies are banking on. Says Kothari of Anatomiz3D, "OT hours, long discharge time plus blood loss and chances of complications are all reduced if the doctor is more informed about a surgery with the real-feel of a 3D model. All these factors would eventually rationalise the costs."

What causes a further setback for medical expenses is that 3D printing isn't yet covered by organised insurance. For that to happen, it would require regulatory supervision to ensure standardisation of procedures and quality control of the printing units. "That will happen once it moves from being a niche product to a more prevalent practice. It will also need new product liability and professional indemnity covers besides specific actuarial interventions for the insurance companies," says Samir Bali, a senior management consulting and insurtech professional. Eventually, 3D printing will make medical procedures more time-efficient (by improving planning and reducing overheads) and cost-efficient (when implants are produced at a scale), and insurance companies will recognise the significant advantage accruing to them, Bali adds.

IS THE FUTURE HERE?

Perhaps because the 3D health care industry is still counting down to a take-off, one has barely seen any funding in startups since 2014 (till 2017). Data from Tracxn shows that while about 40-odd 3D printing startups have mushroomed every year since 2014, those focussed on health care remain in single digits. During that period, while the startups have raised $3.60 million through nine rounds of funding, not a single penny in venture capital (VC) has come in for the health care ones.

"Given their limited constituency, these startups may not feel the need to raise crores from VCs to scale up. Like traditional businesses, they can grow to ₹5 crore to ₹10 crore or ₹20 crore. But that may not be the scale in which VCs may be interested," says Dr Ramesh Byrapaneni, a cardiologist-turned-VC who is now the managing director of Endiya Partners.

One exception would be Bengaluru-based Pandorum Technologies, the first Indian company to 3D print a liver tissue. In February, Pandorum raised about ₹23 crore in a Series A round from investors like the Indian Angel Network, 021 Capital, existing investor Binny Bansal and Hero Enterprise Chairman Sunil Munjal (own capacity). But co-founders Arun Chandru and Tuhin Bhowmick refuse to be called a 3D printing firm. "3D printing is a popular word. But it's just one of the tools we use. Our work is in tissue engineering and regenerative medicine, a much broader field. We work on bio-engineered liver and cornea, with the final goal to develop them as lab-grown transplantable tissues," says Bhowmick.

In 2015, Pandorum developed its first 3D mini liver tissue. The company can generate such tissues that comprise 10,000 to 1 million cells. But it may take about five years to build the working prototype of a tissue that has billions of cells and can be transplanted into a patient. Such a tissue will need to have its own blood vessel structure and be able to integrate within the receiver's body; this will require multiple trials before it can be even deemed fit for human use. "Right now, the mini-liver tissue reflect the characteristics of those grown within the human body. So pharma companies can test the hepatotoxicity of drugs, or FMCG companies their products, nixing the need for animal trials," says Chandru.

The world is now experimenting with the endless possibilities of bioprinting, or the 3D printing of living cells. In May 2017, researchers were able to restore fertility in mice with bioprinted ovaries. Says Gordon Wallace, the director of the Intelligent Polymer Research Institute, University of Wollongong, Australia, and the co-author of an ebook on bioprinting, "The versatility in the arrangement of composition and bioactive entities in 3D printed structures means we have an effective approach to tissue/organ repair. So we are currently learning how to print systems that facilitate the growth of bits of organs. Surely, one day, that knowledge will morph into an ability to create complete organs."

But what is a realistic timeframe to figure out if this final frontier can be breached? "If I have to bid a number I would possibly say 10 to 20 years. But five years ago, we didn't think we would be having a conversation about printing stem cells. So who knows what the future holds?"

WHY 3D PRINT IN HEALTH CARE?

- **Models** for studying organs, understanding anomalies and practising complex surgeries

- **Surgical guides**, enabling surgeons to have patient-specific 'stencils'

- Custom-made **implants** to match a patient's unique anatomy

- Customised **devices and implements** for doctors

- **Bioprinting**, or printing tissues outside the human body; the process is in its early stages of research

> **"Five years ago, we didn't think we would be having a conversation about printing stem cells. So who knows what the future holds?"**
>
> **GORDON WALLACE**, PROFESSOR, University of Wollongong

What Did The AI Say?

Healthtech startups in India are using artificial intelligence and machine learning capabilities to bring health care services to underserved and unserved areas

By RUCHIKA SHAH

PHOTOGRAPHS: HEMANT MISHRA FOR FORBES INDIA

The World Health Organization (WHO) says that every country should have at least one doctor per 1,000 people. But like 45 percent of its member states, India lags way behind. It has less than one doctor per 1,000 people, 0.758 to be precise, according to WHO.

As of 2010, 30.9 percent Indians lived in urban areas, and 29.4 percent or 104.7 million of the urban population lived in slums, latest United Nations data shows. A health care system with basic and quality health care services restricted to urban and semi-urban areas, especially private hospitals, has kept accessibility and affordability low for most of India's population. The situation is deplorable when it comes to government hospitals. One doctor has to look at 11,082 patients, Minister of State for Health and Family Welfare Anupriya Patel told the Lok Sabha on July 20 this year.

Is the answer more doctors? A study by the *Indian Journal of Public Health* says India would need 2.07 million doctors by 2030, a near impossible target. "Accessibility to health care services really drops as you move to smaller cities and remote areas," says Manish Singhal, founder, pi Ventures, an early stage fund investing in artificial intelligence (AI)-led startups. "Training more doctors is not feasible; it takes time and quality output is not guaranteed."

The only way to improve accessibility in a low-cost manner is through technologies that can extend human knowledge and experience, he says. "AI is best suited because of its human-like intelligence that can take a lot of decisions better than humans can."

Rapid advancements in AI, large data sets from open source universities, big hospitals and research organisations, and access to capital have allowed Indian startups to enter the healthtech space. These founders are striving to change the health care scenario in India using machine learning (ML) and creating their own low-cost portable hardware. These startups use available data to train their algorithms to identify and analyse diseases at the point of care. If adopted at scale, with a large part of the initial diagnosis left to machines, India's limited medical professional resources can be used efficiently.

CARDIOLOGIST ON THE GO

"Three fourths of medical emergencies actually happen outside the intensive care unit (ICU). This is true everywhere," says Rahul Shingrani, CEO and CTO of Ten3T.

Adarsh Natarajan, CEO, Aindra Systems

With this intelligence, Shingrani and his co-founder, Sudhir Borgonha, created a wearable device that allows doctors to monitor patients in real time and avoid emergencies.

Named after the 1,03,000 times a human heart beats in a day, Ten3T manufactures Cicer, a palm-sized reusable sticker that can be stuck to a patient's chest for a few hours to a couple of weeks for remote monitoring. It can read ECG, heart rates, respiration rates, blood oxygen levels, patient postures and temperature, and create a report in 30 seconds to send it to a doctor's smartphone or central monitors.

Ten3T's AI and algorithm reads the heartbeat data segmented by Cicer "to predict any abnormality and whether a patient is going to deteriorate soon," Shingrani says.

Apart from heart patients, it can be used for post-operative care, pre-natal care, and panic attacks. Ten3T is in talks with the Indian Army for use in high altitude remote areas.

Ten3T started operations in 2014 and launched commercially only a year ago. It caters to hospitals, renting out its devices and supporting infrastructure like large-screen monitors. Plans are afoot to launch a smaller device for consumers in the next 12 months, who can buy the patch and download the app to monitor their vitals.

PERSONAL THERAPIST

Nearly 56 million Indians suffer from depression, and 38 million have anxiety disorders, says a 2017 WHO report. That is about 7.5 percent of the population. The Ministry of Health and Family Welfare says India needs 11,500 psychiatrists, but has only 3,500.

Ramakant Vempati and his wife Jo Aggarwal, co-founders of Wysa, an AI-enabled stress, anxiety and depression alleviation chatbot, are trying to solve the problem of stigma, accessibility and affordability. "For an anxious person, there is no greater comfort than knowing someone's always around to watch over you," says Vempati.

Wysa Buddy, a penguin chatbot, was launched in January 2017 as a mood recorder that asked users how they were doing, every day. Trials on a focus group showed reduced depression scores, leading the co-founders to conclude that "people didn't want to talk to another person fearing judgement but still wanted to feel heard," says Vempati.

Wysa's app has three tiers. In the first level, the chatbot asks basic questions and recognises emotion. It can play back good memories on a bad day. The second level has therapeutic tools encoded in conversations. It offers guided meditation, mindfulness techniques, breathing techniques, cognitive behavioural therapy techniques, according to the mood it perceives. The chatbot has about 50 AI models to recognise different emotions. The 30 million conversations it has had with people around the world—it has users from over 30 countries—help in training.

"We mostly use AI to listen. It allows personalisation and scalability, while users feel heard empathetically and without judgment. A chubby little AI penguin fits in well," Vempati says. The third, and the only paid tier, provides a clinical psychologist 'coach'. At about ₹1,900 a month,

COO Prasad Bhat (left) and co-founder and CEO Rahul Shingrani of Ten3T

Tathagato Rai Dastidar (left), CTO, and Apurv Anand, COO of Sigtuple

Wysa claims to provide access to a mental health professional at one-fourth the usual cost.

CANCER SCREENING

"Cervical cancer is the largest killer of Indian women; technologies like AI, optics and mechatronics can change that statistic," says Adarsh Natarajan, founder, Aindra, an AI-powered healthtech company.

Aindra was initially setup as a software company, with resources focussed on developing AI models to screen cervical cancer. It shifted gears when Natarajan realised "no real change will happen if we can't take our solution to the point of care."

So Aindra "backward integrated and developed hardware components that could be taken to point of care," he says. Apart from a tie-up with Fortis Hospital, which deals with the lifecycle management of cancers [from diagnosis to treatment], Aindra has partnerships with diagnostic labs and gynecologist clinics. Working with NGOs like Cancer Care India and Mahati Trust takes it to the rural areas.

"It's all a chain reaction; improve accessibility, and affordability will get better," he says. Traditional tests can cost between ₹800 and ₹2,000, plus the cost of travel and time. Aindra's screening costs ₹300 to ₹500. "Nearly half of patients opt out of treatment if the result is not given on the same day," says Natarajan. Traditionally, it takes four to six weeks to get results for a cervical cancer test, whereas Aindra can do it in a couple of hours, he claims.

A technician at a clinic or camp with Aindra can collect the test samples; it is then stained by chemical reagents (which make the cells visible under a microscope) and a digitised image of the slide is fed to the AI. "The AI allows us to look for clinically significant parameters, take clinical data to make a decision on the sample, and even the extent of the cancer," says Natarajan.

A pathologist sitting anywhere in the world can confirm the result. "Reinforced learning and AI retraining through pathologists' confirmations make it a continuously learning system. AI and ML are central to what we do. Without it, we would not have a meaningful way of achieving what we want to."

Aindra has been developing its technologies and hardware since 2015; it is now in the clinical validation phase and has screened 1,000 patients so far. It is also getting a European Union standard CE certification as a self-regulatory measure. "Timely intervention and early diagnosis can dramatically improve the incidence to mortality ratio in cervical cancer," Natarajan says.

TESTS FOR THE MASSES

Artelus, a deep learning technology platform, was set up by four co-founders—Pradeep Walia, director; Rajarajeshwari Kodhandapani, director; and Lalit Pant and Vish Durga—to bring primary health care screening "to the forgotten billion," Walia says. It uses AI and ML to screen bus and cab drivers and others at the bottom of the pyramid for diabetic retinopathy (DR). It is also developing capabilities for breast and lung cancer, while its tuberculosis and pneumonia screening is in the validation phase.

Diabetic retinopathy, which can cause blindness, can be prevented by early detection. "It is asymptomatic, so by the time the problems arise, it is usually too late," Walia says. It affects one in three diabetics. "With only 20,000 ophthalmologists and 5,000 retina specialists and 90 million diabetics in India, the doctor-patient gap may take decades to fill."

That's where AI comes in. Equipped with affordable ophthalmic cameras and algorithms that can fit on a pen drive, Artelus carries out screening camps every day in Karnataka, in partnership with Dr Agarwal's Eye Hospital, which is based in Chennai. They screen about 100 people in three hours, whereas traditional tests take at least a day. Artelus takes three minutes from patient registration to generating a report. The screening and analysis process by the AI system takes only 30 seconds. They have screened 25,000 diabetics so far in India.

Artelus's AI uses a 211-layered deep neural net to identify and classify diseases. It was trained for a year and a half on retinopathy data. "Our core AI platform Tefla can be used to develop applications in the fields of natural language processing (NLP), robotics, drug discovery, and so on. Our custom hardware rack is built using NVidia graphics processing units [GPUs] to accelerate deep learning training," Walia says.

Artelus is currently working on embedding its AI solution on a chip to eliminate dependency on internet connectivity. The company is hoping this will help take health care to remote areas.

There are two revenue models: Pay per screening for camps and clinics where the cost is usually less than $1, and a bulk licensing model for government and large institutions.

PATHOLOGY

A host of reasons brought three ex-American Express employees to health care when they decided to turn entrepreneurs in 2015. There was a social impact opportunity; NVidia had just said GPUs were going to keep getting cheaper, and Google announced plans of investing one-third capital into health care.

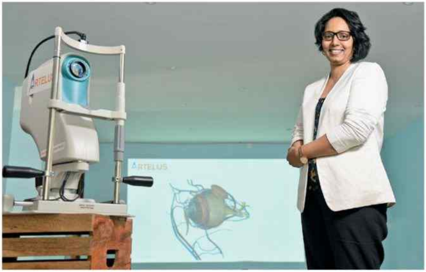
"We had a clear intent in mind; solving inaccessibility, inaccuracy and unaffordability which plagues all layers of health care," says Rohit Kumar Pandey, co-founder and CEO, Sigtuple. After analysing a lot of data and tests, Pandey, along with co-founders Tathagato Rai Dastidar (CTO) and Apurv Anand (COO) decided to focus on common screening tests like complete blood count (CBC).

What started as a contraption of Apple iPhone 6s and a manual microscope, held together by cellphone holders bought from ecommerce portal Alibaba in 2015, is today a full-fledged AI device. AI 100 digitises blood slides and sends the data to its cloud-based platform Manthana. "We use AI for an in-depth analysis of medical images and videos to come up with a comprehensive analysis [of the blood sample] backed by visual evidence," Anand says. Manthana has been trained by data sets from big hospital chains and laboratories.

A traditional blood test needs a technician, device, reagent, microscope, and pathologist. All these elements are usually not located in the same place—19,000 pathologists serve 3 lakh labs and collection centres in India, Pandey says. Logistics and device add to the time and cost of a blood test.

Sigtuple eliminates the reagent model and "our AI has enabled us to achieve higher accuracy as compared to the de-facto standard of manual analysis. It has also given us an edge over the existing devices or solutions available in the market," Anand adds. Reports created by Manthana can be approved by a pathologist sitting 200 km away. The entire cycle is completed within 10 minutes. Platforms like Manthana can pave the way for low-cost collection centres in smaller cities with only one technician.

After a go-ahead from the Directorate General of Commercial Intelligence and Statistics, it was launched this April. With 10 deployments in Bengaluru, Sigtuple uses a prepaid or postpaid subscription-based model and also provides in-house pathologists to laboratories, a model that costs slightly more. It charges per report and not for the device. The company is partnering with the government to take the solution to rural areas. It has completed phase two of clinical trials for urine and semen tests, and plans are afoot to bring them to market by year end.



Rajarajeshwari Kodhandapani, co-founder and director of Artelus

THE AI EDGE

IMPROVES AFFORDABILITY

- AI generates digital reports that can be confirmed remotely; does away with need to have a pathologist in every diagnostic lab
- Eliminates the reagent model for screening tests, thus bringing down cost
- Since reports are usually generated on the spot, it cuts time and travel cost for patients
- Cost benefit can be passed on to the patient

IMPROVES ACCESSIBILITY

- Portable AI-enabled devices are taken to point-of-care in remote areas by way of screening camps
- People who would have typically not been aware of vulnerabilities like cervical cancer or diabetic retinopathy now get screened for nominal or no cost
- More screening and collection centres and diagnostic labs can be set up in tier 2 and 3 cities and remote areas with only a technician

IMPROVES AWARENESS

- Most companies carry out awareness drives in the remote areas they serve
- Apps like Wysa remove the stigma and normalise seeking help for mental illnesses

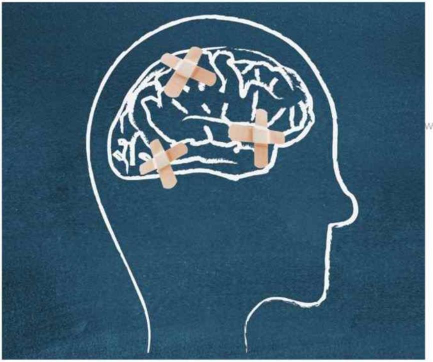
IMPROVES EFFICIENCY

- In screening and testing large number of patients in a day, humans can introduce errors and bias
- AI, ML and deep learning capabilities improve with every new sample it analyses and brings down errors and bias to a minimum

Mind Games

With greater awareness, mental illness is now being treated seriously. And tech-based ventures in the space are lending a helping hand

By NAINI THAKER



SHUTTERSTOCK

Sachin Chaudhry was distraught to see his younger brother fight a lonely battle with schizophrenia. This was 1994 and there was hardly any awareness about mental health in the country. Being healthy was restricted to one's physical and social well-being.

The experience prompted Chaudhry, 41, to set up TrustCircle in 2015. The startup uses mobile and artificial intelligence (AI) technology to improve emotional resilience. "I realised early on that there are clear gaps in India's mental health care ecosystem, with a complete disregard for any preventive, participative or protective approach," says Chaudhry, founder and CEO of TrustCircle. "Why do high-functioning adults not pay attention to our one critical organ: Brain?" he asks.

Chaudhry points out that since we don't feel the pain of the trauma that the brain goes through, we stop giving enough importance to the vitals that keep it healthy: Emotions.

The National Alliance on Mental Illness describes mental illness as a medical condition that disrupts a person's thinking, feeling, mood, ability to relate to others, and daily functioning. According to the National Mental Health Survey of India, 2015-16, mental illnesses and disorders are caused by a complex interaction of biological, social, cultural and economic reasons.

In India, besides the lack of understanding, there is a stigma attached to mental illness. That apart, there is a limited supply of trained professionals to treat people suffering from it. "People are more comfortable reaching out if there are emotional distress-related issues; if it's about mental illness, the stigma stops people from opening up and seeking help," says Tanuja Babre, 26, programme coordinator of Tata Institute of Social Sciences' (Tiss) iCall, a psychosocial helpline.

RAY OF HOPE

Times, though, are changing. People are coming to terms with the seriousness of mental illnesses and acknowledging the need for help. "In 2014, when we were planning to start an initiative in the mental health care space, I wanted to call it the Mental Health Initiative. However, people told me it would be extremely negative. Today, there is more acceptance of the term, especially since celebrities like actor Deepika Padukone have spoken out about their battle with depression," says Rajvi Mariwala, director, Mariwala Health Initiative (MHI).

While several organisations are at the forefront of this battle, a big ray of hope came in the form of the Mental Healthcare Act, 2017—passed by the Rajya Sabha in August 2016 and Lok Sabha in March 2017. It is the first time that India has passed a law that gives people the right to mental health care, an aspect neglected for years.

MHI is one of the few organisations in India that funds and strategically supports ventures and projects [in rural and urban areas] focusing on mental health care. "We look at innovative mental health projects that focus on human rights and are accessible to the marginalised communities. They need to raise awareness, have a good training component, deliver services effectively, have a robust referral system [to connect people to on-ground resources] and a research

Richa Singh (left) and Puneet Manuja (right), the co-founders of YourDOST in Bengaluru

SELVAPRAKASH LAKSHMANAN

component," adds Mariwala. To date, MHI has reached out to over 1.4 lakh people in India. Some of the projects it has tied-up with include iCall, Bapu Trust, Centre for Mental Health Law and Policy's Atmiyata and Anjali.

Started in September 2012 and funded by MHI since April 2015, iCall has been working with the Maharashtra government on training programmes for the Mental Healthcare Act. "We are working with the state government to help with the implementation of the Act, but there are a lot of challenges. There is a dearth of trained experts in the country, so there is barely a team for us to train," explains Babre.

TECH BOON

Usually, those suffering from mental illness prefer to remain anonymous while seeking help. Technology and a proliferation of startups tackling the subject help them do that. iCall, for instance, set up an email service a year after it was launched. It is now moving to the chat-based model. "Our aim was to ensure everyone has access to our services, without any geographical or financial restrictions. That is why our services are multi-lingual and for free," says Babre.

Unlike other helplines, iCall claims it is run by professionals, not volunteers. As a result, 50-60 percent of the calls it receives are from follow-up clients. It even collaborates with the Maharashtra Police to conduct workshops for suicide prevention, given the stressed lives that members of the force lead. Babre concedes that helplines can't be the only solution. "Face-to-face interactions are essential," she says.

Like iCall, YOURDost is a sought-after helpline among young adults because of the privacy and personal interactions it offers via chats, voice and video calls. IIT-Guwahati graduate Richa Singh, 31, launched YOURDost in 2014 after a college friend of hers committed suicide. The online platform connects individuals with psychologists, life coaches and psychiatrists. "Contrary to popular belief, we find men seeking more support in matters like financial pressure and not being able to give time to their families. Around Valentine's Day, they even talk about feeling lonely. During the exam

"During the exam season, it's not just students, but also mothers who call for not being supportive enough to their children"

RICHA SINGH, CO-FOUNDER, YOURDost

Amit Malik, who co-founded online therapy and consultation platform InnerHour

season, it's not just students, but also mothers who call for not being supportive enough to their children. More recently, we have had clients talking about their social media and internet addictions," says Singh.

YOURDost has raised $400,000 in angel rounds from Phanindra Sama (redBus founder), Aprameya Radhakrishna (TaxiForSure founder), Aneesh Reddy (Capillary Technologies founder) and investors like Sanjay Anandaram (Seedfund), and Venk Krishnan (NuVentures). In 2016, it raised $1.2 million in a pre-series A round from SAIF Partners.

Among other startups that make optimum use of modern technology are InnerHour and TrustCircle. Founded by Amit Malik, 42, and Shefali Batra, 42, in February 2016, InnerHour provides online therapy and consultation; it even offers face-to-face interactions when required. The Mumbai-based startup received an initial funding of $450,000 from Batlivala & Karani Securities India Pvt Ltd, investment firm Venture Works and others.

While a lot of players in the space focus only on online video/chat-based counselling, InnerHour has also developed a mobile application. "It asks a bunch of questions and then creates a 28-day programme with various 5-minute activities for the individual to work on each day. This is to help them develop emotional skills without seeing a therapist," says Malik. The application also has features for immediate relief from any form of stress or anger. The founders are working on integrating artificial intelligence as part of the application. In extreme cases, InnerHour either asks the person to see its therapist or recommends one.

TrustCircle, on the other hand, was set up using the preventative, participatory and predictive (3P)

"There is a binary understanding of mental illness in rural India. They understand what 'madness' means, but it is stigmatised."

SOUMITRA PATHARE, COORDINATOR, CMHLP model. Its focus was on improving emotional resilience, through its products, the flagship one being mHealth Tests. It is a mobile test that can be taken anonymously for free. "Most organisations are not focusing on preventative measures since they don't realise their importance. If measures can be taken to prevent the illness at an initial stage, the individual might not need external help. Through the 3P model, we offer solutions that allow individuals to reflect, learn from and track their journey," says Chaudhry.

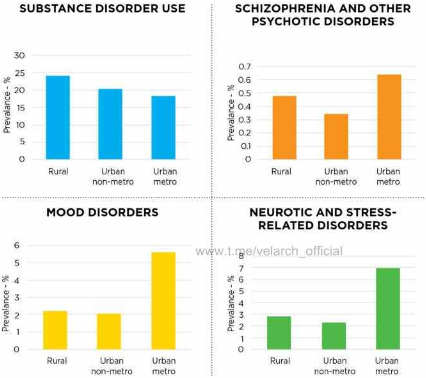
RURAL RAMIFICATIONS

Experts admit that there is a huge difference in the context and challenges related to the issue in urban and rural India. Organisations like the Schizophrenia Research Foundation (Scarf) and the Centre for Mental Health Law and Policy's (CMHLP) Atmiyata Programme are trying to bridge the gap.

Scarf began experimenting with telepsychiatry in 2005 and received support from the Tata Trusts in 2010, when it moved its services to a mobile platform. The service is provided on a bus, which has a consultation room and a pharmacy. Through online video counselling, Scarf connects patients in remote areas to a psychiatrist based in Chennai. TrustCircle is a technology partner for Scarf and the foundation is now focusing on prevention and early intervention. "There is a standardised assessment that students in various schools and colleges have to take as part of an emotional wellness screening. This is to identify those who show signs of psychosis," says Chaudhary.

While these mobile buses have gained popularity down south, the Atmiyata programme is focussed on Gujarat's Mehsana district. It is co-funded by MHI and Grand Challenges Canada; the latter funds innovators in low- and middle-income countries and in Canada. It follows the peer-to-peer training model where

DISTRIBUTION OF MENTAL MORBIDITY



Source: *National Mental Health Survey of India, 2015-16*

villagers are asked to volunteer to become 'Atmiyata Champions'. "We train these champions to identify people who might have mental health distress, or as they refer to it, 'stress and tension'. We teach them skills like problem solving and active listening so that they can help people with basic counselling," says Soumitra Pathare, consultant psychiatrist and coordinator, CMHLP.

"On an average, there is a binary understanding of mental illness in rural India. At one level they understand what 'madness' means, but it is stigmatised; on the other, they know what stress and tension mean, but those aren't illnesses to them," says Pathare. Nine months ago, CMHLP launched a suicide prevention programme in Mehsana called Spirit (suicide prevention and implementation research initiative) to bring down the number of suicides and attempted suicides.

OPEN MIND

Mental health, unlike physical discomfort, is tougher to tackle, but experts feel technology and communication can bring about a positive change. "You could increase awareness, which would tackle stigma and then offer people products and services that are easily available, using which they could get better," says Malik of InnerHour. New laws like the Metal Healthcare Act and a growing conversation on the subject augur well, but there's still a lot left to be done. "We would love to see a mental health ecosystem coming together with a social environment that is accepting of persons with disabilities [both mental and physical] and has enough people willing to fund mental health. Our aim is to work collaboratively with others, and change the conversation surrounding mental health in India," says Mariwala.

Rahul Parekh founded online pharmacy RxHeal in 2015; he aims to become a thought leader in the generics space

Click to Heal

The market for epharmacies is substantial but evolving a profitable business model will take time

By SAMAR SRIVASTAVA

Over the past two decades, Rahul Parekh has been on the go. The 47-year-old was KPMG's first employee in India in 1994, launched his own consultancy and helped acquire and consolidate a gaming business for an Italian family. Then, in 2015, Parekh saw an opportunity in the pharmacy space. At ₹100,000 crore, according to AIOCD, an Indian pharma market research company, this was a market fragmented among 800,000 chemists across the country. Surely, with the use of technology, the unit economics of the business could be improved. It was and is a sector ripe for consolidation, Parekh believed.

He is not alone. At least a dozen epharmacies have staked their claim to this market. As sales of branded generics have risen steadily in the last decade, the Indian pharma industry is closely monitoring the growth of this new sales channel. Yet most buyers who've done away with their neighbourhood pharmacist and opted to shop for their quota of medicines online will find it hard to admit that they weren't (at least initially) tempted by the discounted prices.

Offers of up to 35 percent off or more on the retail price are *de rigueur*. As a customer acquisition tool this may be difficult to justify as only about a fourth of customers stay loyal to a single site. While there is a lot of value-add that epharmacies could bring, it remains uncertain whether for now the customer is willing to be swayed by anything except price.

It is hardly surprising then that three years after Parekh launched RxHeal, he is candid enough to admit that "the biggest problem I face is deep discounting. It is not a road I plan to go down for long". He's not comfortable burning cash endlessly; even though RxHeal has raised some seed funding, it is working on pivoting its business model to steer clear of the cash-burn game.

For now it's not hard to see why India's epharmacies are willing to go the extra mile to fight for market share. The Indian pharma industry is extremely profitable for everyone in the value chain—the pharma companies, the distributor and the chemist. This is not a category like mobile phones where margins online on new best-selling models are as less as 5 percent. Chemists work on a 20 percent margin, which is a huge lever in the online world.

In some categories, scale has brought in the hope of even higher margins. Unlike consumer goods or electronics, medicines are not bulky to transport and delivery charges are usually no more than ₹20 for a company that delivers along a pre-determined route every day. Purchases except for the cold, cough, headache variety are almost always pre-planned. For chronic patients suffering from hypertension, diabetes or osteoporosis, medicine is a specialised product where bill sizes invariably total ₹1,500 or above. This constitutes about 70 percent of the market and there are loyal repeat customers. PharmEasy, a three-year-old platform, for instance, claims to have 1 million unique customers with about 35 percent on a regular plan. Their prescriptions are stored online to meet with regulatory requirements.

BENEFITS TO CONSUMERS

Increased Convenience
Able to order medicines from mobile phones or computers

Improved Accessibility
With the use of technology and access to inventory of multiple stores at a time, epharmacies can aggregate supplies, making otherwise-hard-to-find medicines available to consumers across the country

Cost Advantage
Entrepreneurs like to broaden their customer base, reduce working capital and overhead costs, as well as increase margins; it translates into cost advantage to end-consumers

Improved Patients' Compliance
Value-added information to consumers, such as drug interactions, side effects, medicine reminders, and information on cheaper substitutes, enables consumers in improving compliance

Authenticity
All medicine purchases are digitally stored making it easy to track the supply chain, thereby decreasing the risk of counterfeit medicines, drug abuse, and self-medication

Source: *FICCI*

Why then are epharmacies bleeding and is there a way out? The answer lies equally in reducing discounts and slashing their operational costs. Sripal Bachawat, director, C-Square, a software company, has seen the industry operate up close. His company has developed the software platforms Indian epharmacies operate on. "Instead of thinking like retailers, they (chemists) need to start working like distributors and emulate their business practices," he says.

Here's how. Typically, medicine priced at ₹100 packs in a 20 percent margin for the seller and, after that, 10 percent (₹8) for the distributor. The typical distributor serves about 30 chemists a day and spends about ₹20 on each delivery to get it to them. This business mostly works on the daily replenishment model. He gives a 3 percent discount for instant payment and spends 2.5 percent on delivery and administration costs. Depreciation is another 1 percent leaving him with ₹2.40—an Ebitda margin of slightly over 3 percent. Software development expenses are a one-time cost for epharmacies and the asset is depreciated to zero over time.

As the business evolves, there are some epharmacies that are thinking differently and admit that in order to function like distributors they need to partner with retailers rather than thinking of them as adversaries. Kolkata-based SastaSundar Ventures, which runs stores under the Health Buddy brand, provides some clues as to how the business may evolve. The company has tied up with 220 stores in West Bengal and 20 in the National Capital Region. "By working with stores, we have the advantage of getting them to exclusively order through us as well as reducing the headache of managing deliveries," says Ravi Kant, chief executive of SastaSundar Ventures.

The company gets a franchisee to rent a store space (branded Health

"By working with stores, we have the advantage of getting them to exclusively order through us as well as reducing the headache of managing deliveries."

RAVI KANT, chief executive, SastaSundar Ventures

CHAITANYA DINESH SURPUR

Buddy), usually about 100-125 square feet. The space needed is smaller than regular chemist stores as they don't need to store medicines on their shelves and the company is able to partner with small entrepreneurs who don't block capital in keeping medicines. SastaSundar is thinking of this as a pure play retail business where higher throughput instead of higher margins drives profitability. Medicines, packed and labelled, are supplied by SastaSundar from their warehouse with a flat 15 percent discount passed on to the customer. Six percent is shared with the operator of the store.

Ravi Kant of SastaSundar Ventures does not want to sacrifice profitability in the rush to expand

SUBRATA BISWAS FOR FORBES INDIA

While it is still early days, there are initial signs that the model could work. After losing ₹2.44 crore in the financial year ended March 2017 the company made a profit of ₹11.32 crore a year later; SastaSunder is a listed company with a market capitalisation of ₹310 crore. Even though Kant realises that there is little to prevent others from copying the model, he is clear that he doesn't want to sacrifice profitability in the rush to expand. "There is enough room for everyone," he says.

If working to make retail more efficient is the Holy Grail for SastaSundar, others have opted for other paths to growth. "As digital advertising (Google AdWords) is not permitted, we have chosen to go down the information route," says Prashant Tandon, co-founder of 1mg, whose website received 150 million monthly page views of content every month. The firm uses this to sell medicines as well as keep a track of patients' illnesses. It may even recommend tests. PharmEasy sends SMSes reminding patients when to take their pills. Both agree that discounts of 15-20 percent are hard to sustain although Dharmil Sheth, co-founder of PharmEasy, says, "In certain categories where we have scale, we are able to procure medicines between ₹60 and ₹72 on a retail price of ₹100."

The desire to compete on price alone has led to some unscrupulous practices among a few epharmacies. Recently the government of Rajasthan seized a consignment of spurious drugs. According to documents reviewed by *Forbes India*, Alkem Laboratories confirmed that it had not manufactured the drugs. Two chemists in Mumbai confirmed reports of spurious medicines being sold online. They declined to be named.

One of the quirks of the Indian market is that even generics are branded and what a doctor recommends often depends on the incentives he is given by the pharma company. It is not uncommon to find several medical representatives sitting outside a doctor's office on any given day. Section 16 of the Drugs and Cosmetics Act prohibits chemists from recommending generic names of the same drug. If a doctor prescribes a particular brand the chemist has to fulfil the prescription or advise the patient to go to another shop.

A recent change in the government's stance is likely to make a substantial dent in the fortunes of epharmacies. Under the government's Jan Aushadhi scheme, citizens can access cheaper generics through a network of 3,500 pharmacies. The industry hopes that the Drugs and Cosmetics Act, 1940, would be amended, allowing it to build a repository of knowledge to suggest a cheaper alternative.

RxHeal wants to become a thought leader in the generics space. Parekh says they can recommend different (cheaper) alternatives down to the same molecule level once the law changes. For now he has scaled back and is conserving capital. RxHeal only takes order on phone and WhatsApp. "This way I know that only the most loyal of my customers are with me," he says. With a large pie to play for, competing for scale may not be the only way to win in this business.

In-The-Box Innovations

Products that come in a pack are using technology to save lives, improve treatments

By NAANDIKA TRIPATHI

In the last few years, healthtech companies have come up with products that address problems at a primary level. From stopping the flow of blood from severe wounds, to transferring ECG readings in real-time, some of these products aim to save lives even before the patient reaches the hospital, while others use new methods that make it easier to administer medication.

According to a healthtech report by Nasscom, published in 2017, "India is a complex market, with hugely varying education levels, income levels and access to health care. Within the Indian context, access, awareness, affordability and quality are all important, and health care technologies should be implemented understanding these intricacies and need-gaps." The report adds that startups in India are using technology to address the three main issues in health care—access and delivery, affordability, and quality.

Suresh Jayaraju, senior director, and head at 10,000 Startups (a Nasscom initiative), says, "Indian healthtech startups can definitely become a world-class company and sell their products globally; it is just a matter of time. All of them are developing products which are globally acceptable."

Reimagining the Pill

Orally soluble films are thin strips, which, when placed on the tip of the tongue, rapidly become wet with saliva, and melt to release the medication, which is then absorbed into the bloodstream directly via oral mucosa without passing through the gastrointestinal tract. These strips have the advantages of tablets (precise dosage, easy administration) and of liquids (easy swallowing, rapid absorption). Films, which are similar in size, shape and thickness to postage stamps, are a convenient alternative form of taking medicines for patients who have difficulty in swallowing pills or taking medicines in traditional forms such as injections.

Arrow Greentech Limited (AGL), manufacturers of water-soluble films, will be investing in its pharma firm Avery Pharmaceuticals, to make orally soluble films in 2019. These will be able to carry dosages of up to 100 mg. "We are going to manufacture medicated mouth-melting strips that can be delivered directly in the mouth without converting the medication into tablets, injections, syrups and so on," says Neil Patel, director, AGL. "The challenges that we're facing include the inability to incorporate high dosages onto the strips."

Neil Patel, director, Arrow Greentech

K Tripathi, the company's pharma business strategist, says, "Oral soluble films will transform the solid dosage forms segment and offer suitable drug delivery, specifically for patients with an issue of choking, such as children, elderly people and the bedridden. The strips also improve patients' compliance for medication."

"Pricing will be different for different products. However, if you compare the same products available as injections or tablets, our strips will have similar price points," adds Patel. Field trial runs are expected to take place by the first quarter of 2019, and production is expected to commence by the following quarter.

MOBILE SCANNERS

In 2017, US-based Zebra Technologies, makers of marking, tracking and computer printing technologies, launched its DS8100-HC series of scanners and TC51-HC mobile computers for health care professionals in India. Ryan Goh, vice president and general manager, Zebra Technologies, Asia-Pacific, says, "The mobile computer is Android-enabled and can perform various tasks like calling/messaging, accepting calls through PBX [private branch exchange], accessing patient records, scanning barcodes and increasing medication supervision accuracy. Health care workers have all the functionality they need to tackle any task, without negotiating on patient privacy or data security."

NEIL PATEL: ADITI TAILANG

ECG on the Go

Gajanan Nagarsekar and Kevin Kreger's Mobmon 12.0 helps patients get immediate diagnoses during cardiac emergencies

Gajanan Nagarsekar and Kevin Kreger, founders of Kallows Engineering India, have developed Mobmon 12.0 (an acronym for mobile monitoring), that aims to save lives during cardiac emergencies. "Our ultra-portable ECG machine is coupled with an Android application that can record, store and manage ECGs," says Nagarsekar. "It can receive diagnoses from doctors in remote locations within minutes. Mobmon 12.0 also includes a pulse oximetry, which monitors a person's blood oxygen level."

While regular ECG reports are shared as images or PDF files, Mobmon Android application displays ECG readings in real-time. Launched in 2012, a single unit weighs less than 200 gm, and along with cables and accessories such as electrodes it weighs less than 1.5 kg. The doctor can provide instant cardiac first-aid to the paramedic who is next to the patient, and the entire communication takes place in less than 2 to 5 minutes. ECG tracings can also be accessed through a website.

"We observed two major lacunae in the ECG market: The cost of ECG machines, and the ability to have a diagnosis," says Nagarsekar. Live transfer of ECG tracings to remote doctors is critical in ambulances so that cardiac first-aid can be administered and the patient stabilised even before reaching the hospital.

The company has got investments of $0.5 million from Sriram Natarajan, an industrialist from Goa, since 2014, and has clocked an aggregate revenue of more than ₹3 crore. Kallows' customers include Narayana Health, Stemi India, MS Ramaiah Memorial Hospital, Express Clinics, GenWorks Health, and Apollo Hospitals. F

Sealing Wounds

Leo Mavely with Axiostat, a non-absorbable dressing which is applied to an open wound

As a college student, Leo Mavely was often involved in taking road accident victims to hospitals. It occurred to him, even then, how there was no solution to for a primal issue such as bleeding, which can result in death. It is common knowledge that in a medical emergency, the first hour is the 'golden hour' in which the victim must get basic treatment. "In most cases, they don't get it, and it's too late by the time they reach the hospital. This is where our product Axiostat proves to be most effective. It's a first-aid dressing that stops profuse bleeding within just 2 to 3 minutes," says Leo Mavely, founder and CEO of Axio Biosolutions.

When Axiostat, a non-absorbable dressing, is applied to an open wound, it reacts with the blood and turns into a sticky material that seals the wound and stops bleeding. Once the patient receives medical attention, Axiostat can be removed by simply applying water and peeling it off.

"Axiostat is created by using a biomaterial platform based on 100 percent chitosan, which is a natural biomaterial adapted for medical application," says Mavely. "It is a technology that works on charge interactions between negatively charged blood components and positively charged Axiostat."

Launched in 2008, it is India's first US Food and Drug Administration-approved wound care product, and is used by the Indian armed forces and paramilitary forces, and in government and private hospitals. Funded by Ratan Tata's UC-RNT Fund, Accel Partners and IDG Ventures, the Bengaluru-headquartered Axio Biosolutions is present in 12 other countries.

"We're growing 200 to 300 percent year-on-year, and expect to break even in the next 18 to 24 months. We expect to reach a topline of more than ₹250 crore by 2023," says Mavely. F

LEO MAVELY: NISHANT RATNAKAR FOR FORBES INDIA

Pay By Impact

Is outcome-based financing the right cure for maladies like high maternal mortality? Results of Utkrisht, a development impact bond launched in Rajasthan, will tell

By VARSHA MEGHANI

Rajasthan's maternal mortality rate is a worry even though it fell by 22 percent since 2010-2012

SHUTTERSTOCK

Pregnancy for women in Rajasthan comes with a significant risk of death. According to the government's most recent data (2014-2016), 199 women die from complications for every 100,000 live births in the state. With the national average at 130, the state's statistic is sobering. Even more so when compared to China's 19.6 deaths per 100,000 live births recorded last year.

"What's alarming is that most pregnancy-related deaths can easily be prevented," says Pompy Sridhar, India director at MSD for Mothers, a $500 million global initiative focussed on ending preventable maternal mortality, by US-based pharma firm Merck.

Mindful that most maternal deaths occur due to factors such as postpartum bleeding for which there are known cures, the government of Rajasthan has been actively investing in public health care facilities. It has also been incentivising women to deliver at such centres, rather than at home. While the efforts have yielded results—the maternal mortality rate in Rajasthan has fallen by 22 percent since 2010-2012—it's far from enough.

A quirk of law requires public health facilities in India to meet certain quality accreditation standards to get insurance reimbursements, but private health facilities aren't held to the same standards. So the latter remain unregulated and lack standard operating procedures, explains Sridhar. With studies indicating that more than 50 percent women access health care in private facilities, rather than public ones, it was clear to MSD for Mothers that to see a reduction in maternal mortality rates, the quality of care at private hospitals had to be upped.

Rather than traditional grants or charitable donations to NGOs, MSD for Mothers tied up with a number of partners to launch the world's first development impact bond (DIB) in health care. Dubbed 'Utkrisht', or excellence in Hindi, the $3 million (₹21 crore) bond is funded upfront by UBS Optimus Foundation, the Swiss wealth management firm's grant-making arm. NGOs Population Services International (PSI) and Hindustan Latex Family Planning Promotion Trust will use this working capital to deliver quality interventions in private health facilities in Rajasthan.

If certain predetermined outcomes are met—in this case reach up to 600,000 pregnant women across 440 private health care facilities to avert up to 10,000 maternal and newborn deaths over a three-year period—philanthropic donors MSD for Mothers and the United States Agency for International Development will repay UBS Optimus Foundation the principal amount plus 8 percent interest. If the objectives aren't met, UBS Optimus Foundation risks losing all or some of its money. Palladium, an advisory and management organisation that designed the bond, will manage its implementation over three years. If the targets are met, the Rajasthan government has pledged to come on board in years four and five to procure those outcomes themselves.

Announced in November 2017, operations kicked off this April. So far, around 500 private health care facilities in five districts across the state have been mapped to ascertain whether they meet certain eligibility criteria, says Pritpal Marjara, managing director at PSI. Of these, 57 have been found to make the cut for inclusion into the programme. Once the targeted number of facilities have been identified by the two NGOs (by December), the work of actually providing the upgraded amenities, training and support will begin.

Does this new way of funding improve the way work is done on the ground? "It's not that we are suddenly more efficient just because a bond is in place, rather than a donation," says Marjara. "But because the bond is focussed on achieving outcomes, it leaves us to do what we do best—work with health care facilities, rather than worry about reporting back to the donor on how the inputs were used." Grantors or donors of charitable projects generally ensure that money is not wasted by keeping track of the inputs, such as number of vaccinations given or teachers trained, for example. But whether the intervention actually did good often remains unclear.

Moreover, because each of the implementing partners has committed a total of 20 percent of the capital required, everybody has their "skin in the game", points out Sridhar of MSD for Mothers.

This method of aligning the interests of all stakeholders and then paying for results via a development impact bond has seen success previously, albeit in education. Three years ago, UBS Optimus Foundation provided the funds—through a DIB—to Educate Girls, an NGO tasked with enrolling out-of-school girls in Rajasthan into primary and upper primary schools. The results of the pilot project announced in July this year showed that 92 percent of all girls identified in the programme area were enrolled in school, with their progress being measured on outcomes such as attendance and proficiency in English, Hindi and mathematics.

The challenge, however, will be to go from succeeding at pilot projects to creating scalable solutions, says Neera Nundy, co-founder at Mumbai-based not-for-profit Dasra that focuses on strategic philanthropy. According to her, in order to move from the margins to the mainstream, DIBs will not just need to bring accountability and measurability of outcomes to the table, but also cost efficiency—that is, the per unit cost of delivering the desired outcomes at scale should be feasible. "As soon as you can do these three things, you can unlock government funding, which is the ultimate pot of cash that is going to move the needle on our development outcomes," explains Nundy.

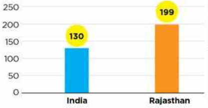
Equally important is unlocking private sector funding. As far as the Utkrisht bond and the DIB extended to Educate Girls go, Sietse Wouters, programme director, innovative finance at UBS Optimus Foundation, says initial investors have been "socially motivated individuals" and organisations with an "appetite for risk", or those who are willing to sacrifice some, if not all, financial returns in exchange for potential social gains. DIBs enable NGOs and governments to access the funding they need to roll interventions while staying focussed on the outcomes, says Wouters, "It shifts risk from implementing partners [NGOs/service providers] and governments to private investors."

That said, Nundy is quick to warn that with DIBs, "We need to make sure we are unlocking new money, and not just redirecting money that would otherwise be philanthropy. We have got to make the pie bigger, not just restructure the pie."

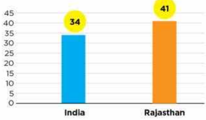
If indeed this can be achieved, then complicated and time-consuming to structure as DIBs maybe—the Utkrisht bond took a year and a half to design, including identifying the outcomes that can be tracked and measured—they can be a force for good. Rajasthani women will not be the only ones breathing easier.

SOMBRE STATS

MATERNAL MORTALITY RATIO IN 2014-16
(Per 100,000 live births)



INFANT MORTALITY RATE IN 2016
(Per 1,000 live births)



Source: *Niti Aayog*

OLD PROBLEMS, NEW SOLUTIONS

According to a recent UN report, $1.4 trillion (around ₹100 lakh crore) of extra funding will be needed each year for low- and middle-income countries to reach the ambitious sustainable development goals by 2030. Innovative financial instruments will play a critical role in bridging this massive gap. Here's a roundup of some of them:

1. Impact Investment Funds
While funds such as these that pool together private capital to invest in businesses in return for financial benefit as well as social outcomes have been around for more than a decade, they're now increasingly mainstream. Consider the $2 billion Rise Fund launched by US-based private equity firm TPG Growth in December 2016, as well as similar funds by biggies like BlackRock, Bain Capital and Bank of America Merrill Lynch.

2. Social Impact Bonds
These loans are similar in design to development impact bonds and in fact, preceded them. The difference being that instead of private philanthropists repaying the loans if the outcomes are met, national governments shell out the monies.

3. Social Success Notes
Social businesses operating in high impact but usually low-margin areas often find it difficult to attract traditional capital. Social Success Notes make it attractive for private investors to fund social businesses. They work as follows: A private investor makes capital available upfront to a social business. A philanthropist such as a foundation agrees to repay the investor with no additional return. However, if the social business achieves a predetermined social outcome, the philanthropist provides the investor with an additional return or 'outcome payment'. The interests of the three parties are thus aligned.

4. Outbreak and Epidemic Insurance Schemes
The Ebola crisis that struck western Africa a few years ago served as a trigger for the African Risk Capacity (ARC)—a specialised agency of the African Union—to develop a solution that could meet the immediate funding requirements created by natural disasters, without relying on national governments, international organisations or humanitarian appeals. Launched in 2017, ARC's insurance product for outbreaks and epidemics enables African governments to tap into global capital markets when the early signs of disease are detected. Insured countries receive immediate payouts to help manage the crisis.

What The Doctor Ordered

A combination of telemedicine and on-the-ground presence, along with an asset-light model, are helping Gramin Healthcare scale its primary health care model in rural areas

By MONICA BATHIJA

On a hot, humid August day in Nalvi Kalan village in Haryana's Karnal district, a portion of a primary school is being used for a health camp. For two days before this, Seema, a nurse who is now checking a woman's eyesight using charts suitable for the unschooled, went around the village with a megaphone, announcing the camp. Announcements were also made at the school so that children could tell their parents about it; today women and men, children in tow, are lining up to register for a health card that will give them access to primary health care all year round. A doctor and two nurses conduct various basic tests, including blood pressure, ECG and vision. Villagers can also buy ayurvedic medicines and prescription glasses at the camp.

A camp like this is the last mile in Gramin Healthcare's model of providing primary health care in rural India which, since it was started in September 2015, has set up 110 primary health care centres in six states; one centre is for a cluster of ten villages or so. These aim to provide villagers, who would otherwise go to a local medicine man or travel to the nearest town, with institutionalised health care closer home. Twice a week, the staff head out to individual villages to hold camps, while also maintaining digital health records of all the card holders.

"People in villages have to travel to hospitals or clinics, which not only costs them money but also a day or half a day of work. It's worse for women who depend on their husbands to take them to the doctor. This way, the women can come over themselves. The camp also makes it easier for senior citizens," says Sonia Vohra, head of operations, Gramin Healthcare.

A few kilometres away, in the compound of a Skill Development Centre, is a space rented by Gramin for a centre where a nurse is on hand and can do about 30 tests. For further consultation and prescriptions, she is equipped with a tablet that she uses to connect via an audio or video call with a doctor from the Gramin team based in Gurugram. It is where Rajni, 32, who is among the women learning embroidery and stitching at the centre and where a camp specifically for women was held a month ago, registered for a card. Her husband, a rickshaw driver, has hernia. Since registering, she has brought her children and him to the centre a couple of times.

The card currently costs ₹120 (with ₹100 often sponsored) and entitles a family of four to check-ups and consultations for a year. Though the card was launched only in August last year, Gramin founder Ajoy Khandheria says he was clear from the beginning that it would be a paid-for model, not just to be able to scale but also to ensure it's not charity. "I think non-profit organisations do not scale up and if you scale up, somebody questions if it is really non-profit. I'm saying I'm a for-profit organisation. Therefore, if I am doing this correctly,

"The people I'm serving are not being served on charity, they are being served on merit."

AJOY KHANDHERIA, founder, Gramin Healthcare

PHOTOGRAPHS: MADHU KAPPARATH

Clockwise from left: Gramin Healthcare's polyclinic in Karnal has state-of-the-art dental facilities; a woman undergoes an eye check-up at a camp in Nalvi Kalan village; nurse Sunita at the IFFCO Bazaar in Nigdhu

if I am able to make money, I will be able to scale up. I don't need charity to grow; I am growing and the people I'm serving are not being served on charity, they are being served on merit," says Khandheria, 57, who has over 25 years of experience in building telecom, telematics, and health care businesses. He launched Gramin after hearing "horror" stories from people in fertiliser cooperative IFFCO, with which it has partnered to set up the centres.

While there are a few standalones like the one at the Skill Development Centre, most of Gramin's centres are in IFFCO Bazaars that the cooperative started setting up in 2016 to take fertilisers and education about farming processes to farmers. "We always wanted to provide health care facilities to all our stakeholders. Our association with Gramin Healthcare started about two years ago. We started with telemedicine, mobile vans, etc. Once we started rolling out our IFFCO Bazaars, we decided to offer a shop-in-shop health care clinic to our stakeholders, the farmers of India," says Manish Gupta, director (strategy and joint ventures), IFFCO, which also picked up a 26 percent stake in Gramin last April.

Nurse Sunita has been working at the IFFCO Bazaar in Nigdhu for about a year and a half. "People come in with complaints of joint pain, fever, blood pressure," says Sunita, recollecting how a farmer with extreme pain was referred to a hospital.

The company has also partnered with nearby hospitals where a card holder can get a 40-60 percent discount, says Vohra. The idea is to keep the model asset and capital light and focus on building primary care to the level of secondary. "We believe we can make a modest profit with scale, with deeper penetration," says Khandheria. Besides cards and partnerships with hospitals, other revenue streams include sale of medicines, spectacles and services at subsidised rates. On the cards is a partnership with manufacturers of biodegradable sanitary pads.

"I don't think people have a clue about the extent of the issue when it comes to primary care in rural India. A study by World Bank economist Jishnu Das revealed some shocking figures—80 percent-plus practitioners of primary health care in rural India don't have any kind of medical-related qualifications," says Muralidharan M Nair, health care advisory, EY India, while stressing on the need for trained professionals and the government to take the lead. "The right-skilled persons need to be supplemented by technological tools like artificial intelligence and cost-effective diagnostics as well as access to specialist advice." Another challenge, says Nair, "Is how do you get people to work there? That is also where you will have to innovate and create."

Taking the centre's model forward, Gramin is now also setting up polyclinics, aiming for one for every 10 centres; besides consultation with doctors, they will also offer dental and physiotherapy services as well as a pharmacy and day care facilities. "Secondary (care) onwards there will be other people who will do that. But in primary care I will do everything—vision, dental, physio, pain management. If somebody has a slip disc in a village, he requires pain management, he requires physio. Every human being requires a dentist. And you don't have high quality facilities available for this. We will provide that in the clinics," says Khandheria.

The first of its clinics in rural areas (there is one at its office in Gurugram that serves delivery boys and other staff), in Karnal town, is a cheery space with orange and grey walls and state-of-the-art facilities. Polyclinics also help address the manpower challenge. "Every aspiring health care professional wants to work in a city... working in primary care is not career-enhancing. So we decided for every 10 primary centres we will have a polyclinic. It will be larger, fancier, and a place where doctors and other health care professionals are happy to be working. These are lessons we have learnt over time and are modifying the model," says Khandheria who started Gramin with his own funds, an investment of about ₹1.5 crore.

Though there are others like

Gramin Healthcare founder Ajoy Khandheria now aims to provide quality care by setting up polyclinics

Rajasthan-based Karma Healthcare working in the space, IFFCO's local presence and influence have helped Gramin scale. Gramin reported a revenue of ₹1 crore in 2017-2018 and is looking at ₹5 crore for 2018-2019.

It is also in talks to employ its model for truck drivers at petrol pumps. "Many of the truckers probably have more problems... they have a posture that gets damaged because they are driving 12 hours a day. But they cannot take time out to go to a doctor because they need to be at a particular place at a particular time. So if we can be there for them and if we can help them out there it works out well. So a lot of innovation from being on the ground and learning," says Khandheria. Their physical presence in villages

"We always wanted to provide health care facilities to all our stakeholders (farmers)."

MANISH GUPTA, director (strategy and joint ventures), IFFCO

through the camps means they can also create awareness about the Ayushman Bharat scheme announced by the government recently.

"With the emergence of non-communicable diseases and chronic ones, there is a growing need for care for these kind of illnessess. The model increases the outreach of medical services using nurses as the point of contact. With the India situation—few doctors and a larger population—and doctors unwilling to go to rural areas, this is a reasonable model," says Dr Abhay Bang, who works in the field of community health in the villages of Gadchiroli, adding that patient uptake is key.

With a team of 15-20 doctors and 110-plus nurses, Gramin has grown to 250,000 unique patients a year and is looking to get to about 5 million unique patients a year in three years. Considering the target audience for primary health care in India is about 700 million people, 5 million, says Khandheria, is not a big number. "If there are ten companies doing it, we have addressed 50 million. We are nowhere. Five million sounds like a huge number but it is less than one percent of the target audience. And which successful businessperson can be considered successful with one percent market share?"

A Healthy Future

The time has come for India to build a robust health care system with heavy infusion of technologies and ensure equitable access to all citizens

By NALINIKANTH GOLLAGUNTA

Shahpara village in West Bengal isn't used to the attention it has been getting since Rukhsar Khatoon was identified as the last reported case of polio in the country. From 50 percent of the world's polio cases in 2009 to zilch in 2011, India's polio eradication programme has been a remarkable feat—an inspiring case showcasing how governments, private enterprises and NGOs can mobilise 2 million health workers to deliver 170 million vaccinations every year.

But despite substantial progress in the past decade, India continues to contribute disproportionately to the global disease burden, especially in non-communicable ones. Access to health care is inadequate, quality of services varies considerably as regulatory standards are not defined and enforced, and affordability is a serious problem for most given that 70 percent of care is paid out-of-pocket.

The government has launched a series of initiatives, including Ayushman Bharat, one of the biggest moves in India's journey towards universal health care coverage. Here are a few targeted accelerators that can help us get there faster:

BRIDGE THE GAP WITH TECH

Health care in India is characterised by limited resources servicing large needs. Digital solutions can address these gaps as they are asset-light and can easily be scaled up. They can overcome fundamental barriers to access, cost and quality, and help drive better clinical outcomes and customer experience. To meet the aspirations of Ayushman Bharat, strengthening our primary health care (PHC) infrastructure, skilling their workforce and digitally connecting them to tertiary centres will be critical. We should see the emergence of a Digital PHC to provide comprehensive care, essential drugs for free and diagnostic services. Our partnership with Tricog for cloud-connected ECG devices in under-served locations is helping detect heart complications at scale. Similarly, CritiNext—an eICU solution by Fortis in partnership with GE Healthcare—manages over 150 ICU beds, treating over 500 critical patients every month.

In health care, limited resources service large needs. Digital solutions can address these gaps

LEVERAGE PRIVATE SECTOR

Reasonable health insurance coverage will trigger a steep rise in demand for tertiary infrastructure. As the largest and oldest health care public-private partnership (PPP) player in the country, we believe this can drive positive health outcomes at scale—PPPs in Assam, Andhra Pradesh, Rajasthan and West Bengal are testimony to that. The government must innovate similar PPP-based models to expand into maternal and infant care, oncology and cardiology.

TECH CAN LEAPFROG SKILL GAPS

Artificial intelligence (AI) and machine learning (ML) are helping interpret diseases accurately and faster. Startups like Arterys have proven that AI and ML can augment the radiologist's effectiveness in interpreting scans and eventually aid in task-shifting. With advances in wearable health devices, we should see a paradigm shift from 'hospital-centric' to 'patient-centric' models.

SKILLING AT SCALE

Mixing traditional methods with augmented reality (AR) and virtual reality (VR): Taking inspiration from the Skill India initiative, GE launched its Yogya Bharat Aarogya Bharat initiative in 2015. Having trained and placed thousands of students in health care institutions, we must now leverage advanced simulation and AR/VR tools to improve scalability of skilling programmes. Recent efforts such as Microsoft HoloLens have shown a lot of promise in this direction.

It's time for India to build a robust health care system with heavy infusion of technologies. If implemented properly, in the next 10 to 15 years, people in Shahpara will stand a chance to get the same level of care as delivered in Bengaluru. That is the future we should aspire for.

(The writer is president and CEO, GE Healthcare, South Asia)

EXACT SCIENCES

Maybe You Don't Need a Colonoscopy

Exact Sciences has a pretty good test for cancer. Gastroenterologists are unenthusiastic

By MICHELA TINDERA

Three years ago Kevin Conroy was standing on Ireland's Cliffs of Moher, gazing at the Atlantic Ocean 500 feet below, when he was blindsided by a phone call about his company's colon cancer test.

Since 2009 Conroy has been running Exact Sciences, a firm trying to sell a non-invasive would-be alternative to a colonoscopy. The caller informed him that the influential US Preventive Services Task Force had declined to recommend the Exact test as a cancer-screening tool, which meant it would not be covered by health plans under the Affordable Care Act. "Our stock took a massive hit," says Conroy, 52. "It was surprising. In many ways energising, though."

Energised, Conroy sent in more data. In 2016 the task force gave the Exact test a green light. Exact's share price is now more than triple what it was before the task force brush-off.

There are three main ways to detect colon cancer. A colonoscopy is accurate but expensive ($2,200 on average). A faecal immunochemical test, which looks for hidden blood in a stool sample, costs about $60 but is more likely to miss cancer and must be taken every year. Then there is Exact's Cologuard for $649.

Like the immunochemical test, Cologuard uses a stool sample collected by the patient and checks for haemoglobin. It also looks for an assortment of aberrant DNA sequences that are likely to occur in cancerous and pre-cancerous cells. Result: High enough sensitivity that patients can take the test only once every three years.

Cologuard's false-negative rate is 8 percent and its false-positive rate is 13 percent. Back-of-the-envelope math: Among 100,000 people who take the test once, 90 might have colorectal cancer, and Cologuard will catch all but seven of those cases. It will also send 13,000 healthy people off with worries and instructions to follow up with a colonoscopy. But then Cologuard has spared 87,000 customers the unpleasantness of a colonoscopy prep day.

Catching colon cancer early matters. The five-year survival rate for patients diagnosed at stage 1 is 92 percent, but for stage 4 that drops to just 11 percent, according to the National Cancer Institute. Colorectal cancer kills more than 50,000 Americans a year. And still only about 65 percent of those who should get screened for colon cancer do. Maybe Cologuard can change that.

Conroy was approached about the Exact Sciences job in 2009 after he sold his previous diagnostics company, Third Wave Technologies, to Hologic for $580 million. Exact had "no product, no meaningful intellectual property and no scientist", he says. The company had been studying DNA markers since 1995 but didn't have a marketable test.

Two things persuaded Conroy to sign up. One was that the company would move from Marlborough, Massachusetts, to Madison, Wisconsin, where he lives. The other was a compelling argument from a Mayo Clinic researcher,

Chief Executive Kevin Conroy aims to use his $1 billion cash pile to try to develop a blood test to detect diseases like lung cancer and liver cancer

Dr David Ahlquist, that adding different DNA markers to the test panel could dramatically improve Cologuard's sensitivity. Ahlquist has a financial interest in Exact.

Conroy hatched an unprecedented plan. Until then, companies had done one clinical trial to get approval from the Food & Drug Administration (FDA) and a second to convince the Centers for Medicare & Medicaid Services to pay for the test. This would have been so expensive and time-consuming, Conroy says, that Exact would have gone out of business. So he persuaded the bureaucrats to let Exact do one.

The trial, using samples from 10,000 patients, was enough to get FDA and then Medicare approval in 2014. The American Cancer Society recommended the test shortly thereafter, and the nod from the Preventive Services Task Force followed in 2016. (Exact has donated $15,000 since 2016 to the American Cancer Society.)

But there is yet one more gauntlet for Exact to run: The Multi-Society Task Force, which represents gastroenterologists. (Exact has donated over $30,000 to a group involved in the task force.) That panel gives Cologuard a "tier 2" recommendation, compared with "tier 1" for the immunochemical test and the colonoscopy. The group wants long-term studies that show Cologuard saves lives. It also says a Cologuard test every three years costs more than the cheaper stool test every year.

That may be so, but in fact many people go directly to colonoscopies without any pre-screening via stool samples, and that's a very expensive way to prevent cancer deaths.

Plenty of others get no testing. Susan Pickering of Milwaukee avoided having a colonoscopy for 12 years until she was finally persuaded by a friend, at age 62, to use the Cologuard kit her doctor had prescribed. After months of letting it sit around her house, she ended up testing positive and was diagnosed with stage 2 colon cancer in 2017. After surgery and chemotherapy, she has no detectable cancer.

Says Mayo's Ahlquist: "As a gastroenterologist I've been dismayed, reflecting my feeling about how my GI colleagues across the country have responded defensively to the emergence of Cologuard. They've looked at it from the onset as a threat rather than as a tool that their patients can use regularly."

There's also an insurance problem. Because the Affordable Care Act mandates coverage of colon cancer screening, 85 percent of patients have no out-of-pocket cost for Cologuard. But those who test positive then need a colonoscopy. And this second, more expensive procedure is not covered by some plans.

Chief Executive Kevin Conroy in a specimen-processing area at Exact Sciences in Madison, Wisconsin. Exact is building a second facility that could process 4.5 million colon cancer screening tests a year

TIMOTHY ARCHIBALD FOR FORBES

With big marketing expenses (it recently hired singer Harry Connick Jr as a spokesperson), Exact lost $39 million on revenue of $90 million in the first quarter of 2018. Still, its $7.3 billion market value means there are a lot of believers in both Cologuard and whatever comes next.

Conroy aims to use his $1 billion cash pile to try to develop a blood test to detect diseases like lung cancer and liver cancer. Exact has competition from well-funded startups like Grail and Guardant Health.

"This is transformational. If you can do it, you must do it," says Ahlquist. "There's enough convergence of technology now where this is realisable. Is it going to be easy? Absolutely not. It's going to be hard, but we can get through this." F

AIRBUS

Flying with Airbus

The domestic business accelerator unit of the European aircraft manufacturer is giving wings to startups in India

By ANSHUL DHAMIJA

Last year proved to be a momentous one for Neewee, a four-year-old startup based out of Bengaluru's IT hub of Whitefield, which develops industrial analytics software for the manufacturing industry. Co-founded by Harsimrat Bhasin, 47, it was selected to be a part of Airbus BizLab India, the business accelerator of the €60-billion aircraft manufacturer Airbus.

Based in Bengaluru, Airbus BizLab India was launched in January 2016. It offers a six-month accelerator programme through which startups get access to free office space, dedicated coaches to handhold them as well as access to a pool of mentors and experts from within Airbus, and outside the company, to help them with industry knowhow. This was Airbus BizLab's third facility—the first two were in Toulouse, France (2015) and Hamburg, Germany (2015)—and the only one outside Europe, the home turf of Airbus. A fourth centre was recently inaugurated in Madrid, Spain.

"Before coming to BizLab, we had done a few pilots [projects],"

From left: Harsimrat Bhasin, Prem Kumar, Gucchu Gul Lalwani, Aruna Schwarz, Siddharth Balachandran, Neeraj Waghchaure, Pradipta Kishore Sahoo and Soham Narayan Patel at Airbus BizLab India

PHOTOGRAPHS: NISHANT RATNAKAR FOR FORBES INDIA says Bhasin, who is also the chief operating officer of Neewee. Little did he know that the six-month stint with BizLab in 2017, would prove to be the turning point in the startup's journey. The European aerospace major eventually became his firm's biggest client. Neewee's software product helps manufacturing companies increase cost efficiencies across the supply chain, improve on delivery rates and reduce quality issues.

"Roughly, each [Airbus] aircraft has about 4 million parts, which means several suppliers across the globe," says Siddharth Balachandran, leader, Airbus BizLab India. "With a supply chain analytics startup like Neewee, we saw there could be a requirement from our procurement team and hence brought them on board."

During the programme in Bengaluru, two employees of Airbus India's procurement team mentored team Neewee and helped in piloting the company's software with a tier 1 supplier of Airbus. Following the successful completion of that pilot project, Neewee has now deployed its industrial analytics software at an Airbus manufacturing facility in Hamburg. "The [accelerator] programme gave us access to a client like Airbus. That kind of validation has opened the doors to other clients," says Bhasin.

Similarly, three other startups from the accelerator programme have gone on to sign partnerships with various affiliate companies of Airbus. Besides, a two-member team from Airbus India's engineering division in Bengaluru is in the process of setting up its own startup. This comes in the wake of an idea for creating a consumer product for flyers being finetuned at Airbus BizLab India. Over the last two years, the business accelerator has mentored 16 startups.

Balachandran, who joined Airbus BizLab India in mid-2016, believes it's the accelerator's job to identify technology startups and connect them to the right teams within Airbus. "I'm sure a lot of founders have previously tried to reach out to different teams in Airbus. But finding the right person and the right team from outside is a challenge," he says.

Stelae Technologies, part of the same batch as Neewee for the programme, signed a partnership with Navblue, a wholly-owned Airbus subsidiary in July. Navblue is an integrated flight operations and air traffic management services company. The Chennai-headquartered Stelae is helping it in its digital transformation drive.

Co-founded by Aruna Schwarz, 55, in 2007, Stelae is an enterprise software product company that transforms unstructured documents (like PDFs) to structured, searchable and analysable outputs like Json (for big data), S1000d and ATA (for the aerospace and defence sectors) and DITA (for manufacturing). Though it has the Indian Air Force as a client, getting accepted by Airbus BizLab India was critical to the company. "Mentoring and coaching were less important for us. It was about getting Airbus as a customer," admits Schwarz. For any small company or startup, trying to get a foothold into Airbus, adds Schwarz, could take 50 years. "This [Airbus BizLab] really hastened that," she says.

Like Stelae, Eflight, a three-year-old Bengaluru-based startup, was also focussed on having Airbus as a partner. "We knew we needed a branded global company [as a partner/client] for us to expand. As a startup, the brand factor is always a question mark," says Prem Kumar, 42, co-founder and business development head of Eflight, which was incorporated in 2015.

With its web-based, cloud software application, the startup has digitised the flight planning process—filing of departure time, the aircraft's speed and altitude—for pilots operating chartered flights. It also provides trip support services such as ordering fuel and booking hotel rooms.

Over the last three years, Eflight has handled around 75,000 chartered flights and has been generating revenues. And just as Kumar had hoped for, after graduating from Airbus BizLab India, Eflight became the official India reseller of Navblue's aeronautical charts—airport maps and terminal charts.

It is also helping Navblue develop aeronautical charts for smaller airports in India; approximately 50 airports in India, such as Hosur (Tamil Nadu) and the Jindal Vijaynagar Airport or Vidyanagar Airport (Karnataka), don't have aeronautical maps. With this partnership, Navblue intends to build its presence in India where rival Jeppesen, a Boeing

Formidable Partnerships

Neewee (2014)
Co-founder: Harsimrat Bhasin
Product: Industrial analytics software
Utility: An Airbus manufacturing facility in Hamburg, Germany, is using Neewee's software, which increases cost efficiencies across the supply chain, improves delivery rates, and reduces quality issues

Eflight (2015)
Co-founder: Prem Kumar
Product: ATC flight planning and trip support software for charter flights
Utility: Navblue, an Airbus subsidiary, has designated Eflight as the India reseller of its aeronautical charts. In addition, Eflight will develop aeronautical charts for smaller Indian airports

Airpix (2013)
Co-founder: Neeraj Waghchaure
Product: 3D drone data analytics
Utility: Airbus Aerial, an imagery services subsidiary of Airbus, has signed a go-to-market partnership with Airpix for the India market

Stelae Technologies (2007)
Co-founder: Stelae Technologies
Product: Enterprise software
Utility: Navblue, an Airbus subsidiary, has signed on Stelae Technologies to help with its digital transformation

CHAITANYA DINESH SURPUR

company, has an overwhelming dominance. "Navblue now wants to disrupt that," says Kumar.

Typically, Airbus BizLab does not work with very early-stage startups. It looks for those companies that already have a product out in the market or have a ready prototype. That said, Airbus BizLab likes to call itself a hybrid accelerator. "We don't work only with startups; we also work with our internal teams and encourage them to come up with innovative ideas that we can transform into a viable business," explains Balachandran.

Such encouragement has borne results. Sometime in 2016, Soham Narayan Patel, 32, and Pradipta Kishore Sahoo, 37, both engineers at Airbus India in Bengaluru, discussed the pain points of economy class flyers over a cup of tea in office. "On long-haul fights, after three hours or so, you start getting back pain and leg pain as the economy seats aren't good enough for sleeping," says Patel. His chat with Sahoo was about how they could modify the seat and make it more comfortable. They sketched an ergonomically designed seat and sent their idea to Airbus BizLab India. While the idea was welcomed, the seat could not be developed in quick time.

"We found out that the certification of an aircraft seat would take at least two years. So we pivoted from modifying a seat to designing a comfort kit, which a traveller can carry as hand luggage," says Patel. The comfort kit, adds Patel, would make it easy for economy class travellers to sleep in different postures. Weighing under 700 grams and about the size of a 15-inch laptop, the foam-based product is under patent filing. "There is potential. And since it [the product] has a bigger [addressable] market, we are helping this team spin out and form a startup of its own," says Balachandran.

Airbus BizLab India does not only consider startups in the aerospace sector. "What we need is a technology solution or product that can help any of our teams [within Airbus] do their

"We work with our own teams and encourage them to come up with ideas that can turn into a business."

SIDDHARTH BALACHANDRAN, LEADER, AIRBUS BIZLAB INDIA

"Mentoring and coaching were less important for us. It was about getting Airbus as a customer."

ARUNA SCHWARZ, CO-FOUNDER, STELAE TECHNOLOGIES

job better or that can be adapted for our sector," adds Balachandran.

Airpix, a five-year-old 3D drone data analytics startup, recently signed a go-to market partnership with Airbus Aerial, an imagery services subsidiary of Airbus, for the India market. Founded in 2013, Airpix has aggregated a pool of drone pilots across India who capture images (still, video as well as thermal), all of which are then analysed for different purposes across various industries. For example, with the help of drone imagery, Airpix carries out blade inspections of wind turbines.

To date, Airpix has undertaken 200 projects for 70 customers, a majority of them being government projects. For the Indian Railways, it periodically captures images on the progress of the laying of rail tracks across the country. On an average, Airpix captures and analyses data for projects that spread across 10 and 100 square kilometres. Now, Airpix is thinking big: Analysing data of projects that are 1,000 square kilometres and more. "In order to acquire a largescale project, we need certain credibility and partnering with a company like Airbus does that," says Neeraj Waghchaure, 27, co-founder, Airpix. Airbus Aerial, which itself collects, analyses and distributes high-resolution satellite images as actionable data, now gets an entry into the India market through Airpix.

"For the last couple of years, I have been convinced with the potential and quality of entrepreneurs in India," said Bruno Gutierres, global head, Airbus BizLab, while announcing some of the India partnerships in July. "I am pleased to see that all these partnerships between Airbus and Indian startups are proving me right."

The next accelerator programme at Airbus BizLab India starts in October for which the selection of startups is under way. Airbus shortlists 20 startups from its pool of applicants and invites them for a two-day boot camp. Once that's over, a jury comprising senior Airbus management picks the top five or six to be a part of the programme. "For Airbus, the core focus through BizLab isn't revenue. Our focus is on innovation and new technologies and how they can help revolutionise the way we do things," says Balachandaran.

AVIATION & TOURISM

Flying High

As mainland money and visitors pour into Cambodia, China backs two new airports. Too bad about the French company that had an exclusive concession

By DANIELLE KEETON-OLSEN

The future of Cambodia's economy, as Tekreth Samrach, chairman of the government-controlled flagship airline, sees it, is in tourism. And thanks to China, tourism, like many sectors in the economy, is surging. "To be frank, everyone goes to China to make money," he says from his office decked with pilot caps and model planes. "So we have to go to China to make money, too."

Following that logic, the government appears to be making a sharp break from its long-standing partnership with French infrastructure conglomerate Vinci. It's drafting plans and starting work on two new airports backed by mainland money, despite granting an exclusive, 45-year concession on international airports to a company majority-owned by Vinci. That concession isn't supposed to end until 2040. The government's move is meant to address the rapid rise in tourism, but it also reflects Cambodia's increasingly enthusiastic embrace of booming Chinese investment.

One of the new airports will serve tourism centre Siem Reap and the nearby 1,000-year-old temples. The government signed an agreement in 2016 with Chinese company Yunnan Investment Group and two others from Yunnan Province to invest in and build the project. Since March they have been prepping 750 hectares to the southeast of the Unesco World Heritage site. On the company's website, the group's chairman, Sun Yun, called it "a benchmark project for the Belt and Road Initiative", referring to China's development strategy to connect Eurasia in trade and transportation, with president Xi Jinping at the helm.

The plan for the second airport, in Phnom Penh, is more audacious. Announced in January, this project will be a joint venture between

The existing Siem Reap airport, owned by Cambodia Airports, has been expanded to cater to the tourist boom.

KANOKRATNOK / SHUTTERSTOCK

Cambodian developer Overseas Cambodia Investment Corp, or OCIC, and the State Secretariat of Civil Aviation, and built on 2,600 hectares of open land. The airport itself will cover 700 hectares and the rest will become an "airport city," with a special economic zone, industrial area and housing developments, according to the secretariat's deputy director-general, Sinn Chanserey Vutha. OCIC will invest $280 million, but the bulk of the funding, $1.1 billion, will come from the Bank of China, he says.

Both Sinn and Tekreth say they have few details about the Phnom Penh plans because the airport was directly ordered and arranged by prime minister Hun Sen. OCIC representatives declined to comment; the company is owned by Pung Kheav Se, a local tycoon and chairman of the country's second-largest commercial bank, Canadia.

Cambodia Airports just spent $130 million on its Phnom Penh and Siem Reap airports to handle at least 5 million passengers a year

As of now, the company holding the airport concession, Cambodia Airports, 70 percent of which is owned by Vinci and the rest by two Cambodian tycoons and a Malaysian company, won't be involved in either of the new airports. But Eric Delobel, Cambodia Airports chief executive, exudes confidence, saying his company will "accelerate and intensify" investment and development at its three airports regardless of whether the concession ends. He says negotiations are under way but won't reveal details.

Though Cambodia's aviation market is far smaller than Vinci's largest markets in Japan and elsewhere, it's important because it's growing so quickly. Vinci, which generated $48 billion in revenue last year, enjoyed a 25 percent jump in traffic to 8.8 million passengers at its Cambodian airports, the fastest growth of any of its markets.

Cambodia Airports is counting on more traffic. It just spent $130 million to expand its Phnom Penh and Siem Reap airports so they can each handle at least 5 million passengers a year. At the company's headquarters on Phnom Penh's outskirts, now painted a light, clean grey as part of the upgrade, Delobel outlined the company's efforts to train the workforce, add connecting flights and pursue other ways to bring in more passengers. "We are very open to discussing with [the government] the future development of those airports," he says. "What has to be stressed to them is that today, in terms of capacity, we just achieved in 2016 and 2017 a vast development programme."

The expansion doubled capacity at the two airports, but the number of passengers coming through Cambodia's international airports has grown by at least 10 percent annually for the last seven years. "There will be some limitations at some point, so [within the government] there's a desire to transition to a new airport sooner," says Capa Centre for Aviation chief analyst Brendan Sobie.

He's not sure, however, that Phnom Penh and Siem Reap can each support two airports, if the two China-backed airports are built. One way would be for an airport to emerge as a regional hub, but Cambodia's small population and the lack of a major flagship carrier works against that. Southeast Asia's primary airports are swiftly reaching capacity as tourism and investment continue to skyrocket. But even if one of their airlines decided to set up a secondary hub outside its country, there would be plenty of competition for that business around the region. "[Competing airports] work in places like Bangkok, but maybe Phnom Penh isn't a city that could support that," he says.

The new airports face other obstacles. Phnom Penh's airport could stall amid a fresh dispute over the land between local villagers and rice growers and the government. Sinn, the civil aviation official, maintains that the land is owned by OCIC. Even if the conflict is resolved, says Sobie, the airport's construction could take a decade, allowing time to resolve Cambodia Airports' concession.

The concession always included a stipulation to build a new airport in Siem Reap, according to Tekreth, the chairman of Cambodia Angkor Air and also the secretary of state of the government's council of ministers. But Sobie says the government is not sending a good message to investors by seemingly ending a concession with no evidence that the public-private partnership failed.

Meanwhile, Cambodia's tourism industry continues to soar. It generated $3.6 billion in revenue last year, or 12.3 percent of gross domestic product. And the mainland accounts for much of the sector's potential. More than a million Chinese toured Cambodia last year,


Lofty plans: Cambodian Prime Minister Hun Sen (left) and Pung Kheav Se, owner of OCIC, a partner in the airport development

and the government aims to double that number by 2020. Cambodia's economy has traditionally relied on the garment industry, but growth in the value of garment exports has steadily declined since 2010, partly because of declining US purchases, according to the World Bank. Recently, the US and European Union threatened sanctions against Cambodia after its Supreme Court dissolved the opposition Cambodia National Rescue Party, months after its candidates were elected in hundreds of communes.

As mainland visitors tour the country in droves, Chinese investors are following. Real estate prices rose in response to news of both airports, but Key Real Estate founder Sorn Seap is sceptical investors will make money anytime soon. Construction is characteristically slow in Cambodia, and in the case of Siem Reap, Sorn says the new airport's location is far from the tourist attractions in the city, so developers will struggle to market businesses near the airport. "I don't think [the airport] is the one factor you should judge to invest nearby," he says.

Overall, Cambodia's economy already leans heavily on China. Not only is China the primary source of investment in the country, at roughly $1 billion of the total $6.3 billion received last year, but China holds 47.5 percent of the country's debt.

One result of the Chinese investment can be seen in Cambodia's port city, Sihanoukville, dubbed a second Macau for its grandiose casinos studding the coast as well as the Chinese money flooding in. North of the port and Kampong Som Bay, a contested environmental protection site, China's Union Development Group will build a $350 million charter airport as part of the company's $3.8 billion investment in the Dara Sakor Seashore Resort. The city's airport, also managed by Cambodia Airports, drew a measly 386,000 passengers in the 12 months ended in March, according to Vinci's first-quarter report, but Sinn says the development of the city makes the small airport worth watching. "Look at Sihanoukville," he quips. "There is a tourism resort, there will be a big port, and another investment will be oil and gas. When we consider all that, we want the Sihanoukville airport to become the biggest in the country."

Tekreth says the country will continue to absorb investment from China, just as other Southeast Asian countries have done. "We need jobs for our people, so we need more investment to follow," he says. "This is the first time in Cambodian history that you see this kind of investment in our country." F

Forbes INDIA
TYCOONS of TOMORROW
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Honouring Excellence

The inaugural Forbes India Tycoons of Tomorrow list celebrates outstanding young entrepreneurs

By TEAM FORBES INDIA

While legacy-led businesses built the basis for an economically independent India, the current generation of entrepreneurs has its eyes set on things beyond profits and popularity. The inaugural Forbes India Tycoons of Tomorrow list celebrates such first- and next-generation entrepreneurs. An eminent jury comprising Ajay Srinivasan, Anil Rai Gupta, Manish Sabharwal, Prashant Purker, Rajendra Srivastava and Rashesh Shah chose these names from a shortlist drawn up by the *Forbes India* team. The list is not a ranking and it has been drawn up after considering factors such as age, experience and their contribution. The tycoons will be felicitated on September 25 at a ceremony in Mumbai, where the issue will be unveiled as well.

JURY SPEAK

"Tycoons know that their success is only a means to a more just, fair and prosperous India. They take risks; they know that the odds of winning the lottery are low, but the odds are zero without buying a ticket."

Manish Sabharwal, co-founder and executive chairman, TeamLease Services

"At present, the emphasis on sustainability is greater than ever before. Hopefully, this would re-orient the connotation of being a tycoon going forward and make the great lords strive also for the larger good of society as a whole."

Prashant Purker, managing director & CEO, ICICI Venture Funds Management Co Ltd

"The tycoons of tomorrow must have a larger vision for life and judiciously use their power for the good. They are the philosophers of 'good life' in the space of political economy."

Rajendra Srivastava, dean, Indian School of Business

"Innovative ideas and grit are the new currency today and the ones with these currencies today will become the tycoon tomorrow."

Anil Rai Gupta, chairman and managing director, Havells India Limited

"Originating from the Japanese word Taikun, the word tycoon automatically brings to mind drivers of change, leaders and success."

Ajay Srinivasan, CEO, Aditya Birla Capital Limited

"The ability to take cognisance of the society at large is what sets apart the tycoon of today from other successful individuals."

Rashesh Shah, chairman, managing director & CEO, Edelweiss Group

FAMILY BUSINESS

True Blue Heirs

How the Muthoot Pappachan Group is transforming the family-owned business of gold loans into a full stack financial services provider

By RAJIV SINGH

The split of the family business of gold loans, started by patriarch Ninan Mathai Muthoot in 1887 as a trading firm in Kerala, was without any fuss. Thomas John Muthoot, 56, vividly remembers how swiftly the umbilical cord was cut in 1979. "Everything ended within 10 minutes."

The three sons of Ninan Mathai sat around a table in their ancestral village building in Kozhencherry and amicably settled the matter. "We were just spectators," recounts the chairman and managing director of Muthoot Pappachan Group (MPG), started by John's father Mathew M Thomas, the youngest of the three brothers fondly known as Muthoot Pappachan.

"Everything was divided into three," recalls John from the third generation. M George Muthoot, the eldest brother of Pappachan,

ARJUN SURESH FOR FORBES INDIA

From left: **Thomas Muthoot**, director, Muthoot Pappachan Group, MD, Muthoot Microfin, and executive director, Muthoot Fincorp; **Thomas George Muthoot**, director, Muthoot Pappachan Group, and MD, Muthoot Capital Services; **Suzannah Muthoot**, zonal strategic consultant (West),

Muthoot Fincorp; **Tina Suzanne George**, associate vice president-finance, Muthoot Capital Services; **Thomas John Muthoot**, chairman and MD, Muthoot Pappachan Group and Muthoot Fincorp; **Thomas Muthoot John**, chief manager-marketing, Group Marketing

"We will not be very aggressive. That's not in our DNA. We are not really bothered about competition. We do things that are correct."

THOMAS JOHN MUTHOOT, 56, CHAIRMAN AND MANAGING DIRECTOR, MPG

"Value is more important than valuation, which is anyway only for a few people. Customers are part of our extended family."

THOMAS GEORGE MUTHOOT, 56, DIRECTOR, MPG

"An NBFC doesn't have to trust the customer. In fact, the customer must trust the NBFC as she is giving away her most prized asset: Gold."

THOMAS MUTHOOT, 52, DIRECTOR, MPG

branched out to Kochi with a red logo of two elephants standing trunk-to-trunk and came to be known as Red Muthoot. The gold loan business run by Pappachan started operations from Thiruvananthapuram and later identified itself as Blue Muthoot because of its blue branding. "It's like Coke and Pepsi," John smiles, "but there's no sibling rivalry."

The partition had another unprecedented element to it: Common ownership of the building in Kozhencherry. On Monday and Tuesday, all transactions through walk-ins accrue to the eldest brother (Red Muthoot). The business of the next two days goes to the second brother (Muthoottu). And Friday and Saturday are for the youngest one—Blue Muthoot. "The arrangement is unique," says John.

Fast forward to 2018. MPG is in the midst of a transformation from a family-run gold loan business to a full stack financial service provider catering to the bottom of the pyramid.

The group has a turnover of a little under ₹3,500 crore, of which Muthoot Fincorp, the gold loan vertical, accounted for ₹2,186 crore in fiscal 2018. In contrast, Muthoot Finance, the flagship gold loan vertical of the red faction, had an income of ₹6,185 crore. Playing catch-up is not a priority for John. "We will not be very aggressive. That's not in our DNA," he asserts. "We do things that are correct."

One of those 'correct' things John may be hoping is Muthoot Microfin. A microfinance company providing loans to low-income woman entrepreneurs, Microfin has emerged as the second biggest revenue contributor to the group in a short span of time: From ₹50 lakh in FY14 to ₹459 crore in FY18.

Then there is Muthoot Capital. A listed NBFC into two-wheeler vehicle financing and the first diversification gambit by the Muthoots, Capital has also pulled up its socks: From ₹159 crore in revenue in FY14 to ₹398 crore in FY18. Muthoot Exim, the precious metal vertical and the fourth biggest revenue contributor to the group, is also making its presence felt with revenue climbing from ₹22 crore in FY14 to ₹278 crore four years later. MHFL, the housing finance division, makes a modest contribution, although its grown three times in four years, from ₹33 crore to ₹109 crore.

The diversifications are scaling at a time when the group warhorse, Fincorp, is growing in single digits: From a de-growth of 5 percent in FY14 to a 2 percent revenue growth in FY16 and 4 percent two years later.

John's twin brother, younger by a few minutes, Thomas George Muthoot, explains how the group has evolved to cater to the financial needs of the entire spectrum of the low-income segment. "First it was gold loans, then loans for two-wheelers, next was microfinance for small businesses and then housing and so on," says George, explaining the need to reinforce the 'blue' identity of the group with its latest campaign with actor and brand ambassador Vidya Balan.

Though the company painted itself blue in 2010, the confusion with 'Red' persisted as both the groups use 'Muthoot' in their business. "Any family business with multiple groups will have an identity crisis," reckons George. "For a small customer, the best identity is colour."

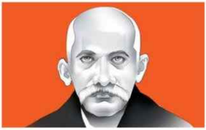
FOUR PILLARS OF TRANSFORMATION

The transformation has not been confined to diversifying the group and reinforcing its blue branding in the minds of users. Business processes have got restructured as well.

The most radical change has been deep collaboration among the various verticals, which were working in silos. "The One Muthoot experience for the customer is crucial," George contends. Cross-selling or leveraging the power of over 4,100 pan-India branches which serve over 1 lakh customers every day became an

Who are the Muthoots?

Muthoots take their name from a branch of a traditional orthodox Christian family based in Kozhencherry, in Pathanamthitta district of south-central Kerala



WHO STARTED THE GROUP?

The group was founded by Muthoot **NINAN MATHAI** in 1887 as a trading company in timber and food grains, supplying rations to large British-run plantations. In 1950s, he got into the gold loan business

WHEN DID FAMILY PARTITION TAKE PLACE?

In 1979, the family business was divided between the four sons of Muthoot Ninan Mathai—Ninan Mathew, M George, M Mathew and Mathew M Thomas, also known as Muthoot Pappachan

RED AND BLUE MUTHOOT

While M George Muthoot branched out with a red logo of two elephants standing trunk-to-trunk and came to be known as Red Muthoot, the gold loan business run by Mathew M Thomas uses the colour blue in its branding. The Blue Muthoot group is known as MPG and is run by three brothers

MPG in Numbers

₹3,442.1 cr
Revenue at the end of March 2018

₹20,449 cr
Assets under management

4,190
Pan-India branches

1 lakh
Customers served every day

26,642
Number of employees

21 states/UTs
Presence across India

INFOGRAPHICS: SAMEER PAWAR

integral part of the strategy.

"The branch has become the main supermarket for financial services by turning into a primary distribution centre," says Vasudevan Ramaswam, chief operating officer of Muthoot Fincorp. That Muthoot Blue has a huge customer base means an opportunity to sell to them other products. "We do not want to be just a gold loan company," asserts Ramaswam. While gold loans would stay as the primary core product, the group sees a floodgate of opportunity in tapping into the customer-lifecycle needs of its users. Suddenly, a gold loan taker became a potential consumer for a two-wheeler loan, a housing loan or an MSME loan. She could also be a potential consumer of gold jewellery from Muthoot Exim.

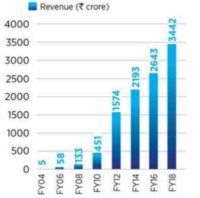
The second pillar of business transformation is people development. While a sharper focus on developing the talent of over 26,000 employees was assigned to a people development officer, all the group verticals got a new head over the last two years. Rationalisation of manpower at the branch level and a structure to empower the grassroots worker was also put in place.

Digitalisation is the third pillar. A technology team is working towards a seamless integration of the various group verticals, an analytics team is digging deep into the data of over a lakh users to make new products, and efforts are being made to optimise the efficiency of each branch.

A delicate balance between the old and new is being maintained to avoid disruption. "We have not disturbed the legacy way of doing business, but are using technology and creating a parallel system," says Thomas Muthoot, the youngest of the three Muthoot brothers running MPG. An app has been developed that tracks every transaction across the country. "I get brand updates, product information, profitability targets or anything about the business in real time," he says. Hunting for investment opportunities in new-age businesses was also explored, resulting in equity stakes in peer-to-peer lending platform Faircent and RemitGuru, which offer online money transfer service to Indians abroad.

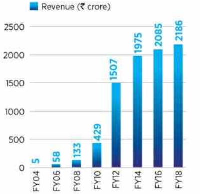
Profitability is the fourth pillar of transformation. Previously, the branches were more bothered about assets under management. "Apart from fixing accountability, every branch has to work towards turning profitable," says Thomas, adding that non-performing branches have been either closed or merged.

Growth Is Back On Track



Gold Loans Is the Biggest Business of MPG

Muthoot Fincorp (MFL) is the gold loan arm, and the flagship of MPG



Source: *Company data*

HARVARD, AND FAST FORWARD

Although the transformation started some 18 months ago, the seeds were sowed in 2014 when John completed his three-year Owner/President Management programme from Harvard Business School.

The programme, meant for owners of business of a particular size for over 10 years, not only expanded the mental horizon of the third generation entrepreneur, but also bridged the gap between legacy and the future. "I knew I was doing many things right, but I needed to know what I didn't know," John says.

Thanks to interactions with leadership professor Rob Kaplan, John learnt to ask 'the right kind of questions'. Kaplan, John recalls, used to point out that answers are plenty but questions few. "One must ask the right questions all the time," he says.

In 2012, while at Harvard, John asked the 'first right question': Why do we exist? All the top executives were taken to an offsite for a one-day discussion and asked to brainstorm this question. A year later, a similar exercise was undertaken, but the question this time was different: Would our consumers miss us if we are not there tomorrow?

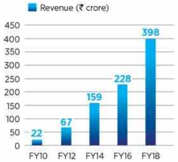
The question that set the transformation ball rolling came only in 2014, when John had completed the course. "Where are we going to get our next set of consumers, Eugene," John asked the chief purpose officer of MPG. The question left Eugene Koshy stunned. "That was a funny thing to ask because we had over 75,000 people walking into our branches every day at that time," he recalls. "John could sense the tectonic shift in the business and consumer landscape," he reckons, adding that there was another query that John posed.

"How do we ensure that we stay relevant tomorrow?" This question, Koshy recalls, hastened the transformation process. It brought to fore the unpleasant memories of what happened to companies like Kodak and BlackBerry, which failed to hit the refresh button at the right time.

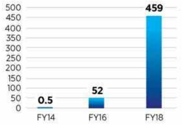
What Harvard also did was to

A Diversification Gambit Has Started to Pay Off

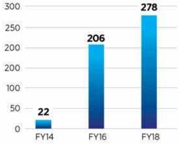
Muthoot Capital, the group's first diversification in FY09-10, is a listed NBFC largely into two-wheeler vehicle financing



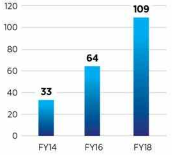
Muthoot Microfin, a microfinance company providing loans to low-income woman entrepreneurs, is the second biggest revenue contributor after Fincorp. It has filed for an IPO



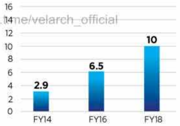
Muthoot Exim, precious metal vertical, is the fourth biggest revenue contributor to MPG



MHFL, the housing finance division, comes next in revenue contribution



MRIBS, related to risk insurance and broking service, has the lowest share in the pie



Source: *Company data, regulatory filings*

help John rediscover the Founder's Mentality. In a book titled *The Founder's Mentality*, authors Chris Zook and James Allen contended that when companies fail to achieve their targets, 90 percent of the time the root causes are internal, not external. The solution lies in developing the "founder's mentality"—behaviour with three traits: An insurgent's clear mission and purpose, an unambiguous owner mindset and relentless obsession with the front line.

With the induction of the fourth generation into the family business, says John, the balance between experience and youth has also been found. Tina Suzanne George, the eldest daughter of Thomas George Muthoot, is associate vice president with Muthoot Capital. A chartered accountant who has had stints with Deloitte and EY in the US, Tina has been championing financial strategy for the group. "A lot has been revamped over the last two years. New functions, verticals have been added," she says. Ask her how she differs from her father, and pat comes the reply: "I am more organised. I have a structure in everything that I do."

Thomas Muthoot John, son of Thomas John Muthoot, has been involved with the operations at Muthoot Fincorp. The group's decision to invest in fintech startups was largely driven by him. "We do not want to become the number one brand in the country," he says, mirroring the ideology that he inherits from his father. "In terms of emotional connect with consumers, we want to be the best."

FACING THE BLUES

Alhough the group, unlike other NBFCs, has been prudent enough to diversify itself into businesses that complement the core, it still stares at huge potential challenges. The biggest is the overreliance on Fincorp. If global gold prices crash, as they did in 2014, the group might come under tremendous pressure.

Being heavily concentrated in South India—Kerala, Tamil Nadu, Karnataka, Andhra Pradesh and Telangana are its top five states in terms of branches—is another potential risk. Take, for instance, the recent floods that devastated Kerala, where MPG has 872 out of 4,190 branches. With the repayment capacity of most of the unbanked segment of population linked to daily labour, the natural calamity will take a toll of MPG.

Though cross-selling mitigates the risk of diversifying, working with the bottom of pyramid has its own share of blues, points out Anil Joshi, founder and managing partner, Unicorn India Ventures. "They need to ensure that repayment logistics don't burn a hole in their pocket." he says.

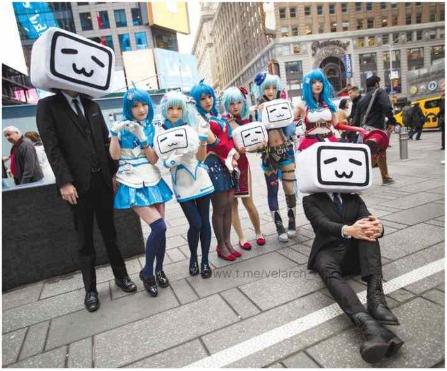
Meanwhile in Kochi, a month before the floods, the three brothers had got together at their home for a sumptuous meal. Amid gusts of a monsoon wind and a backdrop of a ferry cruising along , the trio was firm on staying the course. The pace of growth isn't top priority. Neither are numbers. As George sees it, "Value is more important than valuation." That's not something you'll hear a lot in the country's financial capital or its tech and startup hubs, but in God's country doing business is a bit like a ride along the backwaters: Reaching in a hurry is not the end game. Enjoying the ride, and its sights and sounds, are.

BILIBILI

Show Me the Money

Chinese millennials are flocking to the anime and gaming site Bilibili. But can it make a profit?

By YUE WANG



Attendees wearing anime costumes celebrate at the Nasdaq during Bilibili's IPO in March

Anime and video games have long been an obsession for Li An, but the 30-year-old IT worker from China's southern city of Shenzhen can spare only about an hour a day to indulge his interest. When he goes online to watch videos of his latest fascination, a sci-fi game about androids taking over the world, there are several platforms competing for his attention, but he's loyal to just one site. "I discovered Bilibili when I was in college," says Li. "It's still one of my favourite pastimes today."

Li is one of more than 77 million Chinese fans watching the animation and gaming videos hosted by Bilibili every month. The Nasdaq-listed company sees that user base, which is both internet-savvy and loyal, as its biggest advantage. Chen Rui, Bilibili's chief executive, told local media recently that its strategy is to offer more online services, such as gaming and paid memberships, so it can boost revenue and start turning a profit. The company's revenues more than doubled to $138 million in the first quarter this year, with losses shrinking to $9.2 million.

Under the leadership of 40-year-old Rui, a confessed anime fan as well as a serial entrepreneur, Bilibili has carved out a formidable niche while going up against internet giants like Alibaba and Tencent, which have been spending billions in a cut-throat race to dominate the country's massive online video market. Analysts say Bilibili has some unique advantages, but it remains to be seen whether the company can turn a profit while keeping all those Chinese millennials engaged.

Bilibili has several unusual features that distinguish it from rival sites. In addition to providing content through exclusive partnerships with local artists and overseas studios, the platform has created a number of ways to immerse its users in the so-called "er ci yuan" culture. The term, which loosely translates as "two-dimensional space", is widely used in China to refer to the virtual world of anime, comics and games.

"Bilibili is like a community of young fans," says Tong Chen, managing director of investment firm IDG Capital, which has invested in the company. "In China there isn't any similar platform of this scale, and it is keeping users highly engaged."

One such feature allows users with site membership to gain access to more content by passing online tests with questions involving subjects that range from company history to Japanese manga artists. Members also have access to more interactive functions like "bullet-screen chatting", which allows multiple viewers to type in comments that are shown simultaneously across a streaming video, like darting bullets.

Bilibili's users spent an average of 78 minutes a day on the platform in April, up from 73 minutes in March, according to consultancy Analysys International. As Tong says, Bilibili's user base is distinctively young: More than 55 percent of its viewers are under 24, compared with 18 percent

Bilibili's user base is distinctively young and its users spent an average of 78 minutes a day on the platform in April, up from 73 minutes in March

to 19 percent at Alibaba's Youku Tudou, Tencent Video and the Baidu-backed iQiyi, Analysys International's data shows. The rest of Bilibili's fans are mostly longtime followers like Li, who started to visit the site during his first year of university and helped spread its popularity through word of mouth.

Chen, who was a founding member of New York-listed mobile apps maker Cheetah Mobile before joining Bilibili in 2014, has an official page on the site that uses a Japanese cartoon as his profile picture. He regularly engages with users by commenting on trending clips and is a fan of popular anime series including Fate/Apocrypha and Re:Creators.

More important than Chen's online interactions has been the talent Bilibili has recruited. The company was founded in 2009 by Xu Yi, 28, who built the prototype site. He later gave control to Chen but stayed on as president to take charge of its "community culture", according to its prospectus (which also states that Chen Rui has a 21.5 percent ownership stake and Xu Yi 13.1 percent. Chen has since upgraded the company's technology, expanded its team to 2,000 and introduced more services such as anime-themed games and pay-per-view shows. "It is rare to find someone of Chen's age who understands Bilibili's youth culture and also has the right expertise to manage the firm," IDG's Tong says.

Still, Bilibili is nowhere close to achieving Chen's grand ambition. The company says in its prospectus that it has evolved into a "full-spectrum online entertainment world" covering video, live broadcasts and mobile games, but it has yet to figure out how to make money beyond gaming.

Bilibili depends on mobile games—chiefly the Fate/Grand Order and Azur Lane, both licenced from Japan—for as much as 80 percent of its revenue. The imbalance is a risk because it shows the company's "main operation of video streaming isn't becoming a revenue driver", says Ma Shicong, an Analysys International analyst. And this seems unlikely to change in the near future. In China, people are just starting to open their wallets for content, after years of rampant piracy that severely hindered subscription-based memberships. For Bilibili, this means that related payments are unlikely to contribute much to revenue anytime soon, says Guo Chengjie, an analyst at Beijing-based consultancy iResearch.

Meanwhile, the company's experience selling advertising—a major revenue source at other Chinese video services—sparked an online backlash. In 2016 Bilibili placed ads in several Japanese anime series, which angry users pointed out was in violation of the founder's promise of "forever no ads" in the videos on its site. Chen quickly made a public apology, and now the site carries only banner ads. In the meantime, competition has been heating up. In a bid to attract young users, iQiyi, Youku Tudou and Tencent Video are all beefing up their anime channels, with the Tencent-backed video-sharing site Kuaishou recently acquiring Bilibili rival AcFun for an undisclosed amount.

IDG's Tong remains optimistic. "Monetisation is at the very early stages," he says. "If not done right, this will affect user experience. But as long as the company can keep people engaged and spend longer periods of time inside its platform, monetisation is sure to happen someday." F

CEO Chen Rui, serial entrepreneur and confessed anime fan

PHOTOGRAPHS: MICHAEL NAGLE / BLOOMBERG

BYTEDANCE

ByteDance to the Music

The super-unicorn's Douyin video site is cutting in on WeChat's hold on Chinese youth

By YUE WANG

Athena Yang learnt about Douyin from her boyfriend and soon became hooked. The 29-year-old, who works at an investment firm in Beijing, now spends her lunch break and evening watching music videos on the app, where people post 15-second clips of themselves—dancing, singing or even applying make-up. "There is a lot of funny and creative stuff on Douyin," Yang finds. "It is really relaxing and helps to relieve stress at work."

Developed by Beijing ByteDance Technology, Douyin, also known as Tik Tok, has taken China's younger generation by storm. Similar to the popular music app Musical.ly, which ByteDance acquired for $1 billion last year, it allows users to make, edit and broadcast short video clips to their favourite songs, while using an algorithm to promote them in individually tailored feeds. Now Douyin's explosive popularity is giving ByteDance—a $20 billion startup also known for the Toutiao news app—an edge as it contends with Tencent to become China's media and entertainment powerhouse. Yet the firm is facing YouTube-like challenges: Some of Douyin's clips are drawing scrutiny and a backlash online for inappropriate and potentially dangerous content, adding to the regulatory grief ByteDance already faces.

Shake it till you break it: Music app Douyin lets users have their 15 seconds of fame, sounding a sour note for rival Tencent

Douyin's recent success comes from its content production mechanism. As with most short-video platforms in China, it relies on clips made by both professionals and amateurs to attract eyeballs. But ByteDance does it better than local peers: Douyin regularly invites social media stars to participate in company-hosted online video contests, where they challenge each other or ask followers to broadcast clips to a certain theme. This has given rise to viral online trends that upped the app's popularity.

For example, some 70,000 app users once raced to make humorous moves to the song "Seaweed Dance" by Chinese artist Xiao Quan—a craze that inspired countless internet memes and offline dancing contests across China. Douyin selects the most popular moves to put in personalised feeds. And some online stars, such as 25-year-old music producer Zhou Yue, tell *Forbes Asia* they can earn millions of yuan a year by making videos for Douyin. Advertisers like automobile companies and gaming studios are paying to work with them on related promotional songs that are shared across the site.

"Douyin has been producing better-quality content than other short-video platforms in China," says Chen Yuetian, a partner at Chinese investment firm S Capital. "Its clips are more fashionable and attractive to young people."

A year and half after its launch, Douyin has attracted 166 million active users, a majority of them under 30, according to Beijing consultancy Analysys International. They spend an average of 12.6 hours inside the app monthly—an engagement level surpassing the 12.3 hours spent at Tencent-backed video-sharing site Kuaishou, the firm's data show. Meanwhile, Douyin has been topping the downloading chart at the China iOS Store for months, and it even became the most downloaded non-game free app worldwide in the first quarter this year—an accolade previously held by Facebook's WhatsApp, according to US research firm Sensor Tower.

The popularity is being felt at Tencent. The Shenzhen tech giant has been building its own entertainment empire, often using the super-app WeChat to direct people to Tencent-offered text or video services such as Weishi, a mini-video platform the company revived in April after launching it in 2014. WeChat has also been adding more video elements, such as allowing users to upload longer clips to their friend circles to increase engagement.

But as people spend more time on Douyin, their attention is being diverted from WeChat—where Tencent wants to keep them for more selling. According to Questmobile, a Chinese data analytics firm, short-form video accounted for 7.4 percent of the total time Chinese people spent online in March, up from 1.5 percent a year ago. Meanwhile, instant-messaging services, primarily WeChat, are down to 32 percent from 37 percent in the same period. "Short-form video apps like Douyin are putting pressure on WeChat," says Zhang Xueru, an analyst at Shanghai's 86 Research. "They are all competing for users' leisure time, but it is now increasingly occupied by Douyin."

ByteDance and Tencent are taking their clashes to court. The two companies recently filed a series of lawsuits against each other for defamation and unfair competition, with Tencent demanding one yuan ($0.16) in damages and public apologies on ByteDance's platforms. ByteDance is asking for 90 million yuan in damages, accusing Tencent of purposely blocking its content on the popular QQ messaging app. ByteDance founder and chairman Zhang Yiming, 34, also engaged in a rare online spat with Tencent founder Pony Ma, accusing the latter's Weishi app of plagiarising Douyin's model. ByteDance and Tencent didn't respond to *Forbes Asia*'s requests for comment.

Meanwhile, Douyin has other issues. In Hong Kong the app has been drawing a backlash for what some consider inadequate protection for underage children, who are uploading clips containing violent and sexually suggestive scenes to gain online fame. What's more, the state-run *People's Daily* is calling for stricter oversight of the app, after press reports that some users were seriously injured by imitating Douyin videos. Douyin responded publicly by saying some dance or sport moves "are not suitable to be imitated by all users"; it urged parents to take care and said the app would include "risk warning systems".

These come as ByteDance is already mired in a regulatory quagmire. China's ministry of culture and tourism has just launched a formal investigation of the company for publishing a comic series that it said distorted Chinese history. (ByteDance took it down with an apology.) In April, authorities also told the company to permanently shut down its popular joke-sharing app Neihan Duanzi, which the country's media watchdog criticised for promoting "vulgar and improper content". In a public apology letter, Zhang said the product "walked the wrong path" and promised to hire 10,000 people to police his sites.

Douyin has attracted 166 million active users, a majority of them under 30. It even became the most downloaded non-game free app worldwide in the first quarter this year

Competition is also heating up. In addition to Tencent, China's internet giants are all tapping short-form video to capture young users. The Baidu-backed iQiyi, for example, recently launched its own mini-video app Nadou, using artificial-intelligence-based software to analyse online trends and edit related clips. This may force ByteDance to bolster marketing to promote its own service, potentially hurting margins, 86 Research's Zhang says.

"They need to generate more good content to build an online community," Zhang says. "Regulation is one thing, but what determines how far this product can go is whether it can add more social elements, so users can become better engaged." F

The Zone Rangers: Senator Tim Scott and entrepreneur Sean Parker in North Charleston, South Carolina

EVAN KAFKA FOR FORBES

OPPORTUNITY ZONES

Break and Build

The never-told story of how an unlikely group of billionaires and politicians quietly passed a law that revolutionises investment in struggling regions—and offers one of the greatest tax-avoidance opportunities in American history

By STEVEN BERTONI

Success Street in North Charleston, South Carolina, might be the most misnamed place in America, a path through a weedy, desolate neighbourhood with 20 percent unemployment and a 40 percent poverty rate. Its biggest claim to fame strolls past the gritty brick apartment buildings and tumbledown bungalows on a muggy morning in late June: Timothy Scott, a local product who grew up to become the first black Republican US senator in more than three decades. Joining Scott is another success story: The frenetic, peripatetic tech billionaire Sean Parker, who flew in by private jet from Los Angeles's ritzy Holmby Hills for a personal tour of the senator's hometown.

"I remember so many kids with amazing potential who died on the vine," Scott says as he surveys the shuttered Chicora Elementary School, where weeds climb the walls and greying plywood shields shattered windows. "The frustration, irritation and low expectations were so pervasive here that I always wanted to make a difference."

He now may get his chance. Today's visit is less a grim walk down memory lane than a legislative victory lap for Scott and Parker. The unlikely pair are core members of an even more unlikely group of conservatives and liberals, capitalists and philanthropists, US lawmakers and small-town mayors who have successfully created one of the greatest tax-avoidance opportunities in American history, in the service of underperforming American cities and neighbourhoods.

For all the focus on drastic tax-rate cuts, the fate of the state and local tax deduction and the exploding federal deficits, it's the least-known part of last year's tax-cut law that could be the most consequential. Officially called the Investing in Opportunity Act, it promises to pump a massive amount of cash into America's most impoverished communities by offering wealthy investors and corporations a chance to erase their tax obligations.

Too good to be true? "The incentive needs to be powerful enough that it can unlock large amounts of capital, aggregate that capital into funds and force the funds to invest in distressed areas," says Parker, the original Facebook president whose think tank, the Economic Innovation Group, created the policy and helped press it into law. "Instead of having government hand out pools of taxpayer dollars, you have savvy investors directing money into projects they think will succeed."

The heart of this new law: Opportunity Zones, or "O-zones", low-income areas designated by each state. Investors will soon be able to plough recently realised capital gains into projects or companies based there, slowly erase the tax obligations on a portion of those gains and, more significantly, have those proceeds grow tax-free. There are almost no limits. No limits on how much you can put in, how much tax you can avoid and, for most of the country, the types of taxes you can avoid, whether federal, state or local. No limits on how long those proceeds compound tax-free. And precious few limits on what types of investments you can make.

As Scott rests against a rusting handrail at the abandoned school in his old neighbourhood, he and Parker brainstorm what these investments could look like in North Charleston, which already has its O-zone designation. Real estate investors rehab the school into a tech incubator. Venture firms back the startups that emerge, while other funds launch automotive vendors and suppliers to serve the $1.1 billion Volvo plant recently opened 30 miles away. To help fight gentrification, impact investors can offer cheap renovation loans and subsidised mortgages so locals can benefit from rising property values instead of getting priced out. Finally, local government can take the new payroll-tax and property-tax revenues and reinvest them in the community to improve basic services and infrastructure.

In other words, systemic change. "This isn't about the redistribution of other people's wealth," Parker says. "It's the redistribution of their time, attention and interest." Senator Cory Booker has a name for O-zones: "domestic emerging markets."

"If we can get the trillions of dollars of capital off the sidelines and get the best investment minds coming into our communities," adds Booker, a New Jersey Democrat who co-sponsored the bill, "we can end up creating jobs and opportunity."

As we said, it sounds too good to be true. If everything goes right, a big slice of the estimated $6.1 trillion of paper profits currently resting on American balance sheets is about to go to work to revitalise America's depressed communities. If all goes wrong, however, it will prove to be one of the biggest tax giveaways in American history, all in service of gentrifying neighbourhoods and expelling local residents.

Senator Cory Booker has a name for O-zones: Domestic emerging markets

The genesis for the Opportunity Zone law traces to 2007, in the hills of western Tanzania, where Parker, after his famous Facebook exit, was checking out the UN's work on malaria prevention and economic development. The poverty was striking, and he saw little hope that the region would ever attract the kind of private investment that could deliver progress. Back home, he noticed similar problems in rundown areas around DC and San Francisco. At the same time, he was holding a Facebook stake heading into the billions, with many startup peers minting multimillions in equity as the social media boom took hold.

"People were sitting on large capital gains with low basis and huge appreciation. There was all this money sitting on the sidelines," Parker says. "I started thinking, 'How do we get investors to put money into places where they wouldn't normally invest?'"

He quickly became obsessed with the problem. Booker, then the mayor of Newark, was one of his early calls, which led to a dinner in San Francisco over expensive sushi. "Sean was going a mile a minute on this stuff," Booker says. "My time zone was three hours ahead, and I was pounding caffeine to keep up."

For Parker, a self-taught polymath, deep questions often lead to ambitious action. Long fascinated by the human immune system, he spent $250 million to create the Parker Institute for Cancer Immunotherapy. Curious about his life-threatening peanut allergy, he funded the Sean N Parker Center for Allergy & Asthma Research at Stanford. His interest in the music industry led to the Sean Parker Institute for the Voice at Weill Cornell Hospital in New York. So it's not surprising that he'd eventually turn to policy. From the beginning, Parker's Economic Innovation Group, backed with $15 million, focussed on the causes of inequity and the potential of using tax policy to force profits out of portfolios and into poor neighbourhoods. "Peter Thiel bet me a million dollars that I wouldn't get it done," Parker says. "So that was part of my motivation."

He's a hard guy to bet against. In 1999, along with Shawn Fanning, he co-founded the free online music-sharing platform Napster, which blew up the recording industry—and later itself after triggering an avalanche of copyright lawsuits. In 2004, after seeing Facebook on a friend's computer, he used his Napster fame to score a meeting with a young Mark Zuckerberg at a Chinese restaurant in New York. He spent the next year as Facebook's first president, scaling the startup before clashing with investors, exiting with enough equity to give him a current net worth that *Forbes* estimates at $2.6 billion. He then became an early backer of Spotify, playing a large role in bringing the then-nascent Swedish streaming startup to the US.

More recently, Parker has turned his intense focus to philanthropy, donating more than $400 million in the past four years—a decent chunk, given that he's still in his 30s. For the problem of blighted neighbourhoods, however, Parker sees his tax-avoidance policy as a better play: "You'll never solve domestic poverty by giving your money to a foundation. That's not going to achieve anything. What you need is trillions of dollars in investor capital." Parker built the Economic Innovation Group to be independent, bipartisan and pragmatic, "basically representing the poor people in America". To run it, he recruited Steve Glickman (a former senior economic advisor to former US President Obama) and John Lettieri (a government-affairs veteran who served as a foreign-policy aide to Senator Chuck Hagel). His economic advisory board included Kevin Hassett, Trump's chief economist, and Jared Bernstein, who held the same job for Vice President Joe Biden.

The think tank quickly focussed on crafting a policy that uses tax incentives to move investor cash into struggling communities. The group met with hundreds of lawmakers to share findings, hear feedback and build a base of supporters. Parker would visit Washington every few months for a marathon of meetings, slowly garnering promises of support. Parker boasts that he walked the congressional corridors until his feet ached and would lob late-night calls to top lawmakers for updates on the initiative. As the idea crystallised, other wealthy entrepreneurs, including Steve Case, Jim Sorenson and Michael Milken, jumped on the bandwagon.

The Opportunity Zone bill was ideological surf and turf

By 2016 the Opportunity Zone bill had won the support of 72 legislators from both parties. It was ideological surf and turf. For Republicans, it promised a tax cut, a market-based solution and a way to put power in the hands of state and local governments. Democrats, meanwhile, liked the prospect of pouring money into areas in dire need of funding. Also in the idea's favour: It was new. "If you come up with something that's completely novel," Parker says, "there's no organised opposition against it."

That April, toward the tail end of the Obama administration, Scott and Booker introduced the bill on the Senate floor while Congressmen Pat Tiberi (R-Ohio) and Ron Kind (D-Wisconsin) proposed it in the House. They toyed with attempting to pass it as a standalone law but decided it was best to wait for some fast-moving legislation to hitch it to.

Parker had held a fundraiser for Hillary Clinton at his Los Angeles mansion, but Donald Trump's surprise victory—and the GOP's subsequent push to cut taxes—offered him an unexpected ride. "The opportunity was one that I thought was horrible—but Tim Scott thought was awesome," Booker says. "But for our bill, this was perfect, and we decided to make it part of the larger tax reform."

By now they had a bipartisan group of roughly 100 lawmakers sponsoring the bill. Speaker Paul Ryan and Senate Finance Chairman Orrin Hatch backed it.

Despite that broad support, O-zones were left out of the version of the tax cut passed in the House. A saviour was Tim Scott, who had met with Trump and says he got the president's blessing for the provision. The bill's early sponsor, Scott was also a member of the Senate Finance Committee. He manoeuvered to get O-zones into the Senate version of the bill. Once in there, the O-zone clause had life—but could very easily have been removed by the conference committee, a small group that worked out differences in the House and Senate versions of the bill.

The years that Parker and EIG had spent building a base paid off. "You prove that you're really into it—and that you're not going away," he says. Many conference-committee members had been O-zone sponsors. When Trump signed the tax bill into law in December, the initiative was in there, but it was little-understood or hardly noticed.

The law's engine is a new breed of financial product, the opportunity fund, that offers investors a trifecta of attractive tax breaks. Here's how it works. Investors who sell assets have 180 days to plough their taxable capital gains into an approved opportunity fund, which must hold 90 percent of its assets in Opportunity Zone projects. To put money to work fast, the law requires that the funds invest all of their cash within some specified time frame. (The treasury department is still deciding on that and other crucial details.) Tax on the original reinvested gain isn't due until 2026, and the taxable gain is cut by 15 percent. Meanwhile the new opportunity investment grows tax-free, like a Roth IRA, provided it's held for at least ten years. (If it's sold earlier, it can be rolled into another opportunity fund and remain tax-free.)

For a census tract to qualify as an O-zone, it must have a poverty rate of 20 percent or higher or a median household income that is less than 80 percent of the surrounding area. Governors are allowed to designate 25 percent of their states' eligible tracts as O-zones. In all, about 8,700 areas, ranging from rusty industrial towns to dusty rural hamlets, have been approved.

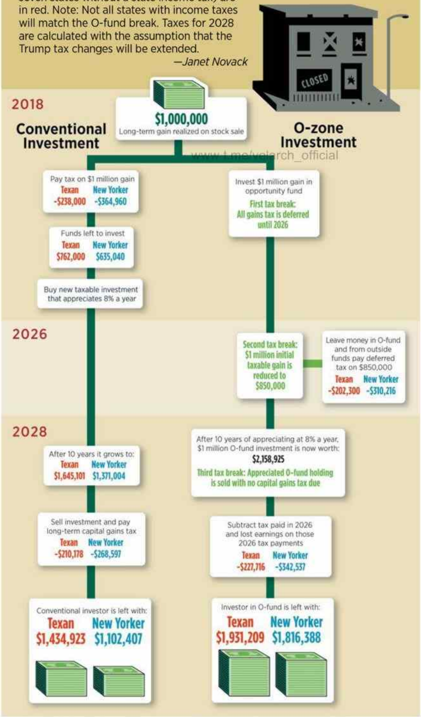
Unlike previous development incentives such as Enterprise Zones and New Market Tax credits, which capped tax benefits and placed restrictions on the industries and regions you could invest in, the O-zone law is broad and scalable. Vice businesses (liquor stores, casinos, massage parlours) are barred. And while venture capitalists, private-equity shops and banks will be essential for launching opportunity funds, those firms can't simply locate in an O-zone and grow tax-free. Other than that, the investment options and those who can invest are broad.

"The great thing about this legislation is it can bring together sectors that may not have worked

The Ultimate Tax Break

Investors who plough a 2018 capital gain into an opportunity fund get three tax breaks: Deferral of tax on their 2018 gain until 2026; a 15 percent reduction on those gains when they are taxed in 2026; and tax-free growth of their opportunity investment, as long as they hold it for at least ten years. Results for residents of New York City, who can save state and local taxes by investing in an O-fund, are shown in blue, while those for residents of Texas (one of the seven states without a state income tax) are in red. Note: Not all states with income taxes will match the O-fund break. Taxes for 2028 are calculated with the assumption that the Trump tax changes will be extended.

—Janet Novack



PETER AND MARIA HOEY FOR FORBES

STOCKTON, CALIFORNIA

Population: 310,500
Median Household Income: $46,033
Poverty Rate: 23.7%
Advantages:

- In the mix: Less than an hour to Sacramento; an hour and a half from San Francisco
- Field and stream: Inland port, retail waterfront, San Joaquin delta, Lodi vineyards
- Farm teams: University of the Pacific, AHL Hockey, NBA G League

MONTROSE COUNTY, COLORADO

Population: 41,780
Median Household Income: $43,890
Poverty Rate: 16.4%
Advantages:

- Launch pad: Regional airport. Direct flights to Los Angeles, New York, Denver, Chicago, Dallas
- Room to run: Open tracts of land for mining, ranching, energy, farming
- Great outdoors: Gateway to national parks, tony ski town of Telluride

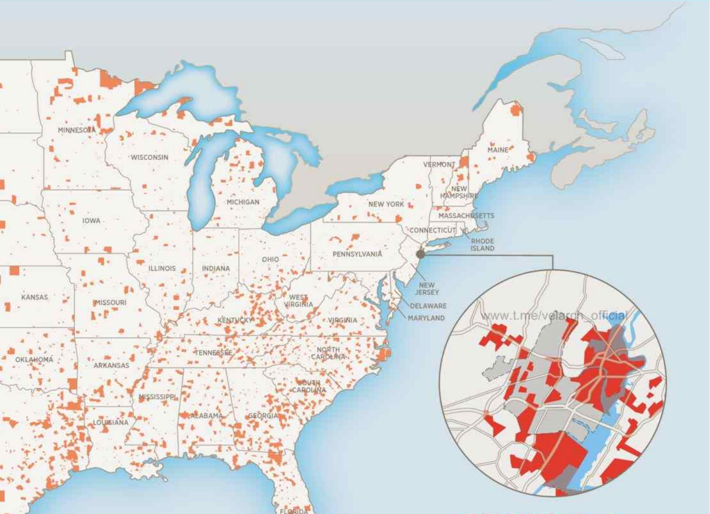
KOPP ILLUSTRATION FOR FORBES

together before," says Jim Sorenson, a Utah-based entrepreneur and impact investor who was an early part of Parker's coalition. "There can be a great collaboration between state and local entities to add more incentives to further sweeten the pot."

Sorenson says philanthropy can play an important role in prepping an O-zone for growth, providing initial capital to secure real estate loans or launching job-training programmes to create a large supply of local talent ready to work. "We can come in first, solve problems and de-risk projects to make them more feasible for investors," Sorenson says. "Then you tap into the institutional markets—that's where the big money is."

Big money can come from a host of sources: Real estate developers, private equity funds, venture capital (VC), investment banks, wealthy individuals, family offices and mutual funds. And there are many places for big money to go. Rural communities can host projects that need wide spaces, like farming, energy, mining, data centres and labs. Cities are likely to attract real estate developers, startups and venture funds.

For real estate developers, O-zones offer cheap real estate and unlimited,



LAND OF OPPORTUNITY ZONES

NEWARK, NEW JERSEY

Population: 285,150
Median Household Income: $33,025
Poverty Rate: 29.1%
Advantages:

- Jet set: Newark Liberty International Airport
- Sweet commute: 15 miles from New York City; affluent suburbs
- Town and gown: Rutgers Newark, Seton Hall Law, New Jersey Institute of Technology, Prudential Center, NJ Performing Arts Center

untaxed upside if a neighbourhood takes off. Developers must do more than stash cash in crumbling property. To qualify for tax perks, they must make swift and significant upgrades (at least equal to the cost of the initial purchase). With real estate projects come new office buildings, industrial districts, restaurants and affordable housing—all of which can lay the groundwork for an economic boom.

"The real estate aspect is a great catalyst to attract new businesses," says AOL founder Steve Case, an early supporter of the O-zone initiative, whose Rise of the Rest Fund invests in backwater areas. "But it's the startups that will be the real job creators."

For venture firms, which tend to make many small, risky bets with the hope that a few will be blockbusters, backing O-zone startups can carry unbelievable gains. Under the law, VCs can plough returns into opportunity funds, deferring taxes and setting the stage for a future tax-free windfall. "If Facebook could have chosen to locate itself in an Opportunity Zone, like the Tenderloin in San Francisco, the investors would've paid no capital gains on their equity," says Parker, who presumably would have been one of the big winners. The promise of mega-returns could send VCs, investment banks and private equity firms scrambling to launch their own opportunity funds to create incubators, scour second cities for overlooked talent or move portfolio companies into O-zones. "It wouldn't surprise me if a lot of Silicon Valley VCs started to tell founders, 'We'd like you to go over the bridge to Oakland, or we'd like you to go to Stockton'," Parker says.

If they do, they'll find a welcome wagon. "We started at zero. We were the foreclosure capital, our homicide per capita highest in the nation, we declared bankruptcy," says Stockton mayor Michael Tubbs, a charismatic 28-year-old Stanford grad who returned to his hometown following a cousin's murder. "We're not afraid of the future. We're not afraid of new. We're not scared of Opportunity Zones. Let's do it."

Stockton is a good example of what could be: 90 minutes from San Francisco and 45 minutes from Sacramento, it's surrounded by agrarian possibilities yet crippled by high costs, high unemployment and high crime (in 2011, *Forbes* named it America's "most miserable city"). Roughly 25 percent of its 300,000 residents live in poverty.

Tubbs envisions new apartments in its bleak downtown, industrial parks along its airport corridor and a waterfront "like the San Antonio Riverwalk, where people can live and work", complete with hipsters and beer gardens. To make it happen, he's already preparing formal pitches for opportunity funds, forging strategic committees with the local government and business, real estate and academic leaders to surface potential and streamline action. Past that, "I'm not going to share all my secret sauce with other cities," he says.

The joke betrays a fierce competition brewing. It's likely that only a handful of the roughly 8,700 designated O-zones will attract the critical mass necessary for a significant turnaround—or investor confidence. "There will be a herding mentality and a domino effect," Parker says. "The more momentum an area gains, the more investors it will attract."

"It's like the Amazon headquarters battle," says Margaret Anadu, the head of Goldman Sachs' Urban Investment Group. "It has mayors and regional players asking, 'What great things does my city have to offer? What are the challenges? What are my plans to address them?'"

The law's rich tax perks will lure many players more interested in the programme's tax benefits than its societal ones

Where Opportunity Zones go, opportunists will follow. The law's rich tax perks will lure many players more interested in the programme's tax benefits than its societal ones. The broad and flexible nature that gives the plan its power also leaves ample room for abuse, loopholes and unintended consequences. With billions in for-profit capital likely to flow into poor communities, there's a chance that the very people the program is intended to lift up could instead get pushed out. Nearly everyone *Forbes* interviewed agreed that gentrification is a real risk.

The answer for Michael Tubbs is local control, with the government steering investments to places where capital would make a sizeable impact. "We don't have many people living in our downtown, so new housing wouldn't be displacing people but bringing new people in," Tubbs says. "You'd be making downtown safer and bringing in units that people can afford."

For Booker, it started with governors choosing Opportunity Zones that show no sign of current gentrification. He says leaders must ensure that a large portion of locals are hired to build and service new projects and that towns adopt and enforce zoning and affordable-housing laws as new capital flows into the community.

"The whole point of this is creating opportunity for the people who are living in those places today," Goldman's Anadu says. "If the investments don't provide better housing, better jobs, an increased tax base and better government services, then it's been a big waste of time and we've all failed."

On the flip side, what happens if the programme is too successful? What if the next Facebook moves just a few miles into a neighbourhood O-zone like East Palo Alto, vapourising tens of billions in capital gains without really transforming a city? Or if it just accelerates a Brooklyn-like real estate boom that would have happened soon anyway? "You can paint all types of possible scenarios," says Scott, "but I have 50 years' worth of evidence showing the risk of doing nothing."

For now, it's a waiting game. Treasury and the IRS are scheduled to hand down the final O-zone rules by the end of 2018. Investments could conceivably start early next year. Until then, investors wait on the sidelines as mayors perfect their pitches.

Parker, meanwhile, is steering his think tank to create new policies. "I came away with an optimistic view about members of Congress," Parker says, voicing a sentiment precious few have echoed in the past 20 years. "They want to talk about an idea that can move the needle and fix the structural issues facing the country. There's probably a bunch more of these things out there that we can do."

OF NEW VENTURES, AND FLAVOURS

Viney Singh, *CEO of Fabindia, talks about the company's foray into food over a meal of Chinese delicacies*

By **Anoothi Vishal**

The dish of the day happens to be a tea egg—boiled to perfection in tea, in a warm water bath at a precise temperature of 63 degree Centigrade so that the yolk remains runny, the white creamy. We may have admired the egg even more, had it not come buried in a nest of shredded filo, which obscured from our view the beautiful brown veins on the egg's surface produced by tea seeping in through a partially cracked shell. That's what makes any Chinese tea egg a quintessential street snack. It's like marble; a thing of beauty, joy and childlike glee.

At Baoshuan, the Oberoi New Delhi's rather new (it opened this January) rooftop Chinese restaurant, the egg is a showy, cheffy starter. Still, I am glad we ordered it, not just because it is perfectly cooked, but also because it brings back for my guest, Viney Singh, CEO and MD of Fabindia, a host of memories.

Tea is not just a Chinese obsession. It has seeped into the Indian cultural fabric in a way few other beverages have. But Singh's connect with it is far more than an average tea drinker's. As a child growing up on tea estates in Assam, and then in Tamil Nadu where his father worked, Singh was exposed to the typical plantation life—a relic of Colonial times, but one that was to have an impact on his tastes and sensibilities in obvious and subtle ways.

"In Assam, we had the Baruah Mug cooks, who knew these wonderful continental dishes and bakes because they came from a line of traditional cooks who had worked in British homes and clubs," he says of his earliest tryst with gastronomy. If Singh's mother was table proud, entertaining lavishly, his Rajput father dabbled in weekend meat cooking, stirring age-old family recipes from their ancestral residence in Rohet Garh, near Jodhpur.

"Rohet Garh recipes are well known in Rajasthan. The *safed maans* (white meat) cooked there is acknowledged as the best among Rajput clans," Singh says, between tales of his outdoorsy early plantation life, where sporty pursuits like horse riding and swimming were interspersed with fabulous meals, Western and traditional Indian, all cooked with fresh ingredients from the estate. "We had a small dairy. So butter, milk and ghee was always fresh, there was always country chicken on the table, and the vegetables were all grown in our kitchen garden."

Guarding against envy, I suggest we order some more food. Singh, ever the gentleman, decides to leave it to my judgement, but his eyes light up at the mention of prawn and pork dumpling with crackling on top.

Baoshuan is not really an outpost of the one Michelin Star dim sum and regional Chinese eatery A Wong in London, run by the eponymous chef who decided to take up his family's restaurant business after a degree in anthropology from the London School of Economics. But A Wong—known for elevating traditional Chinese food to sophisticated creations using modern cooking techniques and presentations—is consultant chef to Baoshuan, and has brought in all the stars of his London menu to Delhi. I quickly zero in on these.

There is a soup dumpling filled with warm broth, with a more delicate and yet firm skin than what you may have encountered in Hong Kong's yum cha places. There's a bao presented on astroturf (like they do in London), which makes us spend some minutes wondering about whether the "grass" is edible (it is not). Then, there is a sensibly abridged version of

Viney Singh has been gluten-free for two years; he refused carbs and drinks at Baoshuan, the Oberoi New Delhi's new rooftop Chinese restaurant the Peking duck. Instead of the whole roast duck, here they serve two legs that are carved up; enough for just two diners who will not be plagued by the guilt of wasting the rest of the bird.

Singh refuses carbs and drinks, even though he has just been telling me about a wine- and tapas-filled holiday in San Sebastian. On weekdays—we are dining on a Monday evening—he is strict, he says, with himself; a discipline that is necessary for someone who, at 58, still plays squash and takes fitness seriously (he has been gluten-free for two years now).

This interest in good food that is also healthy neatly coalesces with his latest assignment at work. Singh joined Fabindia two years ago, at a time when the company was looking at food as a serious vertical, with a potential to grow into a major source of revenue. While apparel makes up 75 percent of Fabindia's business, food (with an accent on health, regional and local produce) is just about 6 percent. However, since this is a category that is booming, not just in India but globally, there is clearly scope to grow this vertical.

Singh will not discuss Fabindia's recent acquisition of Organic India, saying it is a separate business and there are still internal deliberations taking place. What he points to, instead, is Fabindia's nascent foray into the restaurants business. The first Fab Café came up only around a year and a half ago in Delhi's Vasant Kunj, around the same time Singh took over.

It was part of executive vice chairman and director William Bissel's vision to develop various experience centres within each of the Fabindia outlets to create a retail destination within a single store for the entire family. These experience centres include an alteration centre with tailors for apparel, a design centre with designers who can customise home products, a wellness centre with advice on lifestyle ailments, an activity area for children, and the Fab Café.

Baoshuan (above) served perfectly cooked tea eggs (bottom right); Viney Singh's eyes lit up at the mention of prawn and pork dumpling with crackling on top (bottom left)

Three such centres have come up in Delhi, Mumbai and Bengaluru (which opened in August). The next two months will see nine more opening across the country, with the eventual aim to go to tier 2 and 3 cities too.

Personally involved with the scaling and structuring of this reworking of the Fabindia formula—from plain vanilla stores to experience-led ones aimed at engaging more with younger consumers—Singh's love for what's on the Fab Café menu is quite apparent. "There's liver with jackfruit and banana chips, paandhi curry with multigrain paranthas, quinoa biryani, chaats made with alternate grains and even hyper local ingredients like kulat dal from Uttarakhand," he says, referring to his lunch at the Bengaluru Fab Café's inauguration. The menu keeps changing seasonally but is meant to be standardised across outlets pan India.

It's interesting that Fabindia should venture into the restaurants space on its own (though it has a tie-up with an experienced hospitality professional, we are told) rather than as a tie-up with a well-known chef or restaurateur. "It is important for us to have the cafés reflect what Fabindia stands for, which is Indianness and everything natural. Sometimes, celebrity chefs and other businessmen do their own thing," Singh explains. Interestingly, there is a standalone café too incubating in Delhi, and whether that takes off may determine another new foray for the group.

As we mull on the possibilities, the meal comes to an end. We've declined dessert but the restaurant sends one anyway—it is a chocolate confection filled with banana cooked in, what else, but tea! We spoon it up with the realisation that meals—and life—do tend to come a full circle.

VINEY SINGH (FACING PAGE): AMIT VERMA; COURTESY THE OBEROI

HOW GREEN IS YOUR LIPSTICK?

Eco-conscious consumers in India are driving growth in makeup that is natural, organic or cruelty-free

By **Pankti Mehta Kadakia**

It's no secret that ugly truths hide behind the gloss of the beauty industry. A third of global landfills are choked with plastic containers, a common packaging material for beauty products; mercury, parabens and other chemicals used in makeup are known to trigger the growth of cancer cells; chemicals such as P-phenylenediamine (found in lipsticks) and dibutyl phthalate (used in nail polish) are heavy pollutants. And that's not all, of course.

With greater purchasing power, more women joining the workforce in India, and because of a constant need to look camera-ready, India's cosmetics industry is growing rapidly. According to market research firm Redseer Consulting, it has an overall market standing of $6.5 billion and is expected to grow to about $20 billion by 2025 with a CAGR of 25 percent. In comparison, the global cosmetics market is growing at 4.3 percent CAGR and will reach about $450 billion by 2025. This means that, by 2025, India will constitute 5 percent of the total global cosmetics market, and become one of the top 5 global markets by revenue.

The good news, however, is that more women are becoming aware of the possible perils of using toxic chemicals, for both their own skin as well as the environment. Redseer's report also says that coupled with multiple other factors, herbal cosmetics products are growing—this segment alone is expected to grow at 15 percent, as more consumers switch to 'safer' products.

If you paint by numbers, the potential is huge. But while natural and organic skincare has seen several players such as Forest Essentials, Kama Ayurveda and Patanjali make a mark, the natural makeup space is still an open field—one that is seeing a serious bout of action now.

"Product development for makeup is definitely more difficult than that for skincare, and is often outsourced," explains Vishal Bhandari, founder and CEO of SoulTree, an organic ayurvedic beauty brand that was founded in the 1990s, but introduced a sustainable makeup range only in 2013. "Makeup has an aesthetic element that is more visible than, say, shampoo, which makes customer expectations very high and often hard to meet."

SoulTree now stocks a range of ayurvedic kajals, lipsticks, mascara, lip gloss and, just this month, introduced BB creams too. "Makeup is seen as decorative and artificial," adds Bhandari. "We found that using ayurvedic principles can, in fact, benefit your skin. For instance, our lipsticks are made of ghee, which helps with chapped lips."

"Makeup has an aesthetic element that is more visible than, say, shampoo, which makes customer expectations very high and often hard to meet."

Similarly, when former publicist Rubeina Karachiwalla, a self-confessed "makeup addict", began to carefully read the labels of existing beauty brands in India, she was left disturbed, and decided to start her own organic makeup line, which hit the markets in March 2017. "I was always very conscious of what I exposed my body to, in terms of food, skincare and makeup," she says. "With no background in chemistry or cosmetology, I dived into heavy research, and hustled for three years before we had our market launch."

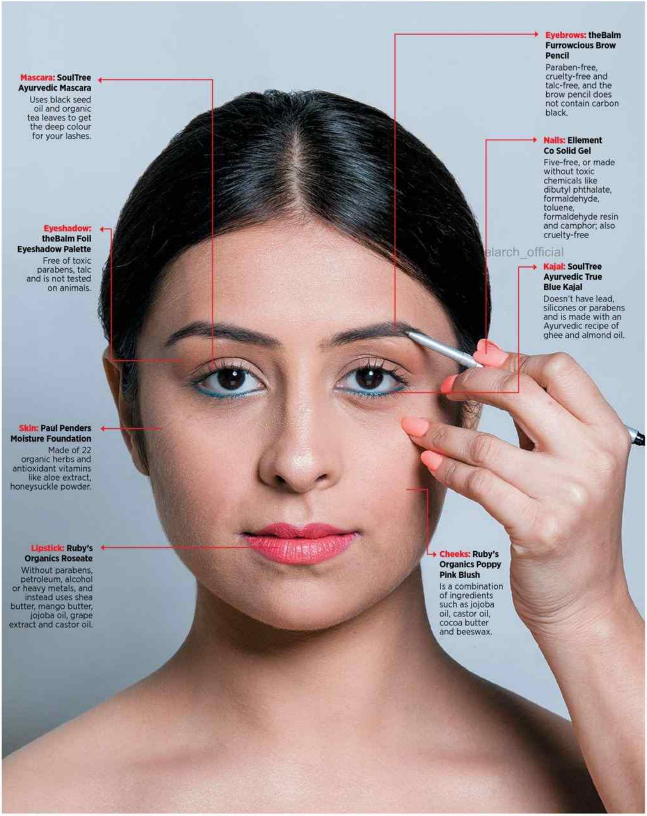
Her objective, she adds, is to introduce the idea of clean beauty in India using natural ingredients that are also efficient. "When it sits on your face, it should be doing something," she says. So her brand Ruby's Organics offers products described as "skincare at the core, tinted with mineral colours". So while you wear the crème highlighter, the composition including jojoba oil, shea butter, beeswax and castor oil helps heal your skin, while giving it the illuminating glow of the highlighter.

Ruby's Organics now retails collections of concealer, foundation, eyeshadow, highlighter, blush, lipsticks and their newest products, dual eyeliner-kohl pencils and kohl-brow fillers. The makeup is organic, paraben-free, 100 percent vegetarian and against animal testing.

"When we began to market

Looking Good, Naturally

A serious bout of action is now taking place in the Indian market to tap the potential of 'safer' makeup products



PHOTOGRAPH: ADITI TAILANG; MODEL: AYESHA ADLAKHA; LOCATION: ROHAN SHRESHTA ACADEMY STUDIO, BANDRA
MAKEUP: HINA PATEL, MAKE-UP DESIGNORY

ourselves, we felt a sense of relief from people, because most organic beauty brands only extended their makeup range to kajal and lipstick," says Karachiwalla. "Our products are aimed at well-travelled educated young women aged 20 to 40. They are not meant for high-gloss magazine shoots, but for real, everyday women who want a solid product that is both effective and guilt-free." The base of all of Karachiwalla's products is the same—a mix of butters, oils, clays and waxes. All ingredients are sourced in India, and the products are manufactured and packaged in the country too.

Ruby's Organics claims to be growing between 10 and 15 percent per month, and introduces new products every other month. Next on the agenda is compact and loose powders, but their bestsellers remain their lipsticks. They retail via ecommerce websites such as Nykaa and Scootsy, and are available at Nykaa's offline stores too.

Mumbai-based travel executive Michelle Cordo, 31, is a loyal customer after discovering Ruby's Organics at a local exhibition, where she tried the lipstick. "I never used to wear a lot of makeup as it made my skin uncomfortable, itchy and dry," she says. "I liked the colour and it didn't come off easily. I started wearing it every day, and ended up buying almost all the shades. I use the other products too, and it never feels heavy, unlike chemical cosmetics."

Another young brand is Ellement Co. Less than a year old, it was founded by Minash Bablani. Ellement Co is a gifting company for the modern woman, with products spanning cheeky sweatshirts, baby apparel and bath salts; its flagship line is a range of nailcare products that are 'five-free' (made without dibutyl phthalate (DBP), formaldehyde, toluene, formaldehyde resin, camphor) and cruelty-free.

"More and more people are seeking products that are not tested on animals and are free of toxins,"

Rubeina Karachiwalla of Ruby's Organics

says Bablani. "For instance, pregnant women often can't use regular nail polish. Our unique formula, manufactured in Germany, gives you gel nails without a base coat, which often dehydrates and yellows your nail bed."

Moreover, while most foreign brands are made for colder climates, Ellement Co's nail polish is tested for tropical weather and oilier nailbeds. They are tripling sales each quarter, and introducing new colours every four to five months. Their main sales channels are ecommerce and salons. At ₹1,250 for a 100-ml bottle, the nail polish is priced at a premium.

"We have seen a rising trend for natural and organic beauty products, which makes international brands view India as their next entry hub."

"India is a discount-driven market and it definitely is a challenge to convince customers that the product is worth its price," says Bablani. "While everyone wants nail art, few are concerned about nail hygiene. But it definitely is a growing segment. Communication is key, and once customers know that better alternatives are available, they'll keep coming back. They would rather not harm the environment, animals and themselves."

Foreign Interest

International beauty brands in the organic and natural space are also seeking to cash in on India's huge potential for such products. For instance, theBalm, an American brand known by its quirky packaging and its cruelty-free products that are also free of paraben and talc, launched in India in September. Another American brand, Paul Penders, which uses no chemicals and animal testing, came to India with its makeup range about a year ago.

"In recent years, the Indian beauty market has evolved tremendously," says Sargam Dhawan, CEO and director, Paul Penders Botanicals, India. "We have seen a rising trend for natural and organic beauty products here, which makes international brands view India as their next entry hub. This is a result of changing lifestyles and global beauty trends, but also a call back to tradition. India has always seen the co-existence of tradition with modernity."

Paul Penders' makeup products contain LevensEssentie Gold (made from 22 herbs) mixed in a base of plant waxes, plant oils and vitamins with organic dyes. They will soon add botanical eye shadow, blush and liquid lipstick to their range. "India's makeup market is flourishing, and the challenge now is to offer affordable cosmetics with quality ingredients," says Varun Gupta, founder of Leap India, the India partner for theBalm.

KNOW YOUR LABELS

→ **Organic:** When a product contains a minimum of 95 percent organic ingredients

→ **Cruelty-free:** Not tested on animals

→ **Natural:** Uses only ingredients that exist in nature

→ **Vegan:** Does not contain any animal or animal by-products. However, this doesn't mean it is not tested on animals, or that it is free of chemicals

"Additionally, brands need to understand the needs of the Indian skin tone, and how geographical factors contribute to the use and application of different products."

Name Game

According to Shahnaz Husain, a veteran in ayurvedic beauty, one of the first challenges in the makeup industry is the ambiguity in nomenclature. "Organic, natural and herbal are words that are used interchangeably, although they don't mean the same thing," she says. "It's difficult for consumers to be sure that the product that they are purchasing is, in fact, checking the boxes they'd like it to."

Minash Bablani of Ellement Co

So, despite its name, Ruby's Organics doesn't claim to be 100 percent organic. "We also use minerals and other natural ingredients," says Karachiwalla. "This makes us 100 percent natural, but not 100 percent organic. These words are often misused, and customers must learn to vet each claim."

Similarly, claims of sustainability must extend beyond the ingredients used. "It's difficult to bring all stakeholders on the same platform for complete sustainability," says Bhandari of SoulTree. "In terms of waste management and packaging, for instance, India lags far behind."

Being environmentally conscious also limits the product range, as certain colours and textures cannot be achieved without chemicals. For instance, Karachiwalla says, liquid lipsticks and eye products are a challenge to make. Bhandari adds that conscious brands are competing with regular makeup brands, and consumers use the same standards of benchmarking for them.

"Making natural cosmetics abound with difficulties, stemming from the fact that beauty products do not exist in nature," says Dhawan of Paul Penders. "Ingredients are extracted from natural sources, and the processes require significant chemical synthesis. Even if you find naturally extracted ingredients, you will still have the problem of keeping them free from contamination and microbial growth. Creating these products requires careful consideration of what consumers believe to be natural, and then making products that match their standards.

HOMING IN ON HERITAGE

Two art galleries, in two different cities, find enough reason to move into old, storied locations

By **Jasodhara Banerjee**

Amrita (left) and Priya Jhaveri at the new location of Jhaveri Contemporary in Colaba, Mumbai. They wanted a space that would have a warehouse feel to it. After an on-and-off search for two years, they zeroed in on an apartment in Devidas Mansion. It took about six months of work to convert the derelict space into one worthy of housing fine works of art

The view is probably reason enough for opening an art gallery on the third floor of Devidas Mansion, on Mereweather Road in Colaba: Its wooden, arched windows frame two of Mumbai's iconic structures—the Gateway of India and the Taj Mahal Palace hotel—along with a breathtaking view of the Arabian Sea.

Devidas Mansion, built in 1889, itself presented reasons good enough for sisters Amrita and Priya Jhaveri to move their eight-year-old gallery, Jhaveri Contemporary, from its earlier location in Walkeshwar to its new bustling neighbourhood. "The earlier space was in a residential neighbourhood," says Amrita, "where nothing much really happened. Visitors to the gallery did not have any other attractions in the neighbourhood." There was also real estate redevelopment looming large.

But looking for an alternative location was not an easy task. "We wanted a space that would have a warehouse feel to it—with high ceilings—but shouldn't ideally have a corporate feel to it," says Amrita. "And since our earlier space was like a cube, we did not want to repeat that look," says Priya.

After being on the lookout, on and off, for about two years, an abandoned apartment in Devidas Mansion presented itself. Located

MEXY XAVIER

Priyanka and Prateek Raja, co-founders of Experimenter art gallery, located in a near-100-year-old house in Kolkata

SUBRATA BISWAS FOR FORBES INDIA

on what is now officially called BK Boman Behram Marg, it stands in the midst of a mix of commercial activity aimed at tourists and locals alike. There are curio shops, bars, cheap hotels, art galleries, and an assortment of offices, some glittering and others about to crumble.

In the first few decades of the 20th century, the Mansion was called Thoburn House, after Bishop James Mills Thoburn, the first American Methodist to arrive in the country in 1859, and was a hub of missionary activity. The building was surrounded by a large lawn, and was quiet enough to have the hymns of the nearby Bowen Methodist Church to be heard during its Sunday services.

Although the rest of the building—housing several commercial enterprises and private residences, all presenting a vibrant, cosmopolitan occupancy—continued to thrive, this apartment fell by the wayside. "This place had been abandoned for the past 15 years or so," says Priya. "It was absolutely barren. There weren't even window panes or frames, and it was open to the elements." There was no electricity or plumbing either.

It took about six months of work to convert the derelict space into one worthy of housing fine works of art. "Instead of working against what was already there," says Priya, "we worked with it. We did not change anything, and whatever we added was keeping in mind its heritage." This explains the attention given to detail, such as the wooden frames added to the windows, and the brass door handles that are reminiscent of vintage designs. Or the iron beams left in their places in the ceiling high up. "We even left the walls unpainted," says Priya. "It is not a very big space—just 1,500 square feet—but the walls and ceilings, and the view from the windows, give it a much more spacious appearance. And unlike in our previous space, the walls here punctuate the viewing experience for our visitors."

Relocating to Devidas Mansion also brings Jhaveri Contemporary to one of the art hubs in the city. "There is one hub in Worli, with Saffronart, Nehru Art Centre and Tao Art Gallery being located there, and there's another one here," says Amrita. The Colaba neighbourhood is home to galleries such as Chatterjee & Lal, Galerie Mirchandani + Steinruecke, and The Viewing Room, while also hosting the offices of international auction houses Christie's and Sotheby's.

The Jhaveris inaugurated their new gallery space with an exhibition, starting September 1, of works by 21 artists from South Asia, called *What's Essential*, and includes works as diverse as Mrinalini Mukherjee's bronze sculptures, Monika Correa's hand-woven tapestry, Lubna Chowdhary's ceramics, Raghubir Singh's photographs and Nalini Malani's digital animation. "The works in this exhibition speak to the gallery's re-location, by invoking the textures, tonalities, and motifs that give the gallery's new space—at the fringes of land and sea—both roots and anchors," writes Diva Gujral, in her accompanying note on the exhibition. "All these artists are those with whom we have worked before, and with whom we would want to continue our relationship," adds Amrita.

"This building is like an old lady with wrinkles," says Priya. "And we want to keep her that way."

"This building is like an old lady with wrinkles. We want to keep her that way."

PRIYA JHAVERI, co-founder, Jhaveri Contemporary

Old buildings should not be a novelty in an old city. Especially in a city as old as Kolkata, which has imbibed English, French, Dutch, Danish, Armenian and Portuguese influences into its architecture. In the decades after the capital of the colonial government moved from Calcutta to Delhi (in 1911), the city continued to evolve with its creative and inventive architecture, up till around the 1960s.

And yet, old buildings are the most endangered of architectural species in an old city, with few managing to fend off the destruction wrought by real estate developers. One such building that escaped the builders is tucked into a quiet residential neighbourhood in South Kolkata's Ballygunge neighbourhood, and caught the eye and imagination of Priyanka and Prateek Raja, co-

Experimenter Ballygunge is housed over two floors of a residential building

SUBRATA BISWAS FOR FORBES INDIA

founders of Experimenter art gallery. "I think Prateek must have seen every 100-year-old building in South Kolkata over the few years in which we were looking for a new space," laughs Priyanka, as Prateek adds, "The space had to have character; it could not be just a white cube."

And character they found at 45 Ballygunge Place. Located over two floors of a near-100-year-old residential house, it is a far cry from the conventional cube-like structure of art galleries. "A portion of the gallery has a new structure, which is an 8-metre high sky-lit contemporary architectural element that juxtaposes itself with the older part of the building, which has rare mosaic flooring, a gorgeous staircase, tree-lined balconies and French louvered windows in pentagonal rooms," says Prateek. "We also have an entire open terrace for our outdoor programmes, film screenings and performances." The Rajas, having started Experimenter in 2009, inaugurated their second gallery space, Experimenter Ballygunge, this February.

"We had started thinking of a larger space because of a physical requirement, along with the future of Experimenter. We have never seen ourselves as a standard model for a gallery; we challenge the concepts of what a gallery means in the Indian space," says Priyanka. "We wanted an active space for engagement."

The two floors of the building that now houses Experimenter Ballygunge were very well maintained, although the family—"a very erudite one", says Prateek—living in the house had barely used the space over the past two decades. It is home to Aveek Sen, writer, thinker and essayist, who was born, and continues to live, in the house.

The new gallery space is located in a neighbourhood that is witnessing a drastic change in its skyline, and a demolition of its architectural heritage, especially of houses built in the late 19th century and the first half of the 20th century. Prateek is a member of Calcutta Architectural Legacies (CAL), a citizen's initiative spearheaded by author and musician Amit Chaudhuri, with the aim of preventing the destruction the city's distinctive architectural heritage.

Prateek says what plagues heritage buildings the most in Kolkata is an economic model that can sustain their existence. "It's not like all owners want to redevelop them into generic buildings. In fact most owners have innumerable memories, a certain sense of pride, and they understand that once it's gone, a small part of the city's or their precinct's fabric changes forever," he says. "The new gallery is able to portray an alternative life for the building and is a perfect example of how the existing architectural elements of an old building can be used to benefit the art it shows."

Although the Rajas have made alterations to the space, they have retained its character. The mosaic floors have been left untouched, and the walls have been spared the hammering, thanks to a shell that has been created within the original framework. The space was redesigned by architect Rajeev Agarwal, and lighting design team Lyle Lopez. "We have used material and lighting that are used in the leading museums of the world," says Priyanka.

Experimenter's new space has hosted three exhibitions so far. While its two spaces will have independent programmes, the Rajas are planning to have the same show running simultaneously at both places. "We have seen that visitors in Kolkata are willing to move from one gallery space to another, especially because they are just five minutes apart," says Priyanka.

As part of the Experimenter Learning Program—which enables dialogue, discussion and debate in the fields of contemporary and performing arts, curatorship, film, writing, language and social culture—the Rajas have designed a classroom-like format for the new gallery, and have invited about 20 practitioners from varying fields so far. The groups, of 15 to 20, include a diverse range of attendees, including students, homemakers, filmmakers, writers and artists. "Most people in Kolkata do not have access to this kind of thinking," says Priyanka. "We are trying to get here the foremost thinking process in every field. What is the 'now'?"

Contemplations on the 'now' are perhaps only made more pertinent when housed amid walls that have witnessed a past that no one else has. F

A view from Upper House hotel

MY HONG KONG

The vibrant place has a buzzing nightlife and some best-kept secrets

I regularly travel to Hong Kong for meetings. I was born there (albeit I am British/Irish), so in some ways, it is like returning home. The first thing you notice about the city is its vibrancy. And most of the times, you will see a new building or a change in the skyline. Hong Kong is built upwards, and that adds an element of charm and excitement to the place.

RECOMMENDATIONS

The Upper House in Pacific Place is a fairly new boutique hotel. It mixes modern lines and spot-on but casual service. You get some of the best views of Hong Kong's iconic harbour from its bar, Café Gray.

For business trips, I'd recommend the Central and Admiralty areas; also East in Taikoo Shing, a new business district. Kowloon, on the northern side of the harbour, is a vibrant place, with its stunning Peninsula Hotel.

Hong Kong has every kind of food you can imagine, for every budget. In the mid-range, and if you are looking for spicy fare (Chinese style), try Chili Fagara on Old Bailey Street. For good Thai food, and casual dinner, opt for Chili Club in Wan Chai. There are plenty of places for drinks too. If you're closing a big deal, what's better than a classic—the Mandarin Grill at the Mandarin Oriental. I have childhood memories of the place.

GETTING AROUND

Taxis are cheap, but getting them can be a hit-and-miss if it rains. The MTR—Hong Kong's underground rail—is excellent. If you are going from the airport to downtown Kowloon or Hong Kong, the Airport Express Train is reliable. Those with spare hours should take a tram on Hong Kong Island; it is a great way to see the city—from the new to the old.

MARK SUTCH

AFTER HOURS

One of the best kept secrets of Hong Kong is its hiking. Within 30 minutes of the city's bustle you have world-class hiking trails in many of Hong Kong's national parks. Nightlife is whatever you want it to be. The Soho area has a great array of bars and restaurants. Lan Kwai Fong in Central has a more buzzy feel to it, and is open all night. The night market on Temple Street is a fun place to experiment with street food. On weekends, a stroll through Stanley Market is enjoyable; it is a good place to grab a bite.

TIPS

Avoiding visiting the city in high summer; travel from October to March if you are going on a holiday.

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Coordinated by Jasodhara Banerjee

To read the full version, visit ***www.forbesindia.com***

A pick of the best, the latest, the greenest, the quirkiest, the most luxurious that money can buy

Sport

PEDAL PUSHING

Madone, the latest generation of race bikes from Trek Bicycle, combines advanced aerodynamics, ultra-lightweight and superior ride quality. The bike's IsoSpeed design not only smoothens the road for riders, but also reduces fatigue. Madone SLR comes with both disc and direct rim brake options. It also has stem options and additional bar sizes apart from +/- 5 degrees of bar rotation.
trekbikes.com

Style

CHANGING TIMES

The Luminor California 8 Days DLC takes several of the most characteristic Panerai ingredients—the California dial, the titanium case coated in DLC (diamond-like carbon), and the hand-wound P5000 calibre mechanical movement with a power reserve of eight days—and combines them in an original way with a completely new cuff strap of supple natural leather

argentorsilver.com

Home

WOODEN CHARM

These chairs from Cane Boutique have been carved out of a single solid block of acacia wood, which has been weathered for a period of six months. The pieces do not have any polish to enhance their look, and can be used indoors and outdoors with equal ease.

caneboutique.com

Home

SILVER LININGS

The Burnished Bamboo collection from ArgentOr Silver, known for its superior quality hallmarked silverware, combines oriental beauty and minimalistic design to create utility adornments. These ornaments add versatility and grace to their surroundings.

argentorsilver.com

A motorcycle is an independent thing.

—RYAN HURST

On a motorcycle, you can't really think about more than where you are. There's a freedom that comes with that—from stress, worry, sweating the small stuff.

—LAURENCE FISHBURNE

When I'm riding my motorcycle, I'm glad to be alive. When I stop riding my motorcycle, I'm glad to be alive.

—NEIL PEART

On a bike no one ever asks, "Are we there yet?"

—STACY WESTFALL

That's all the motorcycle is, a system of concepts worked out in steel.

—ROBERT M PIRSIG

There is something about the sight of a passing motorcyclist that tempts many automobile drivers to commit murder.

—HUNTER S THOMPSON

If I could marry my motorcycle, I'd roll her right up to the altar.

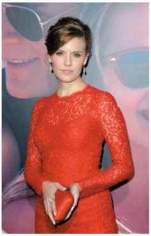
—FLIP WILSON

You live more for five minutes going fast on a bike than other people do in all of their life.

—MARCO SIMONCELLI

You do not need a therapist if you own a motorcycle, any kind of motorcycle!

—DAN AYKROYD



Note to self: Never ride a motorcycle in stilettos and a miniskirt.

—MAGGIE GRACE

The perfect man? A poet on a motorcycle.

—LUCINDA WILLIAMS

Motorcycle adventures are the perfect antidote to middle age.

—ALEX MORRITT

I asked God for a bike, but I know God doesn't work that way. So I stole a bike and asked for forgiveness.

—EMO PHILIPS

FISHBURNE, GRACE, HURST: SHUTTERSTOCK; THOMPSON: MICHAEL OCHS ARCHIVES / GETTYIMAGES; AYKROYD: GETTY IMAGES