



## TECH FOR GOOD COMPENDIUM

AI, blockchain, genomics and other emerging digital technologies present innumerable opportunities to resolve some of the world's most defining issues. Being an IT company, Infosys is committed to fostering technology for good in our communities across education, healthcare, and e-governance while partnering with larger societal stakeholders and helping them harness the power of technology.

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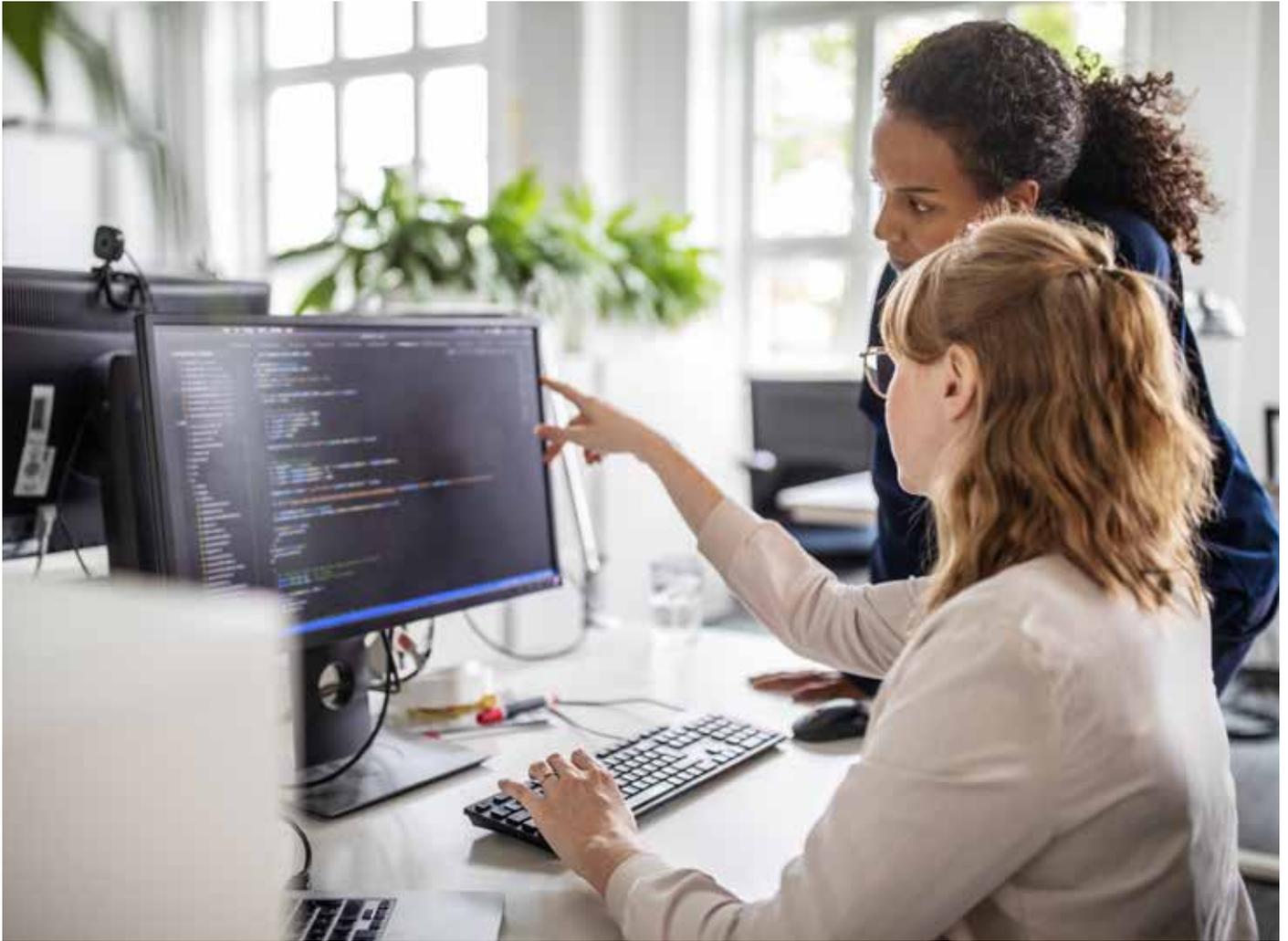
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## Reskill And Restart



## Introduction

The global workforce has been changing rapidly. Several organizations are looking at workforce reduction and other cost-saving strategies. However, a majority of organizations are also struggling to find skilled talent to fill open roles. The only way to bridge and balance this accelerated divide is through reskilling.

## The Problem Statement

The skill gap has further accelerated due to COVID-19. There is an acute shortage of talent with the right skills. However, there also exists a unique

opportunity to provide equal access to learning to those who have been hit hardest by recent job losses – non-degree holders, minorities, and women. The need of the hour is not just to establish employer-employee connections, but to spot talent and give them the right skills to enable them to participate effectively, reskill them rapidly and help employers hire them.

A consortium of partners including Infosys, pymetrics, Merit America, Per Scholas, Revature and Woz U has come together to tackle this challenge.

## Methodology

Reskill and Restart is a free, online platform launched in the US that brings together employees, trainers, and employers on a guided journey. It begins with an aptitude and skills assessment, followed by curated job-specific skills training, and culminates in matching people with roles that enable them to find careers in technology, non-technology, and support functions. It enables employers to review the available talent pool for the right match and hire the right fit while employees undergo rapid and job-specific reskilling on this integrated, multi-stakeholder platform.



Reskill and Restart is powered by Infosys Wingspan digital learning platform, integrated with pymetrics behavioral science and audited AI technology to spot the reskilling needs of available talent. The platform also offers guided training in technology and other career-based programs designed to get people, including those without bachelor's degrees, into the workforce while also enabling simultaneous work related skilling.

## Business Value

As of today, the platform has 250 free digital learning courses covering 18 career streams comprising over 1700 modules and 9,600+ resources. Users are guided to suitable learning and career paths based on their aptitude matches. They also get to explore available job opportunities in the marketplace. The user experience is enhanced throughout their learning journey on the platform as they keep adding skills to their profile.

## Conclusion

We have over 100 users currently who have taken the assessment and are going through multiple courses on the platform. We are also discussing this solution with clients and state governments to support their staffing requirements and boost the employment rate.



# InfyTQ - Enhancing Employability

## Introduction

Statistics reveal that, out of 1.5 million engineering students who graduate each year in India, 80% are unemployed as they lack the digital skills that companies look for. In 2004, Infosys launched Campus Connect, a program to enhance the employability of the engineering students in India. In 2019, Infosys developed InfyTQ, the first and one-of-its-kind next-generation learning and engagement platform, for all engineering students in India to help them increase their 'talent and technology quotient' and enhance their employability.

When InfyTQ was launched in 2019, it had approximately 62,000 students appearing for the technology certification process. The process was executed in a physical proctored setup, in more than 36 cities, across the country. In 2020, it received more than 3.5 lakh registrations. 1.58 lakh students appeared in the 'qualifier round' as part of the certification process, recording a 2.5 times increase in the number of enrolled students.

## The Problem Statement

The large number of interested students required us to be able to address the learning needs of talent beyond a few select colleges, so scalability of the solution was key while keeping costs at a minimum. The COVID-19 pandemic also urged us to create flexible yet resilient formats that would enable us to be effective. Multiple job roles had to be addressed to attend to the needs of diverse learners.

## Methodology

We aimed at nurturing top-class engineering students' learning and make them 'employable' by:

- Sharing industry knowledge so that students could become industry-ready even while still in college
- Offering soft skills courses for professional development. We provided all the study material along with sample tests and the certification test on the same platform enabling a one-stop

solution to learn, get certified and become eligible for an interview at Infosys

Unlike server-based tests that are usually conducted at campus recruitment drives, with InfyTQ, we were able to conduct internet-based tests across the country. The recruitment team at Infosys collaborated with the internal Education Training and Assessments and Information Systems teams to create an assessment platform that enabled them to test more than 55,000 candidates in one go. A user-friendly platform for online registration and slot booking enabled us to receive more than 3.6 lakh registrations for the 2021 batch, within a couple of months.

### Here's how we did it:

- We opened the online registration in December 2019 and informed all stakeholders about it.
- We held multiple awareness sessions for students and placement officers.
- In February 2020, registered candidates were invited to appear for the qualifier round from the location of their choice.
- Candidates who cleared the qualifier round were invited to appear for the certification test in a physically proctored environment in March 2020.
- Due to the unprecedented COVID scenario, we shifted the entire setup to a virtual mode and were able to test the remaining candidates in a web proctored assessment.

InfyTQ 2019	InfyTQ 2020
3,50,000+ users registered on InfyTQ	3,52,524 new registrations on InfyTQ
61,967 students appeared for the test	2,38,713 students registered for Infosys Certification
1925 students were certified	1,58,720 students took the first web-camera proctored qualifying exam for Infosys Certification
1814 students received job offers	20,613 students have been invited to appear in the next round of InfyTQ (certification + upgrade)  Around 4000 students have been shortlisted for the interview round from this pool and interviews are being held currently



## Business Value

### Impact on the key stakeholders

With the advent of our InfyTQ program:

- The time and cost to hire reduced drastically, while constantly improving the quality of the hire
- We were able to reach students in every part of the country, allowing us to discover a bigger talent pool while providing a learning opportunity to everyone

Going forward, we plan to take InfyTQ to the US markets and open it to the world as a universal learning platform and transform the way talent hiring and nurturing can be done across the globe.

## Conclusion

InfyTQ is a one-of-its-kind platform that allows students to learn, get certified, and secure a job as well.

- We were able to multiply the number of registrations three-fold.

- With the help of competition-based hiring, we are able to tap into genuinely interested students. This is an efficient way of sourcing the right candidate.

Since InfyTQ is open to everyone, students can apply for it irrespective of their grades, giving everyone an opportunity to participate.



## Infosys BPM's Apthamitra – A Friend In Need, Indeed



## Introduction

Since the turn of 2020, countries all over the world have been dealing with COVID-19 and its implications. The exponential rate at which COVID-19 is impacting people and the type of treatment it demanded is a great cause for concern. Rather than waiting for the disease to strike, regional governments in India decided to take action proactively and avoid a “shock and awe” scenario.

The Government of Karnataka (GoK) swung into action and immediately constituted a two-phased program. The first program (PRG1) was designed to contact, trace, and contain likely infections arising from travelers coming into Bangalore and Mangalore airports. The second program, named Apthamitra was conceptualized with similar objectives, but with a state-wide reach.

Infosys BPM has played a key role in setting up both the programs for the GoK. Infosys BPM pooled in the collective strength of India’s IT and BPM companies, medical workforce, and the Government of Karnataka to design, develop and execute a complex COVID-19 citizen response system for the state.

## The Problem Statement

Infosys BPM had to look into the following requests for the PRG1 program:

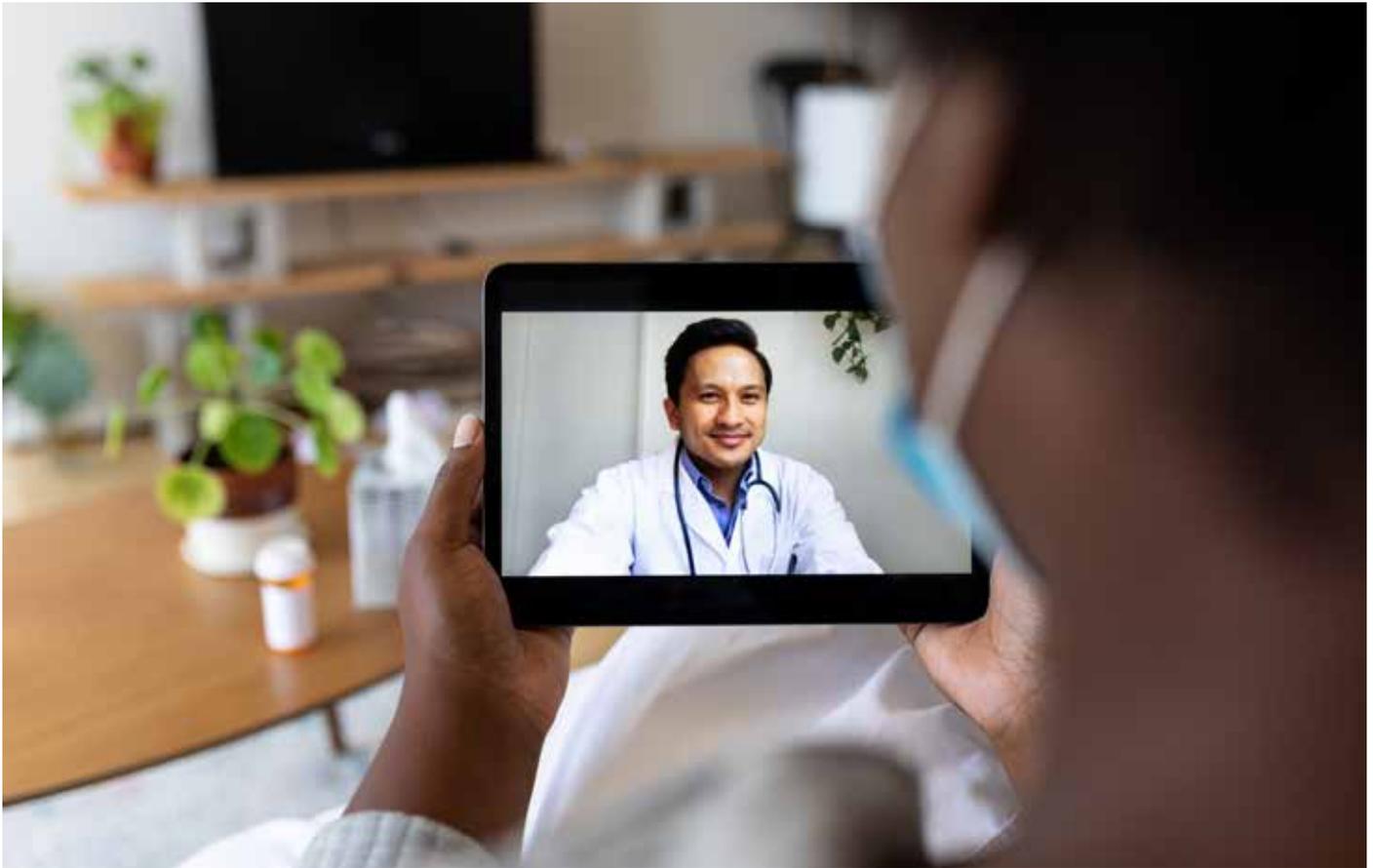
- Digitize data of all travelers who entered Karnataka on or after March 1
- Put together an outreach program to connect with the identified travelers and monitor their health status on a continuous basis for 14 days

- Report back on the health status of these individuals to state government authorities
- Coordinate actions with other stakeholders/organizations in the program for effective and timely on-ground action

The Apthamitra program followed as a direct consequence of the PRG1 effort.

## Methodology

Infosys BPM took the center stage in this massive effort. The origin of this program was the GoK reaching out to Infosys BPM with a request to capture data associated with the program. As the numbers started to rise in the state, the state Government in association with NASSCOM was very keen to help the common people with a telemedicine helpline and Apthamitra was born.



The intended modus operandi of the response program by GoK was to popularize an inbound helpline, which the citizens of Karnataka could use to protect themselves against COVID-19. Citizens are required to reveal limited elements of their personal health and non-health related information while accessing the Apthamitra system through an app or an inbound helpline number. Infosys BPM designed and built the Apthamitra app, meant to help citizens in logging their health data and gaining useful information, including their personal risk status and nearest health centers. Basis this information, a COVID-19 risk assessment is performed and citizens are advised to either go on self-quarantine, visit a state health clinic, or avail emergency help.

In specific cases, the Apthamitra system will arrange for help on behalf of the citizens. The system will integrate and interact closely

with other existing systems, such as the state hospital system and the ambulance system, to assist citizens.

Additionally, the system is designed to enable outbound channels in order to proactively monitor citizens who display a range of at-risk characteristics. Through the analytics that the system presents, it was possible to identify hotspots and create containment zones as small as a few hectares in area. Information on these zones was passed to the relevant health authorities for appropriate monitoring.

#### Infosys BPM engaged with GoK for the program in the following manner:

- We started designing the processes of outreach, diagnosis, treatment (with the actual treatment being handled by the GoK's health

department), and subsequent monitoring through continuous outreach and analytics

- Infosys BPM put together a consortium of 9 BPM companies with operations in Karnataka to conduct both inbound as well as outbound operations
- Furthermore, Infosys BPM engaged with all mobile carriers present in the state to enlist their participation as component executors as well as service providers in the exercise. This was crucial to track down and engage all potentially at-risk citizens on a real-time basis
- Infosys BPM put together a CRM (Citizen Risk Management) system, which can capture relevant data, display it, review it and analyze it in real-time. This system is designed to be used by frontline nurses and the secondline, which is constituted by a team of telemedicine doctors

- Infosys BPM worked with the GoK to define a media and telephony-based citizen outreach strategy. Infosys BPM participated right from designing the print ads, to disbursing SMS messages, to enlisting celebrities to deliver appropriate messages, and so on, followed by a geography-based rollout strategy of the message
- We worked with the health department to design a training curriculum for doctors and nurses enlisted to serve under the program
- Technologically, we have created a system that allows both work-from-home and on-premise models to coexist. Needless to say, this system meets all the demands of modern day scalability and security requirements
- The system can convey messages to citizens in a targeted manner, limited to a cell phone tower, ward, taluka, village or a district, in order to keep the messaging relevant, and thereby eliciting greater cooperation from the general public
- The system can seamlessly transfer data to the state's hospital and emergency response systems in a two-way mode

All processes and systems developed by Infosys BPM meet stringent regulatory standards.

## Business Value

- Over 650k calls were handled by the Apthamitra Helpline between May and Nov. Out of this, over 50k citizens were supported by the telemedicine doctors
- Over 175mn calls were made to reach out to the state citizens targeting the population section which could be prone to the infection. For eg, over 150k calls were made to citizens who had suffered from influenza-like symptoms or from severe respiratory infections in the past
- We connected with and helped 2,400 citizens with level-2 calling and monitoring, of which there were 2 positive cases of COVID-19
- Infosys BPM was able to 'agile' implement a program from idea-to-action within 96 hours, addressing all activities such as designing, detailing, information system building and personnel training

## Conclusion

The Apthamitra response system is a one-of-a-kind system that utilizes the power of technology, consortium building and public-private partnership, to overcome COVID-19. With Apthamitra, we expect to identify, advise, isolate and support infected persons. The system has been one of the levers which has helped prevent the state's health machinery from being overwhelmed with the infection. It also focuses on bringing down the costs of containing the disease (excluding indirect economic costs) by up to 90%, by focusing on prevention, rather than on cure alone.



# Support For The People, By The People

## Introduction

During the lockdown owing to the pandemic, several people were impacted due to a lack of food. Many NGOs, social organizations and trusts couldn't continue their support which further intensified the issue. Local volunteers did their best to help, but there were significant challenges in identifying people who were in need of food and those willing to help them. We found that many people were willing to help but didn't know how to offer help in a safe manner.

At this time, in May'20, a set of technology enthusiasts from Infosys Chennai came up with an idea to leverage technology and connect communities through a web application open to the internet. This was developed in a 5-week timeframe with the help of the Infosys Chennai leadership. A dedicated team was deployed – and a virtual call centre was set up. Sneham

Foundation, Infosys Chennai's employee volunteering group, offered to help by sponsoring high priority requests. Ennangalin Sangamam – another NGO offered to be the eyes, hands and feet of this initiative. In a span of 4 months, 750+ beneficiaries in remote villages of Tamil Nadu were provided with one week's worth of food items. This was possible through a digital platform:

<https://supportmycommunity.org>

The pandemic was unprecedented. Unlike other natural disasters, this one was exacerbated due to risks associated with contact and an inability to travel/move around.

Many people especially the physically challenged, visually impaired and those below the poverty line were severely impacted. Many social organizations that they were dependent on couldn't continue with their help as the inflow of donations was also impacted.

## The Problem Statement

There were pockets of individuals offering help, however, they struggled to find the right people who needed this help. They were also limited by their dependence on messages on WhatsApp or the telephone. We analyzed the problem to determine if technology could help fill any of the existing gaps. We also realized that the people we were looking to help could not afford phones to exchange information.

## Methodology

The solution involved applying principles of supply chain. The team designed a community support chain with various roles for volunteers. Detailed description of role and process flows were documented and made available on the internet.



Around 10 technology enthusiasts joined hands to create a digital platform. The objective was to minimize operational costs and maximize the value to the beneficiary – so we had to find a low cost approach. A Java web application was developed using minimal cloud infrastructure.

- Application developed using cloud native open source technologies
- Primary hosting using S3 static website, including reports which were developed on HTML with search facility within S3 to optimize cost
- Interactive needs were catered to through Java application on AWS – EC2 with elastic scaling based on the load
- As the beneficiaries were primarily based in rural areas, internationalization features were enabled with language capabilities
- Leveraged social media channels – Facebook, Twitter, Instagram, YouTube
- Used WhatsApp as the primary medium for building awareness – leveraging creative inputs for messaging and videos
- Virtual call center setup and co-ordination was done through volunteers

Web-application link:

<https://supportmycommunity.org>

[https://www.youtube.com/channel/UC4ZjXUGvV-vmdecjgxbSgw?view\\_as=subscriber](https://www.youtube.com/channel/UC4ZjXUGvV-vmdecjgxbSgw?view_as=subscriber)

<https://facebook.com/tnudavungal>

<https://twitter.com/Supportmycommu1>

## Business Value

230+ individual requests were fulfilled through volunteers. The beneficiaries included 28 BPL (below poverty line) students studying in the Government School in Cuddalore, Tamil Nadu. Once schools were shut due to the pandemic, nearly half of these students started begging on the streets as they couldn't afford to eat the only good meal they were being served daily through the government's mid-day meals program.

### The solution also ensured that

- 580 students were served mid-day meals in Cuddalore and Chennai
- 71 elderly people were provided essential food items in Namakkal
- 500 fishermen were provided essential food items in North Chennai

- 35 poor and destitute people were provided essential food items in Thiruvannamalai
- 50 differently abled people were provided essential food items in Bhavani, Erode

## Conclusion

Unique value was created through this initiative. The newly created digital platform allowed anyone to contribute meaningfully to the supply chain. It included identifying those in need and those willing to help. The community benefitted by getting food when it needed it most. Donors experienced the convenience of donating from home in a safe manner. Volunteers were able to serve the community and technology enthusiasts had a rewarding experience of seeing their innovation benefitting many, come to life right before their eyes.





# Infosys Contact Tracing Solution

## Introduction

Most countries have enforced lockdowns and self-quarantine measures to contain the COVID-19 pandemic and keep their citizens safe. For this, governments are leaning towards technologies that could keep track of affected people to restrict further spread of pandemic.

The Government of Rhode Island was keen on developing a contact tracing solution to help people and state officials slow down the spread of coronavirus while protecting the citizens' privacy. This solution could also assist the state in reopening businesses while reducing community transmission.

Infosys partnered with the State of Rhode Island (RI) to develop a mobile application that enables the health department to monitor a citizen's health by using their location data, with the citizen's consent. This application helps the people of Rhode Island follow the required health and safety guidelines.

## The Problem Statement

- Using multiple proximity sensing technologies
- Enabling multi-vendor ecosystem support

## Methodology

### One-stop application for RI health department and citizens

- Created 'Crush COVID RI' — a location diary and COVID-19 symptom checking app
- Utilized the Infosys Location-based Services platform to develop individual location diaries locally, thereby protecting an individual's privacy
- Used geo-fencing and geo-location to keep a record and display of locations visited



- Developed iOS and Android mobile app with latest design principles
- Multi-lingual app, currently supporting English and Spanish
- Opt-in option to allow the user to share the GPS location in an anonymous way
- Symptom checker survey to allow users to submit the prevalence of COVID-19 symptoms
- Enabled users to access COVID-19 related news, information and guidance along with links to local state resources
- Compliance with government prescribed guidelines
- Management of regulated and secured data
- Provided seamless user experience
- Provide information published by the RI health department such as testing centers, clinics, safe places to stay, health insurance, information about schools and childcare.

### Contact tracing solution – Safe and user friendly

- Helped individuals keep track of the places they visited and people they came in contact with over the last 20-day period, should they test positive

### Business Value

- Around 18000+ downloads within three days of launch
- Captures location hotspots of a user anonymously and locally
- Information shared with the health department only after receiving the user's consent

### Conclusion

The app was designed by the Infosys design team in Providence Rhode Island and has been integrated with Salesforce contact tracing solution.





## A Less 'Taxing' Experience

## Introduction

The Income Tax Department of India introduced e-filing and centralized processing more than a decade ago. The number of returns filed electronically has multiplied 14 times – up from 50 lakhs filed in 2009 to around 7 crore returns filed in 2019. In fact, more than 99% of returns are now filed electronically. However, despite these digital advances, there isn't much awareness and adoption of the existing e-filing portal for self-use by the taxpayer. The increasing load on the system just before the due date for filing increases the processing backlog, and in turn the grievances of taxpayers.

Infosys is rebuilding the new integrated e-Filing and Return Processing system for usability, massive scalability, and high availability. The new system will offer a host of features such as intuitive navigation, virtual assistants, quick view dashboards, redesigned communication notices, and most significantly will reduce the average return processing time to less than two weeks.

## The Problem Statement

Most taxpayers need help in preparing and filing their income tax returns. The URL, password, or filing steps are often forgotten given the fact that most people are infrequent users of the e-filing portal. Taxpayers usually login only once a year, at the time of filing their returns. The fact that return filing requires some basic knowledge of income tax rules as well as a grasp of numbers further complicates the matter and alienates many taxpayers. In select cases when the tax department sends a 'demand notice' or any notice that requires action, the taxpayer is often left at odds wondering how to respond or act.

Infosys is working with the Income Tax Department of India to build a new integrated e-Filing and

Return Processing system which seamlessly weaves components of digital technologies to transform tax administration in the country. The new system brings 'convenience', 'usability', and 'transparency' to the taxpayers while improving 'accuracy', 'efficiency' and 'speed' for the Income Tax department.

## Methodology

- **24\*7 online portal** gives access to information and aids transparency
- **Microservices**-based design helps scale up and handle load on demand
- Instant PAN allocation due to **API-based integration** with other systems
- Notices designed with detailed information and guidance to respond
- E-assessments with **video conferencing** ruling out visits to the tax office
- Objective and timely resolution of grievances using **Virtual Assistants**
- **Electronic disbursement** of due refunds without manual intervention

## Business Value

### Convenience

Wizard-based filing takes away complexity for majority of individual taxpayers and reduces dependency on tax preparer or chartered accountant. Most taxpayers would be able to file returns on their own, from the comfort of their homes.

### Speed

Faster ITR processing leads to reduced interest payout on refunds. This has resulted in savings on the interest outgo, for the Income Tax Department, to the tune of thousands of crores every year.

## Environment

Going paperless is economical and eco-friendly too – 10 crore emails, 20 crore SMS alerts generated annually not only serve as instant communication but also save big money in postal charges, storage space, and office staff.

## Transparency

Manual issuance of refunds by ITD officials has stopped completely. Each year more than a crore refunds are issued online - directly to taxpayer's bank account, without any manual interference.

## Taxpayer outreach

Focused awareness and educational campaigns on social media not only enthruse the taxpayers to comply and file returns on time but also keep them well-informed about important news and departmental initiatives.

## Conclusion

Implementation of the new Income Tax system also underscores the success of the Public Private Partnership (PPP) model. The core skills of the Income Tax - Systems Directorate have been further galvanized by complimentary skills of leading IT service majors. The implementation of the new system required products and services from more than 30 OEMs or vendors. The implementation of a world-class system has been possible only due to relentless innovation and unconstrained collaboration amongst all team members and stakeholders.



# Department Of Posts

## Introduction

The Financial System Integrator (FSI) program is for the Department of Posts (DoP), Government of India. It is one of the eight large programs identified by DoP to completely modernize the postal department through technology. The technology transformation coupled with DoP's unique strength in terms of the department's reach to every nook and corner of the country resulted in immense value creation for the department, government, and country at large.

India Post has been one of the big transformation projects for the Indian Government. India Post serves as a critical channel to provide financial services to a large section of the Indian population (>50%) who do not have access to the banking system.

Hence the impact and visibility of the program has always been very high. One of the key components of the

Department of Posts' vision is to be a "socially committed organization connecting individuals and businesses". Of the total 1.55 lakh post offices, around 10% are situated in urban areas and 90% are in rural areas. On an average, each post office in India serves an area of 21.2 square km and a population of 7,174.

## The Problem Statement

The execution and adoption of such a massive program requiring a complete overhaul of technology and processes in such an age-old institution was a big challenge.

The requirement of a centralized banking and insurance solution for 25K branches of DoP, digitization of crores of manual account records, installation and operation of ATMs for DoP and ensuring interoperability of the ATMs, numerous integrations with other SIs of DoP, NPCI, institutions like Western Union, payment gateways, etc. all introduced significant technical risks.

Infosys provided them core banking, insurance, and enterprise content management solutions.

- Infosys also built key channel capabilities around internet, mobile, and remote applications provided through Infosys Core Banking product - Finacle. Infosys was also able to implement ATM and IVR by partnering with leading industry solution providers. Infosys solution rendered powerful risk-based authentication and secure transactions and they were designed using globally proven solutions like Oracle Enterprise solutions and infrastructure components from IBM.
- Decentralized banking and insurance operations with heterogeneous infrastructure at 25k+ locations.
- Manual process of moving physical files across different locations for approvals with no holistic view of business.



- Migration of more than 60 crore banking accounts and 3 crore insurance policies.
- Centralizing the banking and insurance solution for 25k branches of DoP.
- Installation of 1000 ATMs. ATM managed services including cash replenishment in ATMs, site maintenance, cash reconciliation, etc. were also part of the project scope.

## Methodology

- Finacle and McCamish were the banking and insurance products used to centralize the banking and insurance operations of India Post. Insurance solution has a heavy dependency on documents. Hence, enterprise content management

(ECMS) was used to manage the documents and maintain ease of access.

- Continuous communication and co-creation of a solution with customers through the transformation journey to achieve a customer acclaimed solution. Design of overall plan, training approach and communication mechanism along with the customer.
- The SOPs created for use of new solutions were made user-friendly so that the vast strata of DoP employees coming from various parts of the country and with different educational backgrounds are able to understand and use the system.

- Based on concerns raised by business, we revisited the architecture/solution and did numerous changes to the system to maintain ease of use and increase adoption.
- Ensured approachability of senior members on the project team along with a responsive helpdesk so that issues were resolved fast and people adopted the system.
- Training of more than 40k individuals under train the trainer program.
- A user-friendly migration tool was developed, which allowed the user to perform the extract and transform activities easily. This has helped in reducing the time span and space requirement at a central location, and migrations can be performed at much faster pace.



- Daily reports related to system transactions, success/failure report for the execution of the batches on a daily basis, refreshing of materialized views, etc. were all automated.
- Excel-based tool developed for tracking production support tickets was introduced by integrating with MS Outlook email.
- Deployment of CPMs (a circle project manager is a person specifically deployed in a region to take care of the issues from that region) was done to ensure that regional complaints were addressed in the local language.
- We used technology as a driver and trained end-users.
- Developed Service Delivery Platform for delivering DOP's core services (Banking, PLI, Postal, etc.) on rural ICT devices.
- Rolled out applications to all 1,30,000 EDOs.
- Trained BPMs on application and usage of devices. We provided training to 4000 trainers who further trained BPMs.
- Project management services across the entire network.
- Supply of central hardware.

## Business Value

- Modernized financial services (banking and insurance) business across India Post offices
- The scale of transformation of the India Post Program was huge
- **25000+ offices** live with PLI and
- **23000+ offices** live with CBS
- **Migration of over 650 million accounts** and more than **30 million insurance policies**
- More than **35,000 users** access the application
- **More than 20,000 India Post employees** across the country trained on the usage of the application
- Integration with the enterprise content management system, core banking system, core accounting system, point of sales, HRMS system, IVR, and call-center solutions
- CBS and PLI applications are accessible to 1.5 lakh branch offices through handheld devices
- 992 ATMs rolled out (out of 1000) - Interoperable and being managed by FSI (even cash loading)
- Infrastructure delivery – **more than 24,000 hardware** pieces supplied to 20,000+ locations

## Conclusion

- A big leap in the financial inclusion for the country especially, in the rural sector. Implemented government social security schemes like Sukanya Samridhi, Pradhan Mantri social security schemes, Jan Dhan, etc. to reach the masses.
- The Indian Government via India Post is now able to reach the unbanked sector of India through financial inclusion solutions deployed over a handheld device and rolled out to 1.3 lakh locations in India.



**Rapid Company Registration  
Through One-Stop Solution**

## Introduction

The Ministry of Corporate Affairs (MCA), Government of India, is the regulator for all companies and Limited Liability Partnerships (LLPs) which are registered and operating in India. It is primarily concerned with the administration of the Companies Act (CA), 1956; Companies Act, 2013; Limited Liability Partnership Act, 2008 and other allied Acts and Rules and Regulations framed thereunder for regulating the functioning of the corporate sector in accordance with the law. Apart from the above stated Acts, MCA is also responsible for administration of a wide range of statutes including insolvency and liquidation of corporates, promoting fair competition and functioning of professional institutes.

## The Problem Statement

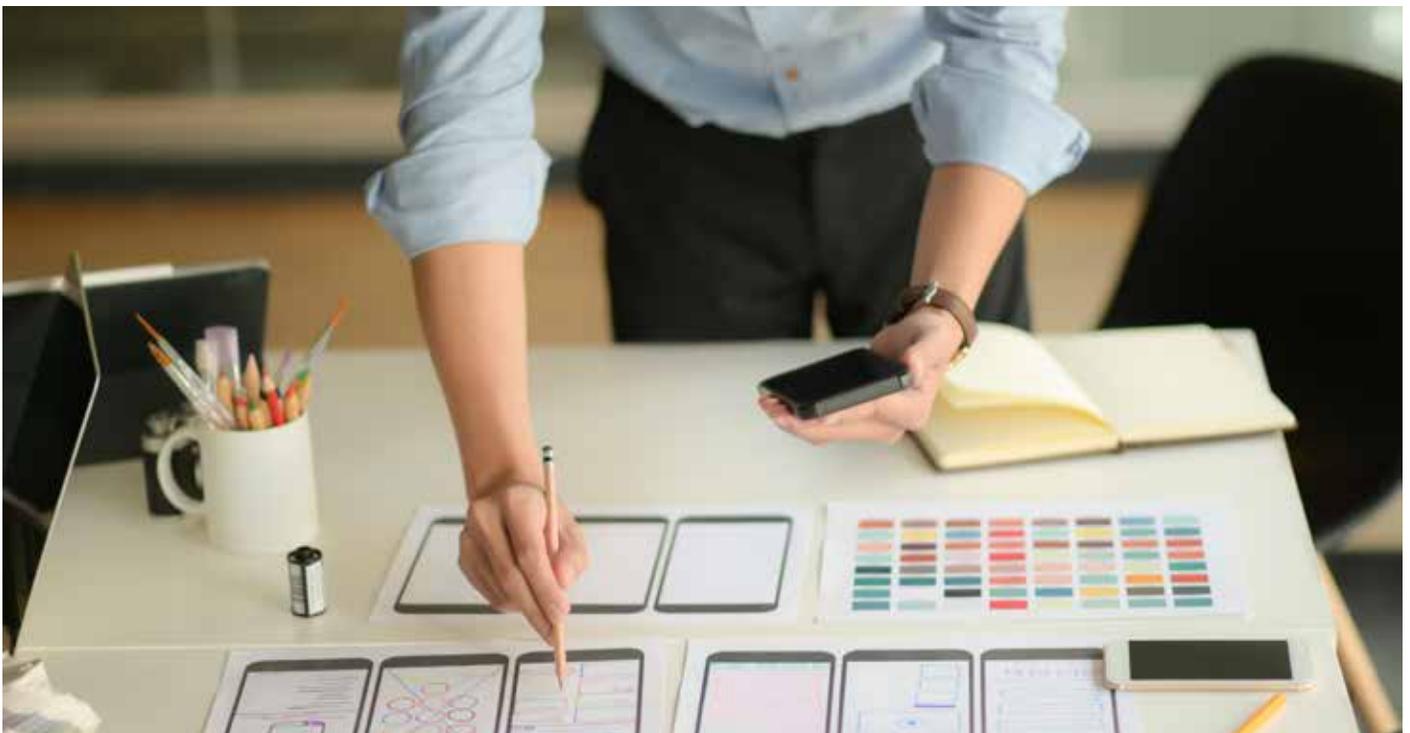
The rise of globalization led to an increase in the entry of foreign companies in India. This resulted in a sudden increase in documentation and paperwork. It was critical to

enhance the speed of document processing while eliminating the evils of manual manipulations and associated inefficiencies. MCA launched an e-governance initiative - MCA21 in order to fully automate a company end-to-end lifecycle under the Companies Act, 2013, which includes incorporation, appointment of director, annual filings and closure of business. The objective was to help the entire business community meet their statutory obligations with ease.

MCA21 is a public services portal with **30+ lakh registered users and 10+ lakh registered companies**. The system directly impacts the economic activity and corporate growth in India. Infosys was chosen as the preferred partner to implement a re-engineered MCA21 V2 in 2013. Infosys operated the MCA21 V2 system until 2020. It was due to the stupendous work done by Infosys on **Government Process Re-engineering and Technical Solution Innovation that led to a significant jump of 14 points (from 77 to 63) in India's ranking on World Bank "Ease of Doing Business" index.**

Infosys re-engineered the legacy e-governance system and rolled out the new MCA21 V2 system in 2016. The project involved standardization of the resubmission/approval workflow and automation of the ticket assignment and resolution with the implementation of IAP (Infosys Automation Platform). This has resulted in effort saving and improved turnaround time for faster incorporation of companies. Our support to MCA involves establishing MCA21 application across 38 locations in India. Infosys also looks after the rollout of the application across an additional 27 offices.

The MCA project has also created and reused several reusable assets as a part of this project implementation, including – Infosys Cognitive Automation Platform (ICAP), Continuous Improvement Continuous Delivery (CICD), chatbot, ticket classifier, email utilities, PDF convertor for complex taxonomies, and Robotics Process Automation for internal processes and payments batches.



## Methodology

The demanding nature of this engagement led the team on a path of creativity and innovation to ensure that maximum value is realized by the client. Complex and cumbersome process of company incorporation in India was re-engineered by the Infosys project team through the launch of **Simplified Proforma for Incorporating Company Electronically (SPICE) form (Oct 2016) as a part of Government Process Re-engineering (GPR) for Ease of Doing Business (EoDB)**. Integrated incorporation of e-form facilitated a one-step process for company incorporation including name reservation, Memorandum of Association (MoA), Articles of Association (AoA) and allotment of Director Identification Number (DIN) to directors.

This led to close to **90-95% reduction in cycle time for Company Incorporation** (including PAN/TAN allotment), from 15+ days to <1 day. Even the time required to complete the entire process of DIN allotment through Company Incorporation was reduced to 50% by re-engineering five processes into a single process (SPICE). Recovery time was reduced by 25% by replacing manual steps with right set of tools.

The rollout was simultaneous across all geographies in India – 26 Registrar of Companies (ROC)/7 Regional Directors field locations. A second major release of the New Companies Act, 2013 (NCA) was rolled out to achieve system availability, steady performance, and run business as usual within 45 days of hyper care period. The team consistently achieved successful and smooth annual peak filing with a stable system and met majority of SLAs, from September 2016 till date.

## Business Value

The adoption of a client-centric approach at every stage of the project, from planning to design to execution, led to significant business value realization for all stakeholders in the project ecosystem – including the Ministry of Corporate Affairs, associated companies/corporates across the country as well as for Infosys as an organization. The considerable reduction in cycle times through process innovation, standardization and automation resulted in 60% drop in the number of complaints received by the client. 90% of all service requests were resolved the same day, while 95% were resolved within 2 days. The percentage resubmissions for SPICE reduced from 65% to 35% under the new regime, with a simultaneous improvement in compliance filings by corporates to over 70%. The considerable improvement in staff productivity (CRC optimization) led to a reduction in the overall requirement for manpower from 45 officers at 24 locations to about 10 officers at a single location.

Form filing to ticket inflow ratio was reduced significantly from 15% in 2017 to 5% in 2018 by implementing Infosys Cloud Cognitive Automation Platform (ICAP) for automated resolution and closures and utilizing Machine Learning (ML) and Natural Language Processing (NLP) capabilities with applications and ITSM tool along with self-help option through chatbots and integration to Known Error Database.

### Other business value additions include:

- Average time taken for company incorporation reduced from 3 days in April 2015 to less than a day in April 2018

- 10% improved TAT (Ticket Turnaround Time)
- Significantly enhanced end-user experience
- Integration into the National Infrastructure
- Ability to extract value from the returns filed by companies
- Enable Value Added Service (VAS) providers

## Conclusion

With Infosys' knowledge and experience in this domain, we offer a flexible, scalable and integrated system that aims to:

- Ensure smooth e-filing by virtue of our proven knowledge and experience
- Modernize experience for internal and external stakeholders by leveraging contemporary technologies including AI/ML to enable automation, self-service and customized products
- Build a customer-centric system that is user-friendly and secured for safe transactions by leveraging techniques like Design Thinking to uncover the implicit expectations of users
- Synergize various functionalities to support the user
- Enable innovative operating processes and digitization of the entire value chain to deliver a future-ready platform.



# One Nation, One Tax, One System – Goods And Services Tax Network

## Introduction

The Government of India enacted the GST (Goods and Services Tax) Act with the objective of implementing a unified indirect taxation for the entire nation. This was a historic indirect tax reform that subsumed most of the applicable indirect taxes levied by the Centre or respective states. This is the **biggest tax reform initiative since independence** spanning multiple dimensions including the introduction of **cooperative federalism, political and administrative change**, and the introduction of **laws, rules and forms** governing the **business processes** and crafting a homogenous IT platform to achieve the vision. The program was complex from both **business** and **technology** perspectives.

GST System was built on an open source platform using agile-based methodology meeting all unique characteristics of the system. It envisioned the concept of One Nation, One Tax, One System and successfully

implemented a robust and scalable solution ensuring the seamless movement of the country into the new tax regime.

**Infosys implemented the transformation program end-to-end** on a turnkey basis – the scope of work included **program management, infrastructure procurement and set-up**, participation in **formulating business process, application development, training** as well as **operations and maintenance**.

## The Problem Statement

We had to tackle multiple challenges to successfully execute the project and provide tangible benefits. Key challenges are listed below:

- **External dependencies** – The GST system has a heterogeneous eco-system involving complex integration with systems of government and non-government agencies such as CBDT, Aadhaar, Accounting Authorities, Banks and GSPs.

- **Design challenges** – Complex computation business log and architecture in open source platform involving five data sources including Hadoop and meeting stringent non-functional requirements.
- **Execution challenges** – Evolving business requirements due to change in GST Law, Rules and Forms notified by Government over a period of time leading to re-design and re-development impacting the original schedule of the project.
- **Reputational challenges** – GST has been one of the biggest transformation projects undertaken by the Government of India in the last 40 years, impacting a large user base of more than 1 crore contributing to a major portion of government revenue. This created high visibility and enhanced expectations from the system and the performance of the SI partner across the country.



GST System is an end-to-end tax collection and tax accounting system aimed to support tax administration under the GST regime. It is meant to replace over 30+ different indirect taxes and allied systems. Hence, the usability factor, a faster adaptability by users and the pace at which the enhancements were needed, added complexity.

## Methodology

We embarked on the journey to design and develop the **GST System** using the **Waterfall methodology**, based on the foundation of the prevailing GST Law/Act, Rules and Forms.

To address the requirement volatility and enable adoption of the agile practice, a specific **GST scrum framework** was designed and adopted along with DevOps best practice of **continuous integration and continuous delivery** to significantly improve our time-to-market and reduce the overall build, deployment and testing cycle time. This resulted in **more than 50% reduction in average lead time for deployment. Over 75% of lifecycle phases were automated** using DevOps tooling; which resulted in over **1000 deployments per month, across 8 environments and 2 rollouts** of incremental changes to production **every week**.

Some unique characteristics of the system are:

**System Architecture – has been the cornerstone to realize the business benefits**

- **Platform-based architecture**
  - System was designed to be a face-less engine leveraging **micro-services**
- Leveraged **SEDA** (Staged Event Driven Architecture)
- Designed **light weight platform** engineered for high performance –

- The base platform has been supported by distributed technologies that enable massive **scalability**

## Business Value

We demonstrated flexibility in delivering GST to the nation by:

- Encapsulating agility amidst the evolving requirement to deliver with faster turnaround time
- Building robust governance framework to
  - Manage stakeholder relationship (that included the Office of Prime Minister of India, Finance Minister of India, Department of Revenue, Group of Ministers and GST Council)
  - Measure deliverables against baselined targets
- **Compliance improvement:**
  - Increase in the number of registered taxpayers
  - 56.69 crore return filings till 22 November 2020
- **Completeness and correctness:** Delivered complete feature and functionality of indirect income tax as required by the Government of India within stipulated timelines
- **Ease of doing business for taxpayers and tax officials:**
  - Businesses across the nation are able to electronically file tax returns, get refunds and reconcile their transactions for validity and consistency to the minutest details
  - Auto-drafting of returns between suppliers and buyers reducing taxpayer's overhead
  - Integration with E-Way Bill improved productivity by faster movement of goods
  - Integration with MCA rendered a single window for incorporation of new company

- Automated refund process with integration with PFMS for single authority for disbursement
- Development of New Returns simplifying the return filing process underway, which has already been made available to a selected list of taxpayers as BETA version

Other notable milestones include:

- One of the largest open source ground-up development projects in the country
- Successful eco-system model
- Among the highest ranked sites in the country (75 on SimilarWeb.com and 140 on alexa.com)

## Conclusion

GGST, one of the first successful implementations of a Government program delivered and managed by a private entity, has become an **emblem of success of this model** in India. Today the GSTN application supports 8.5 million dealers with 500 invoices per dealer per month and scales up to process 1.2 billion invoices on peak days

GST program has become a project for the Government of India to showcase how **large, complex and transformational** programs can be successfully implemented. It has become a reference case study for building a **massive system using open source architecture** and for adoption of **agile and DevOps** to reduce delivery cycle-time.





For more information, contact [askus@infosys.com](mailto:askus@infosys.com)

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