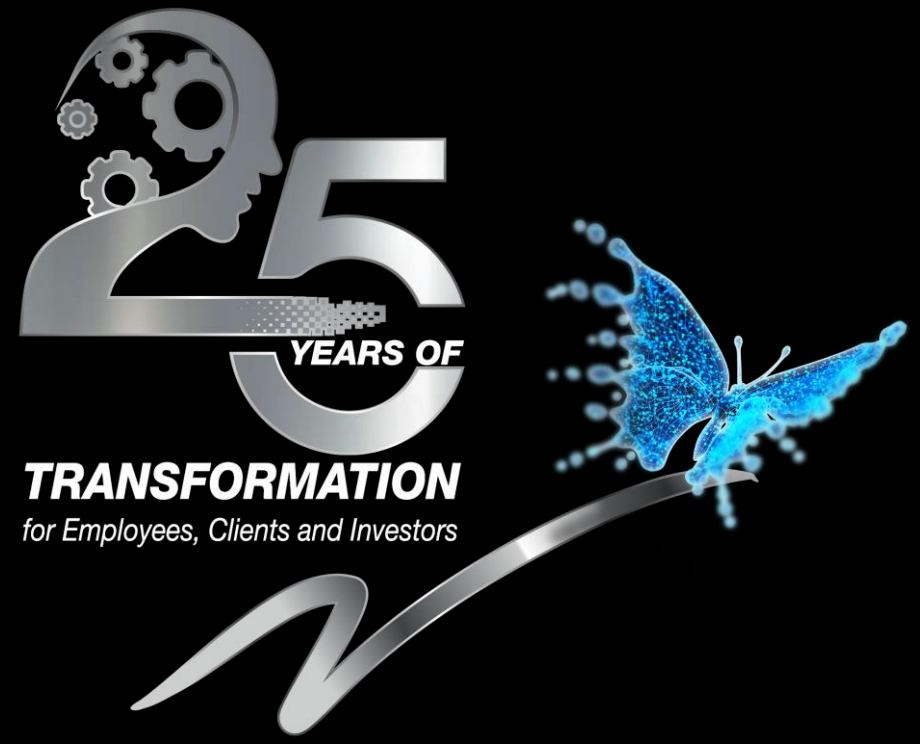
Mphasis
The Next Applied

August 2024

Mphasis - COPA Quantum Computing Challenge 2024



Quantum Computing CHALLENGE

Indian Institutes of Technology & Quantum City, Calgary, Alberta

Airlines – Problem statement, Constraints and Data

Powered by

How will it work?

Mphasis
The Next Applied

Teams	Problem Definition & Dataset	Initial / First Round Evaluation	Final Round Presentation to COPA	Shortlisting Winner
6 Teams From **IITs**	Problem Statements	Mphasis, Quantum City, University of Calgary, IITs	Mphasis, Copa	WINNER
3 Teams From Quantum City **University of Calgary**	Business Constraints / Rule Sets			
	Airline Dataset			
	Output File Format			
Teams from IITs and Quantum City	Airlines - Problem statements, business rules and Dataset	Initial evaluation by a joint team from Mphasis, University of Calgary and IITs	Top Three Teams from initial evaluation	Winner from the Top Three Teams

What are the Timelines?

Activities	Week 1 06/Aug - 09/Aug	Week 2 12/Aug - 16/Aug	Week 3 19/Aug - 23/Aug	Week 4 26/Aug - 30/Aug	Week 5 02/Sep - 06/Sep	Week 6 09/Sep - 13/Sep	Week 7 16/Sep - 20/Sep	Week 8 23/Sep - 04/Oct	Week 9 07/Oct - 11/Oct	Week 10 14/Oct - 18/Oct	Week 11 & 12 21/Oct - 01/Nov (Tentative)	Week 13 04/Nov - 08/Nov (Tentative)
Kick Start												
Challenge Execution & Submission												
Initial Round Evaluation												
Final Round Evaluation												

Legends

Office Hours Touch Base Call – Once In 2 Weeks

Top 3 Winner Announcement

Final Winner Announcement

Where do we work?

Quantum Cloud Platform	qBraid
Credit Available	**500 USD per team**
Quantum SDKs*	***Qiskit, Cirq, AWS Braket, D- Wave Ocean**, NVIDIA Cuda-Q, Classiq, Xanadu Pennylane***
Quantum Hardware & Simulators*	***Gate Based Hardware, NVIDIA GPUs for simulation, Quantum/Digital Annealers/Other Quantum Annealers****

** TBD: Final list will be provided in a week's time. Access to the platform will be provided soon. A walkthrough of the platform will be scheduled subsequently.*

***Credits on qBraid platform can only be used for the list of "Quantum Hardware & Simulators provided above. For quantum/digital annealers or other gate-based systems or simulators which are not available as part of the list above, credits will not be available from the given budget. However, participants are encouraged to use the right SDK – hardware ecosystem to solve the problem @ scale.*

What are we planning to solve?

Airlines, through their Network operations team (NOC), routinely change their flight schedules for reasons such as changes in demands due to seasonality, picking up new routes, changes in flight timings, flight cancellations, changes to flight numbers, operating frequency, etc. Due to these schedule changes, impacted passengers need to be re-accommodated to available alternate flights.

Airlines need a solution to analyze the impact on the passengers due to the schedule changes and automatically identify the suitable alternate flights for the impacted passengers. Due to the scale and complexity of the problem, mathematical optimization-based solutions are routinely used in the Airline Industry to solve the problem.

COPA, Panama's flagship airline, along with Mphasis, is hosting this challenge to build a Quantum computing driven solution to address the passenger re-accommodation problem.

The challenge would require the participants to build a solution consisting of the following modules:

- **Identification of impacted flight segments and passengers**
- **Passenger (CVM – Customer Value Management) score calculation (pre-calculated as part of the input data)**
- **Ranking of alternative flights**
- **Optimal assignment of impacted passengers to available alternative flights**
- **Benchmarking of results**

Q & A

Thank You!

About Mphasis

Mphasis (BSE: 526299; NSE: MPHASIS) applies next-generation technology to help enterprises transform businesses globally. Customer centricity is foundational to Mphasis and is reflected in the Mphasis' Front2Back™ Transformation approach. Front2Back™ uses the exponential power of cloud and cognitive to provide hyper-personalized (C=X2C2 TM=1) digital experience to clients and their end customers. Mphasis' Service Transformation approach helps 'shrink the core' through the application of digital technologies across legacy environments within an enterprise, enabling businesses to stay ahead in a changing world. Mphasis' core reference architectures and tools, speed and innovation with domain expertise and specialization are key to building strong relationships with marquee clients. Click here to know