# Raaj Santosh

## Objectives

To establish a center of excellence to deliver a new renewable energy strategy to the Indian government that includes electricity generation using the polar jet stream, large scale hydrogen production using electrolysis, hydrogen storage infrastructure and back to electricity on demand using hydrogen fuel cells.

To demonstrate my invention (Wind Converter) that generates electrical energy (Giga Watt scale) using the kinetic energy of the Polar Jet Stream.

Consult with potential government clients (worldwide) to implement the hydrogen fuel economy by providing them with a low cost fuel (hydrogen) from India. In other words, create a new export market to replace fossil fuels.

To design, develop and market new educational programs leading to a post graduate diploma / degree in wind power systems.

## Education

- Bachelors Degree in Electronics & Instrumentation Engineering (B.E)
- Major - Digital Signal Processing | Minor – Biomedical Electronics

## Experience

### 1988 - 1992

### Technology Evangelist | Microsoft Corporation | Asia Pacific - USA

Working closely with program management and development teams, I evangelized key Microsoft server technologies at various events worldwide. This role also included educating developers, architects and enterprise users thereby facilitating a seamless transfer of Microsoft technologies from desktop to the server backspace and positioning Microsoft as an "enterprise" company.

### 1993 -1998

### Product Manager - SQL Server | Microsoft Corporation | USA

I was entrusted to re-launch SQL Server (a relational database management system) and position it against Oracle (primary competitor) in the back end server market. To begin with, none of the enterprise users / developers viewed SQL server seriously, worse they perceived it as a toy,

My challenge was to release a new version that must change user perception, challenge Oracle in its domain and evangelize the newly released product across enterprise users worldwide to facilitate its deployment. I re-architected the product (gathering inputs from key clients that used Oracle at the backend) from ground up to facilitate internet / cloud computing (which was in its infancy during that time) as I believed the only way to lock horns with Oracle was to change the rules of the game / paradigm of computing and progressed to develop a product that was future ready and future proof.

I convinced large customers like NYSE (New York Stock Exchange ran Oracle at backend) to become a beta site during the launch phase as it demonstrated SQL server's capability to run mission critical applications at real time. The new release of SQL server knocked out IBM from this market space and overtook Oracle in the Intel server market space.

## 1998 - 2002

## Group Program Manager – Public Sector | IBM Corporation | USA

As a program manager my role involved meeting government agencies / global institutions such as World Bank, etc. to identify potential projects for implementation. I had to liaise with sales and services teams to publish technical papers for clients to enable them understand how a potential project could not only save money and time but also provide them with a competitive advantage. My background with Microsoft helped as I introduced key Microsoft server technologies to retain / re-capture large government accounts that was slipping away from IBM towards Sun - Oracle. This strategy brought me to the attention of the CEO and top management at IBM as none before me had collaborated with a market rival due to IBM policy restrictions. I counter argued explaining that it made sense to introduce Microsoft (market rival) in areas that IBM lagged. For the first time in its history, IBM collaborated with its competitor – Microsoft and bundled its enterprise software to provide equipment and services for government agencies.

## 2003 - 2006
## Director Projects – Public Sector | IBM Worldwide | USA

As director projects I was responsible for reviewing all IBM government programs across the globe. My task was to identify government clients, review their strategy, develop a dossier that listed their weakness to implement their programs and provide them with an option / alternative. I introduced a new computing paradigm (e-Gov / cloud) to governments that helped IBM position its equipment and services along with Microsoft database management systems.

IBM continues to dominate the public sector market space to this date with its advanced IT equipment (servers / network) and provides services globally through large recurring contracts for government agencies.

## 2007 - 2010

## General Manager – Public Sector | IBM Worldwide | USA

I oversaw a large division and reported to the Senior Vice President – Sales who reported to the Chairman, President and CEO. As a division head, I was responsible for IBM sales revenue that accrued from government agencies worldwide.

My work involved extensive travel and meeting with government heads and agencies (wherever applicable) to help implement programs through local IBM equipment and services retailers. Typically IBM generates its largest revenue from sales of its equipment and services to government agencies. My tenure saw cloud computing paradigm (that I evangelized extensively throughout my IT career) gaining credibility with governments worldwide resulting in IBM getting a "makeover" to position itself as a dominant vendor to implement e-Gov programs – implies that equipment sales will accrue from implementing software / services. IBM revenue grew almost twice during this period and now calls itself as a "services" company.

## 2011 onwards

## Researcher | Inventor | Wind Power | Worldwide

As with any new paradigms, people tend to be skeptical on its arrival and deployment. We are not discussing a pointless exercise in fantasy, but a reality in the year 2020 when the current batch of engineers graduate. Germany, Scandinavia, UK and California will have to sell automobiles (cars, trucks, buses, cranes, etc) that have zero emissions.

Toyota has been working on fuel cells for the past 23 years and now sells a sedan in California that has better efficiencies (>65%) than that of an conventional engine from its own stable - https://ssl.toyota.com/mirai/index.html . So have BMW, Daimler, Honda and Hyundai. What appears more interesting is Airbus testing its new electric engines on its heaviest aircraft A380.

At a consumer level, Apple stores sells battery backup to charge their iPhone (if you are away from the grid) with a product called Upp - http://www.beupp.com/ .

One needn't go far to understand that electrical efficiencies are much more superior to internal combustion engines, with an added advantage of having zero emissions. Competition comes in the form of battery (Li ion) operated vehicles; however they lack the mile range and refueling / recharging times when compared to a conventional automobile. Plus disposing used battery poses environmental issues unless they are recycled. It requires more than 5-6 hours to completely charge a battery (we fill a tank of petrol within 8 minutes) which delivers around 200 miles. Hence battery vehicles remain a niche that will eventually fade away once hydrogen fuel infrastructure is made available.

My research started with interacting with climate scientists around the world who were studying the polar jet stream. I was the first to speak out that the weather patterns that were forecasted on a daily basis did not factor the polar jet stream. My theory was proved right (implies all weather forecasts were recalled in the US) when most of US remained frozen for more than a month (2014 winter) and that was due to the polar jet stream traversing / looping (reverse bell curve) most of US (down to Texas). This brought in the cold air from the North Pole and piled snow all through Canada and USA reducing temperatures below zero at some places. It was only when the polar jet stream moved away, did normal winter temperatures appear.

My research concluded that if I were to generate electricity by using the kinetic energy of the polar jet stream, I could in theory supply electricity to the entire world by tapping a fraction of the jet stream. In other words, I could convert electricity to Hydrogen (stored wind electricity) and implement the hydrogen fuel economy worldwide by supplying cheap hydrogen (stored wind electricity).

The only hurdle that prevented hydrogen fuel economy from becoming common was the cost of hydrogen itself. It costs more energy to produce clean and pure hydrogen than what you would get from it. Obviously it didn't make sense, unless the holy grail of renewable energy – the polar jet stream is tapped to produce hydrogen. Wind electricity and water is fed to an electrolyzer to generate clean and pure hydrogen, which then can then be stored in a gas grid to aid various applications.

http://www.industry.siemens.com/topics/global/en/pem-electrolyzer/silyzer/pages/silyzer.aspx

Although there are multiple teams around the globe working towards the same goal, I believe I have an advantage that others do not have – the natural elevation of the Himalayas. My invention has a design that factors natural elevation (7000 – 8000 meters above sea level) to tap the polar jet stream. At India, this was feasible since our honorable jawans monitor the Siachen glacier at altitudes close to 7000 meters above sea level. Secondly, my invention uses proven aeronautics and fluid dynamics, so has a better chance to succeed than exotic new technologies that needs to be feasible / proven – kites that carry generators with associated complex mechanisms.

I propose a hydrogen economy that has distributed power generation (generate power in house using fuel cells and cheap hydrogen), hydrogen fuel cells and hydrogen storage infrastructure. Again, India has an advantage since our mass transport - buses and auto rickshaws run on LPG gas with fueling infrastructure in place even at remote towns, switching to Hydrogen should not be impossible. All that remains is delivering clean hydrogen at costs lower than fossil fuels to unleash the hydrogen economy at India - other countries will follow.

## Awards and Acknowledgments

- Re-launched SQL server that enabled Microsoft gain valuable market share in the enterprise server market. SQL server alone contributes billions of dollar revenue each year to this date.
- Disrupted policy restrictions at IBM to enable IBM and Microsoft work together to implement

government programs worldwide. I was promoted and transferred to parent company IBM Worldwide at Armonk, to review government programs across the globe.

- Salvaged an e-government project that failed thrice for the Government of Thailand sponsored by World Bank. World Bank published this project as a case study for governments that borrow to implement large programs.
- Grew IBM's public sector revenue by almost twice by positioning IBM as a go-to vendor to implement government eGov / cloud programs.
- I was the first person to speak out that current weather forecasts did not factor high altitude winds (polar jet stream) which actually influenced weather at a location.
- Invented a wind converter to tap the polar jet stream in order to convert its kinetic energy to electricity. As of date, I am the only person in the world to have a design that is based on proven technologies. I am currently awaiting clearances from the Government of India to demonstrate a prototype.
- Well connected across the globe to position and sell new paradigms that requires immediate market acceptance in order to succeed.
- Upon demonstration of my invention / prototype, I will be in a position to earn a PhD from any of the top ranked universities as my thesis can be defended (by default) with a working model / prototype.