

# Gyanesh Pandey tells Husk Power Systems story<sup>1</sup>

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## Introduction

One of my passions is to study innovation stories – especially from first person narratives. I typically look for following questions in each story:

- Where did the itch begin?
- Where did the idea come from?
- What was the first experiment?
- What were the experiments to test feasibility? How much did it cost? What kind of partnership took place?
- What were the demos? Which demo brought money / customers?
- How did business model exploration happen?
- Where all did luck play a significant role?

Last month I got an opportunity to listen to Gyanesh Pandey, CEO of Husk Power Systems. HPS is a four year old organization and it is in the business of electrifying villages mostly off-grid. It is very rare to hear a story narrated with all its emotional drama behind various decisions / accidents. Gyanesh's narration belonged to this category.

Objective of this document is two-fold. First objective is to present the story as close to Gyanesh's narration as possible. Second objective is to analyze it through an innovation lens, which I call - CEO model with two loops of experimentation. I have analyzed Watt-Boulton steam engine story [1] and Ranchodlal Chotalal's textile mill story [2] through the same lens before. We begin with the story first.

## Husk Power System story

1. I grew up hating my place (in North Bihar). Nothing made sense to me. Every single thing in the village costs you a little more, quality is poorer and people are lethargic. During holidays, I reluctantly came home from the boarding school. I tried to find reasons for not coming home. I could feel the depression all around.

2. There was a primary school in my village. Its headmaster, Dubey-ji, stayed at my place. In the evening he would sit with kids (us) and teach. Kids knew one thing. If you write small enough Dubeyji can't see much in the lantern light. Then he would start telling stories from mythology because he couldn't teach. The guy was sincere. However, he was forced to cut corners due to lack of simple amenities.

3. I ended up becoming an engineer and going to the US for higher studies. During my PhD I came home to attend my sister's wedding. On one of those evenings with the extended family members I was telling them stories of America. Naively I ended up saying, "It's hard to tell you guys – You can't even dream of how it is (in the US)". I didn't mean to offend anyone. However, an old guy in the room said, "For us, it will always be a dream. Because people like you will

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<sup>1</sup> This is based on the notes from the talk given by Gyanesh Pandey, CEO, Husk Power Systems at IIM Bangalore on Oct 13, 2011. I have tried to keep the language close to Gyanesh's narration.

always maintain a distance from us.” I don’t know what he meant, but his words resonated somehow somewhere with me. This was 2001.

4. In 2002, I started to think “How can I contribute?” I partnered with my best friend from childhood who was living in Patna – Ratnesh Yadav. We came from North Bihar and there were 2 serious problems in the area: flood & power. Since I was an electrical engineer working in power management industry, we decided to do rural electrification.

5. I automatically assumed that something is not being done because technology for doing it doesn’t exist. This was a big mistake. I started playing with new technology. For the next 2 years, I experimented with polymer solar cells. We couldn’t bring the efficiency beyond 1.5%. We needed it to be at least 3.5%. So we gave up polymer cells idea. Next I turned to Fuel cells. I spent one year and more money before concluding it won’t work. Then we looked at wind and micro-tidal energy. It didn’t work either.

6. By the end of 2005 Jatropha based bio-diesel became the next big promising technology. Taxis were launched in Los Angeles that ran on bio-diesels. I talked to a lot of people in India and created my first Excel based financial model. The big plan was that we try to find some piece of land and grow Jatropha on it. Electrify 1-2 villages and grow Jatropha there and so on.

7. I never thought I am coming back from the US. I thought Ratnesh will do it on the ground and I will arrange money. Eventually I will go to Brazil, teach math and play guitar. We bought land deep in naxalite area for Jatropha cultivation. Towards the end of 2006, I ended up going to a 10 day course on Vipasana meditation. I couldn’t survive all 10 days and left after 8 days. However, within a month I was all packed up & back in Bihar.

8. For the next couple of months I took a tour around different places in India to see what’s going on in the field of Jatropha and other renewable technologies. I never had a bigger shock in life. Every single number that I had been told on the phone by so called experts was bullshit. It included the research papers people had published. I was badly depressed. By then we had invested Rs. 1.5 crore in Jatropha project. I put back the real numbers in the excel file and the picture was too terrible. So we shelved the Jatropha project.

9. I had no clue what to do. I started teaching at the local engineering college – NIT Patna. I was in a denial mode. I couldn’t accept the fact that my dream of electrifying villages was going down the drain. I continued living as if we are electrifying villages for no reason at all. We had no technology, no idea and last bit of money from 401(k) (equivalent to provident fund).

10. I got an appointment to see a director at the Renewable Energy Development Agency. He asked me, “How are you going to electrify villages?” I said, “I don’t know. I will do something”. He hit a buzzer and called the peon. “Call the guy who just left the room” Then he told me, “Talk to him. He sells gasifiers. Why don’t you use something like that?” I knew biomass gasification was an old technology developed by Hitler for wartime. People don’t use it anymore. The dealer told me that there were 40 gasifiers being used in Bihar. I said, “Wow!” He thought I am an NRI and he was trying to sell gasifiers to me.

The gasifiers were running on rice husk. 40% diesel and 60% gas – what is called dual-fuel mode. I came home after talking to him and worked out the math. I realized that 40% diesel model would not be economical. I started thinking, “Why can’t we use 100% gas?”

11. I started by finding out all I could on gasification based power generation. I found a paper from IISc and it said you can’t run an engine only on producer gas. Gasification is where you burn a biomass that generates a certain mixture of carbon monoxide and nitrogen and that mixture is combustible and becomes fuel. IIT Delhi had done a project. However, I couldn’t find a single instance where anybody said, “It has worked”. I tried to talk to a professor and he wasn’t even willing to talk to me. I just knew that all these people are wrong. I had no reason why.

At this point a scientist from MNRE, Mr. S K Singh encouraged me. Singh helped getting me hooked with a small engine maker from Agra. This was in June 2007. By August 15, 2007 we had a working system. We had electrified our first village. Soon after this we put out 2 systems electrifying 5 villages. By then we were out of money.

12. A friend of mine in undergrad, Manoj Sinha, was doing MBA at Darden Business School in University of Virginia. We made a video presentation of our experiment and sent it to Manoj. The objective was to participate in business plan competitions and raise money. Those guys did it. They had never seen or touched the system. However, the way they created the presentation and business plan was impressive. I could have never done it. They won many competitions and were able to bring more than \$500K. I saw how Manoj & team took one little success and gave a shape that was of interest to so many people. That is when I was convinced "Presentation matters!"

13. We got amazing citations. "The greatest new idea to change the world". FastCompany magazine called us the "Social entrepreneur of the year". I didn't even know I was an entrepreneur until then. I knew a lot of journalists in Bihar. All of them knew I had done these things. Nobody cared. We got into New York Times in 2008 and suddenly everybody wanted to know everything about us. Nobody cares how they feel about what they see. Everybody cares about what others see. Same was applicable to my family members. Suddenly everybody was proud of me.

14. Then Grant makers came. Shell Foundation came. "How fast can you set-up these generators?" I said, "A couple of them every week". They said, "You gotta be kidding. Take this money and show 2 plants in 3 months". So we did that.

15. Then people started asking about scalability of our model. So we came up with BOOM, BOM and BM models. BOOM is Built Owned, Operated and Maintained by HPS. BOM is Built Owned and Maintained by HPS but operated by a local who is willing to put in 10% of the project cost. BM is closer to the conventional franchisee model where HPS Builds and Maintains the plant and the rest is done by a local entrepreneur. Eventually we want to see more BM systems.

16. How do we do pricing? We didn't look at costing. We asked, "How much can you afford?" The best alternative for the villager was kerosene. 100 ml of kerosene gives you light for 1 hour. Initial calculation was based on 6 hours of lighting. That came to 18 litre of kerosene per month out of which you get 3 litre in regular market and 15 litre in black market. That made the expense Rs. 500. And hence, one may think a price Rs. 250 per lamp is reasonable. But there is a flaw in this logic. If you go and observe, you see that people don't use 6 hours of light. They use only 2 hours. That's how we arrived at a price of Rs. 50-60 per CFL lamp per month.

17. How much are we dependent on rice husk? We are technology agnostic. That means we are looking at all other types of biomass – mustard, grasses, wild bhai-chara etc. Rice husk is still most abundantly available biomass. We are also experimenting with solar on a remote island close to Uttar Pradesh where our rice husk based system is not viable.

18. How are we protecting our technology? We are not protecting our technology. Technology is just 10-15% of the whole game. How do you distribute it? How to monitor it? How do you do metering & MIS? These are critical questions. What is our biggest challenge today?

Getting the right kind of people to work with us. People are thieves. The plant munshie who went from Rs. 2500 per month to earn Rs. 25,000 per month as a regional manager responsible for managing 25 plants turned out to be the biggest thief. He stole Rs. 5-7 lakh.

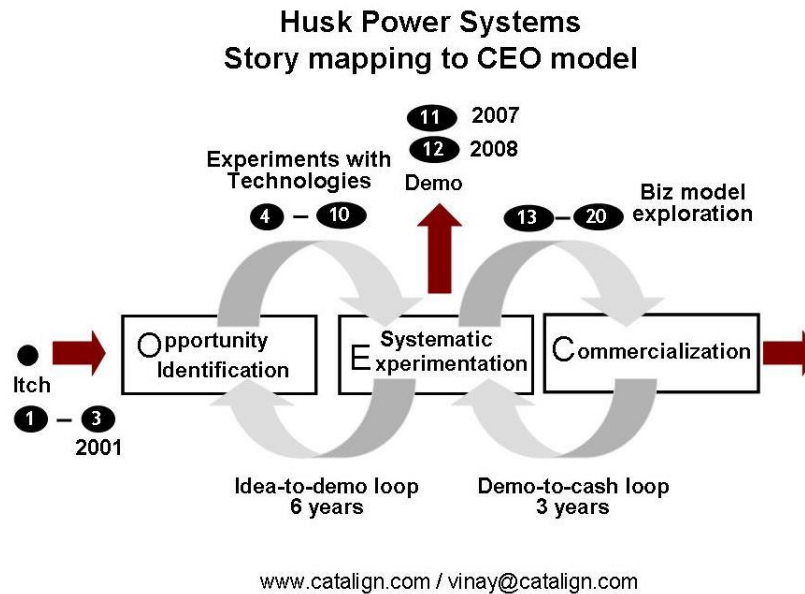
19. How do we decide which village to go to next? We look at two questions: (a) Is there someone in the village wants to set-up a plant there? We don't go uninvited. (b) Is there enough

rice husk or equivalent biomass available? We avoid guessing whether people will pay or not pay etc.

20. Today we are electrifying more than 450 villages / hamlets. We have 500 employees. Our current revenue is Rs. 50 lakh a month. However, as we move to BM model, we believe it can scale faster.

## Mapping the story to CEO model

In the following figure the HPS story is mapped to the CEO model.



## References

1. Learning about the innovation process through 20 point stories, Vinay Dabholkar (Analyzing the story of Watt-Boulton steam engine) at <http://www.catalign.com/data/innov-20pt-story.pdf>
2. Story of real Rancho – Ranchodlal Chotalal (1823-1898) at <http://cataligninnovation.blogspot.com/2010/03/story-of-real-rancho-ranchhodlal.html>