



## Soaring to New Heights Breaking New Ground Through Risk Management

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In August of 2010 the world's first human-powered ornithopter, named Snowbird, took flight. Three years later the same team claimed the Sikorsky prize with the world's first human-powered helicopter, Atlas. Both contrivances were envisioned by Leonardo da Vinci and considered impossible. Coupling the failure-prone nature of leading edge innovation with the unforgiving environment of aviation is a recipe for disaster. Despite this, the AeroVelo team managed to achieve the impossible: twice. On its own their success in 2010 would be worthy of study. However, to repeat that success three years later, with a totally different flying machine, indicates that their success was not just a matter of chance, but a replicate-able model that could offer valuable lessons to the highly competitive world of business projects and innovation.

What made the AeroVelo projects a success where others have failed? We will answer this question and take a look at the underlying success factors of the Snowbird and Atlas projects. To uncover the secret to their success we interviewed the project leads, Todd Reichert and Cam Robertson, and asked four questions:

1. To what do you attribute your success?
2. How formal was your project management?
3. How formal was your risk management?
4. What was the division of focus between Technical vs. Human Resources?

### Responses

To what do you attribute your success?

**Experience** – Even in leading edge innovation, there are always other projects in related fields that exist. It is important to look at what exists, learn as much as you can, and build on that experience. In order to “think

outside the box” you need to first understand what is “in the box”.

**No Constraints** – First ask the question, “What will it take to make this work?” Now figure out how to make whatever that is, possible. On Atlas the numbers called for a design that was double the size of anything built before. Other comparable projects were constrained by the size of the available facility. Atlas was designed to be as large as necessary, only then did the team set out to locate a facility large enough.

**Recovering from Failure** – Give yourself permission to experiment. In other words, you can always put things back together. If you stop short before arriving at the finish line, you have achieved nothing. You need to persevere and keep going until you arrive. Don't consider failure as the end, It's merely a step on the path to completion.

**Being Motivated/Passionate** – A loyal, dedicated, highly focused team is easily 100 times more effective than a team that is not completely committed to the project. Part way through the construction of Snowbird, 10 team members chose to leave. With only the two project leads left, two motivated and passionate members joined and the resulting four-person team were able to produce far greater results in shorter time.

### How formal was your Project Management?

You cannot timeline research, you can timeline production. On projects like Snowbird and Atlas it is important to oscillate between the two approaches. You must allow time for research, then set the build schedule. Both projects expanded during their development. This was not “scope creep” as the end goal was well defined,

it was about being flexible in the approach whilst staying focused on that goal. Constant communication was key. Every morning the team would meet and discuss the timelines and goals.

### **How formal was your risk management?**

A careful metered approach was used in both projects. Snowbird was a very simple and stable machine compared to Atlas and the resulting number of failures reflected this. Following the Atlas experience, risk management approach is more of a driving factor for Eta, the team's current project. Risk must be planned for and it is important to allow yourself enough room and time to be able to step back. If you don't have time to fail, don't innovate.

### **What was the division of focus between Technical vs. Human Resources?**

The HR focus was considered equal to or more important than the technical focus. A motivated individual or team is 10-100 times more effective than a team that lacks motivation. On Snowbird, the highly motivated final team of 4 was considerably faster than the initial team of 12.

### **Personal Reflections of a Team Member**

As a team member, I had the good fortune to observe the progress of these historic projects. My initial impression of the Snowbird project: it's impossible. Once I became familiar with the team and understand their technical approach, I quickly realized that this was not only possible, but these were the people to do it. From my perspective, as an experienced business project manager, I believe it was the right combination of passion, quantitative analysis, and effective risk management that was the formula for success.

**Passion:** My first impression of Todd and Cam was that these were two men who were deeply passionate and driven about what they were doing and fully committed to the project. That drive was infectious. The more time I spent working on the project, the more I wanted to work with them.

**Quantitative analysis:** With a PhD and an MASc in aeronautical engineering respectively, both Todd and Cam were accustomed to "running the numbers". It helped them stay grounded in reality. This, however, is

the optimistic version of reality. One of their favourite mantras is, "We look for the numbers that say it is possible, then we build and learn." This grounded optimism prevented them from pursuing ideas that would not bear fruit.

**Risk Management:** As Safety Officer for the airfield, the flight testing of Snowbird fell under my jurisdiction. Not wanting to interfere, I took an observe and advise approach. With this team being so passionate about this project, I was expecting a more "throw caution to the wind" mindset; thankfully I was wrong. Their Risk Management was carefully thought out and an integral part of the operation. I was impressed with the level of transparency and humility demonstrated by the project leads. They were the experts yet they were always open to input from the team and while they were focused on the prize, it was not at the expense of safety.

### **Conclusion**

Even on the most technical of projects, the people make the difference. The combination of having the right people on the team and assigning the right people to the right job is critical. Constant, clear communication is necessary to keep all the wheels moving and heading in the right direction, especially on a very dynamic project. While Project Management often gives the illusion of being formal and ridged, in reality, it is quite flexible. Finally, have fun! Life is too short not to, and it makes it much easier to stay motivated.

I have long held that effective Risk Management is a key factor that enables projects to succeed where others fail. On the Atlas project, we saw a direct co-relation between a change in risk management to the project's success when mid-project the decision was made to "just go for it". The result was a frighteningly spectacular crash. When the team refocused on a risk managed approach, Atlas soared to success.

It is often difficult to justify the additional time and expense associated with mitigation, especially when it is done well. As PMs we hear, "You don't need mitigation, your projects always go smoothly." The reality is that we do not know what we prevent. It is not until we abandon our risk managed approach that we truly get to see what effect good risk management has on project success.