

## **PART 1 - RISK AND UNCERTAINTY**

### **Page 1: Cover Page**

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### **Page 2: Introduction**

I was asked by the Wisconsin Economic Developers Association to share my thoughts on "Developing a Culture of Risk Taking." I decided that I'd prefer to talk about making good decisions and taking smart risks.

My name is Dave Bayless. I'm one of the co-founders of EIP. My background includes stints as an LBO lender and a private equity investor. In essence, my career has been all about learning to take profitable risk.

During the course of this presentation, I'm going to share some conceptual frameworks that I've found both interesting and practical:

- I'm going to start by making a distinction between risk and uncertainty;
- I'll layout a way to understand how different startups have different risk profiles;
- I'll explain how we often use the wrong tools when assessing risk; and
- I'll give some real world examples of how successful entrepreneurs manage risk.

In other words, I'm going to begin at a very abstract level, and then I'm going to bring us down to the concrete world of application. My hope is that our flight path will enable you to see some new and useful patterns.

### **Page 3: Decisions**

I've come to understand that a common definition is a rare thing. So, for purposes of this presentation, I'd like to offer up a couple.

For starters, a *decision* means much more than the process of reaching a logical conclusion. In this context, it means committing a scarce resource—human, social, physical, natural, or financial capital—to achieve a goal.

#### **Page 4: Risk and Uncertainty**

Second, it's important to understand that risk is a function of, but is not equivalent to, uncertainty.

Given a big enough bet, even a small amount of uncertainty can translate into big risk. Russian roulette, anyone?

On the other hand, a high degree of uncertainty doesn't necessarily mean high risk. If you've got nothing to lose, who cares if the outcome is unpredictable?

#### **Page 5: Risk and Reward**

So, why should an economic development professional care?

Here's why you *should* care: Economic *development* doesn't happen without wealth creation.

Furthermore, it's very hard to create wealth by investing in risk-free Treasury bills. Opportunities to create economy-transforming wealth require some risk-taking.

However, taking prudent risk is not the same thing as reckless abandon. Furthermore, the tradeoff between risk and return is best expressed as a continuum, not an all-or-nothing proposition.

#### **Page 6: The Future is Unevenly Distributed**

However, it would be a mistake to take a naïve approach to entrepreneurial risk. People are often risk averse for good reasons: They understand that risk and reward are not always equitably distributed, nor are they necessarily contemporaneous.

#### **Page 7: Different Kinds of Uncertainty**

As I said before, risk is a function of uncertainty. In turn, total uncertainty is composed of two elements, two kinds of uncertainty: *analyzable* uncertainty and *residual* uncertainty.

Analyzable uncertainty relates to the *knowable*. For example, I know that if I toss a coin enough times, I'll get heads 50 percent of the time and tails 50 percent of the time. Quantum effects in physics and deterministic chaos in mathematics are other examples of analyzable uncertainty.

Residual uncertainty relates to the *unknowable*. For example, if I start hitchhiking from New York City to San Francisco, I simply cannot know in advance my exact route and timetable. The only way to find out is to start hitchhiking.

When it comes to understanding and managing risk, there is a basic requirement that you'll do what it takes to know the knowable. That's the price of admission.

But, knowing what is knowable is a necessary, but insufficient, condition. The real fun comes in recognizing that, in many cases, there is much that is unknowable in advance. That doesn't mean you can't understand the parameters of such residual uncertainty. In fact, in a competitive world, you must.

### **Page 8 - Level 1 Residual Uncertainty**

Not only is there a distinction between analyzable and residual uncertainty, there are different kinds of residual uncertainty; and the differences can matter at the practical level of business decision-making.

There isn't any important decision in business where the outcome is completely predictable. However, in some instances, the amount of residual uncertainty isn't enough to impact your decision.

So called Level 1 decisions tend to occur in well-established, slow-moving environments. For example, decisions made by the operator of a fast food franchise or a manager of a heavily regulated utility are often likely to be characterized by Level 1 residual uncertainty.

Remember though, risk is a function of residual uncertainty and the size of the bet. It's possible to have low residual uncertainty and high risk.

For example, it's probably safe to say that the effect of Toyota's positioning of its Camry automobile versus the Honda Accord is subject to Level 1 uncertainty. They are

entrenched models in a pretty predictable market segment. Nevertheless, the economic cost of being wrong could be considerable.

### **Page 9: Level 2 Residual Uncertainty**

Level 2 residual uncertainty refers to situations where there are a well-defined set of possible future outcomes, only one of which will occur.

In math-speak, Level 2 uncertainty exists where one can describe a mutually exclusive and collectively exhaustive set of possible outcomes.

Decisions related to regulatory change or technology standards often fall into this category. In this stylized case, outcomes A, B, and C describe all of the possible outcomes. However, only one of the three will occur.

### **Page 10: Level 3 Residual Uncertainty**

Level 3 uncertainty is like Level 2 uncertainty in that it is possible to identify a range of possible future outcomes (and the range is wide enough to matter when making decisions). However, in the case of Level 3 uncertainty, it's not possible to identify a collectively exhaustive set of possibilities.

A classic example is the uncertainty related to customer demand for a new product or service. Market research may give you an indication of the range of possibilities, but no finite set of projection scenarios can capture the entire range of possibilities.

### **Page 11: Level 4 Residual Uncertainty**

When you face Level 4 residual uncertainty, you truly are sailing in the fog. You can't even know in which general direction to head. Future outcomes for Level 4 uncertainties are unknown and unknowable in advance.

For example, the possibilities of "m-commerce" (that is, electronic commerce via mobile phones) have characteristics of Level 4 uncertainty.

## **Page 12: Summary of Risk and Uncertainty**

So, the purpose of the preceding was to give us a common language in regard to risk and uncertainty.

I'm now going to bring us down from the "60,000 foot" level of abstraction to about "15,000 feet" so we can examine risk and uncertainty from the perspective of business startups.

Before I begin, I'd like to underscore one very important aspect of uncertainty. That is, uncertainty is dynamic. In other words, time will tell.

The hitch is that businesses don't seem to have much time. Deferring a decision in the face of ambiguity can be a smart move - if you have the time to wait.

## **PART 2 - DIFFERENT RISK FOR DIFFERENT STARTUPS**

### **Page 13: The Landscape of Startup Risk**

I'd like to introduce a framework developed by Amar Bhide, a business professor at Columbia University.

Different startups can be characterized along three, by now familiar, dimensions: initial investment (including the opportunity cost of the founder), likely profit, and the degree of irreducible - or residual - uncertainty. Bhide's research lead to the identification of five startup archetypes that differ from one another along these three dimensions.

### **Page 14: Revolutionary Ventures**

Let's start with the outlier - an archetype that looms large in the mythology of entrepreneurship: revolutionary ventures.

Big bets and Level 3 or Level 4 uncertainty translate into big, big risk. Sometimes, the payoffs are tremendous, as was the case with FedEx. On the other hand, does anybody remember Iridium?

It's understandable that we are fascinated with revolutionary ventures. But, in some ways, it's unfortunate. That's because a disproportionate focus on these exceedingly rare ventures warps our understanding of

risk and proportion. Sometimes, dramatic success entails dramatic risk. But, as we'll see a little later, in many cases, the potential for big return entails modest risk, at least initially.

### **Page 15: Corporate Ventures**

Large corporations have access to large amounts of capital, which means that big companies can place big bets.

For example, IBM transformed the world of computing years ago as the result of its decade-long introduction of the System/360 modular computing system. The System/360 took all the capital, brains, and market muscle IBM had, and it was an enormous success.

But, there is no such thing as a free lunch. Big bets usually means a corresponding focus on low levels of residual uncertainty. At the time of the System/360, IBM's market strength bought the company time, which it used to its advantage by allowing the passage of time to resolve higher levels of residual uncertainty where it existed. And, it analyzed every scrap of valid data available. It was a strategy that IBM executed admirably well—it's also a strategy that failed the company a decade or so later upon the emergence of the PC.

### **Page 16: VC-Backed Startups**

VC-backed startups are, in many ways, very similar to corporate ventures. Furthermore, they represent less than  $\frac{1}{2}$  of 1% of total annual startups in the U.S. I include them here to illustrate an intermediate form that very often evolves from, or is spun out of, one of the other archetypes.

### **Page 17: Marginal Startups**

Something like 85% to 95% of startups - including most single site retail stores, restaurants, professional service firms, construction companies, and consulting firms - are marginal in the following sense: If you start one, you can be pretty sure that you are going to earn a modest profit.

Marginal startups represent a big chunk of GNP and employment, but not much in the way of net wealth creation.

Occasionally, however, a marginal startup manages to transform itself into something else - a transformation that we'll explore later.

### **Page 18: Promising Startups**

In some ways, so-called promising startups are the most intriguing and the least well understood of these archetypes.

Promising startups are characterized by a relatively high level of residual uncertainty, a low level of initial investment, and a low level of likely profit. That said, high uncertainty means that promising startups - unlike marginal businesses - stand to benefit from at least a small chance of a big payday. You might think of a promising startup as a marginal business with a lottery ticket attached.

Consider the very early days of Micro-soft:

- Bill Gates and Paul Allen launched their first product - a form of the BASIC programming language originally developed in 1964 - after spotting a picture of the Altair kit computer on the cover of the January 1<sup>st</sup>, 1975 edition of *Popular Electronics*. Allen is purported to have exclaimed "This is it! It's about to begin!"
- At the time, there were 50 or more groups who had expressed an interest in supplying a BASIC for the Altair. So, at least initially, the likelihood of Micro-Soft becoming the vendor of choice was slim. Even when those chances improved significantly when Allen became Director of Software for the company that made the Altair, it was still true that the demand for personal computers was highly uncertain. From the perspective of an informed, objective third party, the likely profit of the young Micro-soft would not have been encouraging. In fact, the company's first year revenues totaled just over \$16,000.
- Allen and Gates invested a whopping four weeks developing their first version of the Altair BASIC. Not much when you take into account that neither Gates nor Allen had many lucrative opportunities competing for their attention. After all, Gates was just a sophomore in college.

As it turned out, Allen was right: The lottery ticket paid off.

In the grand scheme of things, it doesn't take much investment capital to start most businesses. Some 50% of the *Inc. 500* was capitalized with less than \$50,000 at startup.

The combination of a chance for a big payday and a limited downside is a form of *real option*. One of the curious features of real options of this type is that their *value increases* when *residual uncertainty increases*. It's why people with little to lose will do some seemingly strange stuff.

As an aside, bankers - who typically don't get to benefit directly from a borrower's success - understand this phenomenon, too. However, bankers call it *adverse selection* and *moral hazard*, and they protect themselves against it by trying to increase the opportunity cost of the founders through personal guarantees and second mortgages. Banks are well-adapted to environments characterized by Level 1 uncertainty; but they are ill-adapted to the Level 3 uncertainty of promising startups. Shunning Level 3 uncertainty makes all the sense in the world for lenders, but a community that depends upon debt finance probably also has a lower than optimal number of promising startups.

So, given the low cost of failure, it seems that a lot of residual uncertainty translates into a relatively small amount of incremental risk for promising startups. Not surprisingly, Bhidé's research lead him to conclude that founders of promising startups aren't necessarily risk takers, but they do tend to have a high tolerance for ambiguity.

In order to attach a "lottery ticket" to one's business, one has to be able to cope with initially high levels of ambiguity. In other words, one has to be willing to steer a course into the unknown: Communities need their Henry Hudsons.

### **Page 19: Express Color Printing**

Micro-soft is a nice example of a promising startup. But, let's face it; relating Microsoft to our own communities can seem a little bit of an imaginative stretch. So, I'd

like to offer an alternative example: Express Color Printing of Livingston, Montana.

Livingston is an old railroad town of some 5,000 people located 90 miles north of Yellowstone National Park. Not much of the railroad remains, and the area is not really much good for farming and ranching. Located on the Yellowstone River at the foot of the aptly named Paradise Valley, Livingston has benefited from increasing real estate values and seasonal tourism. But, Livingston is not a place that one would consider to be obviously economically vibrant.

Consequently, it won't be much of a surprise to learn that in the mid-1990s, Express Color Printing, a six-employee commercial printer, was just bumping along - making payroll but not generating consistent profits. In other words, Express Color Printing was a marginal business.

#### **Page 20: Transformation**

But, uncertainty is dynamic - it increases and decreases over time. After 1995, news of the Internet reached all the far corners of the earth - even Livingston, Montana.

Maybe it was because part of his youth was spent in Silicon Valley, but Andrew Field, the owner of Express Color Printing, took note of the emergence of VC-backed online printing companies that were racing to "Amazon" the sleepy commercial printing industry. He concluded these turbo-charged online print companies were making some rather bold - and probably foolish - assumptions.

Using our framework, Andrew perceived Level 3 or even Level 4 uncertainty, while the VC-backed startups were acting as if the online print environment was dominated by Level 1 uncertainty.

Nevertheless, Andrew shared his VC-backed rivals' perception of opportunity. Consequently, with little fanfare and almost no money, Andrew and his colleagues started experimenting with selling commercial printing online as PrintingForLess.com. That is, Andrew bought a cheap lottery ticket and transformed his marginal business into a promising "restart."

### **Page 21: There's No Risk without Reward**

The next few years saw the failure of the VC-backed online print companies. PFL, on the other hand, has been a member of the *Inc. 500* for the last three years. The company is profitable; it has over 100 employees; and PFL has raised seven figures-worth of private equity capital.

The issues the company wrestles with today are:

- The development of managerial capacity
- The optimization of online advertising strategies, and
- The building of a new, more expansive, office and manufacturing facility.

In other words, much of the residual uncertainty regarding the viability of the online printing model has been resolved in PFL's favor. The company has been successful, and everybody involved now has something to lose.

It's ironic, but thanks to the reward from taking a shot in the dark, it seems to me that PFL faces more risk today than it did a few years ago. I'm confident that Andrew would agree.

### **Page 22: Summing Up and Shifting Gears**

To this point, I've talked about two broad themes:

- The concepts of risk and uncertainty; and
- How startups can be characterized along the dimensions of investment, residual uncertainty, and likely profit.

## **PART 3 - UNDERSTANDING UNCERTAINTY**

### **Page 23: Risk Can't Be Avoided but Can Be Managed**

It's now time to turn to the more concrete topics of picking the right tool to explore the boundaries of uncertainty faced by a particular company and techniques for managing the risk that is an unavoidable and, indeed desirable, element of entrepreneurial business.

## **Page 24: Don't Throw Away Your Existing Tools**

Residual uncertainty, by definition, involves the unknowable. Consequently, analytical tools aren't going to allow you to see the unseeable. But, they can help you get a feel for possibilities and to plan for contingencies. By planning, I don't mean prediction. To my mind, planning enables one to sense-and-respond more quickly and effectively as possibilities become realities. In a sense, analysis can magnify and focus an entrepreneur's "gut" instincts.

Market research, benchmarking, SWOT analysis, and discounted cash flow calculations are very familiar tools. They are very useful. However, their utility is predicated upon the existence of Level 1 residual uncertainty. That means these tools are the most useful when applied to fairly predictable environments.

In some cases, the utility of these tools can be extended when used in combination with decision tree analysis and scenario planning. The latter is particularly useful when used to help people *learn* how to make decisions in the face of uncertainty.

Bottom line: This class of tools is tried-and-true in regard to many types of business decisions and 9-of-10 new ventures. There is a lot of value to be added by helping entrepreneurs learn when and how to use these tools more expertly.

## **Page 25: Hammers and Nails**

But, there's a catch. There is risk in becoming *too* expert in the use of the preceding tool set. That's because experts tend to become vested in the tools of their trade. When your tool of choice is a hammer, everything begins to look like a nail.

I have a confession to make: I'm a recovering expert. Armed with an MBA, an Excel spreadsheet, and experience gleaned from the glory days of the LBO, I came to believe that I could analyze and understand *any* company or industry. I looked out over the business horizon, and I saw endless fields of nails waiting to be whacked with my hammer.

Then I started getting involved with promising startups that faced much higher residual uncertainty than the

uncertainty faced by an ideal LBO candidate. Sure enough, I applied discounted cash flow analysis and the rest of my lovingly maintained toolset indiscriminately.

Fortunately, I didn't do any irreparable harm.

### **Page 26: Higher Levels of Uncertainty Require Different Tools**

When business decisions involve higher levels of residual uncertainty, point forecasts lie somewhere between useless and dangerous. Pretending that prediction is a viable course of action when the level of dynamic complexity is high will help you get poor - fast. Ask the VCs who put their money into those online printing companies a few years back.

There are alternatives, however. System dynamics modeling and simulation, for example, help one:

- Make assumptions explicit
- Highlights interdependencies and delays, and
- Facilitates the identification of performance levers and appropriate early warning metrics.

In effect, these tools help push back the fog just a bit in order to give a company a fighting chance to develop *robust* strategies and to sense and respond to market feedback.

Don't you think that Henry Hudson - even without the benefit of an accurate map of the coastal waters of Canada - could have found some use for radar?

So, how many of you are aware of the use of system dynamics simulation and real options valuation by founders of promising startups in your communities?

### **Page 27: Why These Tools Aren't Common**

There are a number of pretty compelling reasons why you probably haven't seen many promising startups making explicit use of system dynamics and real option valuation techniques:

- First of all, people who start promising startups tend to share a valuable trait: They have a propensity to act. Many value action almost to a fault, and they have an equally intensive fear of analysis paralysis.

It shouldn't be too surprising that "system dynamics" and "real options valuation" may not resonate.

- Secondly, research and practical experience have shown that opportunistic adaptation is more effective than "traditional" business planning. It's not immediately obvious to many that system dynamics and real options perspectives aren't just "new and improved" versions of failed divining rods.
- Even if one is open to the idea of incorporating system dynamics and real option thinking into one's decision-making, these aren't tricks that one can learn overnight. Furthermore, these kinds of models yield the most when they are developed with the active engagement of decision-makers. Consequently, the perceived cost of using these tools can be high.

Another reason is probably just as pervasive but is far less compelling: the expedience of relying on "conventional wisdom." As the economist John Kenneth Galbraith noted, economic and social behaviors "are complex, and to comprehend their character is mentally tiring. Therefore we adhere, as though to a raft, to those ideas which represent our understanding."

### **Page 28: Expect to See Increased Use of These New Tools**

Nevertheless, I bet you are going to be seeing more of these tools in the future - and the future is coming at us faster than ever.

Business thinkers John Hagel III and John Seely Brown claim that the "only sustainable edge" in business depends upon dynamic specialization, connectivity, coordination, and collaboration. In other words, they claim that the level of dynamic complexity and residual uncertainty is increasing for *all* businesses.

Some large companies in, for example, the pharmaceuticals industry have already incorporated system dynamics and real options thinking into their repertoire. In fact, some very small companies are beginning to explore them, as well - including, believe it or not, a 10-person, niche manufacturer of carry-on bags.

Does it all seem a little hard to reconcile with the standard rough-and-ready image of the entrepreneur? Well, you may want to consider the fact that over 30% of the CEOs

of the *Inc. 500* have a post-graduate degree. They are do-ers and thinkers.

#### **PART 4 - MANAGING RISK AND UNCERTAINTY**

##### **Page 29: Who Really Bears the Risk of a Startup?**

Risk and uncertainty can be understood, but risk cannot be avoided if your objective is to create economy-transforming wealth. There are at least two effective risk management strategies undertaken by entrepreneurs in the real world:

- Risk syndication, and
- Phased investment.

Startups have limited resources. Even an "immodest" amount of risk can be more than a startup can absorb. That said, risk doesn't just go away – somebody ends up having the risk in their "portfolio." Entrepreneurs syndicate risk to a number of players, including:

- Credit card issuers
- Friends and family
- Employees via stock options and profit sharing
- Customers through early sales, help in product development, and testimonials
- Suppliers through the provision of credit and market validation; and even
- Economic development agencies that provide access to training, credit, and other resources.

Smart entrepreneurs become adept at persuading others to underwrite different aspects of the risk inherent in their venture. That is, they manage risk by getting someone else to absorb it.

### **Page 30: What Lemmings Believe**

Entrepreneurs who pursue all-or-nothing business strategies in highly ambiguous environments tend to be disappointed.

### **Page 31: Invest, Act, and Adapt Iteratively**

Smart entrepreneurs understand that their decisions are based on mental models of the world that are wrong in one or more important ways.

That doesn't paralyze them, though. Instead, disciplined entrepreneurs allocate the smallest amount of resources necessary in order to allow them to engage in the next round of market experimentation. They capture the feedback they receive and, as necessary, adapt their mental model to the new data. The ensuing adaptive change to their strategy leads to a new round of resource allocations, experimentation, observation, and re-orientation.

Small companies are particularly well suited to operating in ambiguous environments because they can cycle through the "OODA" loop quickly and economically. They can make quick, inexpensive probes into the fog and adjust their courses based upon what they learn.

### **Page 32: The 8 ½ x 11 Inch Prototype**

As an example, let me introduce Greg Gianforte, the founder and CEO of RightNow Technologies based in Bozeman, Montana. Back in 1997, Greg recognized that one implication of the emergence of e-commerce would likely be an increase in web-based customer support. So, he began work on a hosted software solution - a kind of automated FAQ service.

However, Greg faced Level 3 residual uncertainty in regard to the feature set of the RightNow Web product; the pricing model was unclear; he didn't really know who his target market *should* be; and the early results of the software-as-service business model were unclear, to say the least.

So what did Greg do? He created an 8 ½ x 11 inch prototype: A one-page document that described the proposed features and assumed benefits of RightNow Web. Next, he sent the document to 25 people he thought would be willing and able to provide thoughtful, *critical* feedback. These 25 people told Greg what they liked and what they didn't

like. Greg took this feedback and incorporated it into a new paper prototype in the following way:

- Valued features and benefits moved to the top of the list;
- Weaknesses in the value proposition were addressed; and
- Features that weren't mentioned were eliminated.

He kept iterating in this fashion until, within a few weeks, someone asked to buy the product. It was at that point that Greg knew he had a business.

Indeed he did. RightNow Technologies was one of the top 10 best performing IPOs of 2004 with a market capitalization of about \$330 million.

### **Page 33: Wrapping Up**

We've covered a lot of terrain, from working definitions of risk and uncertainty to the profiles of different kinds of startups to an overview of the tools and techniques used to understand and manage the inherently unknowable.

### **Page 34: Key Points**

In summary:

It's worthwhile to distinguish between entrepreneurial risk and uncertainty, because the distinction enables a clearer understanding and better management of that risk which is unavoidable. That, in turn, will accrue to the benefit of the entrepreneurs in your community, and your community itself.

### **Page 35: Thank You**

I appreciate the opportunity to share my thoughts with you. If you would like to discuss this topic further, please give me a call or send me an email.

Thank you.