

# Measuring and quantifying success in innovation

## Lessons learned from a decade of profiling emerging technology start-ups

*Authors: Evan Kodra, Ory Zik, Chris Hartshorn*

### Executive Summary

The holy grail of making money from emerging technology is recognizing the future outcome early – allowing business leaders to invest in what is good, fix key flaws where there is potential, and avoid committing to the bad. Doing so is difficult, as reflected in the widely-cited statistic that only 7% to 10% of technology start-ups succeed. We can now show that a robust methodology for assessing start-ups and other innovation-driven new business initiatives has been developed and validated, based on primary research by domain experts using a consistent process with both quantitative and qualitative factors. This direct approach, manifested in Lux Research's briefing process, dramatically increases the probability of identifying successful start-ups – a full 50% of the start-up companies that earned a "Positive" *Lux Take* in this methodology went on to be successful. We also find that ranking specific underlying factors such as quality management, favorable barriers to entry, and strong partnership quality can boost the odds of identifying a successful innovation by as much as four times. Many know that these factors are important to new business success, but applying the methodology consistently and being able to discern them individually, in aggregate, turns this conventional wisdom into measurable, competitive advantage.

### Introduction

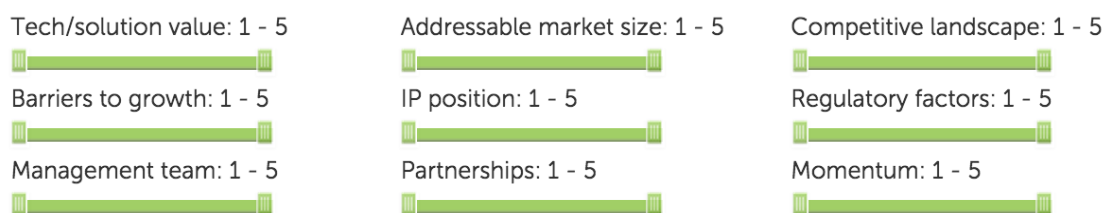
Developing new business from emerging technologies is a minefield, often requiring penetration of unfamiliar markets through adoption and scale-up of an unproven technology. Whether at start-up companies or in innovation initiatives at the largest multinationals, a large number of these endeavors fail. Still, the successes can be game-changing differentiators, so companies cannot shrink from the challenge.

Companies with successful strategies and track records know: There are no shortcuts to identifying the innovations most likely to succeed. There is no replacement for case-by-case, thorough, expert-driven evaluation of the markets, technologies, and companies. However, approaching each opportunity afresh simply isn't scalable, particularly for large organizations that need lots of successes to hit massive new business targets to move the growth needle.

With that in mind, Lux Research has carefully built and refined methodologies for examining emerging technologies – making the evaluation process more

*Picking winners and losers is rarely foolproof, but the Lux Briefing process provides analytical structure where it has been sorely needed and delivers significantly more accurate forecasts.*

Fig. 1: Lux Research rates each company on nine different factors.



scalable, and also allowing clients to rely on an outside resource to make their own assessments more efficiently. This approach, when applied to start-up companies, yields a *Lux Briefing* on each company that summarizes the analyst's evaluation.

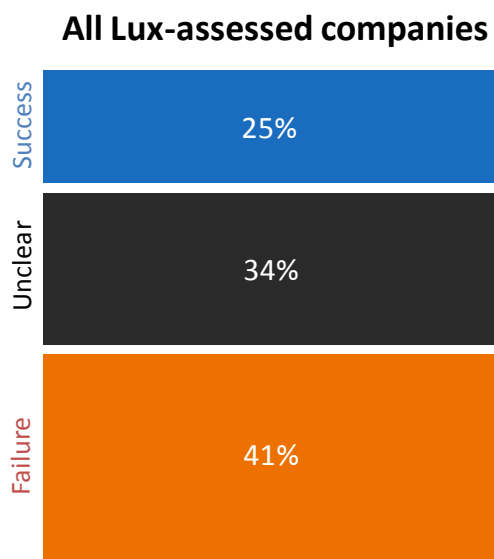
A quantitative look back at the historical performance of this approach shows that the resulting *Lux Take* is a statistically significant indicator of a company's chances of future success. This predictive ability is a reflection of in-depth understanding of the factors that drive success and the methodology built to measure those factors consistently across dozens of analysts and many technologies and markets.

## Establishing a Framework for Assessing Emerging Technology Start-ups

Lux Research has developed a unique methodology for assessing start-up companies using quantitative and qualitative factors. This process combines *primary research* focused on emerging technologies, conducted by *science-trained business analysts*, using *calibrated, consistent processes* of evaluating what will work – and what won't.

- Primary research.** You would never hire a person based strictly on their CV or LinkedIn profile, and the same should be true for picking the right company. The Lux Briefing relies on an in-depth conversation and follow-up dialogue between top start-up executives and Lux's domain experts, allowing us to gather proprietary datapoints and hear responses to challenging questions that aren't available from a web search or other desk research.
- Science-trained analysts.** An understanding of the underlying science is critical when assessing the viability of a new business predicated on technological differentiation, particularly to cut through often over-hyped claims. It is easier to train business expertise into scientists than to train science expertise into business people, so most Lux analysts have advanced degrees in science and engineering.
- Calibrated, consistent processes.** While Six Sigma methodology has been inappropriately applied to innovation initiatives, the need to Define, Measure, Analyze, Improve and Control new business development portfolios is still desperately needed. Doing so successfully is predicated on having a consistent process. Lux uses a scorecard rating companies on a 1-5 scale on nine specific factors to facilitate evaluation and comparison (see Figure 1), as well as providing an overall *Lux Take* that can be a Positive, Caution, or Wait and See.

---

**Fig. 2: Outcomes for All 256 Companies Assessed**

---

Cumulatively, this approach has been used to profile almost 5,000 organizations in the last 10 years – many of them multiple times over many years – developing innovations in 380 technology categories across 15 broad coverage areas. By examining this database of company profiles, the reliability of this methodology can be tested and the factors that are most predictive of success can be identified.

## Validating the Lux Research Framework

We took a look back at the outcomes of a random sample of 256 companies that Lux Research briefed more than five years ago. The companies were start-ups or small to mid-size companies, not profitable at the time of the briefing, and spanned across all technology coverage areas. We found that a quarter (25%) went on to success, defined to include outcomes such as IPOs, acquisitions, and transitions to standalone profitability. In contrast, 41% of these enterprises failed, declaring bankruptcy or falling off the radar more quietly; in the middle, 34% of companies are still operating with a hard outcome still pending.

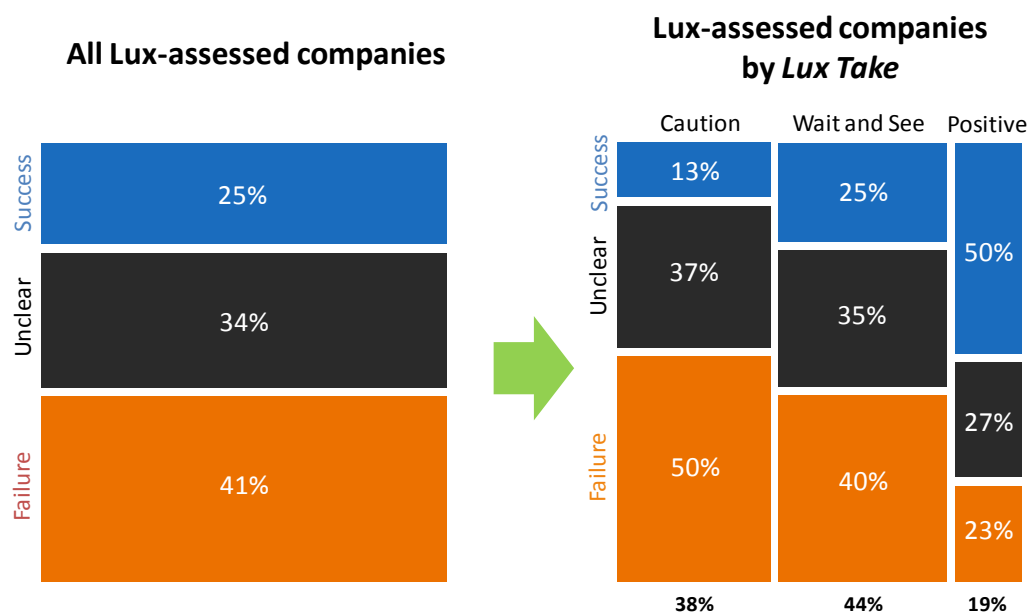
Notably, just appearing in the Lux database is a useful indicator of an idea worth further investigation. Even the 25% success rate itself easily bests the success rates of 7%<sup>1</sup> to 10%<sup>2</sup> found

---

<sup>1</sup> <http://www.businessinsider.com/start-up-odds-of-success-2013-5>

<sup>2</sup> <http://techli.com/2012/06/start-up-genome-project/>

Fig. 3: The Lux Take Is a Strong Predictor of Success Five Years Out



in research on start-ups overall, due to the expert selection of companies for evaluation. If a company is predicated on a tenuous idea, it does not make the first cut into the briefing process.

However, the Lux methodology of assessment by domain experts significantly improves upon success rates (see Figure 3). If we segment this population based on the *Lux Take* assigned five or more years ago we find that 19% of the companies were given a "Positive" *Lux Take*, 44% received a "Wait and See", while 38% had a "Caution" take. Comparing the original *Lux Take* with the result today, we see that 50% of those with a Positive *Lux Take* have been successful, while only 23% of Positive rated companies failed five years later. Among those with a Caution *Lux Take*, meanwhile, 50% failed and just 13% succeeded.

Picking winners and losers is rarely foolproof, but the Lux Briefing process provides analytical structure where it has been sorely needed and leads to more accurate forecasts. What's more, the granular data captured in the nine scorecard criteria enables deeper analysis of specific start-up traits captured to see which have the strongest predictive value. Our sample provides empirical support for the widely-shared view that a strong management team is the top predictor of start-up achievement: Companies with highly rated management teams were four times more likely to be successful than those with weak management. Partnerships, Momentum, and Barriers to Entry are also strong predictors of success (see Figure 4), each doubling or better the odds of success.

Fig. 4: The Lux Take and Other Scores From the Lux Briefing Predict Five-Year Success

A company with....	...is __ as likely to be successful as...	A company with ...
Positive Lux Take	<b>4x</b>	Cautionary Lux Take
Positive Lux Take	<b>2x</b>	No Lux Take considered
Strong Management Team (4-5)	<b>4x</b>	Weak Management Team (1-2)
Strong Partnerships (4-5)	<b>2x</b>	Weak Partnerships (1-2)
Strong Momentum (4-5)	<b>2.5x</b>	Weak Momentum (1-2)
Favorable Barriers to Entry (4-5)	<b>3x</b>	Unfavorable Barriers to Entry (1-2)

These findings are all statistically significant at well above 99% confidence levels, and show a strong ability to forecast the commercial prospects for a technology start-up up, even 5 years in advance. Of course, nobody would argue that excellent management, valuable partnerships, a favorable business landscape, and market momentum are desirable traits in a start-up or small company. But being able to discern these factors individually, consistently, and in advance turns theory into measurable, competitive advantage. The Lux Research approach makes this data available to executives to validate critical business decisions about emerging technologies.

### Case Study: Evaluating Water Technology Start-ups

To demonstrate how this methodology can support executive decision making, we conducted a focused case study for a specific industry sector: Start-ups developing water technologies. We selected water companies analyzed in 2009 that were not profitable at that time, rated as having a strong technology or solution value and an overall "Positive" *Lux Take*, finding a total of 22 companies. In the intervening five years, only one of these companies folded, namely Eco-Solids International, a U.K. company that focused on equipment for sludge treatment, anaerobic digester pretreatment, and leachate treatment. For an additional two – Cambridge Water Technology and Solmetex – updated financials have not been disclosed since their respective acquisitions, the former acquired by Evoqua, while the latter's ownership is now a combination of private equity investors and the management team.

Of the remainder, eight (36%) became profitable over the course of the five-year period. These included Echologics, a developer of acoustic sensors for leak detection (since acquired by Mueller Water); RedZone Robotics, which provides robotic pipe inspection services; and P2W, which uses electrocoagulation and electro-oxidation technology to remove heavy metals and cyanide from

industrial and mining wastewater. Even the remaining eleven sampled companies that are yet to become profitable are still operating with average revenue growth greater than 300% over the 5-year period. All in all, the 22 companies highlighted by the Lux methodology in 2009 have posted impressive results in a field that is not considered fertile ground for start-ups or innovation.

*The criteria used within Lux Briefings identify winners with outsized probability... delivering growth to both the top and bottom line*

As a portfolio, the criteria used within Lux Briefings identify winners with outsized probability in the water start-up community and the broader emerging technology realm, delivering growth to both the top and bottom line.

## Multinational Corporations Can Use the Lux Methodology As Well

Insights from these successes should augment the thinking about the future by executives responsible for new business development at large companies as well. Those who neglected the technology innovation opportunities around non-revenue water losses and industrial wastewater treatment clearly have missed potential growth. Because start-up companies by definition need to find new business opportunities to grow – they have no existing core business to rely on – their success is an indicator of where fertile growth opportunities lie. When this success can be predicted reliably years in advance, large companies can get a head start on the competition in identifying where they should focus innovation and new business development efforts.

What's more, the methodology used to assess start-up companies can apply to innovation programs and projects within larger companies. Clear-eyed assessments of partnerships, momentum, barriers to entry and, of course, management talent can have similar predictive value for a corporate new business initiative. Indeed, some of Lux Research's more forward-thinking clients even ask the same analysts to provide a *Lux Take* for their own product lines, market segments, or technology platforms to get a predictive third-party evaluation of their positioning.

## Conclusion

Growth through investing in emerging technology, applications and business models is a game of odds. Winning investors and successful new business development executives alike focus on improving the odds by looking for information that helps select the winning projects early and recognizing the underlying indicators for success. Lux Research's methodology – based on primary research, evaluation by technology-savvy domain experts, and a consistent process – has proven to be an exceptionally reliable predictor of the odds of future success. It cannot be replicated without the thousands of expert hours and a well-honed and disciplined organization. The Lux briefing process is already established and optimized to help executives spot impactful start-ups, identify fields primed for growth, and even evaluate their own innovation programs. That, at the core, is the Lux Research value proposition.