

Spinning the R&D flywheel

Add the 4Cs to your R&D to help sustain faster growth.



Introduction

Warren Buffet observed that when the tide goes out, you can see who's been swimming naked. And there are plenty of examples in recent years of businesses that appeared to be on the cutting edge only for the tide to recede and reveal their lack of ... anything much.

Today's tech giants who have stayed the course do so under enormous pressure. They are not swimming naked, but they are swimming in a riptide. They face relentless pressure to deliver the 30% to 40% growth that investors and the market now not simply expect, but demand. With as much as 60–70% of their stock price representing future value, those tech stars have to keep on delivering the results, growing new multi-billion businesses, and disrupting markets at a breakneck pace.

And for businesses that seek to join them in the pantheon, there are plenty of people in a sizeable cottage industry willing to show them how to become more like these standard-bearers of innovation. Common advice? Be more like... (insert your favorite FAANG here).

If only it were that easy. The path to star-billing is getting steeper and increasingly strewn with obstacles. Many of the "easy" problems have already been solved.

Bigger challenges such as whole industry digitization, smart everything, income distribution, energy, healthcare, and the environment are the focus. The "we-too" start-up bandwagon is no longer accepting passengers. And the market has figured out the difference between innovation that delivers real customer value and "feature factories" that develop cool trinkets but offer nothing very different.

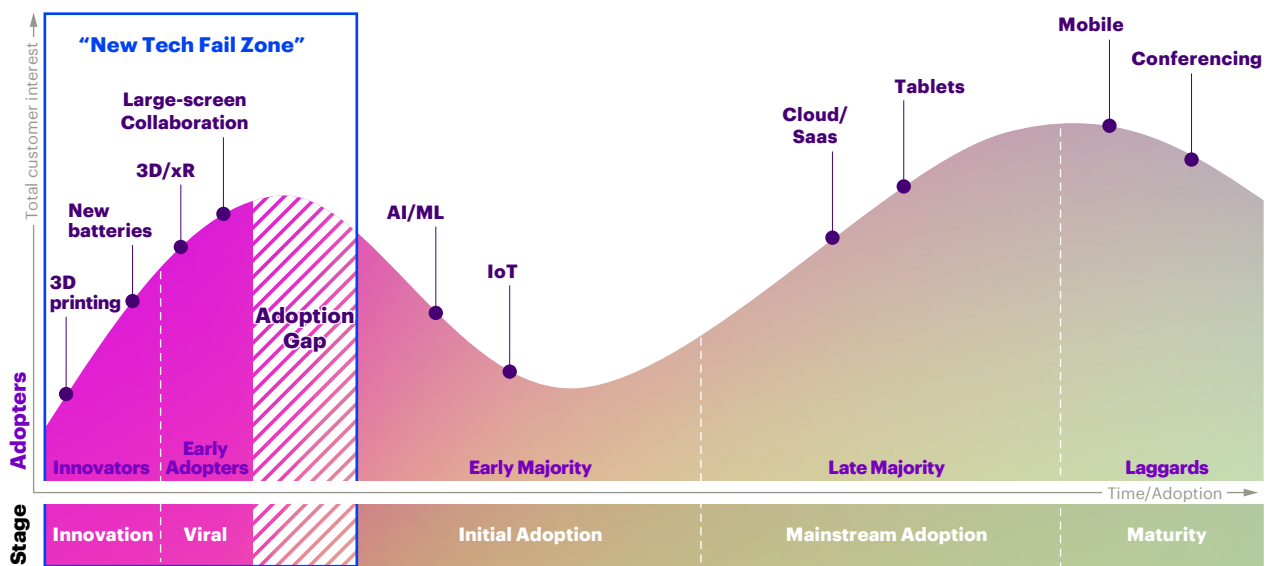
The good news? There are steps to avoid the trap of hamster-wheel product development and take advantage of what flywheel growth can do for your business.

Step 1

Escape the “New Tech Fail Zone”

To escape the New Tech Fail Zone, products on the adoption cycle must cross the adoption gap, and this requires business (not technology) incubation.

New technology interest and adoption cycle



Our observation is that many companies today are investing in foundational R&D that has little or no connection to the creation of customer value. The history of Silicon Valley is littered with examples. Over the years, billions have been invested in projects with very little revenue generated. In addition, many tech acquisitions have failed to deliver their projected upside due to either the inability to integrate, too little value created for customers, or both. They all sit in the “New Tech Fail Zone” (see graphic).

So why do so many technology-focused business ideas and products fall at the first hurdle and fail to leap from a relative handful of early adopters to a significant majority and then mainstream adoption?

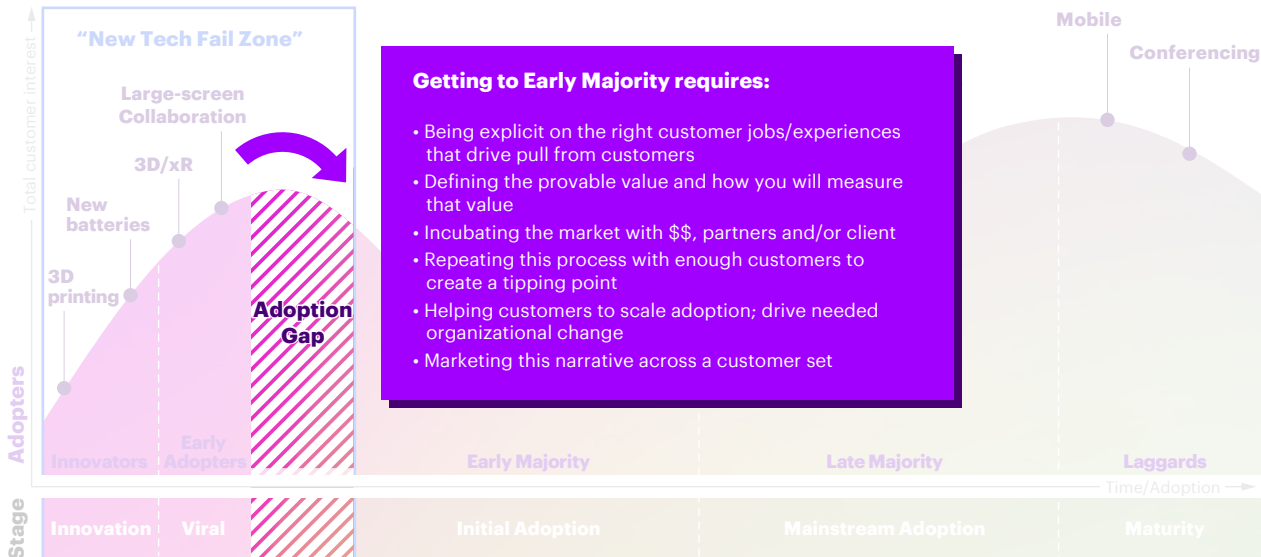
The biggest reason is that they are engineering-led product developers, excessively focused on technology for its own sake, with too little attention to customer value.

Too many engineers drive product development, focusing on technology challenges and features rather than what final customers want or need. It’s easy for businesses up and down Silicon Valley to fall into the habit of designing for what their peers in the same zip code would value—technical advances or ‘cool’ new features.

But technical superiority is rarely the primary driver of success—the triumph over VHS over Betamax being just one notable example, or what about the Segway scooter? A marvel of engineering that was missing only one feature: a clear consumer need or desire.

Crossing the adoption gap—how exactly?

New technology interest and adoption cycle



What matters is understanding what customers want (or may want once they see a product), getting the product into their hands, testing it, refining it, and so on. One example: The Adobe stylus. Testing with the intended main market for that product, graphic designers, revealed only two aspects of form and function that mattered to them. The stylus had to look cool, and its ‘nib’ had to be sufficiently fine and sensitive to enable designers to create the right marks on the screen. All other considerations were secondary. Success depended solely on getting those customer-defined needs right.

What does this example illustrate? Investments in product development that do not deliver value to the customer are wasted. Investing in getting products into customers’ hands as fast as possible and learning from what they tell you is not. It’s an outside-in focus that puts outcomes in the driver’s seat. Just as important is the emphasis on business incubation rather than technology development. Gartner estimates that for every \$1 an organization spends on “upfront innovation,” another \$7 must be spent on execution.*

Here again, it comes to identifying the customer needs, seeding the idea with what customers want, and proving its value. Success with one customer can be replicated with others, pushing toward a tipping point for wider adoption. Scaling adoption further will require organizational change and growing a market with dollars, partners, and/or customers. That narrative of success then has to be told effectively to a set of customers who will propel wider adoption—the flywheel spins.

Starting with the customer and their needs should also drive investment decisions. Experimenting with multiple, smaller investments is more likely to surface successful candidates (and hasten the demise of failing ideas) than persevering with a big bet that consumes ever-larger amounts of resources into a product that meets no clearly defined customer need.

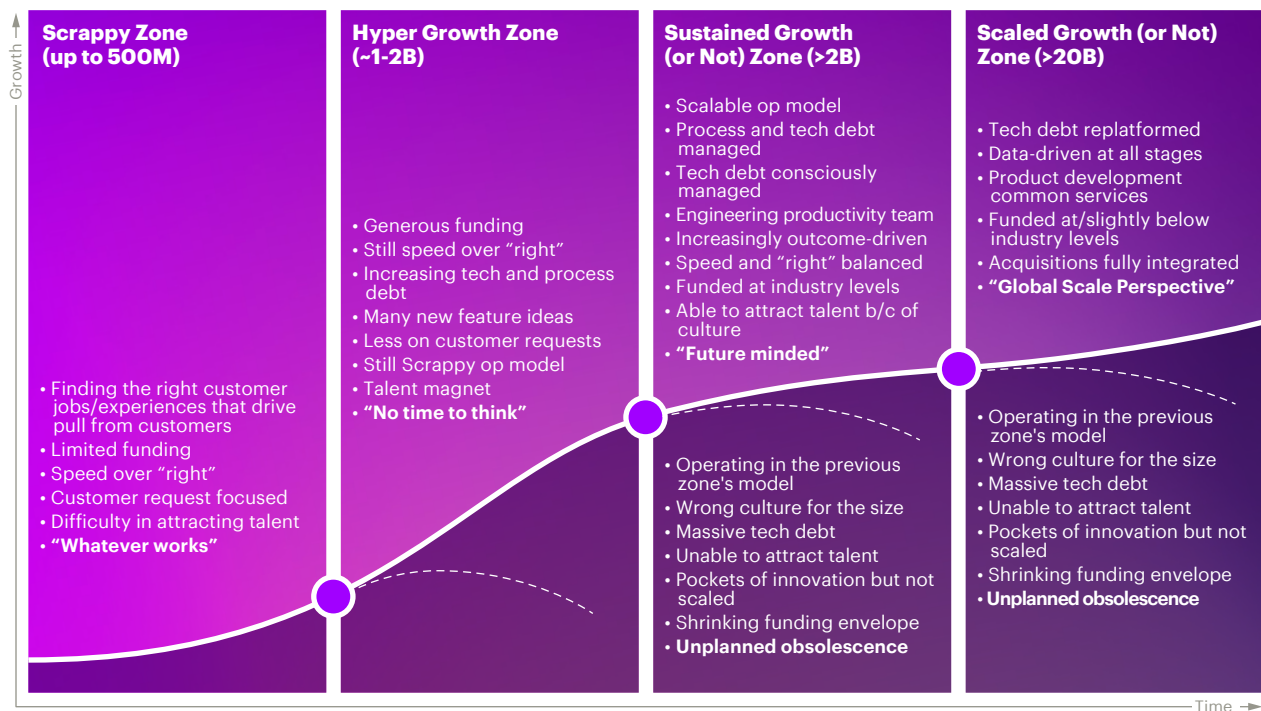
Taking an outcome-driven approach is more likely to help companies escape the fail zone. But it’s unquestionably hard to do. However challenging as this stage is to conquer, it’s still far from the summit.

*Source: [Navigate the 9 Common Pitfalls to Scaling Innovation. Gartner, 2020.](#)

Step 2

You've got a hit. Now the hard work of sustaining growth begins.

Maturing the organization to maintain effectiveness



Without organizational maturity:

-65% returns on R&D (returns have fallen by 65% over the past 30 years)

30% time spent not innovating (by engineers in high-tech companies)

40% struggle to evolve engineering skillset (40% of companies say this is a challenge for them)

● Inflection point

The authors would like to thank Kent Beck, whose "3C" framework inspired their thinking for this chapter.

Even when a product is a hit and a business is on the up and up, the challenges are only just starting. The qualities that enable a company to escape the high-tech fail zone are not the same as those that will sustain them to greater success.

Ironically, the energy and the "whatever works, works" mentality that are unquestionably needed to get a successful product out of the door are also likely to imperil future success.

Single-mindedness has to yield to the coordination of many moving parts. Risks that were linear—the one thing on one path—become logarithmic.

Perhaps the best example of a business that has mastered sustained growth: Amazon. Amazon operates with multiple business models, enabling each new business it creates to operate with only the minimum of central principles and support.

That radical decentralization is one of the main reasons that Amazon is able to create multi-billion dollar businesses with uncanny frequency. In effect, Amazon is able to operate across the four zones of growth simultaneously. It's been able to achieve sustained growth while retaining the scrappy and sustained phases for the businesses that it incubates. Continuous innovation is continuously scaled.

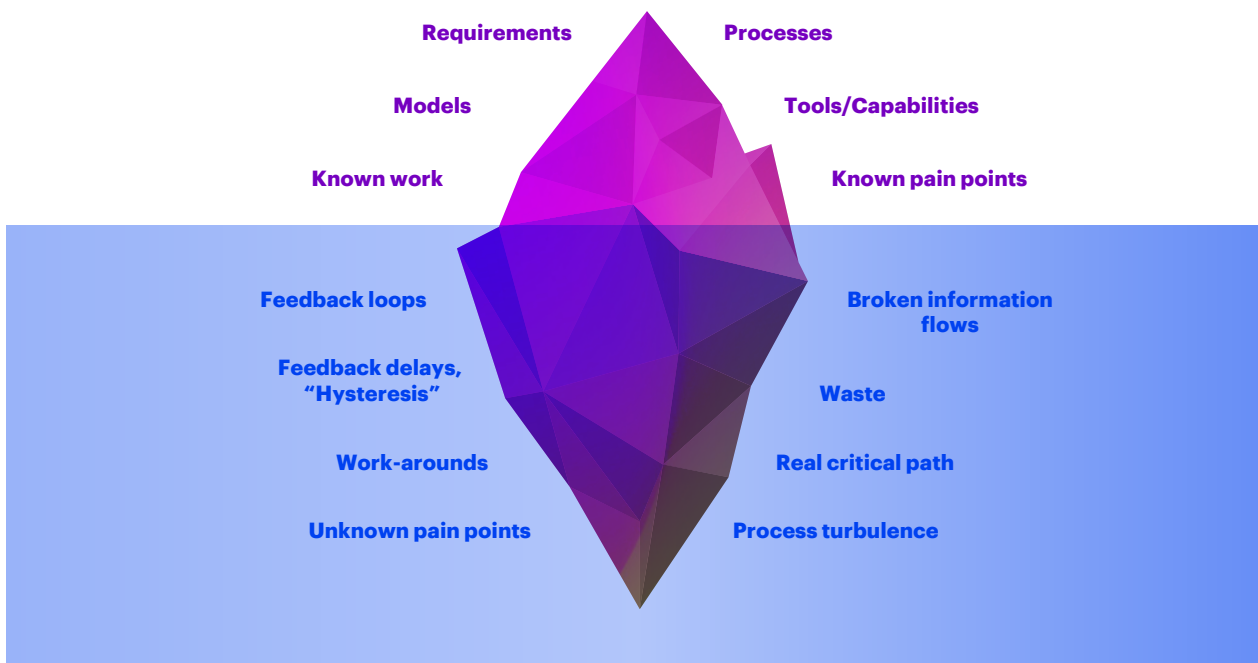
But operating across the three zones requires different skill sets that can best manage the requirements of each.

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Step 3

Pay down value debt before it puts you out of business



Hypergrowth companies take on much more than just financial debt. Their biggest risk arises from failing to track and plan how to repay the Operational Debt, Value Debt, and Culture Debt that they take on during growth mode. Debt, per se, isn't bad—it's the natural exhaust of growth. But too much of any of these kinds of debt incurred without a clear plan for paying it back can severely constrain even the highest flyers.

Too often, strategies for paying down these different forms of debt increase the degree of indebtedness. That's because the same approach a company pursued in its infancy is applied at scale to try and address problems that are of both a different nature and magnitude to those encountered during the business's early years.

So what can companies do to prevent the accumulation of debt that will create a drag on growth? For a start, they need to make sure that they don't fall for their own mythology. We've all seen the magazine covers and the adulatory articles in the business press.

Certain companies are feted as having broken free from conventional business paradigms, having found a completely new path to everlasting value and growth. But these stories are myths. And like many myths, from Icarus to Ozymandias, they should serve as warnings about overreach and hubris.

Technical Debt compromises velocity and quality:

Technical Debt represents a future modernization cost that clients incur every 7 – 10 years. You can think about the cost of Technical Debt in the same way you think about the cost of credit card debt. Excessive debt significantly increases operational costs and limits new revenue.

	“Principal”	“Interest”		
	Technical Debt	Increased operating costs	Incident liability	Opportunity costs
Element	Cost of refactoring legacy code to modern engineering standards should be considered liability	High cost of change leads to slow development cycles, high test burden	Additional costs from reputational damage, service incidents and outages	New products/ opportunities not availed due to system inadequacies
Range	Hundreds of millions (# of lines of code vs cost to fix)	Tens of millions (Excess regression tests, architecture review)	Millions (Incident costs + Travel + Credits)	Tens-hundreds of M (Hours not working on creating new business values)
Financial Statement Impact	Unrecognized/future balance sheet liability	Increased OpEx – R&D costs	Increased OpEx – R&D + reduced revenue	Reduced revenue

How can businesses avoid the temptation to believe their own myth? Fundamentally, it’s essential to understand that debt is an inevitable result of growth. Debt—whether technical, value, cultural, or process—is typically a vital sign of growth. But businesses have to be aware of where and how they’re building it and, critically, when and how they intend to pay it down.

Perhaps the simplest way to think about this is through the eyes of the CFO. As the diagram above shows, all debt can be articulated in familiar financial terms. In this case, it’s technical debt. But any type of debt can be usefully thought of in the same way.

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Step 4

Act like a grown-up

Navigate the "techlash" prudently.

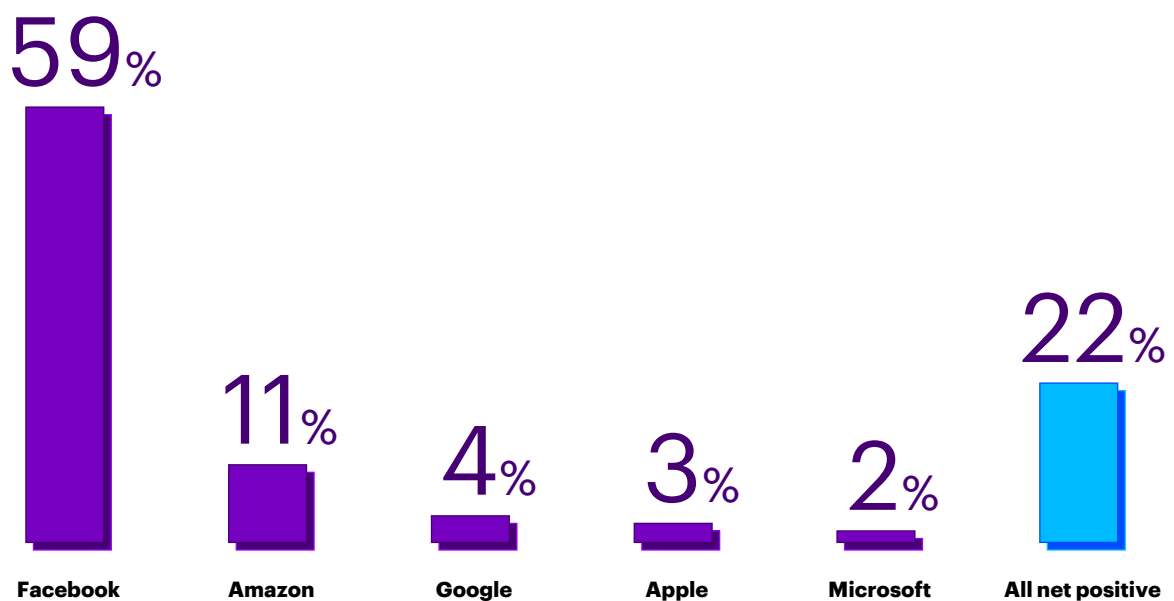
From 2001 to 2014, the world couldn't get enough of Rockstar tech CEOs leading companies that could, in the eyes of the media, do no wrong. Now, most major tech companies face increasing public scrutiny of their role and position in society.

Journalists' and commentators' focus has shifted in just a few years from trying to reveal the source of tech companies' success to counting the ways that they pose a mild to severe danger to society.

Issues raised range from monopolistic behavior, a winner-takes-all mentality, the erosion of social values and more.

Whether these charges, serious as they are, are justified is not the question here. In a market where future value accounts for so much of the tech leaders' stock prices, perception is crucial. Failing to take the challenge seriously, or relying on the founding start-up attitudes and fail-fast mentality to crash through the barriers, is not an option.

In ten years, which company will we say was a net negative for society?



n = 4,217 respondents; Based on a poll conducted by CB Insights on its website in December 2017.
Source: [The worst tech company is... CBInsights Research, 2017.](#)

Content and Trust in tech companies are already very low

77%

of Americans say major internet and technology companies have too much power.

47%

More Americans believe that these companies create more problems than they solve rather than solve more problems than they create (15%).

48%

A majority of Americans also says that these companies allow powerful interests to control society rather than give people the power to change society (19%).

Source: [Techlash? America's Growing Concern with Major Technology Companies. Knight Foundation, 2020.](#)

Businesses like these are now too big not to take a more evolved and sophisticated approach to the impact they have, how their business models are perceived, and the—potentially—harmful externalities that they create. What's more, they need to have all the mechanisms in place to monitor, assess, and manage the various risks that their global scale and reach generate.

If they are not able to achieve that themselves, they risk having the "solution" imposed upon them. And as developments in some countries have shown, regulators can take a dim view of actions (or inactions) that they perceive to show a lack of responsibility.

Tech companies and those wishing to join their ranks need to be hypervigilant of these "consent decree" moments. Missing them could hobble their future growth potential and stifle innovation for years.

This is not a situation that companies can lobby their way out of or paper over the cracks with slick PR. They need to pave a new path of responsible innovation in partnership with their broader stakeholder group—and that's everyone.

Recommendations

Each of the four steps outlined above could (and do) trip up businesses that have achieved early success but find it hard to move to the next level of growth through innovation.

By carefully examining their own business, every company should be able to spot these pitfalls and take the actions required to navigate them successfully. As they do, they need to bear in mind a few no-regret initiatives that can help them regardless of where they sit on their growth trajectory.

- Add 4C to your R&D, Closing the loop on the Commercialization of Company and Customer value
- Drive a cross-functional portfolio planning process that uses data-driven insights to define where a \$1 is best spent to fuel your growth engine (foundational R&D, business R&D, go-to-market, customer incubation, etc.)
- Establish an ongoing debt reduction program (culture, value, tech); fund it; empower it; measure its success. Debt is not a bad thing—unmanaged debt will kill your company. Manage it.
- Segment your organization into different operating blueprints for incubation, growth/scale, sustain. Drive incubation/growth like a venture capitalist firm; scale and sustain like a private equity firm.

Authors



Christian Kelly

*Strategy Managing Director
Software and Platforms*

christian.j.kelly@accenture.com



Steve Roberts

*Managing Director
and Industry X Lead
North America West*

steven.r.roberts@accenture.com

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