TREETOWN TECH

THE PROMISE AND PERIL OF

GAME CHANGING HARD TECH

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What is Game Changing Hard Tech?

Sometimes, incremental improvement and evolution won't be enough for your business. You'll need to change the game – either, externally, internally, or both.

In those times, you'll want technology that can deliver a leap in performance.

And for that game-changing performance, you'll need a solution that combines features and functions in novel ways to give you something no one else has.

This is extra true when you are working on building products that are physical (e.g. not just software), aka hard tech.

When will you want Game Changing Hard Tech?

Market threat: You see a threat coming – especially from a new entrant who is interested in changing the game – and don't want to wait for someone else to change your market.

Production innovation: You see the opportunity for automation to substantially increase speed or reduce costs in your production.

Reinvention: You want new ways of thinking that can break the mold of your current business, reimagine your market, and create innovative ideas.

Forward-thinking company: You want your company to be ahead of your market – you want to dictate the game, not react to it.

Eroding margin: You are losing your customers and your market, and you need to change the game to get back on top.

Blue Ocean opportunity: You have a chance to open up new market space and remake your profit model.

The Promise and Peril of Game Changing Tech

Game Changing Tech is often at the heart of your biggest and most profitable growth – but the challenges are numerous…

- Novel technical challenges that take deep expertise to solve.
- Knowledge of a range of approaches, maybe from very different industries – and the experience to know when to apply them.
- Multi-disciplinary problem-solving that takes different combinations of expertise at different times.
- A dynamic and uncertain dance between the development budget, the production economics, the true market needs, operational constraints, and the profitability to be unlocked.
- Danger lurking in assumptions about customer and market behavior.
- The challenges of building a team, especially if it needs to happen fast.

In short, to unlock the promise of Game Changing Tech, you'll have to navigate an environment that is complex, dynamic, uncertain, and expensive.

What does Game Changing Development look like?

Some larger companies have created “skunkworks” divisions to develop Game Changing Tech – but most companies can’t afford that approach.

Instead, most companies will see the need for a Game Changing Tech and then try to handle it with their existing development processes.

That often doesn’t work – for the 6 reasons we describe on the following pages.

Game Changing Development

Frame the problem
Understand the environment and check your assumptions before starting in on a solution.

Pursue complex challenges
Solve your toughest, most undefined problems

Have experts on hand
Ideally you’d have cross-discipline engineering and business expertise in one place.

Think holistically
Consider a complete solution for the end user, not just technical details.

Build fast and learn fast
Get prototypes in your hands early and often.

Keep your IP safe
Keep control of your ideas to give yourself flexibility for the future.

Framing the Situation

The most important mistakes we see repeated by companies trying to develop Game Changing Hard Tech are (1) not understanding the full view of the opportunities and challenges, and (2) making a number of assumptions (often unrealized) that don't have solid basis.

Assumptions and tunnel vision can lead to many, significant problems in Game Changing Tech, because small misses can put projects significantly off track.

And that's where framing comes in – using a broad perspective to incorporate all the elements that will matter to developing a solution.

Game Changing development needs to look more deeply and creatively at standard inputs like customer understanding, technical needs, and financial constraints, and also take into account the strategy and culture of your company.

All those elements can impact the solution – and the tools to use.

We've learned that the boldness of Game Changing Tech needs to be balanced with humility for how little is known at the start – when the scope of work needs to be loose, and the desire to understand different perspectives needs to be strong.

Possible solutions need to be continuously reevaluated as learning changes.

Pursuing Complex Challenges

Innovation – whether evolutionary, or revolutionary – plays an important role for businesses who are looking to capitalize on:

- Market changes, competitive challenges, and customer discoveries
- Technical advancements
- Product rejuvenation and offering expansion

And, although you could stumble onto a brilliant idea or two, relying on luck is not a strong strategy for a company that wants to control its own destiny.

If you're not comfortable leaving your fate to luck, then you'll find that many of the most interesting ideas for your innovation involve complex challenges.

Complex challenges have a lot of interconnected and interrelated variables undefined at the start, including things like:

1. What value the new product could have in the market
2. What features and functions are most important
3. Which parts to use at what volumes
4. How to make parts work together in both your existing business and what it will evolve to be
5. The investment needed for development and production – especially when there are unknown problems at the start
6. What IP is truly unique and worth investing in

What do you need to deal with the complexity and uncertainty? A solid development process sets the stage, and a broad array of tools ensures you use the right one for the job – but most important is a mix of specialized experts in business and technical disciplines.

Mixing Experts as Needed

For complex problems, you'll need technical and business experts for your development process.

Unfortunately, expertise can be expensive on its own – and even more expensive to combine.

Especially if you're learning as you go, and discovering what expertise, in what dose, is needed. Solve a mechanical challenge and you may uncover an electrical one that's twice as hard, and twice as important. Solve that, and you may be faced with a commercial question that outweighs all of the technical choices.

If you have a big budget, you might be able to hire the experts you need when you need them, and get them to work as a team. But you also may not.

And if you don't have a big budget, you'll need to guess before you start your development which expertise you need to "go big" on and which you can skimp on.

In addition, gathering a group of experts is only part of the solution – you also need to get them to gel into a team, so they can bring integrated, holistic thought and action.

So, let's recap. You need diverse expertise. That you may not be able to plan. To varying degrees at varying times. Working together.

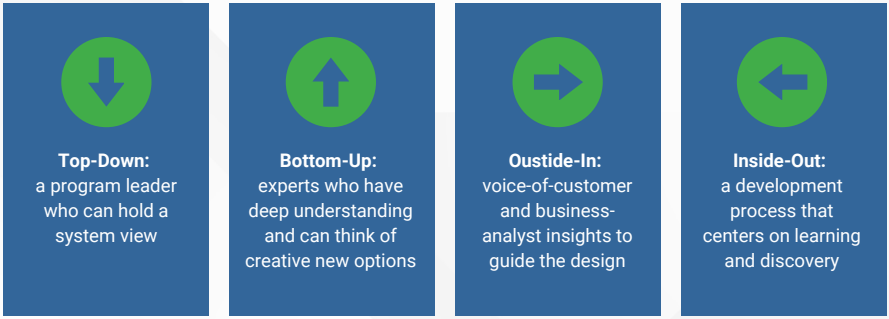
That's hard – and why some companies work with a development partner that has already built a diverse team and spread the cost and management of that team over a range of clients, so there is a range of expertise available on demand.

Thinking Holistically

As complex and uncertain as your development is, the end result needs to offer a brilliantly practical experience for the user.

To do that, you'll need to create a holistic view that can integrate the competing constraints and possibilities, and make the hard decisions about priorities.

How do you create that view?



That 360° view can get deep and fast insights – if it's used with the right process.

Building Fast, Learning Fast

Complexity, uncertainty, expertise, integration – it should be no surprise that your development process needs to emphasize learning, since ”you don’t know what you don’t know” when you’re starting to solve a complex problem.

You’ll want to get prototypes into the hands of potential users early and often. Those prototypes will help you address initial technical questions, and get live-action reaction to your design direction.

Your process will have to match up iteration with de-risking – it’s not enough to just move fast, or to develop iteratively. You have to attack the hard and important problems first.

Without the combination of an iterative process and an understanding of risks, your team will waste time and money solving problems that don’t matter.

With a risk-focused iterative process, you’ll solidify the business case for your new technology faster - to cut off ideas that won’t work sooner, and spend more on good ideas that can change the game.

Controlling Your IP

If you decide that all of the complexity and uncertainty of a new product will be too much to handle internally, you may look to an outside development firm to help.

Outside firms can have a range of IP ownership terms. Some will give you all ownership rights. Others will keep all the IP rights themselves.

When considering all that a partner can offer you, you'll want to include IP ownership in your decision.

Consider these scenarios:

- You decide you want to work with a different development firm for a future generation of the product
- You want to modify the product internally after you have the initial design
- Your development partner decides to work with your competitor
- Your development partner goes out of business

Of course, the more you're in control of your IP, the more flexibility you have to handle different scenarios in the future.

Looking to the Future

If you do a good job developing a Game Changing solution, it'll be the start of your Game Changing Hard Tech journey, not the end.

You'll be able to take your tech in new directions, and change the game even more.

When you do that, you'll need to deepen and expand your process – turning it from a project into a program.

How are Programs different from Projects?

You'll need to add a new layer of strategy over your project team – strategy that can look forward and outward, and create a pipeline of Game Changing opportunities.

At that point, you'll have a Game Changing innovation system that can anticipate needs, and enable you to play the game way ahead of your market.

First Steps

As you can tell, Game Changing development can be a long and winding journey.

And for that reason, we've learned that it helps to start with a clear, simple first step – what we call **"Phase 0."** We think every Game Changing Tech project should start with this step.

For a Phase 0, you'll want to bring together a diverse team of business and technical experts to look at the overall opportunities and risks of the project, as well as the constraints and rough-order-of-magnitude costs and effort. This usually takes 2-6 weeks.

The team should develop ideas and requirements that fit your needs, and present a go/no-go recommendation, as well as:

- A development roadmap with milestones
- Success/failure indicators
- A summary of the risk priorities to address.

If you want to see if we could help you navigate the promise and peril of your Game Changing Tech, reach out and let's talk about a Phase 0.

Who is Treetown Tech?

Treetown Tech is a group of engineers who love finding the best business solutions for new technical challenges – and the best technical solutions for new business challenges.

Our Culture

We live where ideas are as plentiful as trees. The Treetown Tech facilities are based in beautiful Ann Arbor, located in southeast Michigan's Lower Peninsula. Our 10,000 square foot office and lab space houses everything we need for innovative designing, prototyping, and testing.

Our office team operates like a true community. Sometimes it looks like mind-reading, but it's really just years of teamwork and relationship-building. We know each other's strengths and collaborate to get the work done. And we genuinely like each other.

We love our home. Ann Arbor is Treetown – and our home base. Though the products we develop are used around the globe, we love the deep connection we have with our city. It's a university town, a tech hub, a foodie magnet, and an urban oasis. It inspires us each day.

Why We're Here

Solving tough challenges requires a lot of expertise. As experienced engineers, we saw too many projects grind to a halt as people scrambled to source an outside expert. We knew there was a better, more practical way.

Under one roof. Treetown Tech solves problems as an integrated group, with in-house engineering and business teams working hands-on with clients. All the experts are in one place.

Filling gaps. We bring the expertise you don't have so you can complete your project better and faster. Together, we bring unique thinking to tough challenges that haven't been solved before.

Client control. We believe you should own your work and your IP. We don't try to control your work.
We thrive on creating things that are stronger, faster, smarter, and better. We love making brilliant ideas doable because that's what drives business value.