



Innovation-for-Impact

A guidebook for effective team value creation



Innovation-for-Impact Value-Creation Guidebook

Curtis R. Carlson, PhD and Len Polizzotto, PhD

Practice of Innovation, LLC www.practiceofinnovation.com

V1.0 2018

SLAC Proprietary Proprietary

Contents

Topic	Page
1. Introduction	3
2. Customer Value	4
3. The 3 C's	5
4. Key insights	6
Customer needs	
The solution	
5. Value propositions	7
6. Value creation forums	8
. Power of iteration	
. Giving and taking feedback	
4. Removing risk	9
. Identifying the important issues for initial focus	
. Bringing your concept to life and the Minimum Viable Prototype	
5. The 5 disciplines of innovation	10
. Focus on important problems	
. Your value creation process	
. Champions	
. Teams	
. Organization alignment	
6. Tools	11
. Value Factor Analysis	
. Worksheets	
7. Example value propositions	20
8. Appendix	26
. Definitions	
. References	
. Biographies	

“Whenever something — anything — is to be produced, there must be a systematized method of producing it. Whether or not the people who do the actual production fully understand those rules, that system has a deciding effect on product quality, cost, safety, and all essential determinants of success or failure.” Toyota Employee Handbook

Introduction

Innovations are offerings that customers need, at prices they can afford, and that are superior to the alternatives. These offerings have a viable business model for the enterprise producing them. Value-creation is the process that describes the steps required to produce valuable innovations. Below are some helpful definitions for concepts that are often confused:

- **Creativity:** making something that is original and imaginative.
- **Invention:** something novel that is reduced to practice.
- **Innovation in business:** creating and delivering new customer value in the marketplace with a sustainable business model.
- **Innovation in science:** creating and delivering new knowledge that has sustainable value for society

This guidebook is intended to provide you with the basic principles needed to create new innovations. To be understood these principles must be used and applied. It is a best practice to hold a workshop on these concepts and processes at the start of every major new program. This guidebook is most effective when used as a reference after participating in such an Innovation-for-Impact workshop.



$$E=MC^2$$

All significant innovations are surprising at first

Customer Value

• What is Customer Value?

Value is something we think about every day, whether going to buy a pair of shoes, a new car, or lunch. In simple terms we are always looking for the best “bang for the buck.”

Specifically:

Value = Benefits/Costs

A key question is, “Do you want someone else telling you what value is for you?” Of course not. Only our customers determine the perceived value of our offerings. We must be careful we do not put our own bias on it and that we get input from actual customers.

In addition, it is often better to use the more general “value factor”:

$$\text{Value Factor} = (\text{Quality} \times \text{Convenience})/\text{Costs}$$

Quality can often be measured, like the size of an iPhone screen. However, the importance of that attribute is always depends on the customer. Convenience is a subjective factor based on things like ease of use, emotion, bias, or intangible ideas. Cost always contains several elements, such as the offering's purchase price, insurance, maintenance, installation time, and one's time using the product or service.

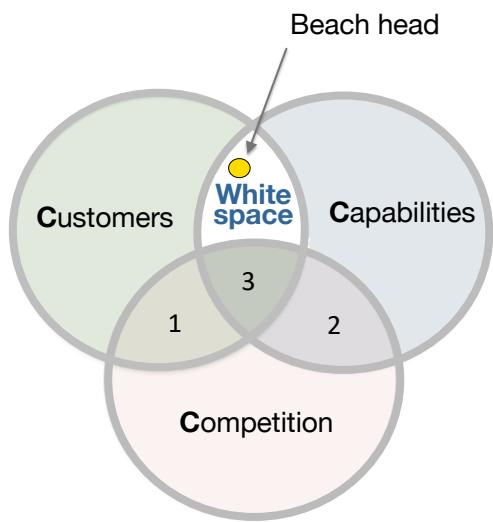
Whatever the offering, the end result must be clearly better value for the customer than any other alternatives, which include direct competition (e.g., different kinds of pizza) and alternatives (different kinds of foods).

There is a hierarchy for value, as shown below, from commodities to higher meaning. Apple under Steve Jobs understood this better than anyone and he created the world's most valuable company when he was alive. In just seven years he put Nokia, the previous world leader, out of business.



The 3-Cs

- The 3-C's stand for potential **Customers**, your **Capabilities**, and the **Competition**. We represent them as a Venn diagram, as shown below.
- When we ask people where do you want to be in the diagram, most say in the middle, represented by the number 3. In this case, you would be in a battle with your competition, often in a commodities market competing primarily on price.
- You want to be in the “white space”, where you can satisfy customers where the competition can not. You have a significant competitive advantage. Within this larger space there should be a “beach head” opportunity, where there are customers who need your product so much they will either pay a premium or accept a product that is not yet perfect. This is where you initially enter the market.
- Once you introduce your solution and it is successful, others will try and replace you. For this reason, you must always be working to provide a better value proposition to your customers than your competition.



- Understand the overall market ecosystem
 - Competition
 - Technical trends
 - Business models
 - Government policies
 - Customer preferences
- White space
 - Important customer and market segment
 - An offering without major competition
 - Barrier to entry
- Beach head
 - Early adopter customers
 - Needs your offering, even if not perfect
 - You often know them by name

Key Insights

. Key insights into the customer's needs

Your first step is to identify an important unmet customer and market need. We tell people that what they think does not count; its what the customer thinks that matters.

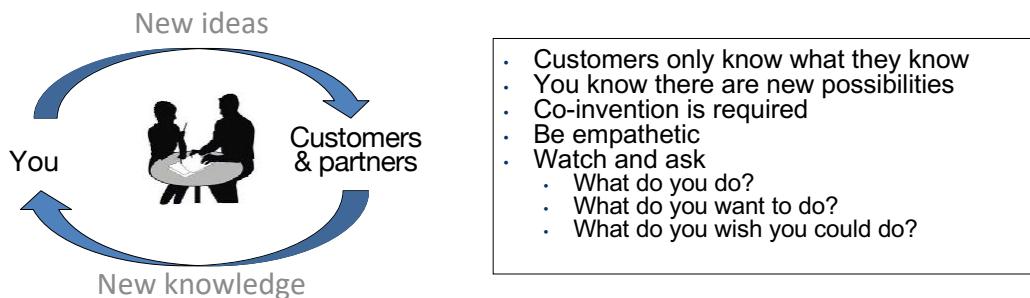
The big question is how do you determine if a problem is important or just interesting? Important problems are ones that the customer really cares about and where there is a large and growing market for the solution. You must deeply understand your market ecosystem and constantly be interacting with potential partners, customers, and competitors (carefully).

Observe what customers are attempting to do, and even try and perform the tasks that they usually do. When you talk with them, do not ask, "What do you need?" They usually don't know. Instead ask, "What do you wish you could do but can't?"

. Unknown needs

We are often asked, what about unknown needs? It is true that for major innovations customers never know all the potential solutions. When you ask them what they need, they can only answer based on what they know. Its your job to come up with innovative solutions that address their "unknown" needs.

The needs are there, they are just undiscovered. Attributes, such as convenience, design, and human connection are real needs but they are only appreciated by customers when shown to them. Once a prototype has been developed it is then possible to iterate or "co-invent" with prospective customers and get meaningly feedback. That is how Steve Jobs worked: he identified unknown needs and then, at the end of the development cycle, intensely iterated with partners and potential customers.

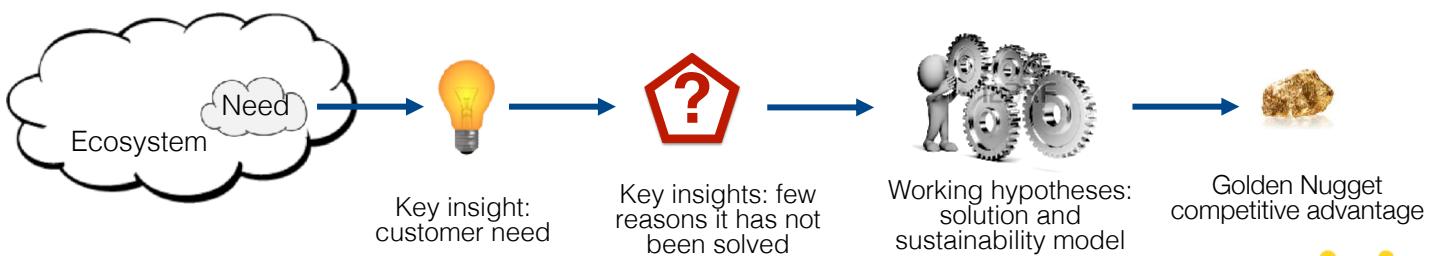


. Key insights into the solution

Once you have identified a major unmet customer and market need, you have to determine why it has not been solved previously. Identifying these reasons are your key insights into the solution.

Usually there are only a few main reasons why it is unsolved, not two dozen. You must identify those few key insights and then determine if you can address them. As shown below, they become core parts of your working hypothesis for the solution and likely your competitive advantage — your "Golden Nugget." That is, what do only you have that is special and that provides compelling value for the customer and great returns to you?

Often the key insights into the solution are not just technical. They might entail the business model, or manufacturing and distribution, or leveraging of proven organizational capabilities, among others. Its is important that you consider all aspects of the business situation and product life cycle.



Value Propositions

· What is a Value Proposition?

A value proposition is a description of the customer need to be addressed, how you plan on achieving it, why your solution will be valuable to customers, and why it is better than the competition and alternatives. Effective value propositions are compelling and easy to remember.

· Why are Value Propositions necessary?

Value propositions are the foundation of your action plan for the work you will do. They clearly communicate to the rest of your team the project's vision, the tasks to be performed, and their purpose. Your value proposition must be written down. That forces you to clarify your thoughts and provides a means for you to iterate with others to get their ideas for improving your plan.

· What are the elements of a Value Proposition?

There are four fundamental elements in a value proposition, which we call an "NABC" value proposition. These four questions must always be clearly and convincingly answered. If one is missing, it is likely you don't sufficiently understand what you are doing.

- **Need:** the important customer and market need. We stress important, not just "interesting". It must be something that customers really want: something that removes severe "pain" or produces major "gains." You must quantify the need. Using the words "bigger, better, faster, or cheaper" are not helpful. For example, bigger than what, a pillbox or a breadbox? Be specific: "We need to cut the cost in half to fifty cents a unit" as opposed to stating, "We need to reduce cost."
- **Approach:** this is your offering that addresses the customer's need plus your business model. You must state what you bring that is unique, special, proprietary, and that provides a sustainable competitive advantage. This is your "**Golden Nugget**". Remember to quantify.
- **Benefits/costs:** this is the value you are offering your potential customers. Again, you must quantify the benefits and costs. If you are not at least 2 times better than the competition, you need to reconsider your value proposition and whether you should continue along your original path.
- **Competition** and alternatives: this is a clear summary of the other ways the customer's need can be satisfied. Remember, don't just think about others with similar technologies today, but with approaches that may be orthogonal to your approach or developed soon by others. For example, if you are developing a new glue, your competition is not only from other types of glue, but from alternative means to stick things together, such as staples, velcro, and tape.

· Beware of the "Big A"!

Many researchers define their Need based on their capabilities rather than on actually identifying the important customer need. We see this in the majority of early Value Propositions.

~~NABC~~

· Actionable Value Propositions

We say, "A meeting without next steps is a social event." The same goes for presenting your Value Proposition. After the "NABC" part, there must be a close that includes the "**Action**" you want. It might be a meeting, or budget and resource request, or approval of milestones and deliverables.

Additionally, your Value Proposition should have an introduction or "**Hook**" to get everyone's attention. The Hook should be quantitative and provide a compelling reason why your audience should be interested in what you will say.

Hook

Need

Approach

Benefits/cost

Competition

Action/Next steps

- Quantify whenever possible
- No bigger, better, faster, cheaper
- When in doubt give a range
- Use figures and trend graphs

Value-Creation Forums

Structure

- **Recurring:** Value Creation Forums (VCFs) are recurring (every few weeks), multidisciplinary, facilitated meetings where 3 to 5 teams each stand and present their NABC value propositions to the entire group. Holding one or two meetings, like with brainstorming, accomplishes little. They must be recurring to produce dramatic results.
- **Efficient and effective:** These presentations are from 3 to 10 minutes in duration and the presenters receive feedback from the other teams. You can also invite outside experts for additional inputs. The goal is to rapidly answer the most important value-creation questions. When properly run, the meetings are short, usually under an hour, and highly productive.
- **Facilitated:** The facilitator organizes the sessions, sets the agenda, and makes sure presenters stay within their time constraints. Typically, one member of the team does the presenting, while the other team members take notes on the feedback given.

Operation

- **Feedback:** Receiving feedback from others is a gift, not a criticism! We tell people that if you had to pay for the consultant fees of the others in the room, you couldn't afford it, yet they freely give you suggestions for improvement. And often the best feedback comes from someone who is not an expert in your field. There are lots of smart people with different perspectives, listen to them. Throw away your ego and let others help you improve.
- **Power of iteration:** The beauty of the VCFs is that you build off of each other's ideas. This is the process of iteration and the foundation of rapid value creation. The feedback is then used to update and improve the value proposition for the next session in a few weeks. In between each team should also be iterating their value proposition.
- **Giving feedback:** When giving feedback, there are four viewpoints that provide constructive input, as shown below. The facilitator will select members of the audience to represent each of these perspectives. The first is to share what was good about the value proposition. The second is ways the value proposition could be improved. This feedback should be positive and reinforcing, not critical of what was done. The third is reflecting whether you would invest in the project or offering. The fourth is to put yourself in the customer's shoes and consider whether or not you would buy the proposed offering.
- **Taking feedback:** After the presentation, the presenter stands and listens to the feedback — no talking back. The objective is to listen and learn from everyone in the room. We all have a tendency to want to rebut when being given suggestions for improvement. If you are thinking about how to respond, you are not listening. Therefore the key to receiving feedback is to keep quiet and simply listen!



The last Value-Creation Forum at SRI before Siri was spun out as a new company. It was the world's first mobile computer personal assistant. Months later Steve Jobs called SRI and bought the company for the iPhone.

Good: keep it
Improve: fix it
Eyes of the customer/user
Eyes of the investor/funder



Team takes notes

Removing Risk

Value versus risk

Value goes up as risk goes down. Remove major risks first.

The goal is to eliminate risk with minimal cost and in minimal time. Risks can be technical, business, competition, manufacturing, distribution, staffing, funding, or a combination of all of the above.

Important; not just interesting

The most important risk reduction element is making sure that there is an important customer and market need and that you have done your homework to identify the correct problem to solve.

The more you ensure this, the greater the probability you will be successful. And of course, make sure you know where the competitors will be when you finally deliver your offering.

Identifying the important issues to be first addressed

We all like to show others our results. Therefore, it is a natural tendency to want to immediately start building the offering. This is almost always a mistake. If you do not work first on the critical tasks, your efforts might all be for naught.

What do we mean? Let's say with a project there are 10 tasks that must be completed and, of these 10, 8 are reasonably routine but 2 are unknown and may require new, difficult inventions. Most people will naturally work on the "easy 8" first.

This is a mistake because if you can't solve the "difficult 2", all your effort will be wasted. Your initial focus must be on proving that addressing those two challenges is possible. You can do this with modeling, simulations, mock-ups, sketches, or data and graphs.

The risk-impact chart shown below is a good way to visualize your priorities and check off your progress. The first goal shown here is to assure that the "critical part" can be obtained.

Bringing it to Life

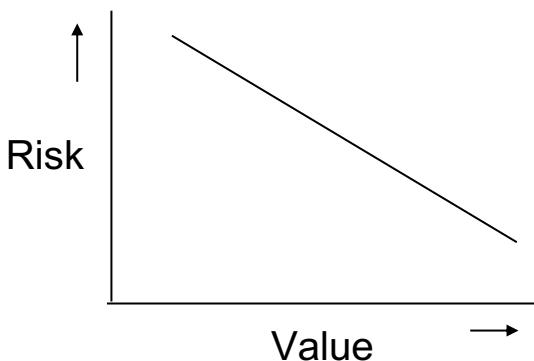
To be effective you need to vividly describe your offering to your team, partners, and eventual customers so that all can be aligned on the vision, understand their part, and communicate effectively. You need to "Bring it to Life." This can be done through stories, figures, mock ups, and simulations. Below is a computer simulation of a proposed ocean buoy showing how wave motion could compress a plastic material in the three "arms" to power the buoy's lights, horns, and GPS systems.

The simulation took a week, it was used to confirm the design with the customer, it generated the first product development plan, and it lead to additional patents. It also profoundly reduced the risk of developing the product.

Minimum Viable Prototype (MVP)

When you are confident you have removed the major risks, you can build a Minimum Viable Prototype (MVP). This is a "bare bones" demonstration of your product. It's important to resist the urge to scale up what you have developed before you have removed the risks. The goal is to eliminate risk with minimal cost and in minimal time.

The MVP should be able to demonstrate that all major features of the product can be built and work as proposed.



"Bring it to life" simulation

5 Disciplines of Innovation

A complete ecosystem

The five disciplines of innovation are overall guiding principles for value creation that teams should adhere to in order to improve their probability of success. We have found that if one of the five is missing, you will likely not be systematically successful. All the elements in an innovation ecosystem in an enterprise must be in place. These are described in the book by Carlson and Wilmot, titled “Innovation: The Five Disciplines for Creating What Customers Want.”

1. Important Customer and Market Needs

As we have mentioned in earlier sections, make sure you focus on things that are important to the customer and the market, and not on things that are just interesting to you. You must clearly define who your customer is and the size of your overall market and beachhead. Remember, if you don't work on important problems it is unlikely you will make an important impact.

2. Value Creation Process

The keys to the value creation process are: 1) having a common team understanding of the framework for a Value Proposition, and 2) recurring Value Creation Forums, where you present your ideas and plans to colleagues and get their feedback. Iterating and building on each other's ideas is essential for rapid value creation.

3. Champions

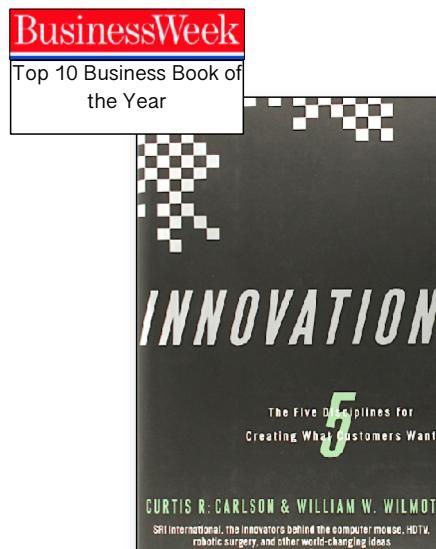
A Champion is an individual who is a dedicated, passionate, and driven advocate for solving the problem. They drive the value proposition, assemble the core team, learn the value-creation skills required for success, and persevere — no excuses. Without a champion, projects usually die a slow death. Our motto: no champion, no project, no exception.

4. Teams

No one is smart enough to address important opportunities by themselves. Important opportunities always require multi-disciplinary teams. You need a team with members who: 1) share the vision, 2) have unique, complementary skills, and can 3) share in the credit and other rewards of success.

5. Organization Alignment

Your project must fit within the overall strategic umbrella of your organization. This is necessary for getting needed resources and staff to make it happen.



Tools

We have developed tools for you to use to help you through the value creation process. These include:

Value Factor Analysis

This spreadsheet tool allows you to do a semi-quantitative analysis of what the customers want, what the competition can deliver, and how well your approach stacks up.

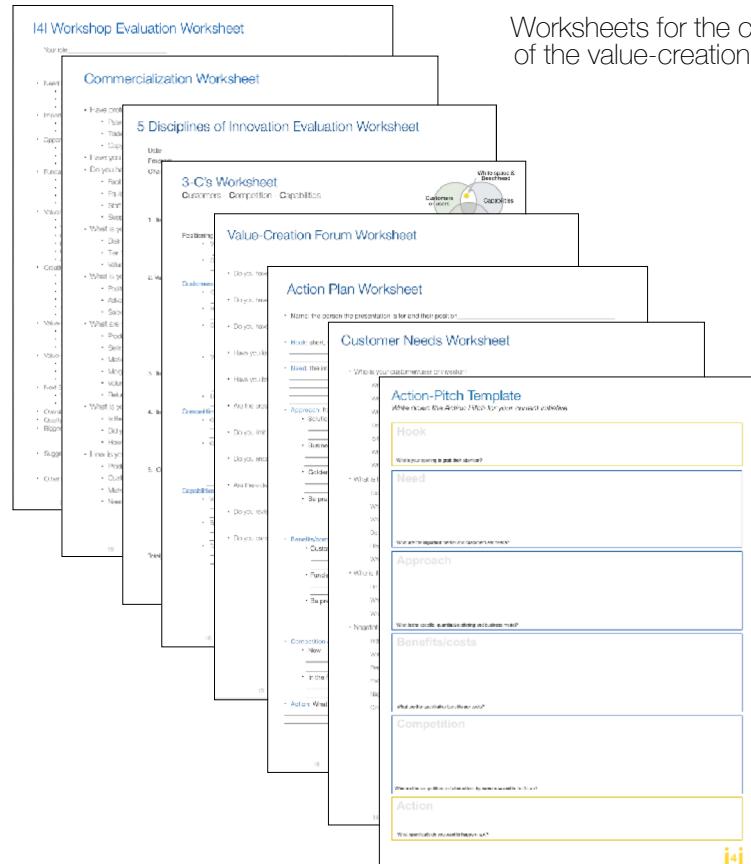
It facilitates productive feedback from customers and partners.

Worksheets to help guide discussions and ask the right questions

- NABC Value Proposition Template
- Customer needs
- Value Creation Forums
- The 3 C's
- Innovation's 5 Disciplines
- Action plans
- Commercialization

Value Factor Analysis™																																																																																																																																	
The Approach: What is your product or service?																																																																																																																																	
The Target Market: Who is your user?																																																																																																																																	
<table border="1"><thead><tr><th>Quality Features</th><th>Market</th><th>Competitor 1</th><th>Competitor 2</th><th>Competitor 3</th><th>The idea</th><th>Total</th><th>Importance</th><th>Score</th><th>Total Score</th></tr></thead><tbody><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>4</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>5</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>6</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>7</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>8</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>9</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>10</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></tbody></table>										Quality Features	Market	Competitor 1	Competitor 2	Competitor 3	The idea	Total	Importance	Score	Total Score	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	Total	0	0	0	0	0	0	0	0	0
Quality Features	Market	Competitor 1	Competitor 2	Competitor 3	The idea	Total	Importance	Score	Total Score																																																																																																																								
1	0	0	0	0	0	0	0	0	0																																																																																																																								
2	0	0	0	0	0	0	0	0	0																																																																																																																								
3	0	0	0	0	0	0	0	0	0																																																																																																																								
4	0	0	0	0	0	0	0	0	0																																																																																																																								
5	0	0	0	0	0	0	0	0	0																																																																																																																								
6	0	0	0	0	0	0	0	0	0																																																																																																																								
7	0	0	0	0	0	0	0	0	0																																																																																																																								
8	0	0	0	0	0	0	0	0	0																																																																																																																								
9	0	0	0	0	0	0	0	0	0																																																																																																																								
10	0	0	0	0	0	0	0	0	0																																																																																																																								
Total	0	0	0	0	0	0	0	0	0																																																																																																																								
<table border="1"><thead><tr><th>Convenience Features</th><th>Market</th><th>Competitor 1</th><th>Competitor 2</th><th>Competitor 3</th><th>The idea</th><th>Total</th><th>Importance</th><th>Score</th><th>Total Score</th></tr></thead><tbody><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>4</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>5</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>6</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>7</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>8</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>9</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>10</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></tbody></table>										Convenience Features	Market	Competitor 1	Competitor 2	Competitor 3	The idea	Total	Importance	Score	Total Score	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	Total	0	0	0	0	0	0	0	0	0
Convenience Features	Market	Competitor 1	Competitor 2	Competitor 3	The idea	Total	Importance	Score	Total Score																																																																																																																								
1	0	0	0	0	0	0	0	0	0																																																																																																																								
2	0	0	0	0	0	0	0	0	0																																																																																																																								
3	0	0	0	0	0	0	0	0	0																																																																																																																								
4	0	0	0	0	0	0	0	0	0																																																																																																																								
5	0	0	0	0	0	0	0	0	0																																																																																																																								
6	0	0	0	0	0	0	0	0	0																																																																																																																								
7	0	0	0	0	0	0	0	0	0																																																																																																																								
8	0	0	0	0	0	0	0	0	0																																																																																																																								
9	0	0	0	0	0	0	0	0	0																																																																																																																								
10	0	0	0	0	0	0	0	0	0																																																																																																																								
Total	0	0	0	0	0	0	0	0	0																																																																																																																								
<table border="1"><thead><tr><th>Cost Components</th><th>Market</th><th>Competitor 1</th><th>Competitor 2</th><th>Competitor 3</th><th>The idea</th><th>Total</th><th>Importance</th><th>Score</th><th>Total Score</th></tr></thead><tbody><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>4</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>5</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>6</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>7</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>8</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>9</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>10</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></tbody></table>										Cost Components	Market	Competitor 1	Competitor 2	Competitor 3	The idea	Total	Importance	Score	Total Score	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	Total	0	0	0	0	0	0	0	0	0
Cost Components	Market	Competitor 1	Competitor 2	Competitor 3	The idea	Total	Importance	Score	Total Score																																																																																																																								
1	0	0	0	0	0	0	0	0	0																																																																																																																								
2	0	0	0	0	0	0	0	0	0																																																																																																																								
3	0	0	0	0	0	0	0	0	0																																																																																																																								
4	0	0	0	0	0	0	0	0	0																																																																																																																								
5	0	0	0	0	0	0	0	0	0																																																																																																																								
6	0	0	0	0	0	0	0	0	0																																																																																																																								
7	0	0	0	0	0	0	0	0	0																																																																																																																								
8	0	0	0	0	0	0	0	0	0																																																																																																																								
9	0	0	0	0	0	0	0	0	0																																																																																																																								
10	0	0	0	0	0	0	0	0	0																																																																																																																								
Total	0	0	0	0	0	0	0	0	0																																																																																																																								
Customer Value (Supply/Convenience Cost)																																																																																																																																	

Value Factor Analysis spreadsheet



Worksheets for the core parts of the value-creation process

Value Factor Analysis

The tool can be used by an individual champion or the team to get an initial impression of the value and positioning of their technology. Iteration begins as additional data is collected and discussions are had with others, including customers, competitors, colleagues, suppliers, and others. It forces you to better understand your customer and what you need to do to create the best value.

Value Factor Analysis™						
The Approach: What is your product or service?						
The Target Market: Who is your end user?						
Quality Features	Market	Competitor 1	Competitor 2	Competitor 3	Our Idea	Total
	Dimension	Total	Score	Total	Score	Total
	1)		0	0	0	0
	2)		0	0	0	0
	3)		0	0	0	0
	4)		0	0	0	0
	5)		0	0	0	0
	6)		0	0	0	0
	7)		0	0	0	0
	8)		0	0	0	0
	9)		0	0	0	0
	10)		0	0	0	0
Total		0	0	0	0	0
Convenience Features	Market	Competitor 1	Competitor 2	Competitor 3	Our Idea	Total
	Dimension	Total	Score	Total	Score	Total
	1)		0	0	0	0
	2)		0	0	0	0
	3)		0	0	0	0
	4)		0	0	0	0
	5)		0	0	0	0
	6)		0	0	0	0
	7)		0	0	0	0
	8)		0	0	0	0
	9)		0	0	0	0
	10)		0	0	0	0
Total		0	0	0	0	0
Cost Components	Market	Competitor 1	Competitor 2	Competitor 3	Our Idea	Total
	Dimension	Total	Expense	Total	Expense	Total
	1)		0	0	0	0
	2)		0	0	0	0
	3)		0	0	0	0
	4)		0	0	0	0
	5)		0	0	0	0
	6)		0	0	0	0
	7)		0	0	0	0
	8)		0	0	0	0
	9)		0	0	0	0
	10)		0	0	0	0
Total		0	0	0	0	0
Customer Value (Quality*Convenience/Cost)						

Quality and Convenience Ratings

Level of Importance	
Critical Importance	5
Most Important	4
Very Important	3
Average Importance	2
Low Importance	1

Level of Satisfaction

Superior Satisfaction	5
Excellent Satisfaction	4
Good Satisfaction	3
Fair Satisfaction	2
Poor Satisfaction	1

Cost Component Ratings

Level of Importance	
Critical Importance	5
Most Important	4
Very Important	3
Average Importance	2
Low Importance	1

Expense	
Very Expensive	\$50000
Moderately Expensive	\$5000
Somewhat Expensive	\$500
Low Expense	\$5
Inexpensive	0

The spread sheet is filled out as follows:

1. Define your idea.
2. Segment your market. Be specific on who your target customer is.
3. List all the quality features the customer might want; then all the convenience factors; and then all the costs associated with “owning” the technology or product.
4. Assign a value to each of these features as to how important they are to the customer; 5 is a must down to 1 which is they don’t really care.
5. Identify several competitors (at least 3) and rate how well they meet what the customer needs. For

Action-Pitch Template

Write down the Action Pitch for your current initiative

Hook

What's your opening to grab their attention?

Need

What are the important market and customer/user needs?

Approach

What is the specific, quantitative offering and business model?

Benefits/costs

What are the quantitative benefits per costs?

Competition

Who are the competition and alternatives by name now and in the future?

Action

What specifically do you want to happen next?

Customer Needs Worksheet

- Who is your customer/user or investor?

What do they say they need? _____

What is their strategic intent? _____

What do they worry about? _____

Do they need an urgent “pain killer” or just a “vitamin”? _____

Is their opportunity important, or just interesting? _____

What do they “wish” they could do but can’t? _____

What are your few key insights about their specified and unspecified needs? _____

- What is happening in their ecosystem?

Technical, business, and government changes or trends? _____

What are the existing competitors and business models? _____

What are accepted practices in their market? _____

Do you have a trusted relationship with a respected “influencer”? _____

How do they contract or purchase? _____

Who is the decision maker? _____

- Who is the competition?

Do they have a current partner or solution provider? _____

Who else are they considering? _____

What are their alternatives? _____

- Negotiating: how many times have you met with them — “Rule of 5”?

Initial meeting to listen and show you are knowledgeable about their world _____

Write down what they said and summarize what happened _____

Present a hypothesis for the solution based on the few key insights _____

Iterate the solution with them _____

Negotiate the outline for a contract or transaction _____

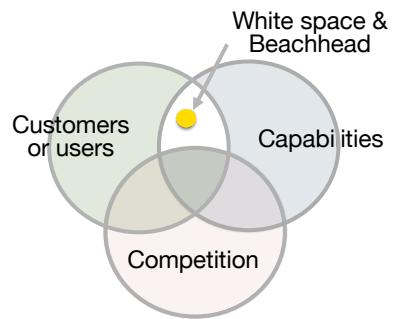
Close the deal _____

Value-Creation Forum Worksheet

- . Do you have someone to schedule and coordinate the Value Creation Forums? _____
- . Do you have a suitable venue to hold the sessions? _____
- . Do you have a facilitator to run the sessions? _____
- . Have you identified a multidisciplinary group of people to participate in the session? _____
- . Have you briefed attendees on how to give feedback, in particular how to build upon each other's ideas? _____
- . Are the presentations in "NABC" format? _____
- . Do you limit the time of the presentations in order for the presenters to focus on the key elements? _____
- . Do you encourage presenters to "bring their ideas to life" with mock-ups, pictures, models, simulations, etc.? _____
- . Are there decision makers who can provide appropriate resources to value propositions deemed "ready"? _____
- . Do you review projects on a regular basis with milestone driven goals and objectives? _____
- . Do you cancel projects that fail to meet milestones? _____

3-C's Worksheet

Customers - Competition - Capabilities



Positioning

- What is the potentially important, unmet need in the “White Space?”
- Do you have a potential “beach-head” to get started

Customers or users

- Can you name them?
- How big is the potential opportunity?
- Do you understand their ecosystem?

What are the technology, market, demographic, and government trends?

Accepted business models?

- What are their specific customer/user needs?
- Probe and question them
- Present your ideas to get their reaction
- Predict where they are going
- Do you participate and observe what they do, not just what they say?

Competition

- Who are they by name?
- _____
- What are their capabilities?

Current status

Potential for new advances

People, partnerships, or strategic alliances

Patents and technical capabilities

Capabilities

- What are the few key insights into why the opportunity is unmet?

- Based on these few key insights what is your hypotheses for a solution and business/sustainability model?

- Do you have the resources to address this opportunity?

Patented technology

RD&I facilities

Unique partnerships

Exclusive team

Proof of feasibility

Proposal preparation

5 Disciplines of Innovation Evaluation Worksheet

Date _____

Program _____

Champion _____

Score
0 to 5 (best)

1. Important customer/user and market/societal needs _____	<ul style="list-style-type: none">• Do you understand your opportunity's ecosystem?• What is your important, unmet, growing opportunity• Have you identified your white space and beach-head customers/users?• Have you identified the key insights for why it has not been previously addressed?• What are the customer's/user's or society's specific needs: products/services/experiences
2. Value creation _____	<ul style="list-style-type: none">• Do you have an NABC value proposition?• Do you have working hypotheses for the solution based on your few key insights• Do you have business/sustainability model based in your key insights?• Do you have at least one partner?• Do you rapidly and continuously iterate it with other colleagues, funders, and eventual users?• Do you hold regular team value-creation forums?• Do you have shared language and concepts for value creation and innovation?• Have you reduced key risks in your working hypotheses and own a Golden Nugget?• Have you brought your idea to life?
3. Innovation champions _____	<ul style="list-style-type: none">• Who will drive the initiative, synthesize the value proposition, and organize value-creation forums?• Is she/he dedicated, committed, and passionate about the initiative?• Are all the fundamentals of value creation understood, embraced, and used?
4. Innovation teams _____	<ul style="list-style-type: none">• Do you have all the skills needed – are any missing – what are they?• Is the entire team passionately committed to the initiative?• Do they have a shared vision, unique complementary skills, and shared rewards?• Do they embrace collaboration, learning, and iterating?• Do the exemplify the 3-commandments: respect, integrity, and trust?
5. Organization alignment _____	<ul style="list-style-type: none">• Is high-value innovative success core to your team's and partner's strategic intent• Does leadership drive value creation?• Are the following are in place?<ul style="list-style-type: none">• Value-creation processes: recurring, facilitated value-creation forums• Performance metrics – specify• Incentives – specify• Teaching of value creation: action plan• A plan for continuous improvement: feedback

Total _____

Action Plan Worksheet

- **Name:** the person the presentation is for and their position _____

- **Hook:** short, vivid statement to gain interest — if possible, quantify

- **Need:** the important customer/user and market/societal need — quantify

- **Approach:** how will you meet what the customers/users want — quantify

- Solution/product working hypothesis

- Business model/sustainability hypothesis

- Golden Nugget — IP, facilities, unique partnership, ...

- Be prepared to discuss, as appropriate:

- Investment / funding
- Champion and team
- Production, distribution, and sales
- Profitability

- **Benefits/costs:** how all stakeholders will have their needs satisfied — quantify

- Customers/users

- Funders

- Be prepared to discuss:

- Other investors
- Partners /staff
- University
- Community

- **Competition** and alternatives: who or what else can potentially satisfy the customers/users — by name

- Now

- In the future

- **Action:** What are you asking for, or what do you want to happen next — be specific

Commercialization Worksheet

- . Protect your intellectual property _____
 - . Patent _____
 - . Trade secret _____
 - . Copyright _____
- . Make a prototype that demonstrates both form and function _____
- . Manufacturing plan _____
 - . Facility _____
 - . Equipment _____
 - . Staff _____
 - . Suppliers _____
- . Distribution plan _____
 - . Distributors _____
 - . Tier 1 suppliers (OEMs) _____
 - . Value Added resellers _____
- . Marketing plan _____
 - . Positioning _____
 - . Advertising _____
 - . Sales force _____
- . Financials _____
 - . Product cost _____
 - . Selling price _____
 - . Market price _____
 - . Margin _____
 - . Volumes _____
 - . Return on Investment _____
- . Timing _____
 - . Market window you must hit _____
 - . Plan if you miss the window _____
 - . Time before competitors jump in _____
- . Product performance in the market _____
 - . Product functioning _____
 - . Quality issues _____
 - . Market share _____
 - . Need for improvements _____

Example Value Propositions

Initial Action Plan for Siri

- . Audience: Silicon Valley VC
- . Hook: In the movie 2001, HAL was a personal assistant. We have developed a friendly version of HAL for your mobile phone I would like to tell you about.
- . Need
 - . Mobile access is a multi-billion-dollar opportunity growing at 30% per year
 - . Keyword search is time consuming and ineffective
 - . Each “click” to find an application drops out 20% of users
- . Approach
 - . Use English to find and deliver information and services via speech
 - . Satisfy user's needs and complete the transactions: "Find the status of United 278"
 - . HAL's beach-head market is access to basic services
 - . The business model is reference fees from service providers
 - . A prototype is developed and a full commercial offering will be delivered within 12 months
 - . HAL has an outstanding team: Kittlaus CEO and Cheyer CTO
- . Benefits/costs
 - . 10-time speed advantage
 - . Free app to users
 - . Service providers get additional customers for modest charge (~dollars)
 - . A billion-dollar global opportunity with powerful network effects
 - . HAL learns from the user, increasing accuracy over time
- . Competition
 - . World's first true computer personal assistant with a scalable business model
 - . Replaces the computer mouse
 - . 2 to 10X better interface compared to mobile Google and Bing
 - . Strong IP position: result of years of SRI AI research with over \$100M invested
- . Action: Can I sent you our presentation and set up a meeting with you to discuss it this Friday at 9AM?



- . The clever HAL reference was immediate dropped
- . It took two years trying different value propositions to get solid working hypotheses for both the offering and the business model
- . Only then was a superb team hired for that approach
- . Another year was spent further validating the working hypothesis and building the offering

Value Proposition for a 1st Year Algebra Center

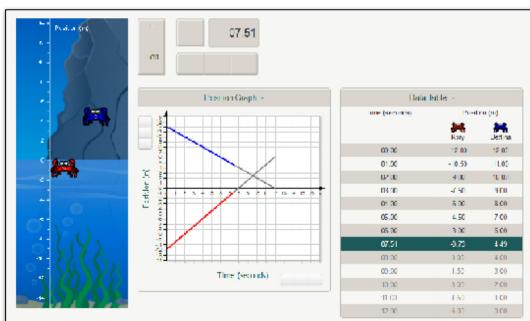
Audience: DoEd director for a major center grant

Hook: Recently 7 Baltimore schools graduated over 50% of their students but not a single student could pass the standard math and reading tests. Our nation is facing an educational crisis and my team would like to help address it.



- Need
 - Only 50% of disadvantaged boys pass algebra in America's largest 50 metropolitan areas and fail to graduate
 - Algebra is essential for success today: the loss of economic value from students failing is many tens of \$Bs/yr
 - Key insight #1: the biggest impact is made with 1st year algebra: that is when children fail and give up
- Approach
 - Teach algebra 5 ways with a simple computer application based on core education learning principles: doing, real-time feedback, teams, multiple representations, big ideas, right tools and frameworks, mentors, and assessment.
 - Teach using stories, equations, numerics, graphics, and motion examples (see below)
 - Focus only on the big concepts: i.e., ratio, slope, proportionality, similarity, etc. (see below)
 - Have students work in teams of threes and incentivize collaboration and joint success
 - Fully integrate the curriculum into the classroom with teachers acting as mentors when computers are used
 - Leave most of the algebra curriculum unchanged: this approach only requires 3 weeks of time out of the year
 - Leverage world-leading Singapore Math curriculum as the framework and be aligned with Common Core
 - Deliver teacher professional development within approved teacher union contracts and summer schedules
 - Business model
 - Form a non-profit and license software to educational districts on a seat basis (~\$20/student/yr)
 - We own key IP and extensive trade craft built around a business model we have built before
 - Key insights
 - #2: the children must understand the big ideas of algebra. If they understand the big ideas the teacher can teach conventionally for 90% of the school year.
 - #3: the solution has to be integrated into the standard curriculum
- Benefits/costs
 - The curriculum is based on proven education science principles
 - First trials confirm significant gains in learning (see results below: 50-100% improvement in outcomes)
 - Enthusiastic support from superintendents, teachers, parents, and students
 - Cost is low (\$20/student-year) and can scale to all schools: uses low-cost computers
 - Majority of the curriculum is unchanged and teacher development is within already negotiated requirements and budgets
 - Unions support the approach because it makes their teachers more successful
- Competition
 - Today's approach, which is failing up to 50% of disadvantaged boys (see results below)
 - KIPP schools: effective but expensive – this approach would make them more successful
 - Kahn Academy: not integrated in the curriculum — in a Gates study gains of only 5% for top 50%

Actions: I would like to visit with you next week in DC to make sure we understand the center criteria to be fully responsive to your needs. Can you suggest a day and time?



Screen shot of the computer assisted curriculum

Item	Pre-test correct (%)	Post-test correct (%)	Difference between pre-and post-test correct (percentage points)
16c	14.90	62.43	47.53
15c	26.69	72.09	45.40
15d	20.68	64.13	43.45
15b	34.36	75.07	40.71
17a	3.76	37.30	33.54

Results from London using standard curriculum and the computer assisted curriculum: 25-35 student in each class

Lockheed Martin Proprietary

Appendix

Definitions

- Bring-it-to-life
 - Communicating your proposed solution in such a vivid, convincing, and compelling way that it can never be forgotten.
 - This makes your NABC value-proposition tool much more effective at gaining new, valuable insights from colleagues.
- Business model
 - How an innovation is delivered to its customers/users and generates sufficient resources to survive.
 - I.e., how an enterprise makes a profit or finds a way to sustain itself (e.g., volunteer contributions).
- Conceptual frameworks
 - Structures and schema that help facilitate value creation
 - NABC value propositions are an example
- Customer value
 - Customer perceived value = (Customer perceived benefits) / (Customer perceived costs) = Benefits / Costs
 - All benefits and costs are subjective — they depend on the customer or other stakeholder's perspectives.
- Five-disciplines of innovation
 - Important needs; not ones that are just interesting to you. Metrics define what "important" means for your enterprise.
 - Value-creation process: A system that efficiently and effectively creates important new innovations based on the fundamental principles of fast learning, searching, and knowledge creation.
 - Innovation champions
 - Colleagues with the required passion, commitment, skills, and human values
 - They drive the value proposition. A champion is required for all significant initiatives.
 - The i4i mantra, "no champion, no project, no exception."
 - Innovation teams: Teams that have shared vision, unique complementary skills and values, and shared rewards.
 - Organizational alignment
 - The team is committed to the innovation's vision and to innovative success
 - All required elements are in place: management support and leadership, a value-creation guidebook, value-creation forums, success metrics, education and skills development, incentives, and continuous improvement.
- Fundamental learning principles
 - 1) Experiential learning, 2) rapid feedback, 3) complementary teams, 4) practitioner mentors, 5) big ideas, 6) multiple representations 7) productivity tools, 8) challenging incentives, 9) human values, and 10) assessment.
 - All these principles must be integrated into a complete system.
- Golden nugget
 - Your unique, sustainable, competitive advantage.
 - It should provide a 2 to 10 times advantage over the competition.
- Human values
 - The building blocks of trust are: respect, inclusion, and integrity.
 - Value creation is an extreme human activity. Without trust intense interactions between teammates becomes impossible.
- Innovation
 - Generically: Creation and delivery of surprising new knowledge with sustainable value for society.
 - Business: Creation and delivery of new customer value in the marketplace with a sustainable business model.
- Iteration
 - Rapid value-proposition improvement is achieved by constantly showing the latest iteration to colleagues, partners, and customers/users and other stakeholders to obtain their ideas.
 - Your objective is to synthesize all the inputs to create a compelling solution.
- Key insights
 - A few clear reasons why it was not possible to previously address the unmet need.
 - These insights help direct the formation of compelling hypotheses for how it can now be solved.
- Min-Max investment
 - Verifying the working hypothesis for an offering and its business model
 - The minimum investment needed to create the maximum increase in value.
- Practitioner Mentors
 - Proven innovators who have thought deeply about the process of value creation and the formation of new ventures
 - They can have specialized expertise in different aspects of value creation: technology, business models, and customers
 - It is a best practice to involve such people in the value creation process when specific expertise is missing from the team.

Definitions, continued

- Productive collaboration
 - Three conditions are necessary for productive collaboration.
 - 1) shared vision, 2) unique complementary skills, and 3) shared rewards.
- Minimal Viable Prototype (MVP)
 - An experiment or activity to rapidly remove risk at minimum expense and time.
 - Sometimes called a minimum viable offering. The idea is to find early adopters, even if the offering is not perfect, and start engaging in the marketplace. Microsoft did this with Explorer V1.0.
- Risk removal
 - Value goes up as risk goes down.
 - An initial objective of all initiatives is to remove major areas of risk. There are many ways to do this without significant expense. Immediately building the proposed solution is seldom wise.
- Stakeholders
 - Stakeholders can include customers/users, society, universities, students, teammates, and partners.
 - “Stakeholder balance” is when all receive fair and appropriate consideration from the initiative.
- 3-R positioning
 - The 3-Rs show the intersection of Customers, Rivals, and your research capabilities.
 - White Space: Where you have customers and capabilities without major competition.
 - Beachhead Segment: Early adopter customers within the White Space.
- Value creation
 - The process of creating new knowledge that sustainability satisfies an unmet customer/user need – i.e., a new innovation.
 - New innovations also create new narratives that include, the innovation’s name, description, and stories about it.
- Value-creation forums
 - The most powerful way to “learn, search, and create fast.”
 - Reoccurring team learning, sharing, creating, and improvement meetings with 5-15 participants.
 - 3-5 teams present their value propositions for 3-20 minutes and then the other participants critique them.
 - The presenter listens silently while a colleague collects the feedback for later discussion.
 - Feedback is given for elements that were effective and suggestions are given for improvements.
 - Some participants act as the “eyes” of customers/users and “funders” to provide additional insights.
 - The meetings are facilitated.
- Value propositions: NABC
 - An unmet customer/user
 - Need addressed by a unique, defensible
 - Approach for the offering and business model that provides superior
 - Benefits/costs (customer value) when compared to the
 - Competition and alternatives.
- Value-factor analysis
 - A semi-quantitative method for uncovering needs and testing them with customers/users.
 - Value Factor = $(\text{Quality} \times \text{Convenience}) / \text{Costs}$.
- Working hypotheses
 - Your “best guess” for addressing an important unmet customer/user need, which can then be tested and risk reduced.
 - There must be a working hypothesis for both the solution and the business model.

Reference Material

- Practice of Innovation, Observations by Curt Carlson: <http://www.practiceofinnovation.com/>
- I-Corps: https://www.nsf.gov/news/special_reports/i-corps/ and <https://venturewell.org/i-corps/>
- Innovation: The Five Disciplines for Creating What Customers Want: Curtis R. Carlson and William W. Wilmot. <http://www.amazon.com/Innovation-Disciplines-Customers-2006-08-08-Hardcover/dp/B012HJSQW>
- How To Create An Innovative Culture: The Extraordinary Case of SRI: Forbes at <http://www.forbes.com/sites/stevedenning/2015/11/30/how-to-create-an-innovative-culture-the-extraordinary-case-of-sri/#47b7a6e0370d>
- “Carlson’s Law” – An interview with SRI International President and CEO Dr. Curtis Carlson: <http://blog.sfgate.com/tmiller/2011/08/29/carlsons-law-an-interview-with-sri-international-president-ceo-dr-curtis-carlson-part-1/>
- If You Really Want to Change the World A Guide to Creating, Building, and Sustaining Breakthrough Ventures: Henry Kressel and Norman Winarsky, <http://www.amazon.com/You-Really-Want-Change-World/dp/1625278292>
- A New Vision for Center-Based Engineering Research, National Academies of Sciences, Engineering, and Medicine, National Academies Press, www.nae.edu
- Innovation and Entrepreneurship: Peter Drucker
- The Practice of Management: Peter Drucker
- Zero to One: Peter Thiel
- Scale: Geoffrey West
- Knowledge and Power: George Gilder
- Creativity, Flow, and the Psychology of Discovery and Invention: Mihaly Csikszentmihalyi
- Start-Up Nation: Dan Senor and Saul Singer
- Art of the Start: Guy Kawasaki
- Start-Up Owner’s Manual: Steve Blank and Bob Dorf
- Change by Design: Tim Brown
- Ten Faces of Innovation: Tom Kelley and Jonathan Littman
- Creative Confidence: Tom and David Kelley
- Crossing the Chasm: Geoffrey A. Moore
- Zone to Win: Geoffrey A. Moore
- Business Model Generation: Alexander Osterwalder and Yves Pigneur
- Interpersonal Conflict: William Wilmot and Joyce Hocker
- Pre-Suasion and Influence: Robert Cialdini
- Presenting to Win: Jerry Weissman
- Blue Ocean Strategy: Chan Kim and Renee Mauborgne
- The Long Tail: Chris Anderson
- Wooden on Leadership: John Wooden and Steve Jamison
- Thinking, Fast and Slow: Daniel Kahneman

The i4i Guidebook follows the recommendations made by the National Academy of Engineering (NAE) for improving the performance of multidisciplinary NSF Engineering Research Center (ERC) grants. Relevant sections from the NAE report are included in the background material.

Biographies

Curtis R. Carlson, Ph.D.

Founder and CEO, Practice of Innovation, LLC
President and CEO, SRI International: 1998-2014
Trustee emeritus, Worcester Polytechnic Institute
U.S. National Science Foundation Engineering Division Advisory Board
Board of the Singapore National Research Foundation



Curtis Carlson is a pioneer in the development and use of innovation best practices and an evangelist for innovation, education, and economic development. He has worked with universities, government agencies, businesses, and foundations worldwide. In 2017 he was inducted into the "WPI Hall of Luminaries," given to only 11 graduates over the university's 150 year history.

Carlson is sought out as a speaker and thought leader, advising ministers and other leaders in the U.S., Malaysia, Japan, Sweden, Denmark, Lithuania, and Finland on innovation, competitiveness, and educational reform.

He served on President Obama's National Advisory Council on Innovation and Entrepreneurship and the Scientific Advisory Board of Taiwan. He was the keynote speaker for Taiwan President Ma's announcement of the first National Innovation Awards.

His insights led to creation of the i4i value-creation guidebook, whose concepts and practices are being used by companies and government agencies in the United States, Sweden, Finland, Chile, Malaysia, Japan, Brazil, Taiwan, and other countries. He was a member of the U.S. 2017 National Academy of Engineering study for improving NSF's large R&D and innovation centers.

Carlson was President and CEO of SRI from 1998 to 2014. During this time SRI's revenue more than tripled and SRI became a global model for the systematic creation of high-value innovations, such as HDTV, Intuitive Surgical, Siri, and many other world-changing advances. These innovations created tens of billions of dollars of new economic value. Mayfield Ventures partner, David Ladd, said, "SRI is now the best enterprise at turning its technology into economic value."

Before joining SRI, Carlson worked at RCA Laboratories, GE, and the Sarnoff Corporation. He was formerly Chairman of the Sarnoff Corporation. In 1977, he started and helped lead the high-definition television (HDTV) program that became the U.S. standard, and in 1997 the team won an Emmy Award. In 2000, another Sarnoff team started by Carlson won an Emmy for a system to optimize satellite broadcast image quality.

With partners, he has helped form more than two dozen new companies, including Siri now on the iPhone. In 2006, Carlson won the Otto Schade Prize from the Society for Information Display for developing the first model for predicting image quality. All of these achievements were made with many other superb individuals, including James Carnes, Glenn Reitmeier, Jeff Lubin, Norman Winarsky, Len Polizzotto, Roger Cohen, and William Wilmot.

Carlson is a Fellow of the National Academy of Inventors. He received the Suffolk University's first Global Leadership in Innovation and Collaboration Award. He was a member of the General Motors' SAB. He has been a Board Member of Nuance Communications, Sarif, Pyramid Vision Technologies, and Sensar and a co-founder and Director of the U.S. National Information Display Laboratory. He has been on numerous DoD review boards. He is currently working with two start-ups in Silicon Valley.

He has received honorary degrees from the Malaysian Technical University (MTU), Stevens Institute of Technology, Kettering University, and Worcester Polytechnic Institute. He is a honorary Kobe Ambassador to Kobe, Japan.

With co-author William Wilmot, Curtis Carlson wrote [Innovation: The Five Disciplines for Creating What Customers Want](#), published by Random House and selected by BusinessWeek as one of the top 10 business books for 2006.

Carlson received his B.S. degree in physics from WPI. He is a member of Tau Beta Pi and Skull. His M.S. and Ph.D. degrees are from Rutgers University. Carlson has published or presented numerous technical publications and holds fundamental patents in the fields of image quality, image coding, and computer vision. He was a professional violinist in the R.I. Philharmonic at 15.

Len Polizzotto, Ph.D.

Professor of Practice at Northeastern University
Partner of Practice of Innovation, LLC

Len Polizzotto is widely recognized for his uniquely successful business development abilities. A centerpiece has been the study, application, and teaching of innovation best practices, where he has made many contributions, including the "Three Cs" for helping identify new business opportunities and "Value Factor Analysis" for maximizing the value of new products.

Previously he was Draper Laboratory's Vice President responsible for international programs. He established Draper's Bioengineering Center on the USF campus in Tampa, a multi-chip module facility in St. Petersburg, Draper's energy business, and lead two medical consortia. One, IMEDS, focused on systems to provide real-time support to clinicians at ICU bedsides.

Prior to joining Draper in 2007, Polizzotto was Corporate Vice President for Business Development at SRI International, where he established a proteomic drug development center in Harrisonburg, Virginia and a center for oceanographic research in St. Petersburg Florida. He helped develop and teach innovation workshops to company executives throughout the world. Previously he was Corporate Vice President for new business development at the Polaroid Corporation, responsible for developing several new consumer products.

Between corporate positions, Polizzotto directed the Center for the Globalization of Technology and taught courses in electrical engineering and design at Worcester Polytechnic Institute. In the past eight years, he founded one and led another high-tech start-up, both in the biomedical area.

He is a Charter Fellow in the National Academy of Inventors. He received his Ph.D. in visual sciences, combining electrical engineering, perceptual psychology, and ophthalmology, from Tufts University. He earned M.S. and B.S. degrees in electrical engineering from Worcester Polytechnic Institute, and he completed The Executive Program at the University of Virginia's Darden Graduate School of Business. He holds eleven patents and is the author of articles on human color perception, digital imaging, microphotography, and innovation (as well as two books on drum playing instruction).



Curtis R. Carlson, Ph.D.

Founder and CEO Practice of Innovation, LLC
President and CEO SRI International 1998-2014
2 Coalmine View, Portola Valley CA 94028

curt@practiceofinnovation.com www.practiceofinnovation.com

Len Polizzotto, Ph.D.

Practice of Innovation Partner
Professor of Practice Northeastern University
len@practiceofinnovation.com