

CORNING

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Corning Incorporated

**Innovation Strategies to
Leverage Your Business**
Ceramic Leadership Summit

April 9, 2014

Marty Curran
Executive Vice President and Innovation Officer

Innovation
Growth



Agenda

- Introduction
- Corning's Innovation Approach
- Agile Innovation Approach
- Closing

Corning Incorporated today

Founded: 1851

Headquarters: Corning, NY

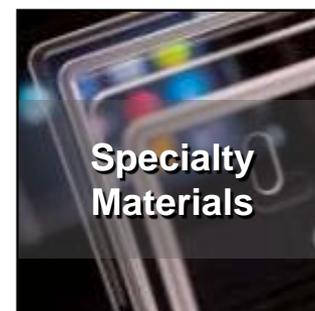
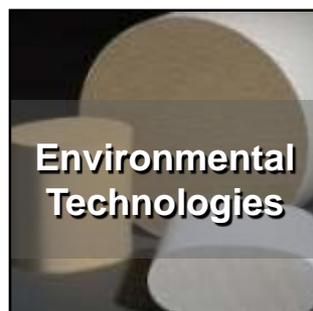
Employees: ~30,000 worldwide

2013 Net Sales: \$8 Billion

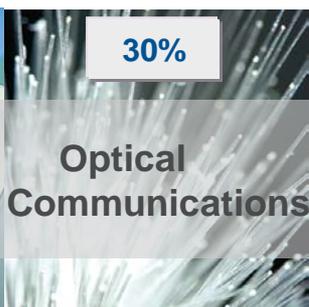
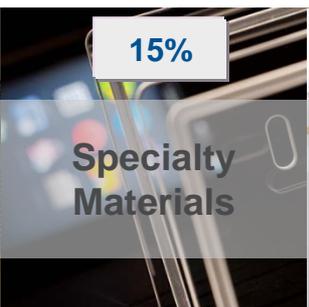
Fortune 500 Rank:

- Revenue: 326
- Net Income: 70

- Corning is the world leader in specialty glass and ceramics
- We create and make keystone components that enable high-technology systems
- We succeed through sustained investment in R&D, 160 years of materials science and process engineering knowledge, and a distinctive collaborative culture



Corning Market Segments and Additional Operations

 <p>33%</p> <p>Display Technology</p>	 <p>30%</p> <p>Optical Communications</p>	 <p>12%</p> <p>Environmental Technologies</p>	 <p>10%</p> <p>Life Sciences</p>	 <p>15%</p> <p>Specialty Materials</p>	 <p>Other Products and Services</p>
<ul style="list-style-type: none"> • LCD Glass Substrates • Glass Substrates for OLED and high-performance LCD platforms 	<ul style="list-style-type: none"> • Optical Fiber and Cable • Optical Connectivity Solutions • Wireless Distributed Antenna Systems • Optical Cables for Consumer Networks • Copper Connectivity Components 	<ul style="list-style-type: none"> • Emissions Control Products <ul style="list-style-type: none"> – Light-duty gasoline vehicles – Light-duty and heavy-duty on-road diesel vehicles – Heavy-duty non-road diesel vehicles – Stationary 	<ul style="list-style-type: none"> • Cell Culture and Bioprocess • Drug Discovery • ADME/Tox • Genomics • Chemistry • Microbiology • General Laboratory Products 	<ul style="list-style-type: none"> • Corning® Gorilla® Glass • Display Optics and Components • Optical Materials <ul style="list-style-type: none"> – Semiconductor materials – Specialty fiber – Polarcor™ • Optics • Aerospace and Defense • Corning Specialty Glass 	<ul style="list-style-type: none"> • Emerging Innovations • Equity Companies <ul style="list-style-type: none"> – Cormetech, Inc. – Dow Corning Corp. – Eurokera, S.N.C. – Samsung Corning Advanced Glass, LLC (SCG)

2013 Revenue Share

A legacy of life-changing innovations from Corning

Electric Bulb Envelope



Lighting the World

Vacuum Tube Envelopes



Radio Radar

CRT Funnel



B&W and Color TV

Optical Fiber



Long Haul/ Metro/FTTH High Speed Internet

Cellular Ceramic Substrates



Low-Emissions Powertrain Clean Air

AMLCD Substrates



High- Definition TV/Screens/ Tablets

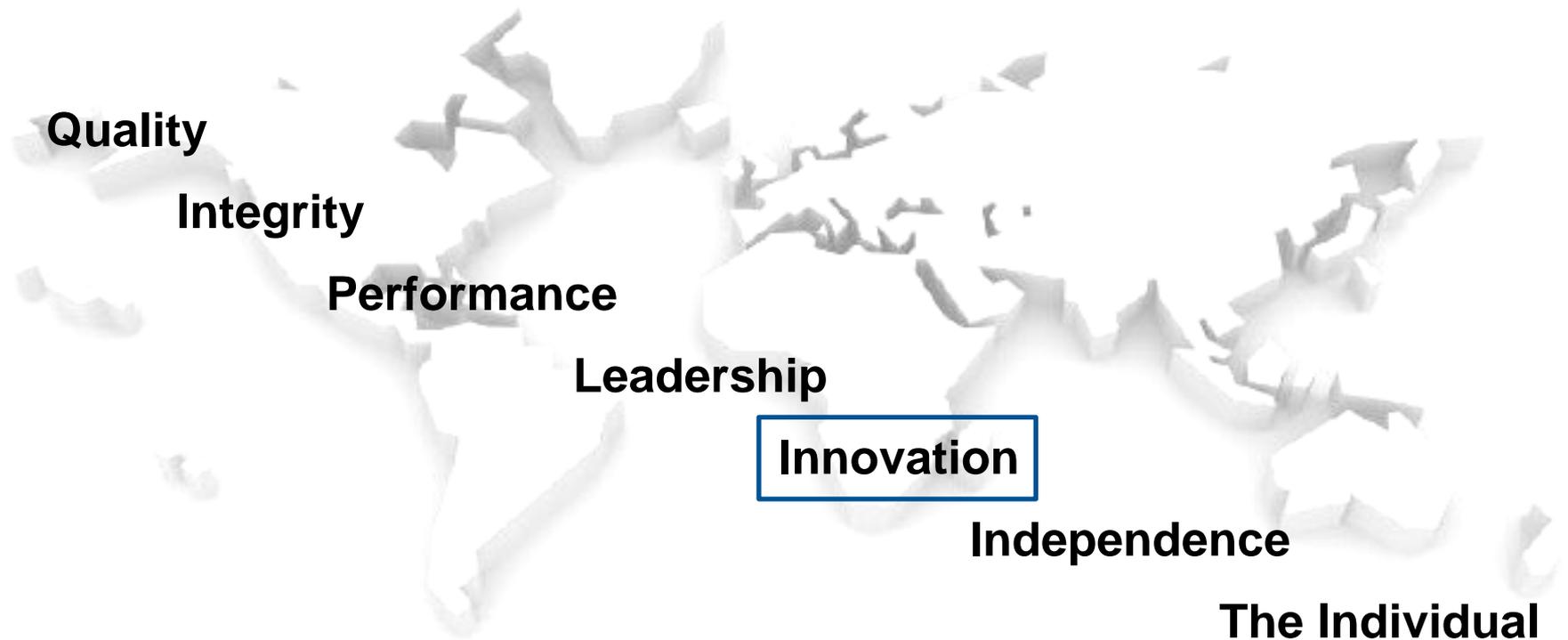
Gorilla Glass



Smart Phones and Tablets

The Corning Values

Our Values are the historic strength of our company, guide our every move, and continue to set us apart from others



All seven, all around the world, all the time

Awards and Recognitions



- Four-time National Medal of Technology winner
- Institute of Electrical and Electronics Engineers (IEEE) Milestone Award for the invention of low-loss optical fiber (2012)
- Edison Award gold medal in Materials Science for Corning® Gorilla® Glass (2012)
- Thomson Reuters Top 100 Global Innovatorsm (2013, 2012, 2011)
- Massachusetts Institute of Technology's list of disruptive innovators (2013)
- "Most Innovative Companies" (2013, 2008) and "Innovation All-Star" (2010) by *Fast Company* magazine
- The American Ceramic Society Corporate Technical Achievement Award (2010)
- One of Fortune magazine's most admired companies (2010, 2009)
- American Institute of Chemical Engineers Corporate Innovation Award (2013)
- Environmental Protection Agency Energy Star Partner of the Year Award (2014)

Research and Development

Corning's Patent Portfolio First Among Top Technology Firms

2014 Patent Scorecard™

Category: Industrial Materials

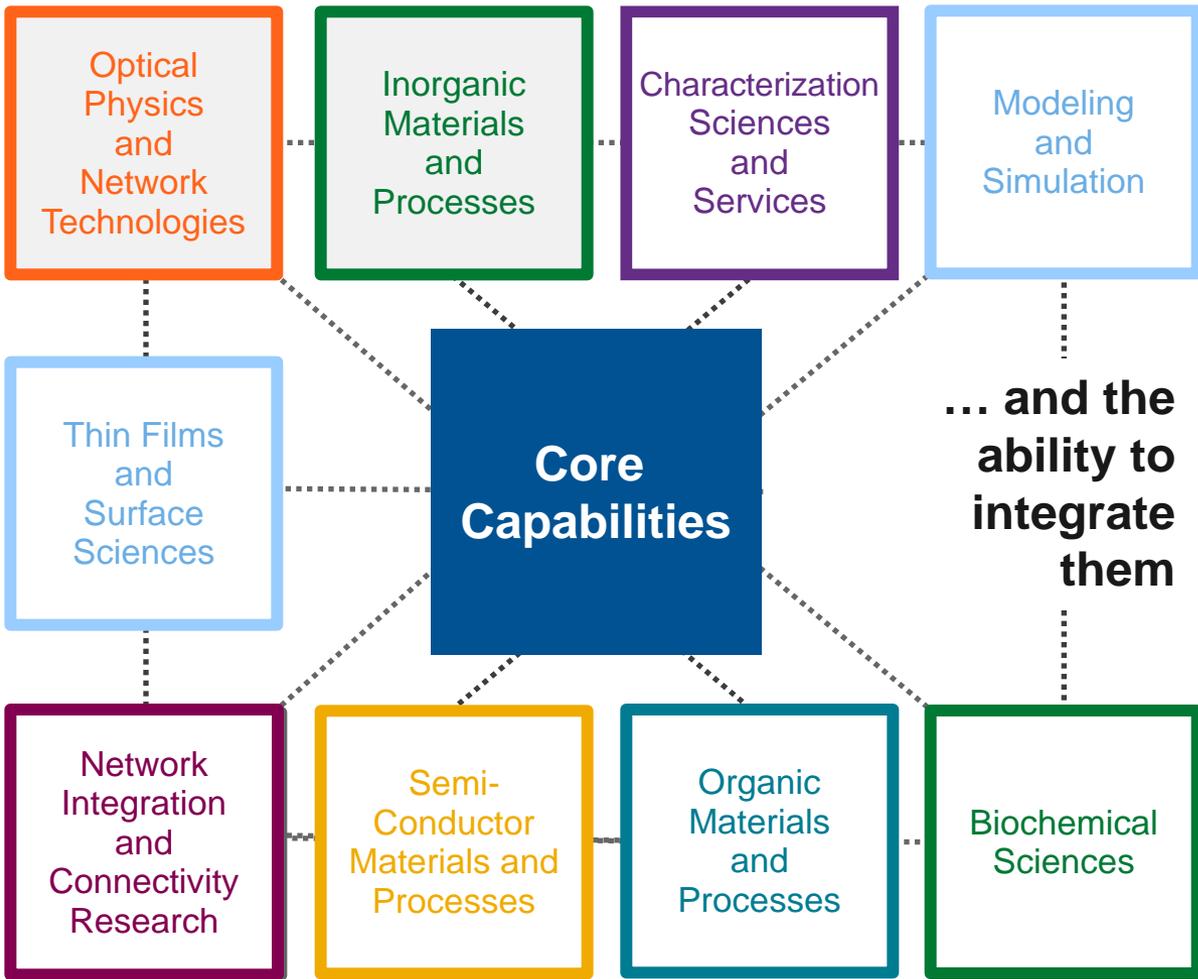
Previous Rank		Current Rank	Company	Patents Granted	Science Strength™	Innovation Cycle Time™	Industry Impact™	Technology Strength™	Research Intensity™
1	↔	1	Corning Incorporated	346	2857	11.5	1.7	415.44	2.03
2	↑	2	Valinge Innovation AB	26	0	15.8	9.91	185	0
4	↓	3	Compagnie de Saint-Gobain	226	456.3	16	0.92	146.04	1.11
3	↑	4	Guardian Industries Corp	77	262.5	10	2.2	119.1	2.01
5	↔	5	Kobe Steel Ltd	99	34.5	10.9	1.42	98.53	0.66
6	↔	6	Graphic Packaging Holding Co	60	0	19.8	2.26	94.95	0
8	↑	7	Prysmian SpA	26	155	10.2	3.83	70.77	2.41
7	↑	8	USG Corp	41	38	20.1	2.19	63.42	0.6
11	↑	9	Fujikura Ltd	100	93.5	11.3	0.87	61.16	0.83
10	↔	10	Nippon Steel & Sumitomo Metal Corp	181	86	16.5	0.45	57.44	0.9

The Patent Scorecard™ ranks corporate innovation using a series of metrics to determine patent quality, technological strength, and breadth of impact.

Source: The Patent Board™ as of 1/17/2014

Deep core technology capabilities

Corning's strength is based on a broad portfolio of core technologies...



... and the ability to integrate them

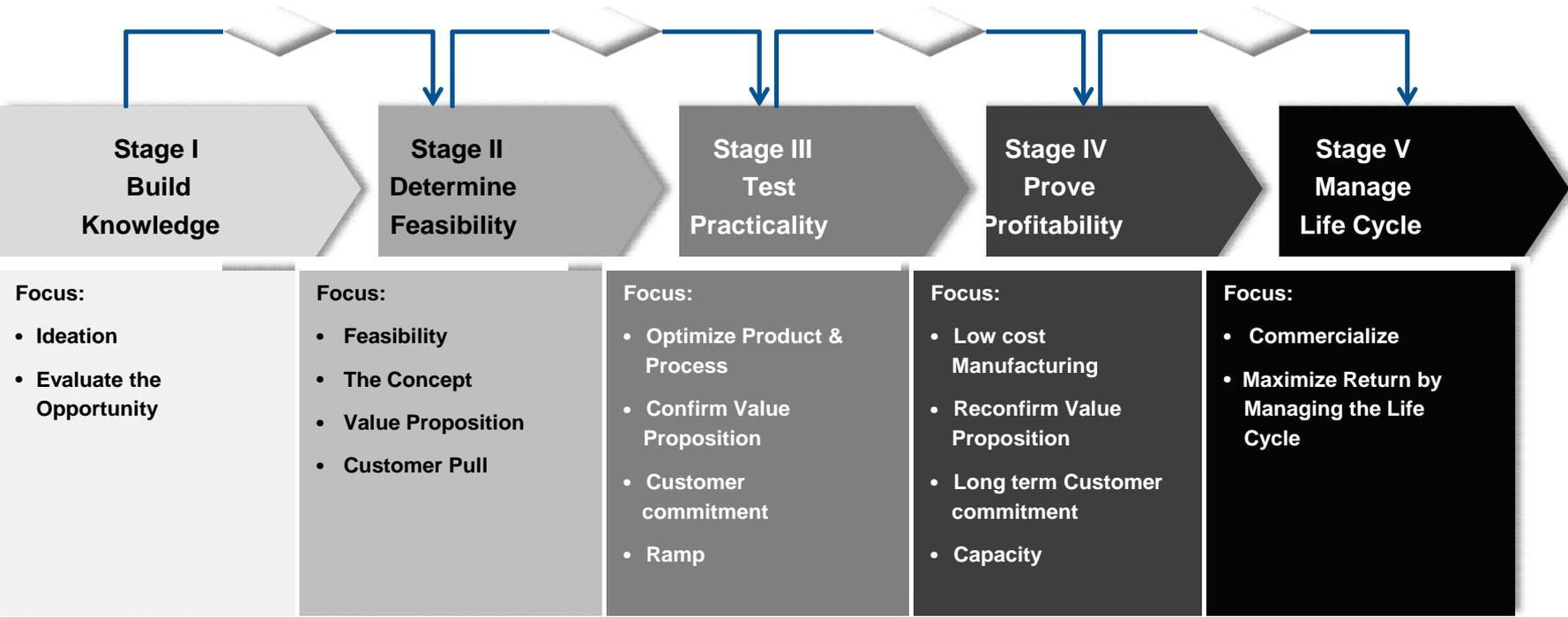
- **Corning has used 5 Stage Innovation Process and will continue use this process**
- Agile Approach is applicable only to certain projects, and appropriate management may decide which approach to apply

Agenda

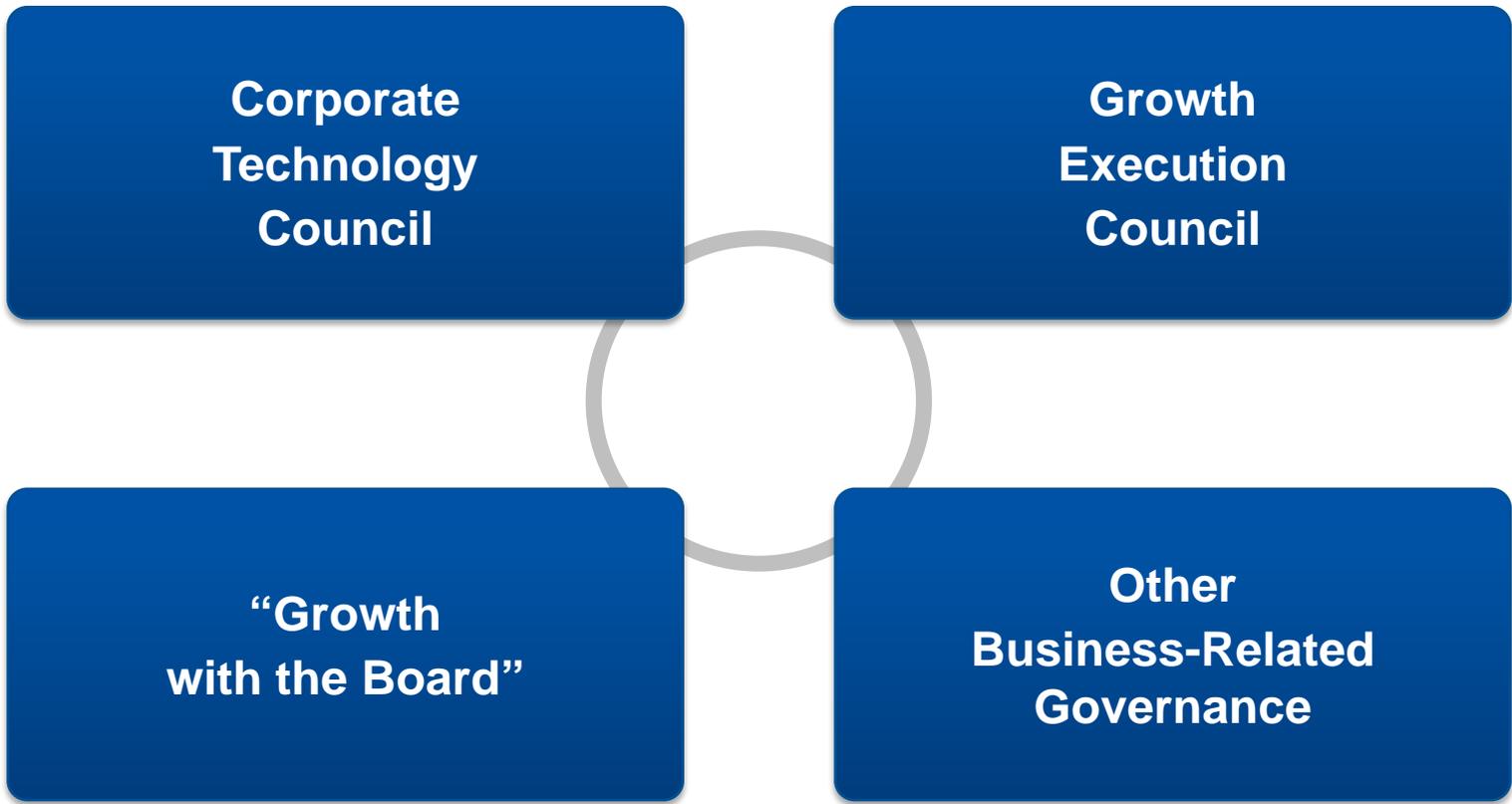
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- **Corning's Innovation Approach**
- Agile Innovation Approach
- Closing



Corning's traditional 5 Stage Process



Innovation Portfolio Governance Involves Senior Leadership



Critical Questions to Evaluate Opportunities

<i>Early Stage Criteria</i>	Realistic Opportunity Assessment	<i>Later Stage Criteria</i>	
Novelty: Is the technology fundamentally <i>significant</i> ?		<ul style="list-style-type: none">• Is the Opportunity Real?	
Pull: Will there be a market?			
Value: Can we solve a <i>big</i> , important problem?		Advantaged Solutions	<ul style="list-style-type: none">• Can We Win?
Fit: Is there a strong connection to Corning <i>core</i> capabilities and basic <i>strategy</i> ?		Winning Value Proposition	<ul style="list-style-type: none">• Is it Worth it?
IP Potential: Can we <i>protect</i> our technology development?		Execute Innovation Process	<ul style="list-style-type: none">• Do We Go Forward?
Practicality: Can we achieve results for a reasonable <i>investment</i> , in a realistic <i>timeframe</i> ?			

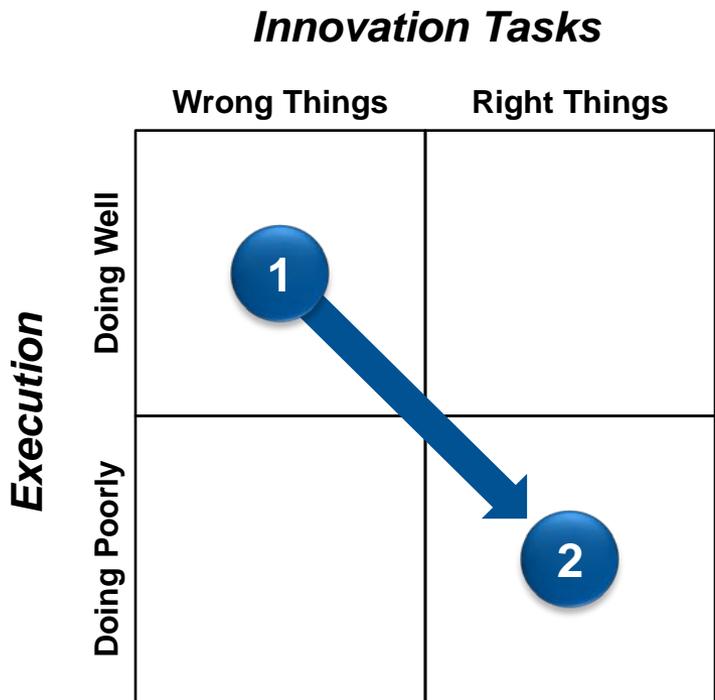
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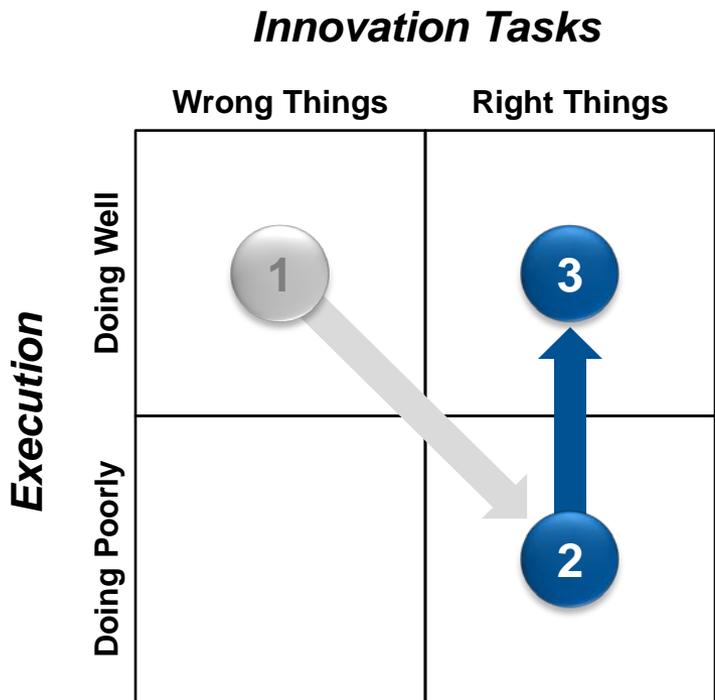
We start off doing wrong things really well; we then move to doing right things (which can be hard) not so well



Examples

- 1** • Great pitch on market size and value prop for internal audience, but data not verified by customer
- 2** • Focus on identifying value prop but the outcome failed to capture all the competitive advantages

Change Management has to occur in order to drive doing the right things well



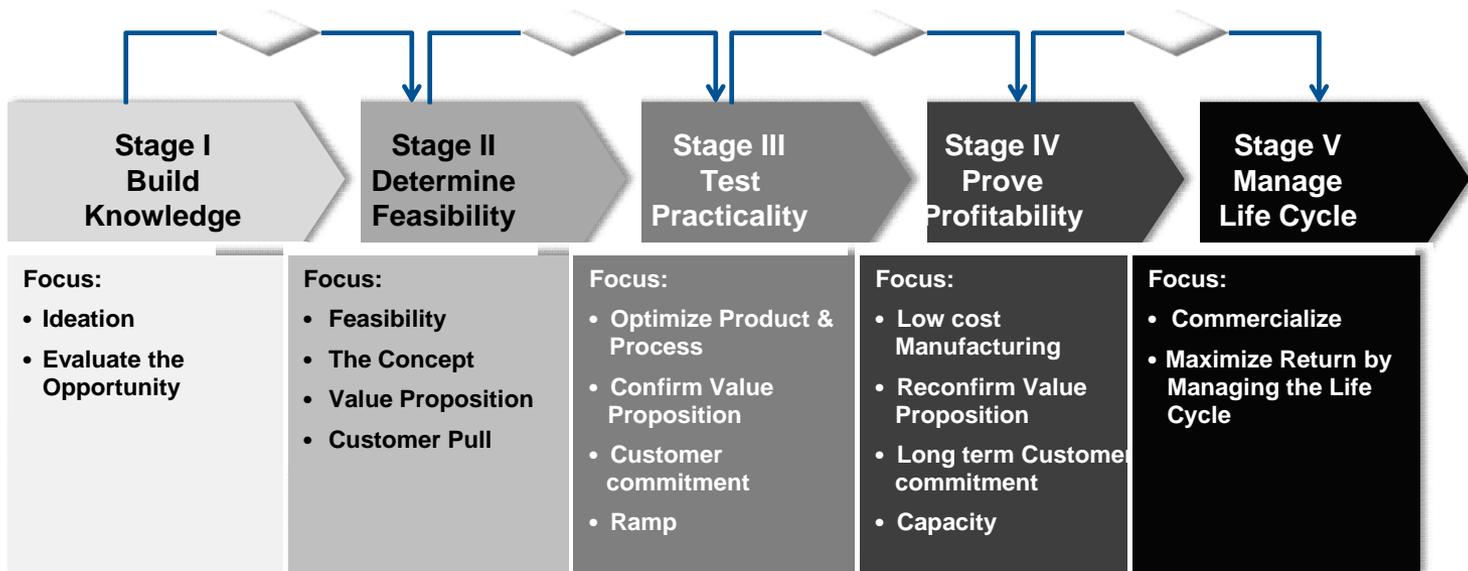
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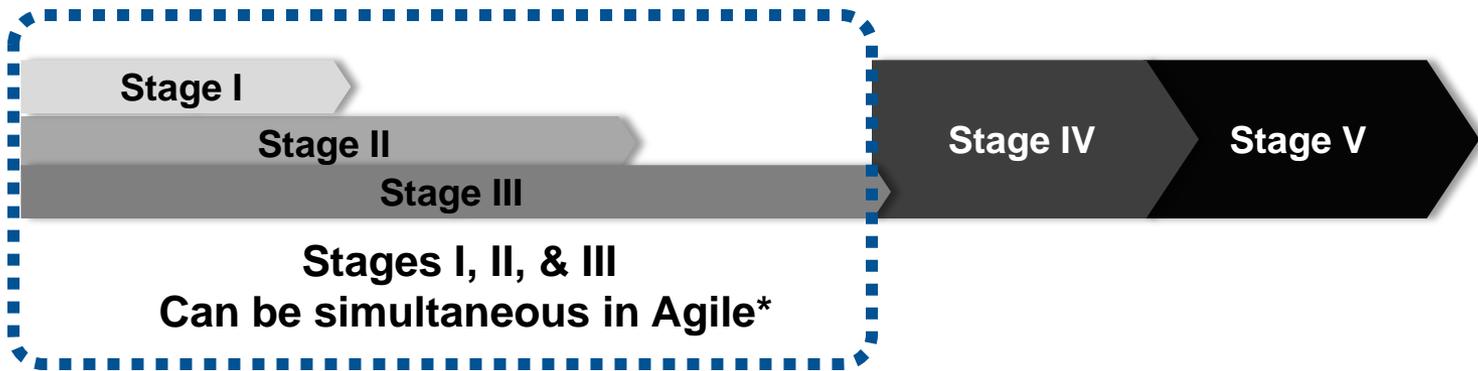
While most programs will get to the “doing right things very well”, we believe the Agile Approach can get us there even faster

We have two different approaches – traditional 5 Stage Process and more recent Agile Innovation Approach

5-Stage Process



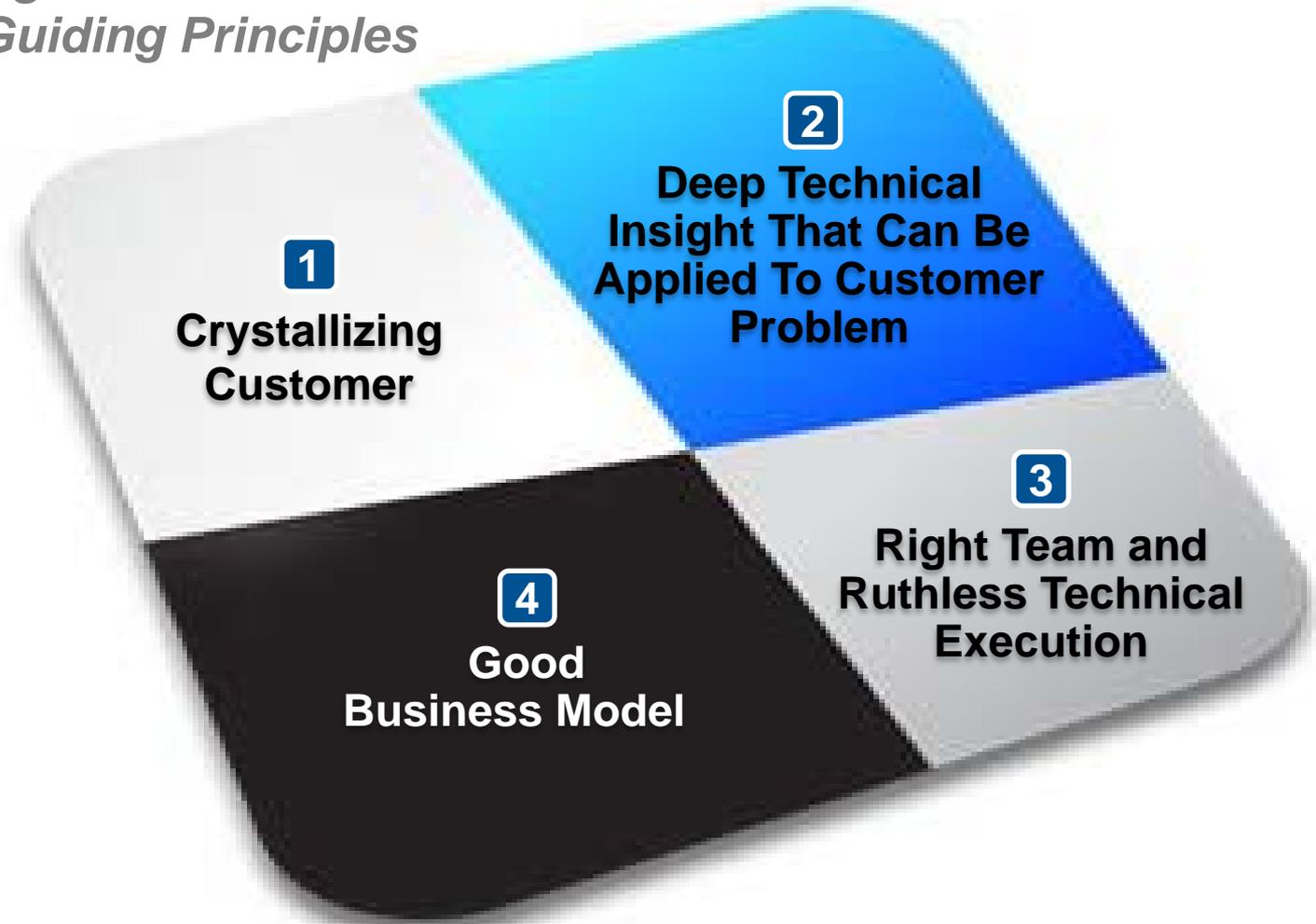
Agile Approach



You need four things to win in Agile Innovation

Work continues on this model...

Agile Innovation Guiding Principles



To use Agile Approach, you must have Crystallizing Customer(s)

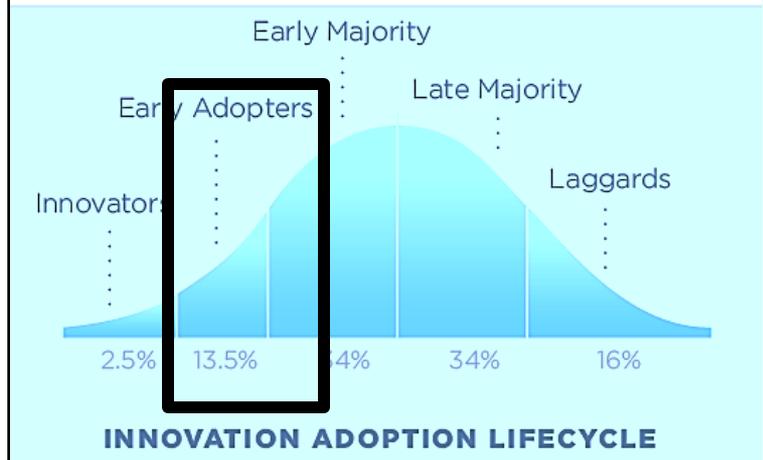
The Perfect Customer

- A perfect crystallizing customer has significant problem to be solved, is willing to “invest skin in the game”
- You have strong value prop, customer has a plan, risk is shared, market is defined
- Agile process tends to be most productive when decision maker buys into the value prop or innovation and are pulling

Power and Influence

- Define who real customer is (who are decision makers, who has power over supply chain partners)
- Be aware of the other transactional partners who have power and influence decisions

Crystallizing customers tend to be “early adopters”



Customers with strong pull and market position preferred



To use Agile Approach, we must have Deep Technical Insight; during the innovation, we focus on solving one or two major problems

- *“Approach those where we have the fundamental understanding to solve their critical problem”*
- *“Problem must be imminent and must be resolved immediately; when there is a lot of time, the value proposition can wear away”*

- **BE PRECISE** in defining the customer’s problem

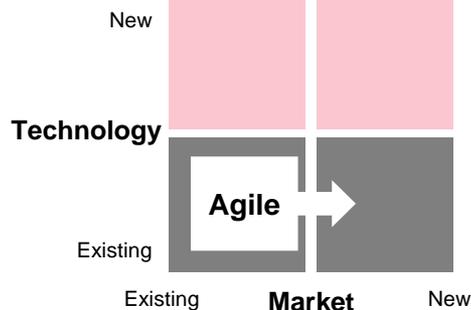
Deep Technical Insight

- Agile Approach works best when we have superior technology insight in the areas where our customers experience problems and/or challenges

Focused Technical Problem Solving

- Do not try to solve all problems at once – 1-2 at most
- Focus on tough problems that are imminent and matter to your customer
- Solve major problem(s) first to get sales early (for you and your customers), lower cash hole and secure path to market
- Be honest about your Value Prop – kill quickly if it is not sufficient to justify the project
- If we have one – move fast to cover all customers in that segment

When to Apply Agile Approach?



The Right Team...

Knowledge and Experience

- Use **people who have previously succeeded** at starting new businesses, peel them off and have them start another
- When building a team, **experience and the accumulated knowledge** from that experience matter most
- No time for learning curve, little chance for error, experienced team also knows **WHAT NOT TO DO** – critical to have a broad spectrum of talent and knowledge for specific projects

Dedicated to Project

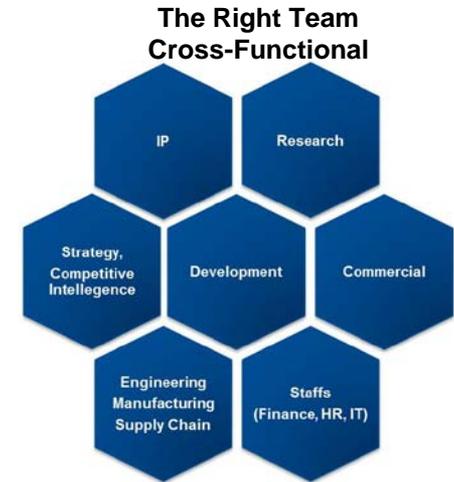
- You fail when everyone is spread too thin; team members have to be absolutely **dedicated – Project Focus** (“Agile Project Capacity”)

How Many Teams are There

- The number of Agile Programs you can do at one time depends on how many experienced people are available
- **Agile is not scalable** because of limited number of experienced teams
- Need experienced players in all areas

Succession Planning

- **Grow your bench on conventional business and traditional 5-stage innovation process**
- Partner experienced with less experienced – put them right next to scientists so they can learn technology and have deep understanding
- Important to engage non-seasoned employees – they have knowledge and the motivation to solve the problems



...and Ruthless Execution - Rapid Prototyping and Learning Cycles

Up Close and Personal

- Pin down customer's request rapidly – the faster you solve the problem, the faster the economics work for your customer and you
 - After getting with customer, make demo, get insights from customer, then demo, listen, demo
 - Be intimately involved with the customer – in and out as often as possible, continuing to process latest learning
 - Have an articulated value prop and path to differentiation – should understand competition thoroughly
-

Right Time to Share

- Control information flow out of RD&E and team...
-

Think Out of the Box

- Use demonstrations and samples that people can touch and feel
 - Quick hit videos work well
 - Minimize PowerPoint slides
-

Ask for the Order

- Cannot do prototyping forever, at some point have to say -- if I do these changes, can I count on an order from you?

Corning often has an innovation but may not have market access nor manufacturing assets

Need “Flexible Business Model”

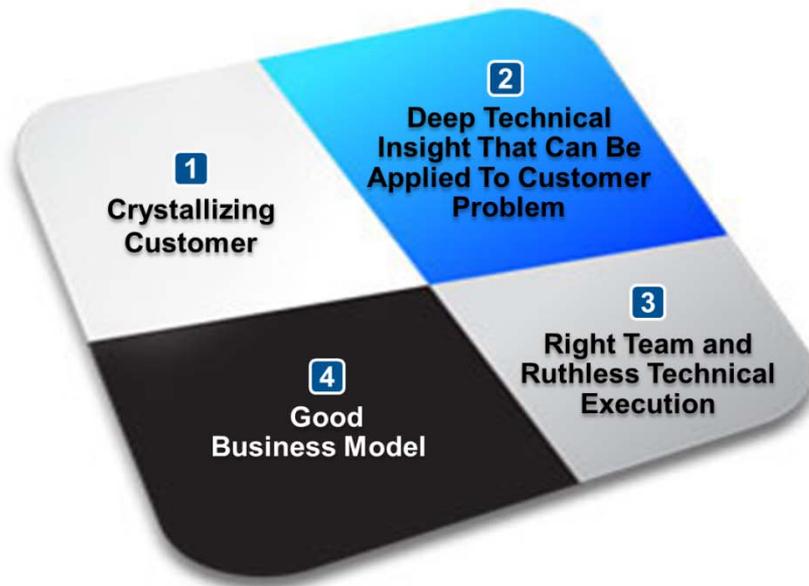
- Ability to use internal and/or external resources (assets, people, etc.) and deploy them rapidly
- Use of partnerships and/or acquisitions to acquire capability
- Consider using external entities for capabilities

Why “Flexible Business Model”?

- Faster time-to-market (product readiness is critical)
- Ensure IP strategy
- Cost and capital competitiveness (minimize or eliminate cash hole)

Flexible Business Model should avoid deep financial hole as well as speed up time-to-market

Agile concepts can apply to traditional 5-Stage approach



- Deep Insight
- Very Focused Technical Problem Solving
- Rapid Prototyping

In addition, the following is also key in the Innovation Process:

- High Level of Senior Leadership Engagement
- Find “Big Lie” faster

Going Fast does not excuse you from doing the right work well

- Accurate Market Information / Data
- Validating a true Value Proposition
- Understanding of your offering versus the competitors
- Reliability / Red Flag Testing
- Profitable Business Model
- Right Team

Innovation
Growth



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The “Lean Start-Up” methodology shares our Agile Innovation concepts

Three Key Principles of “Lean Start-Up” methodology

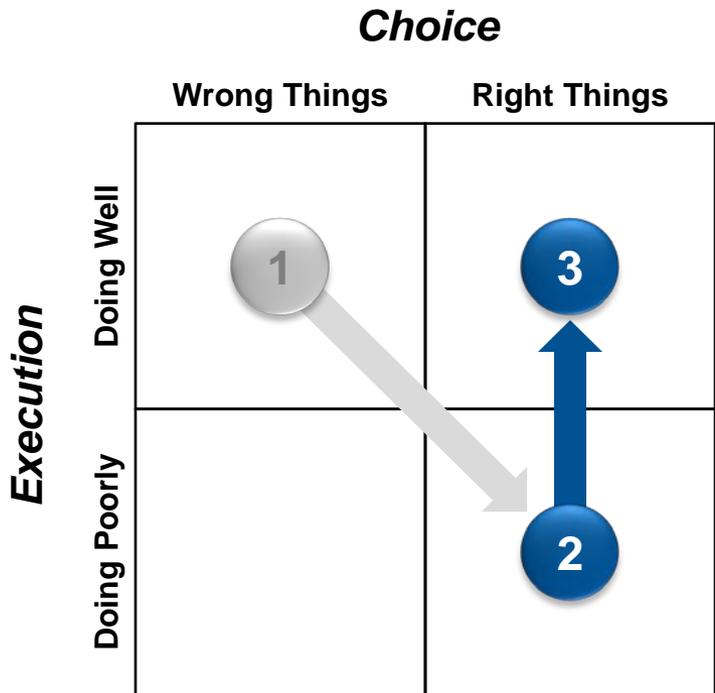
- On day one all you have is a series of untested hypotheses. Instead of preparation of intricate business plan for months, founders sketch out their hypotheses to create a diagram of how to create value for company and customers
- Use “get out of the building” approach – talk to potential users, purchasers and partners to get their feedback on all elements of the business model
 - ✓ Use customer input to revise assumptions
 - ✓ Rework the cycle, testing redesigned offerings and making further small adjustments or more substantive ones (pivots) to ideas that aren’t working
- Practice “Agile development”
 - ✓ Work hand-in-hand with customer development developing product iteratively and incrementally (begin with minimum viable products)

“Lean Start-Up” favors :

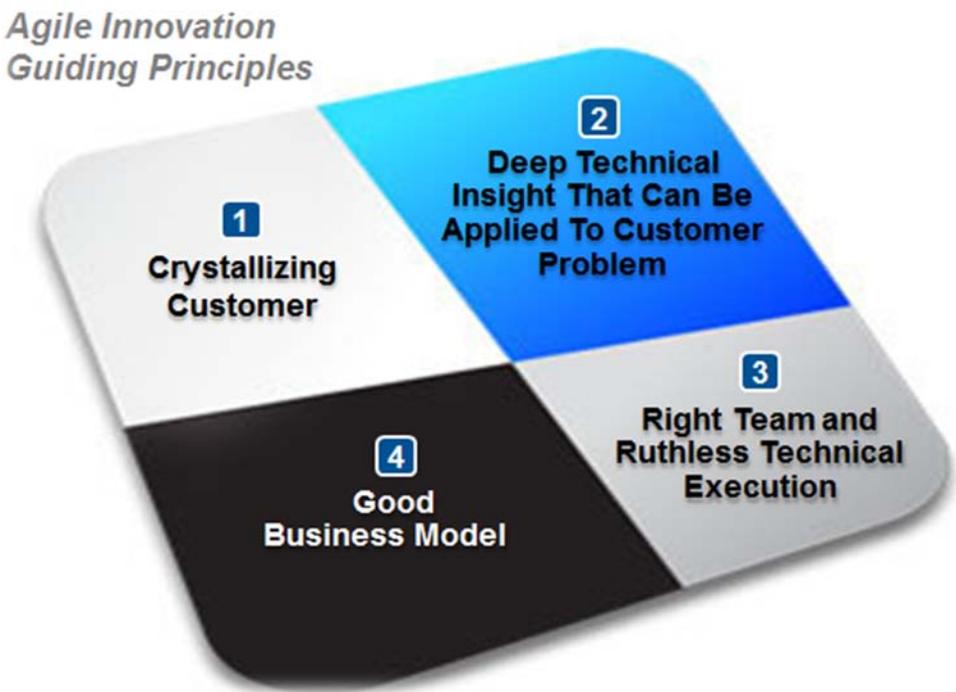
- Experimentation over elaborate planning
- Customer feedback over intuition
- Iterative design over traditional “big design up front” development

Source: “Why the Lean Start-Up Changes Everything”, written by Steve Blank, consulting associate professor at Stanford University (May 2013 Harvard Business Review)

We believe Agile Innovation approach will continue to help us do the “Right Things” well



Agile Innovation Guiding Principles



Concluding Remarks

- **We've succeeded for 160 years**
- **How have we done it?**
 - ✓ **Successive waves of innovation**
 - ✓ **Deep understanding of glass, ceramic materials and optical physics**
 - ✓ **Strong process and manufacturing capabilities**
 - ✓ **Collaboration with customers and partners**
 - ✓ **Exceptionally talented and dedicated people**
 - ✓ **A conservative financial structure and patient capital**
- **We're willing to continually “tinker” with our Innovation Process**

CORNING