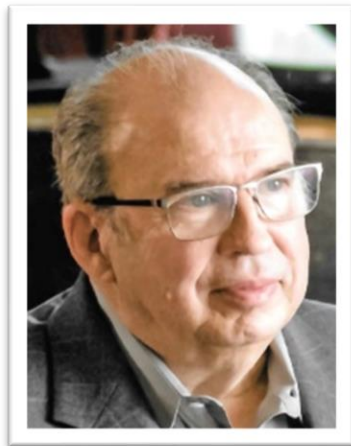


Venturing Outside the Box

Goodyear Innovation Stories

Speaker: Sam P. Landers



Goodyear (1969 to 2010)

R&D Fellow (dual ladder)

BS Mechanical Engineering (U of Akron)

Named inventor on 67 patents

Led development of over 30 new products

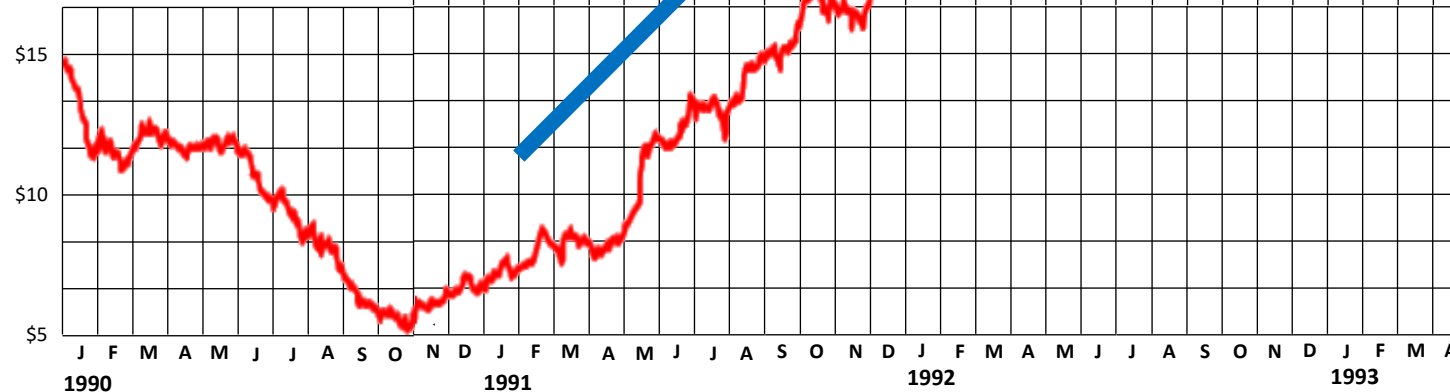
(including Aquatred and TripleTred)

The Aquatred Story

- In 1990 Goodyear stock price had sunk below \$10
- The innovative Aquatred tire was launched in Feb. 1992
- Aquatred increased interest in Goodyear
- Sales increased 21%
- Net Income increased 533%
- Two years later Goodyear stock was selling at over \$20

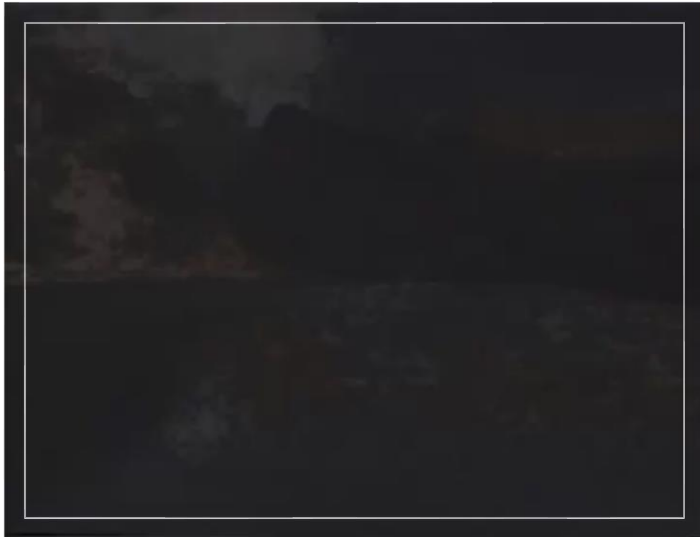


Burning Rubber
Goodyear weekly ending stock price



Here

What was Aquatred ?



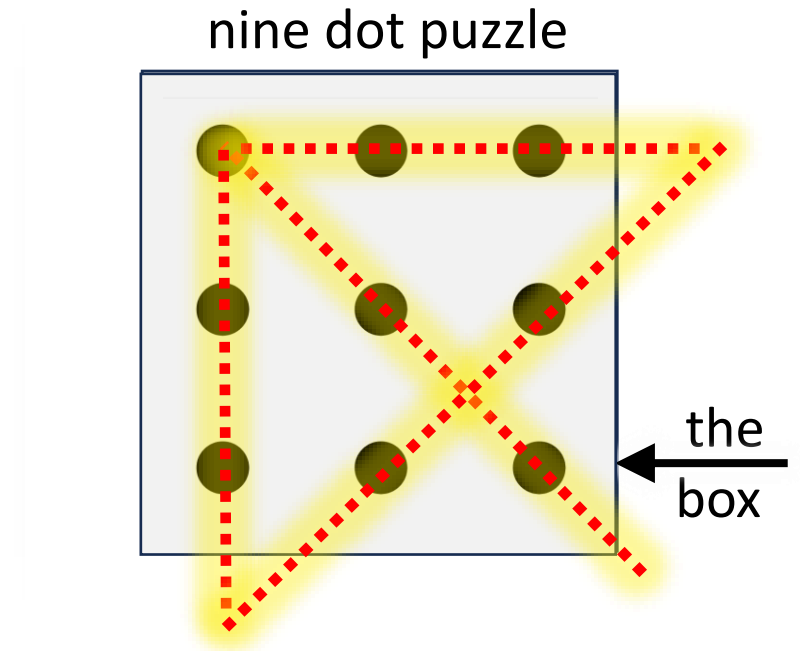
The first TV commercial to use **CGI**
(**C**omputer **G**enerated **I**magery)

Aquatred was Goodyear's innovative (Outside the Box) wet traction tire introduced in **1992** that contributed to saving it from bankruptcy.

(31 years ago)

Thinking Outside the Box

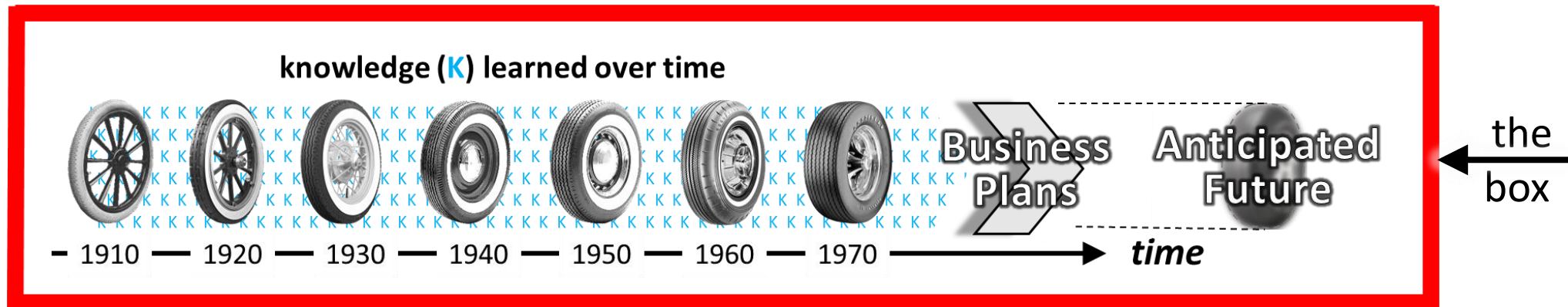
- It is generally accepted that the term 'thinking outside the box' originated in the 1950s with the nine dots puzzle.
- The goal was to draw a line linking nine dots using four straight lines without lifting the pensile.
- Most people incorrectly assume that the paper that the nine dots are printed on is a boundary that limits possible solutions.



The 'Box' is the set of self-imposed thinking constraints that limits the scope of a person's thoughts.

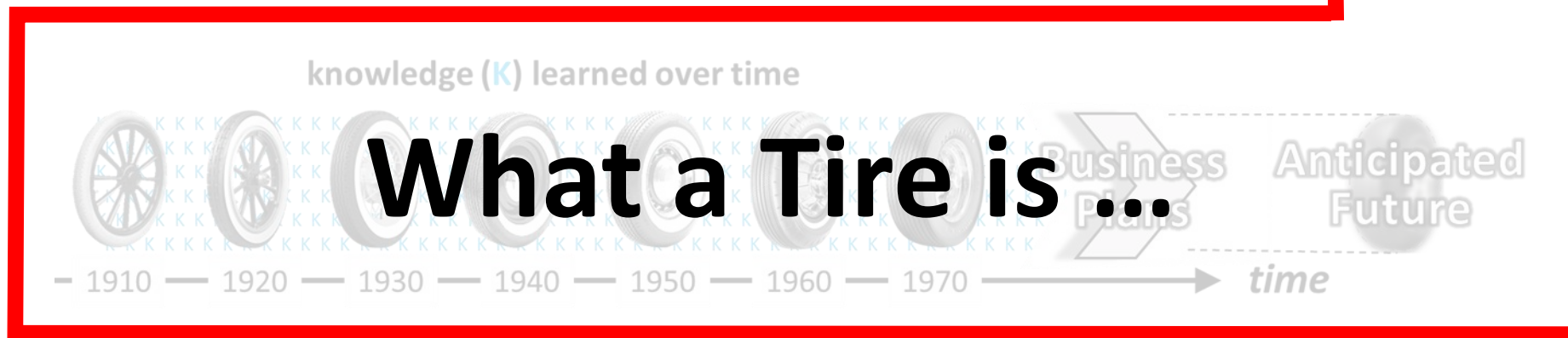
A Company's Thinking Box

- Formed by:
 - its history, successes, and failures
 - all the knowledge it has learned (and assumed)
 - Its employees and leadership (and their boxes)
 - its anticipated future (investments)
 - Its annual business plans (appraisals)



Aquatred: Outside the Box?

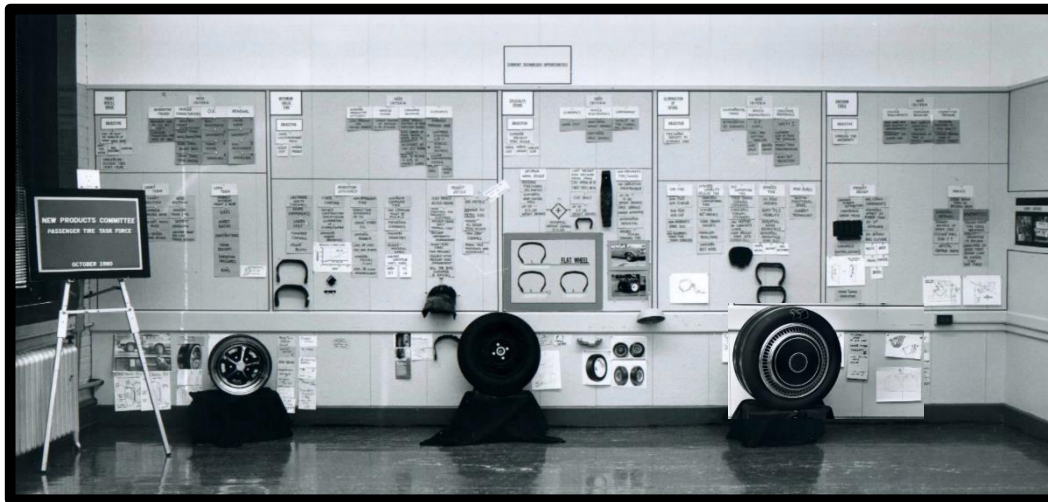
- Not surprising by today's thinking box
- Unexpected innovation in 1992
 - Provided new customer value
 - New enabling technology
 - Had a novel, exciting, appearance
- Did the box temporarily just get bigger?



When and How Did It All Start?

1980 – Task force to forecast future opportunities

- Two week-long group brainstorming event
- 11 creative individuals with diverse experiences



1980

12 Years

1992



Advanced concepts to get funding

Mission :

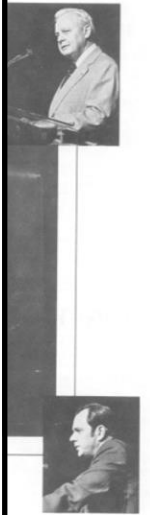
- Develop new, innovative products and processes which go beyond current tire technology.
- Raise strategic product issues based on analysis of long-term perspectives and scenarios.

Goal : Obsolete current products

Staffing : 37 innovative professionals with a diversity of expertise

Budget : Additional – No cuts in other areas

Restriction : Can not work on current business plans



over — page 11)



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Advanced concepts to get funding

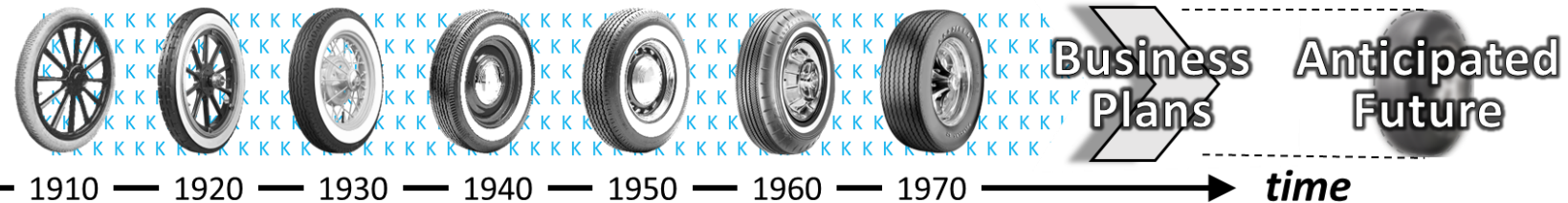
Ad

1981

Outside the company's
thinking box

Advanced
Concepts

knowledge (K) learned over time



Restriction : Can not work on current business plans



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Advanced concepts to get funding

Ad

Good

Creativity / Innovation Training

Advanced Concepts

- Brainstorming
- Storyboarding
- Mind Mapping
- Myers-Briggs Thinking Styles
- Project Management



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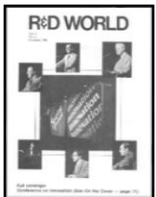
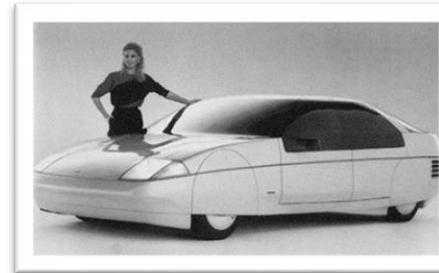
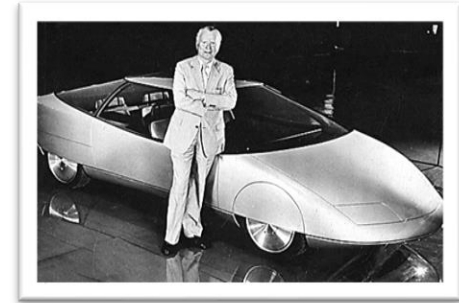
Advanced Concepts Department



Advanced Concepts Department

Strategy: Support Lead Users

- The auto companies explore future possibilities with concept cars.
- Provided tire concepts to support to understand and influence their view of the future.



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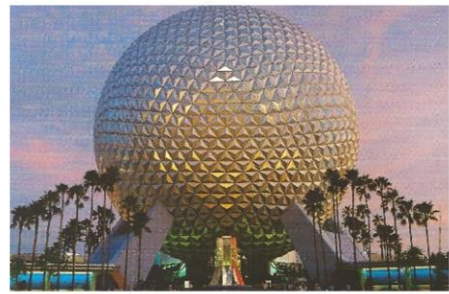
1990

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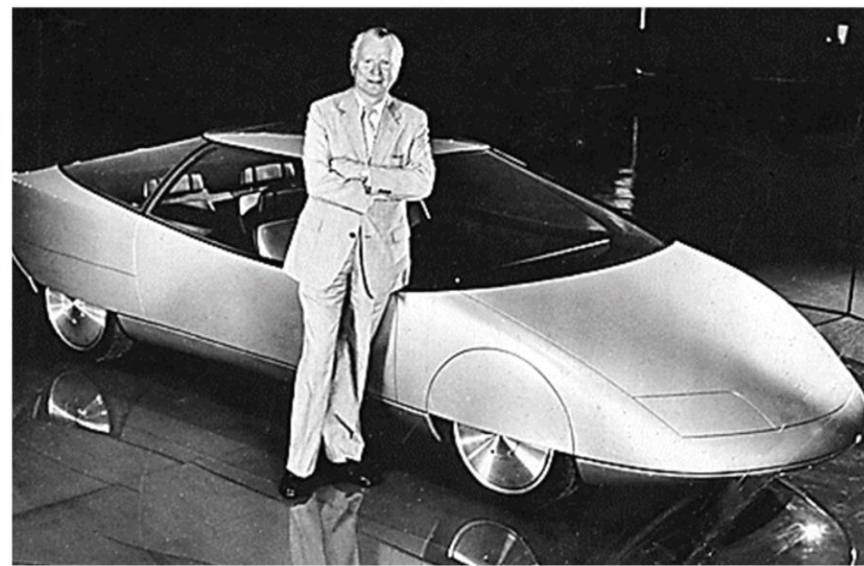


1982 – EPCOT Tire



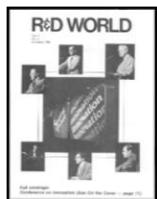
Disney EPCOT

General Motors Aero 2000 (EPCOT)
The Car of the Future



Ea

Tyre



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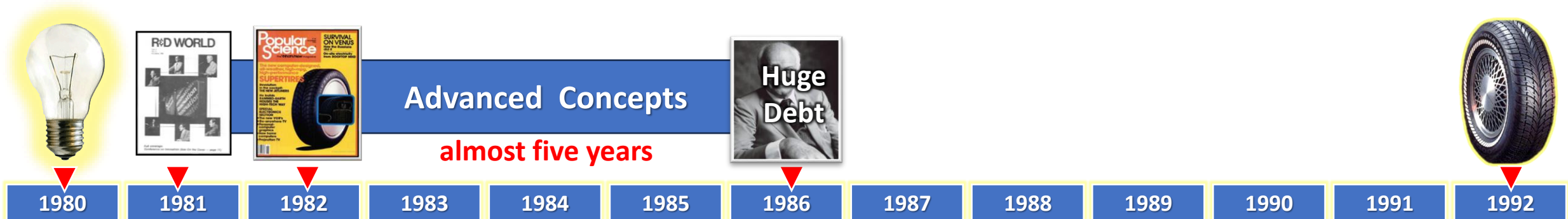
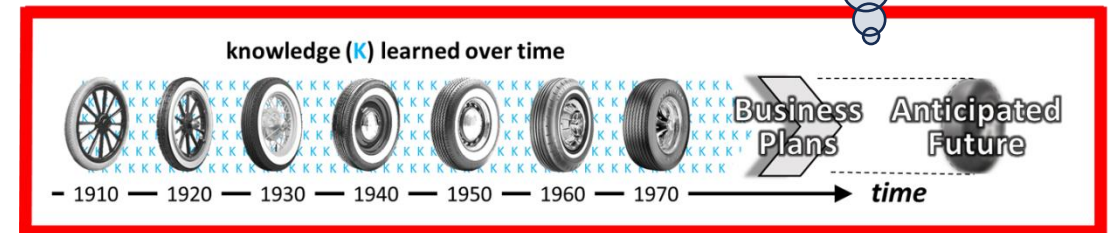
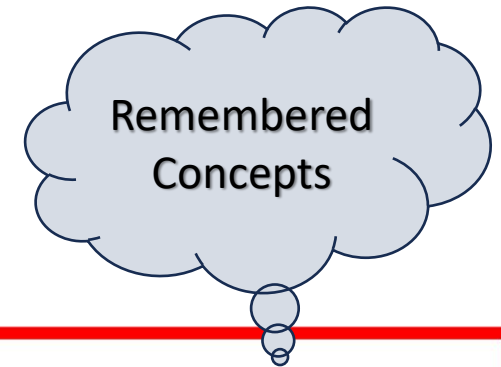
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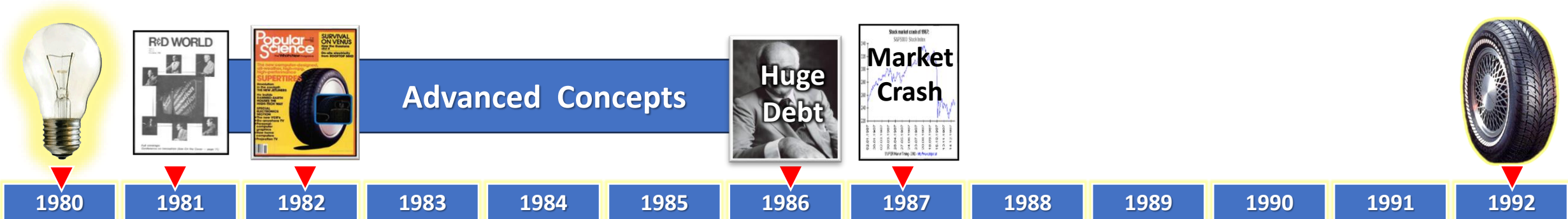
1986 - Goldsmith Takeover Attempt

- Goodyear buys back shares costing \$2 billion.
- To reduce debt Goodyear sells non-tire assets:
- To reduce operating costs:
 - Restructuring / Layoffs
 - Advanced Concepts Terminated
(absorbed into business teams)



1987 - Stock Markets Crash

- Dow Jones fell 508 points (22.6%)
- Goodyear stock dropped from \$74 to \$35
- Goodyear investors very concerned



1988 - Goodyear Res

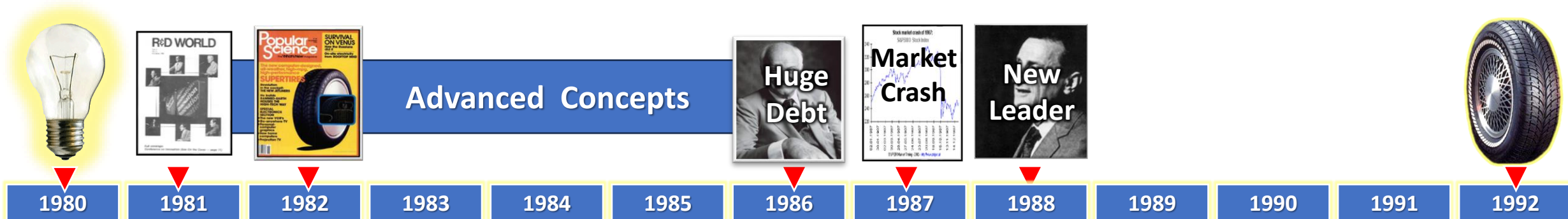
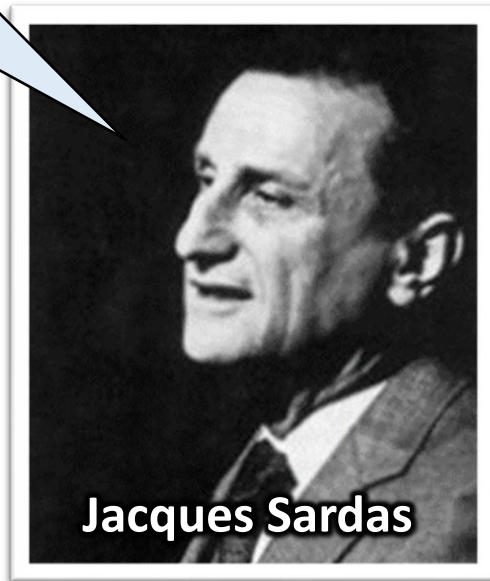
We'll have to do something really different !

- Realigns its business units
- Appointed Jacques Sardas as President of the Goodyear Worldwide Tire Division

Inside the box thinking

- First tried to boost prices to improve profit margins
- Then introduced lower-priced tires for dealers

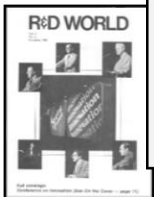
- Nothing was working



1988 - New Products Steering Committee

- Project NewEx (New and Exciting) is initiated

- **New and Exciting** Premium Broad Market Tire
- Set Goodyear apart from the Competition
- A perceptible difference that can be easily seen
- A unique construction and/or design
- An obvious value-added link to a strong benefit
- **Customer driven (focus group market surveys)**
- Generate consumer interest and store traffic
- Launch during the 1992 Winter Olympics



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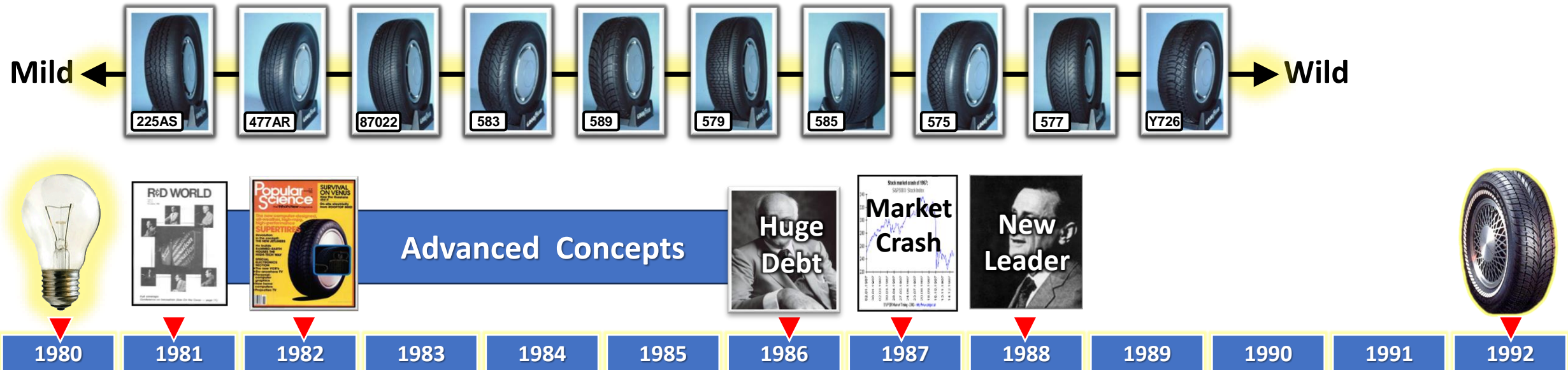
1990

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1992

1988 - Focus Group Market Surveys

- Three demographically different cities
(Boston, Kansas City, Los Angeles)
- Ten concept tires created to explore the design spectrum of mild to wild.



1988 - Focus Group Market Surveys

Wet Traction

- Three demographically different cities

(Boston, Kansas

- Ten concept tires spectrum of mild



the design

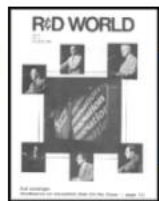


1989 – NewEx Set Based Development

Three identified
by focus group
as most
New and Exciting



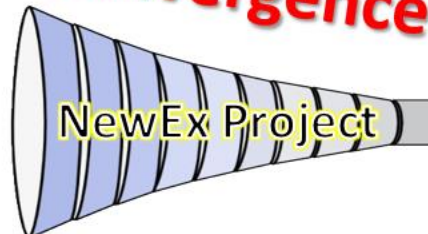
Experimental Molds and Tires



Advanced Concepts



**Concurrent
Convergence**



Start
Up



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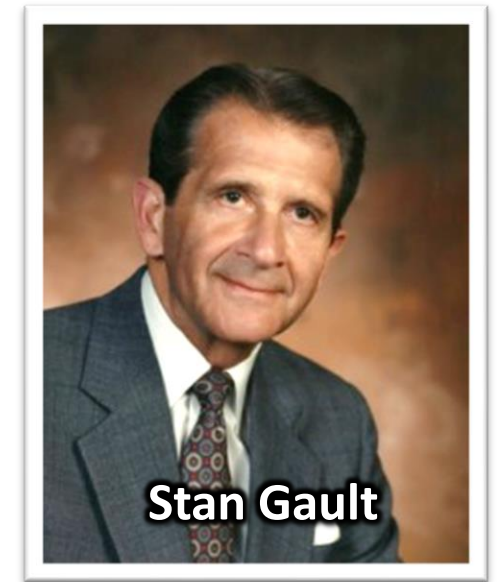
1990

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1991 – Management Shake-Up

- Chairman Tom Barrett resigns in June
- Stan Gault is named Chairman and CEO
 - Good friend of Tom Barrett
 - On Goodyear board of directors since 1989
 - Saw a greater potential in NewEx program
 - Intensified scope of advertising plans
 - Adds 60,000-mile treadwear wear warranty
 - Positioned as premium (+10% price)
 - Sell only in high margin replacement market
 - Doubled the number of planned sizes



Stan Gault

Chairman and CEO (1989-1991)

Marketing Man
(Rubbermaid)

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1992 – Aquatred Success

- Aquatred's received significant recognition and awards:



- Aquatred's success was greater than expected and drew customers into Goodyear stores.



Aquatred sells more than one million in the first year setting new sales records.

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2000 – Aquatred 3

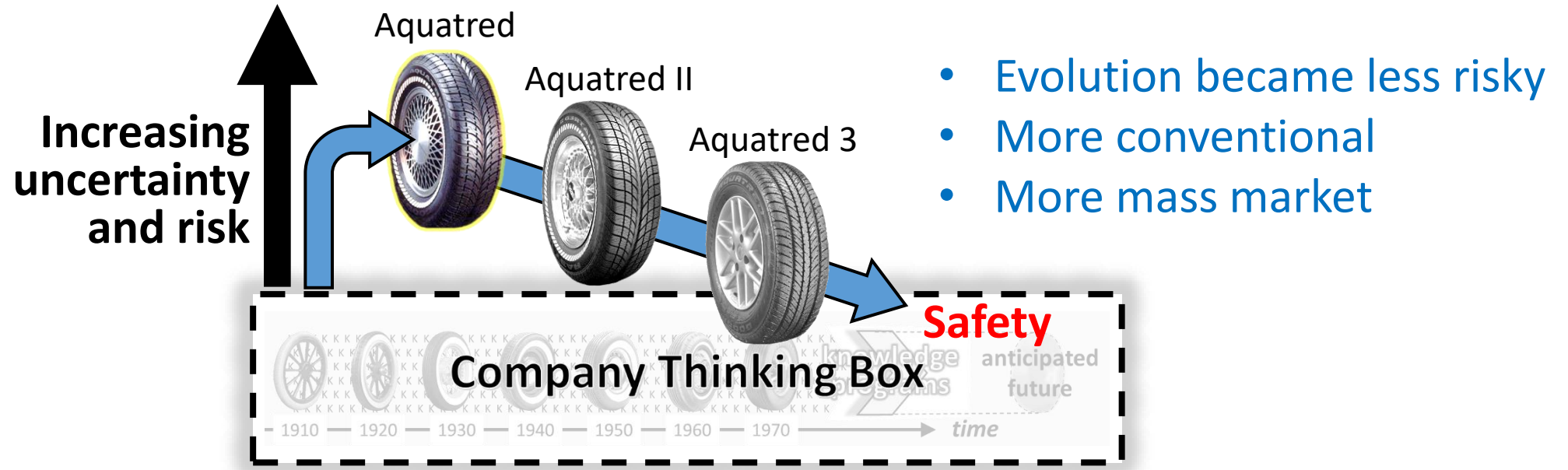


- Goodyear business continued to thrive with sales and earnings the highest in Goodyear's history.
- Goodyear's financial crisis was averted, and the feeling of desperation inside the company had quickly faded.
- Aquatred successors simplified the design and reduced costs while capitalizing on the reputation of the original product.





Aquatred Evolution



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2001 – Another Economic Crisis



- Within a year after the Aquatred 3 was launched worldwide economic conditions declined significantly and entered a recession.
- 2002 was a business disaster for Goodyear with significant losses in both sales and income.
- Goodyear was in danger of defaulting on its loans (bankruptcy) and was desperately struggling to survive by cutting staff.



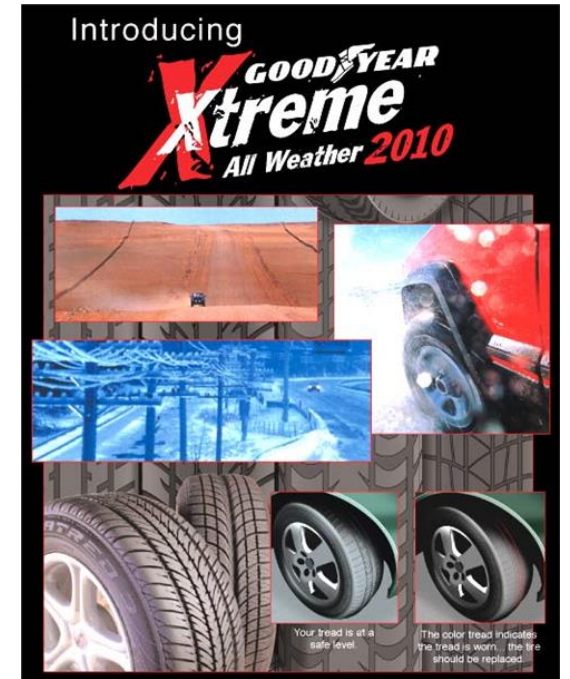
- Goodyear's stock price dropped to a 20-year low, and it was rapidly losing market share.
- It needed some real magic again.



2002 – Goodyear Responds

- Jon Rich was appointed president of Goodyear's North American Tire unit.
- He hired an outside market research company was employed to identify emerging opportunity.
- Their recommendation was to develop an extreme all-season tire with:

- ✓ Best dry traction
- ✓ Best wet traction
- ✓ Best snow traction
- ✓ Best ice traction



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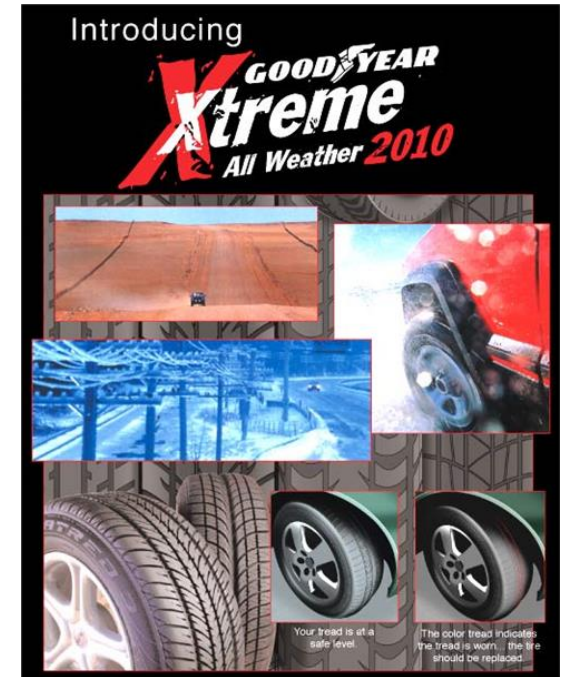
2008

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2003 – NextEx Program Initiated

- Jon Rich request:
 - NextEx needs to be visually distinctive.
 - NextEx will demonstrate Goodyear's best technology.
 - NextEx will provide clearly the best, all around, all-season tire that can be bought at any price.
 - NextEx will rate #1 in outside consumer tests.



- Must pull launch ahead from 1Q05 to 1Q04
(Impossible ... but do it!)

2003 – NextEx Accelerated Innovation

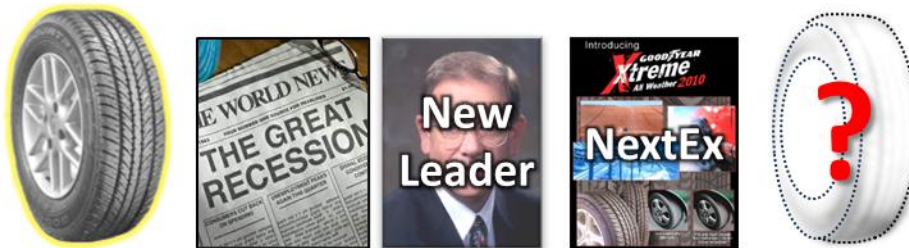
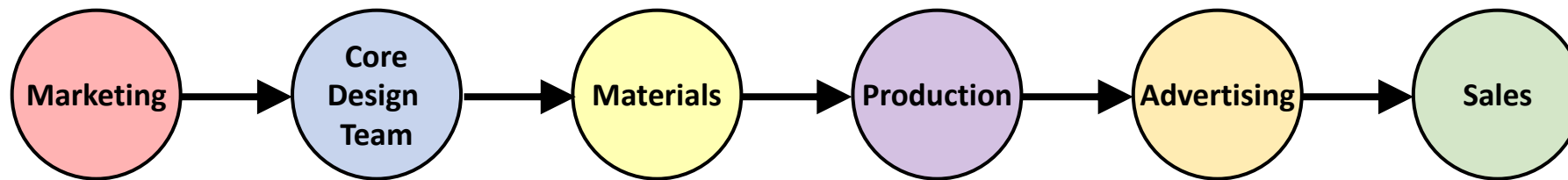
1. **Open Communication** (speed vs. secrecy)
2. **Innovation Marines** (standing core team)
3. **Accelerated Ideation** (jumpstart)
4. **Computer Aided Innovation** (faster PDCA cycle)
5. **Rapid Prototyping and Testing** (no waiting)
6. **Risk Management** (multiple choice)
7. **Team Hand-Off** (change thinking styles)



2003 – NextEx Accelerated Innovation

1. Open Communication (speed vs. secrecy):

- Leadership communicated to all key directors and managers the project's importance and established NextEx as #1 priority.
- Weekly project meetings included not just core team but also representatives from all key departments (Series → Parallel)



- When thinking is **inside-the-box** everyone knows what to do.
- When thinking is **outside-the-box** no one is really sure what to do.

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2003 – NextEx Accelerated Innovation

1. Open Communication (speed vs. secrecy):

- Leadership communicated to all key directors and managers the project's importance and established NextEx as #1 priority.
- Weekly project meetings included not just core team but also representatives from all key departments (Series → Parallel)
- Everyone need to collaborate and learn together
 - Anticipate potential problems early and resolve them
 - Shared ownership and shared responsibility



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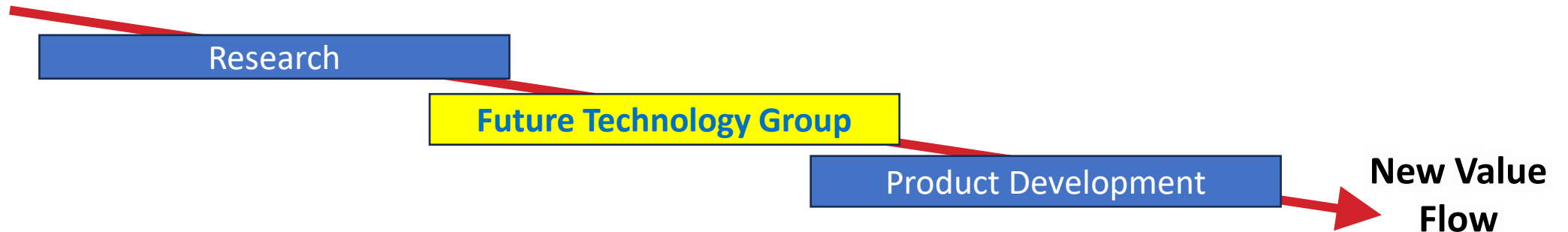
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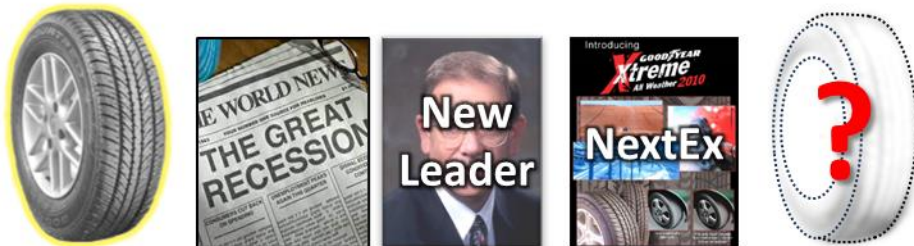
2003 – NextEx Accelerated Innovation

2. Future Technology Group (Innovation Cadre)

- An ongoing organizational unit between research and product development



- Full-time, skilled, multi-functional, innovative types
- Mission: Find, explore, refine, and reduce to practice new technology



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2003 – NextEx Accelerated Innovation

3. Rapid Ideation (jumpstart):

- Like brainstorming but more intensive and more productive
- Three days in one week (Mon-Wed-Fri)
- Ideas → Concepts → Scenarios (two minutes to sell to judges)
- Aquatred Traits Scoring (feature visibility, novelty, simplicity)
- Select most promising six scenarios for computer evaluation
- Provides fast start for core team



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2003 – NextEx Accelerated Innovation

4. Computer Aided Innovation (faster PDCA cycle):

- Simulation of actual testing using finite element analysis



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2003



Computer power advancements
enable testing simulation

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2003 – NextEx Accelerated Innovation

4. Computer Aided Innovation (faster PDCA cycle):

- Simulation of actual testing using finite element analysis
- Rapid program changes allow analysis of outside-the-box designs

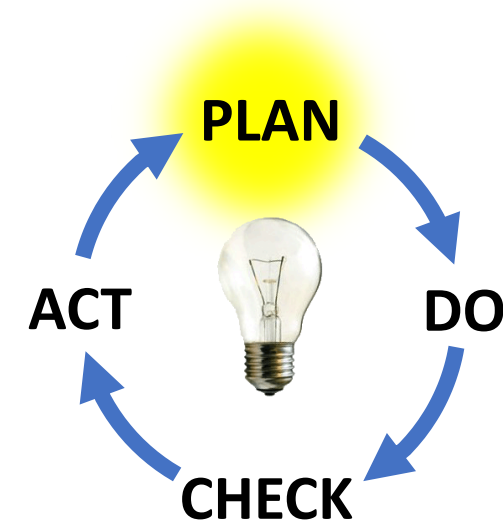


Computer programs are written based on Inside-the-box knowledge

2003 – NextEx Accelerated Innovation

4. Computer Aided Innovation (faster PDCA cycle):

- Simulation of actual testing using finite element analysis
- Rapid program changes to allow analysis of outside-the-box designs
- Creativity is enhanced by accelerating PDCA cycle



2003 – NextEx Accelerated Innovation

4. Computer Aided Innovation (faster PDCA cycle):

- Simulation of actual testing using finite element analysis
- Rapid program changes to allow analysis of outside-the-box designs
- Creativity is enhanced by accelerating PDCA cycle
- Best 3 designs selected for refinement and physical prototyping



2003 – NextEx Accelerated Innovation

5. Rapid Prototyping and Testing:

- Needed hardware expedited to front of the queue (no waiting)
- Prototype tires built in local experimental shop (not automated production)
- Testing performed and reported immediately (test engineer on team)
- Winter testing performed in late summer in Alaska



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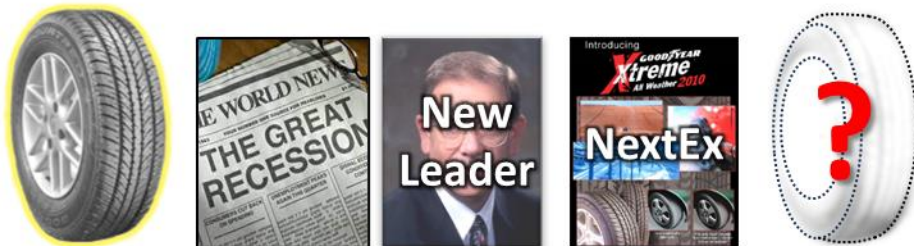
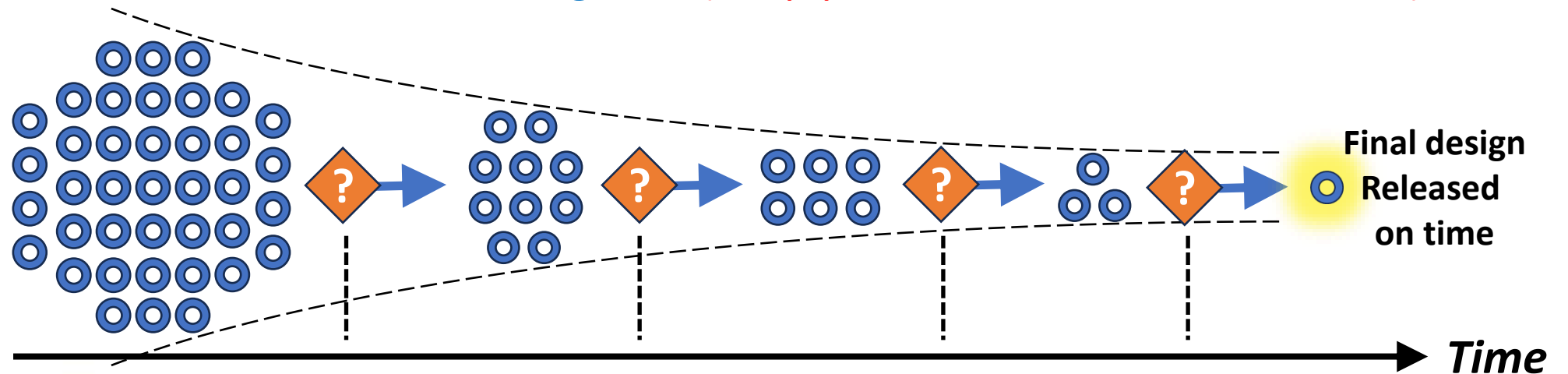
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2003 – NextEx Accelerated Innovation

6. Risk Management (multiple choice):

- Set based controlled convergence (drop poorest in scheduled reviews)

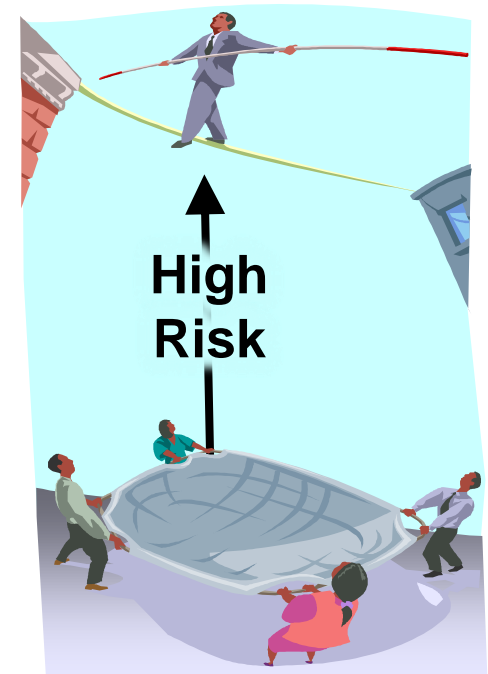


Always include low risk alternative to keep moving forward on schedule

2003 – NextEx Accelerated Innovation

7. Team Hand-Off (change thinking styles)

- Significant innovation is risky (provide a safety net)
 - Not everyone was comfortable with the outside-the-box effort
 - A 2nd more inside-the-box program was added for insurance
 - The 2nd development effort mentally freed the 1st core team
 - NextEx leadership was changed from an innovative risk taker to a conservative protector type for final product release

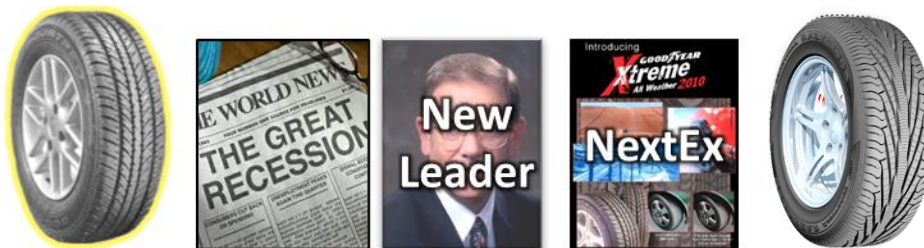


2004 – Assurance TripleTred Launched



- The Assurance TripleTred was launch on schedule at the February 2004 dealer conference with extensive television commercials.
- The Assurance TripleTred was developed with three uniquely different tread zones:

- ✓ Wet & Snow Zone
- ✓ Ice Zone
- ✓ Dry Zone



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Assurance TripleTred Recognition

Tire Survey Results

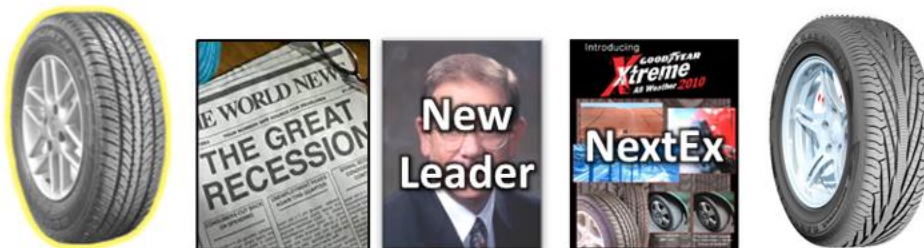
[Other Survey Results](#) | [Submit Online Survey](#)

✉ FORWARD PAGE TO A FRIEND

Passenger All-Season

Brand Name	Tire Model	Would Buy Again?	Rank Within Category	% vs. Best In Category	Tire Performance Ratings									Total Miles Reported
					Dry Traction	Wet Traction	Hydro Resistance	Snow Traction	Cornering Stability	Steering Response	Ride Comfort	Noise Comfort	Tread Wear	
Michelin	Assurance TripleTred	8.9	1	100%	9.4	9.5	9.4	9.1	9.1	9.2	8.9	8.8	9.3	1,497,139
	HydroEdge	8.6	2	96%	9.3	9.4	9.4	7.7	8.8	8.9	8.6	8.2	9.2	2,178,304
Goodyear	Assurance ComforTred	8.4	3	95%	9.0	8.8	8.8	8.3	8.2	8.0	9.3	9.3	9.1	800,178
Michelin	Harmony	8.5	4	92%	8.9	8.5	8.4	8.0	8.3	8.3	8.7	8.3	8.8	2,925,035
Firestone	Affinity LH30	7.6	5	86%	8.4	8.2	8.0	7.5	7.6	7.7	8.2	8.1	7.6	2,441,183
Goodyear	Aquatred 3	7.4	6	86%	8.5	8.6	8.8	7.2	7.7	7.8	7.5	7.0	7.9	9,894,256
Yokohama	Aegis LS4	7.3	7	85%	8.5	8.3	8.1	7.9	7.8	7.9	7.9	7.4	7.0	3,910,339
Uniroyal	Laredo AWR	6.7	8	81%	8.8	7.4	7.0	7.1	7.2	7.6	6.8	7.4	7.9	1,357,287
Bridgestone	BT70s	5.9	9	79%	8.1	7.8	7.8	7.1	7.3	7.3	7.1	6.1	7.2	1,881,329
Yokohama	S330	7.5	10	79%	8.0	7.3	7.3	4.0	6.7	8.0	8.3	8.3	7.7	108,000
Kumho	798	6.3	11	78%	7.4	7.0	7.3	7.1	6.7	6.9	7.9	7.6	7.2	448,750
Uniroyal	Tiger Paw NailGard	5.8	12	77%	7.9	7.5	7.4	6.9	6.9	7.2	7.5	7.2	5.9	982,883
Michelin	XV4	5.6	13	76%	7.7	6.7	6.5	6.1	6.8	7.1	7.4	7.0	7.7	9,242,539
Michelin	Energy LX4	5.5	14	75%	8.0	5.9	5.8	5.5	7.2	7.5	8.1	8.3	5.8	449,014
Kumho	Euro Metric 771	7.3	15	74%	7.6	7.1	6.9	4.9	6.2	6.2	7.5	7.6	7.5	161,500
Kumho	722	5.8	16	72%	7.9	6.1	6.1	5.1	7.3	7.2	6.9	6.7	6.9	676,962

- Rated #1 all-season tire in leading consumer magazine
- Tire Rack top-rated all-season passenger tire
- Consumer Digest “Best Buy”
- R&D Magazine R&D 100 Award for Innovation
- Business Week Silver Idea Award
- Pace Award Competition finalist
(only tire selected)



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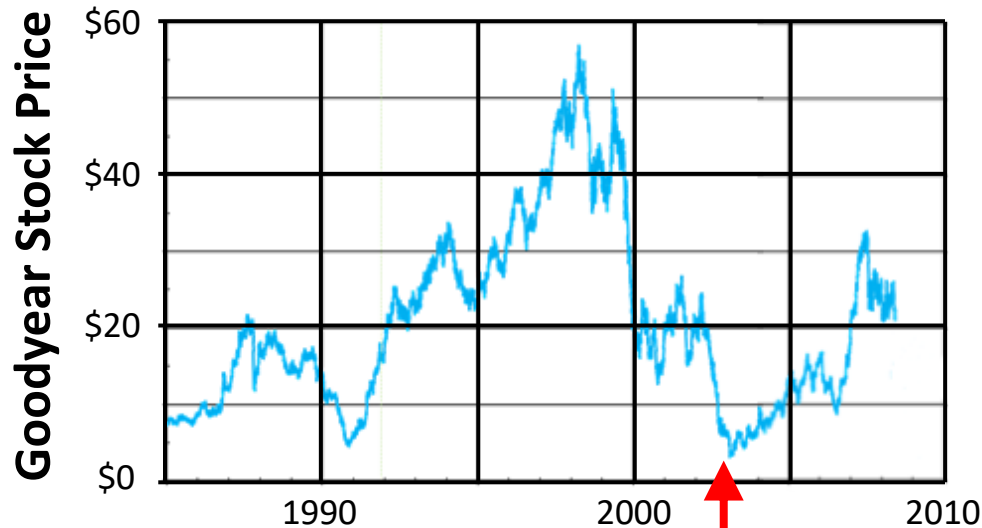
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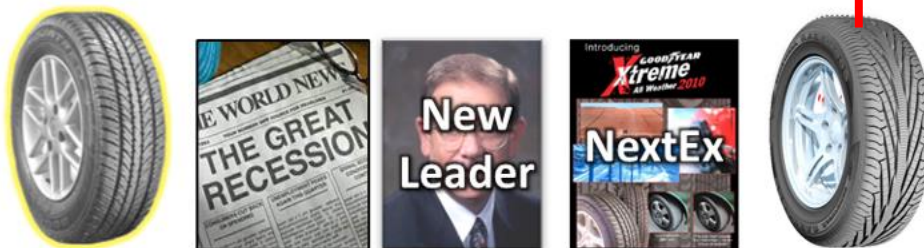
2009

2010

Assurance Economic Impact



- The Assurance launch increased Goodyear's credibility with dealers and consumers.
- Goodyear sold more than 2 million Assurance tires in the first year making it the biggest launch in the company's 107-year history.
- Goodyear was able to successfully raise its prices.
- Goodyear posted its first annual profit in four years (\$114.8 million).



1998

1999

2000

2001

2002

2003

2004

2005

2006

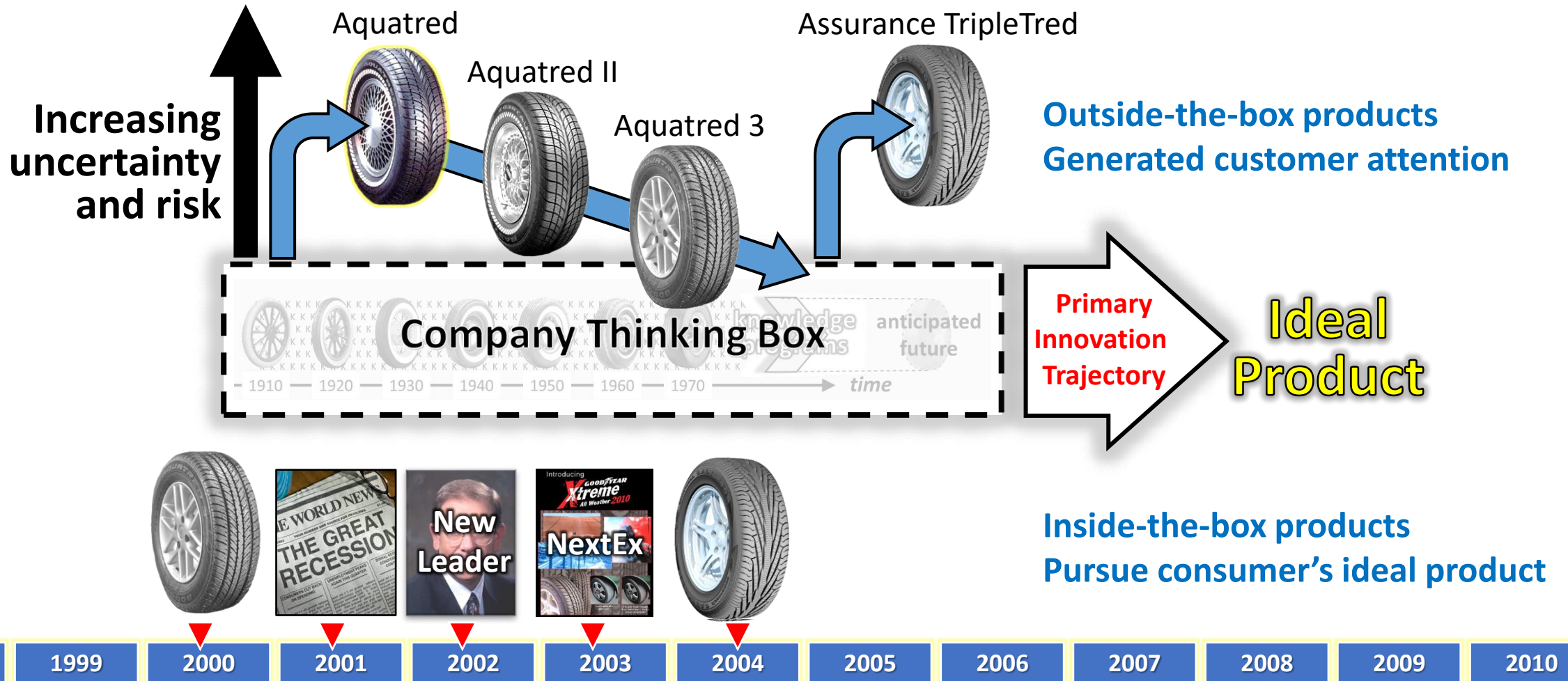
2007

2008

2009

2010

Aquatred to Assurance TripleTred





Summary of Observations

- Know your thinking box / Know your company's thinking box
- Be aware of and explore emerging trends and ideas
- Leadership strongly influences an innovation culture
- Commit to be the one to obsolete your own products
- Learn outside your box
- Know who your lead users are and work with them
- Combine synergistic ideas
- The future isn't always what you planned ... Be agile
- Rapid thinking change may require leadership change
- Show customers future possibilities
- Manage risk with set based controlled convergence
- Effective marketing is a key part of successful innovation
- Outside the box innovations get noticed



Summary of Observations (continued)

- Know your thinking box / Know your company's thinking box
- Inside-the-box thinking may return when a crisis is averted
- Sometimes you must innovate your innovation process
- Leadership needs clearly re-define the boundaries of the new box
- All parts of the value chain need to be involved from the start
- Have an experienced innovation group ready to go
- Select product scenarios that can tell a value story to customers
- Invest in analytical PDCA tools to enhance early creativity
- Provide fast, flexible, and accessible prototyping and test capability
- Converge using a pre-defined schedule
- Use the right people at the right time
- Inside-the-box is the steak, but Outside-the box provides the sizzle



Venturing Outside the Box



Thank You

Any Questions?
Comments?