Never Make Predictions, Especially About The Future: What TRIZ Tells Us About Sustainability In 2030

Darrell Mann
Conclusions

• Work on autonomous vehicles is futile

• The global patent system is killing innovation

• ‘Sustainable innovations’ expecting customers to compromise on cost or performance are doomed to fail

• Sustainability should stay ‘under the radar’ for the next 5-8 years

• After the Crisis, the tide will definitely be in the sustainability direction… be ready for it
Some of our clients from the last 20 yrs:
Innovation versus Operational Excellence

Averages are meaningless in the innovation context. The real question is what did the companies at the top do that the other didn’t?
Innovation?

US Patent 3,216,423

98% of attempted ‘innovations’ fail
What Is Happening Here?

What did the 2% do differently?
THE NEXT 100 YEARS
A FORECAST for the 21st CENTURY

GEORGE FRIEDMAN
FOUNDER of STRATFOR
98% of Lean-sparked innovation attempts fail
98% of QFD-sparked innovation attempts fail
98% of 6Sigma-sparked innovation attempts fail
98% of Design-Thinking innovation attempts fail
98% of JTBD-sparked innovation attempts fail
98% of OBI-sparked innovation attempts fail
98% of WOIS-sparked innovation attempts fail
98% of Blue-Ocean innovation attempts fail
98% of i4i-sparked innovation attempts fail
98% of Agile-sparked innovation attempts fail
98% of Scrum-sparked innovation attempts fail
99.5% of Open Innovation attempts fail
* Ideality is the over-riding driver for system evolution

* Ideality is about increasing the good, decreasing the bad

* Ideality = ‘Value’ = \((\text{Perceived})\text{Benefits} \over (\text{Cost} + \text{Harm})\)

* IDEAL FINAL RESULT – all the benefits, none of the cost or harm

* ‘free, perfect & now’

* ‘SELF’
Problem Solving And ‘Ideal Final Result
Customer expectations increase with time.
If you stand still, you are actually going backwards.
In order to remain competitive, you should be looking to the right along the trend.

**Key jump motivations:**
Service-experience = intangibles
Experience-transformation = responsibility
The Four Great Fallacies

- Rational-Actors Fallacy
- Top-Down Fallacy
- Pareto Fallacy
- Trade-Off Fallacy
Linear Trend Patterns Create Conflicts

Linear Trend 1

CONFLICT EMERGES

CONFLICT RESOLVED

Linear Trend 2
First Principles: S-Curve

anything we wish to improve

time spent trying
First Principles: S-Curve Jumps

Hand-drawn
First Principles: Cycles

Increasing Ideality

Contradiction emerges

Virtuous Cycle

Vicious Cycle

Contradiction resolved
MILLIONS of systems

HUNDREDS of different problems

TENS of successful (First Principle) solutions
Mesoscales
Possible Common Principle:
- Physics: Compromise in Competition
- Maths: Multi-Objective Variational

Mesoscale Bridges between Different Disciplines
- Chemical Engineering
- Process System Engineering
- Geology, Oceanology, Meteorology
- Astronomy
- Uranology
- Quantum, Chemistry/Physics, Materials
- Nuclear Physics
- Atomic Nucleus

Mesoscale = TRIZ
“How wonderful that we have met with a paradox. Now we have some hope of making progress.”

x 9million cases =
### Autonomous Vehicle Contradictions

<table>
<thead>
<tr>
<th>Autonomy Level Jump</th>
<th>Contradiction Problems To Be Solved</th>
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| Level 1 (‘hands-on’) to Level 2 (‘hands-off’) | Sensor reliability  
Adverse weather reliability  
Lane marking maintenance  
Sensor reliability  
Regulation/legal frameworks  
Data Protection/‘Big Brother’  
GPS Jammers/pranks |
| Level 2 (‘hands-off’) to Level 3 (‘eyes-off’) | Sleepy-driver  
People reaction time  
‘Idiocy’ problem – unloaded brain mistakes  
Liability insurance  
Plastic-bag/cat detection  
100% signal integrity  
Geo-fencing (only allowed on some roads) |
| Level 3 (‘eyes off’) to Level 4 (‘mind-off’) | Universal communications protocol  
Ethics (kill driver or pedestrians?)  
Hijacker (steps into road to stop vehicle)  
Certification in realistic situations  
Test transparency  
Jaywalking/fencing  
Bicycles  
Unplanned roadworks  
Ambulance/police prioritisation  
‘Common courtesy’ polite-algorithms |
| Level 4 (‘mind-off’) to Level 5 (‘no steering wheel’) | All-weather/Off-road  
Hack-proof/liability  
100% availability  
5% of population lose jobs  
‘aggression’/prioritisation algorithms  
Platooning trucks?  
Mobility versus vehicle ownership  
Integration with other transport modes |
Contradiction-Solving Process

IDEALLY

BUT

reduce waste

others face consequences

solutions already found by others

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For every complex problem there is an answer that is clear, simple, and wrong.

H. L. Mencken
CAUSE and EFFECT relationships are often highly tenuous...
…which means you can’t ‘exclude the trivial’ because it could turn out to be the thing that triggers a non-linear shift.
“fly as close to your neighbours as possible”
Generation Cycle Research

GENERATIONS
THE HISTORY OF AMERICA'S FUTURE, 1584 to 2069
William Strauss & Neil Howe

The Fourth Turning
What the Cycles of History Tell Us About America's Next Rendezvous with Destiny
William Strauss and Neil Howe

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First Principles:

The manner in which you were raised by your parents in turn influences how you raise your children.
US/UK Generational Cycles

Strauss, W., Howe, N.,
‘The Fourth Turning: An American Prophecy’,
Break the Patent Stranglehold

The patent system was created to support entrepreneurs and encourage innovation – now it does the opposite stifling innovators and new ideas. It was set out to ensure that anyone with a good idea had a window of time to develop and introduce it.

Now patent trolls are using the system to rip off manufacturing companies and large corporations are registering tens of thousands of patents and then sitting on them to create profit by restraining competition.

http://breakthepatentstranglehold.com/
Innovation... Most Difficult Game In The World?

trenDNA
Understanding Populations Better Than They Understand Themselves

Right (1st Principle) Problem

Right Solution

Right Capability

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