

Design is the Problem

Studio:Sustainability Frameworks

Marie Lee

What is Sustainability?

What is Sustainability?

An official definition:

Use and development that meets today's needs without preventing those needs from being met by future generations.

Brundtland Commission, 1987

What is Sustainability?

A casual definition:

Don't do things today that
make tomorrow worse.

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...for your kids

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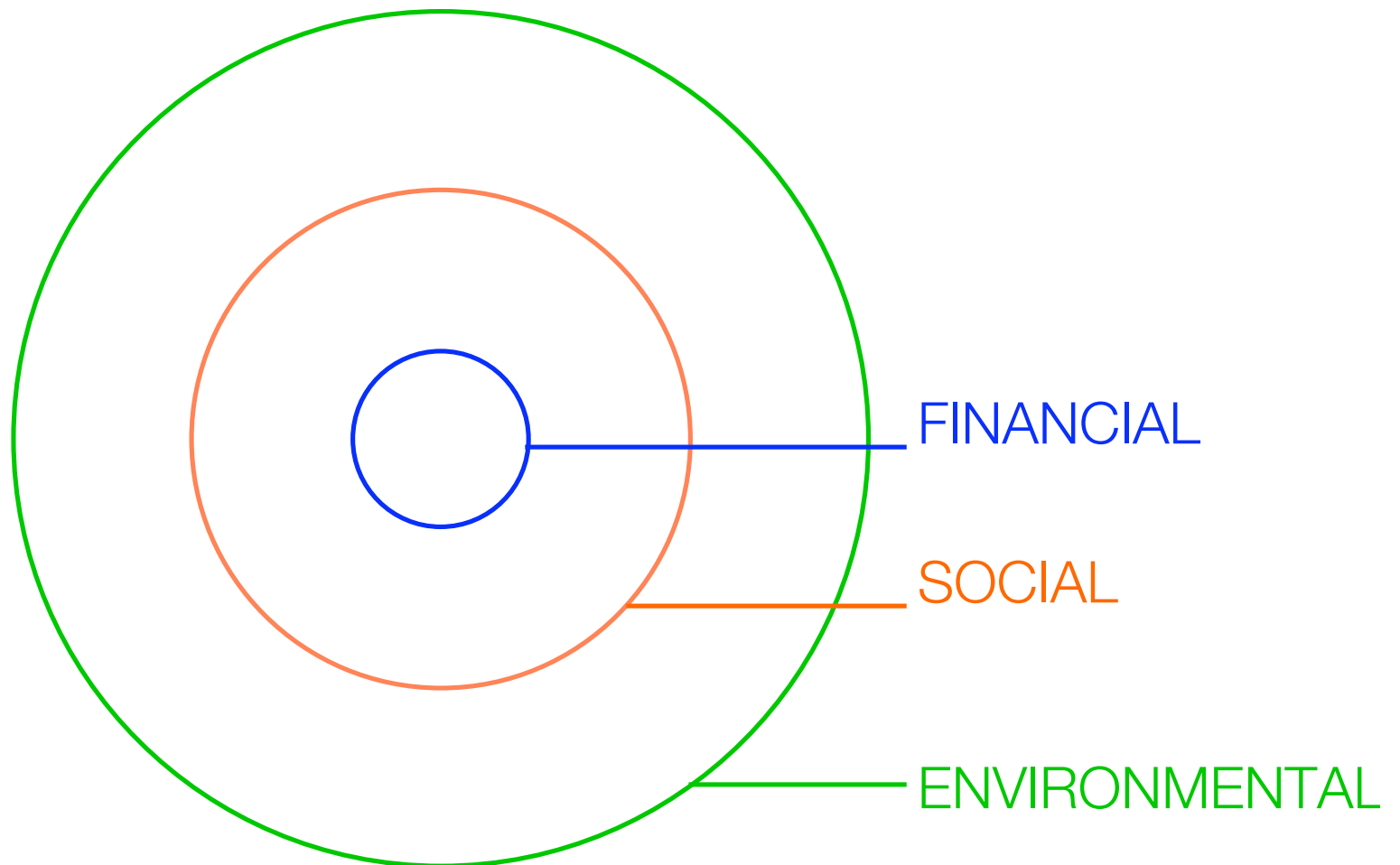
...for your grand-kids

Don't Call it **Green**

Some are calling it **Blue**

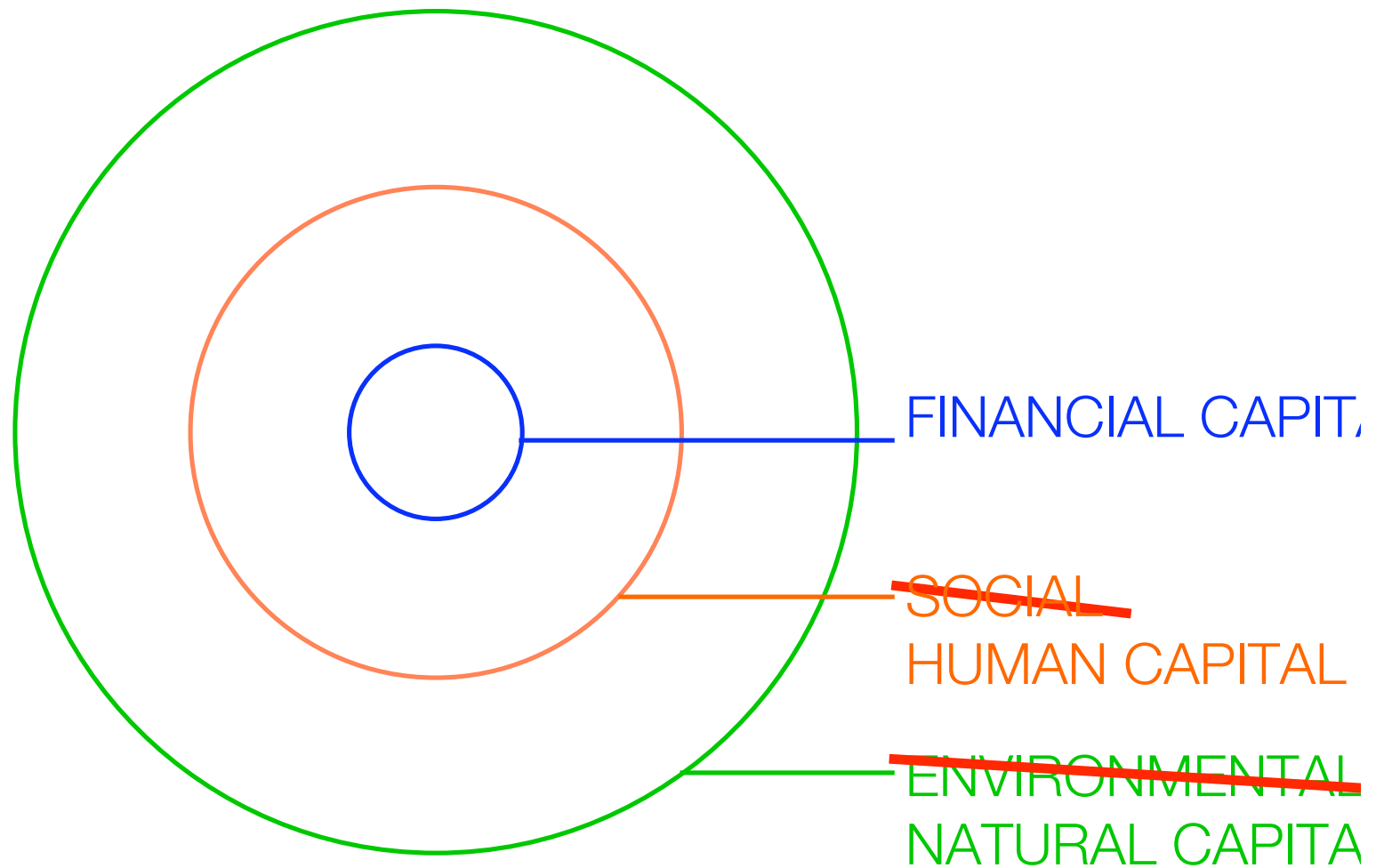
What is Sustainability?

Sustainability encompasses 3 domains:



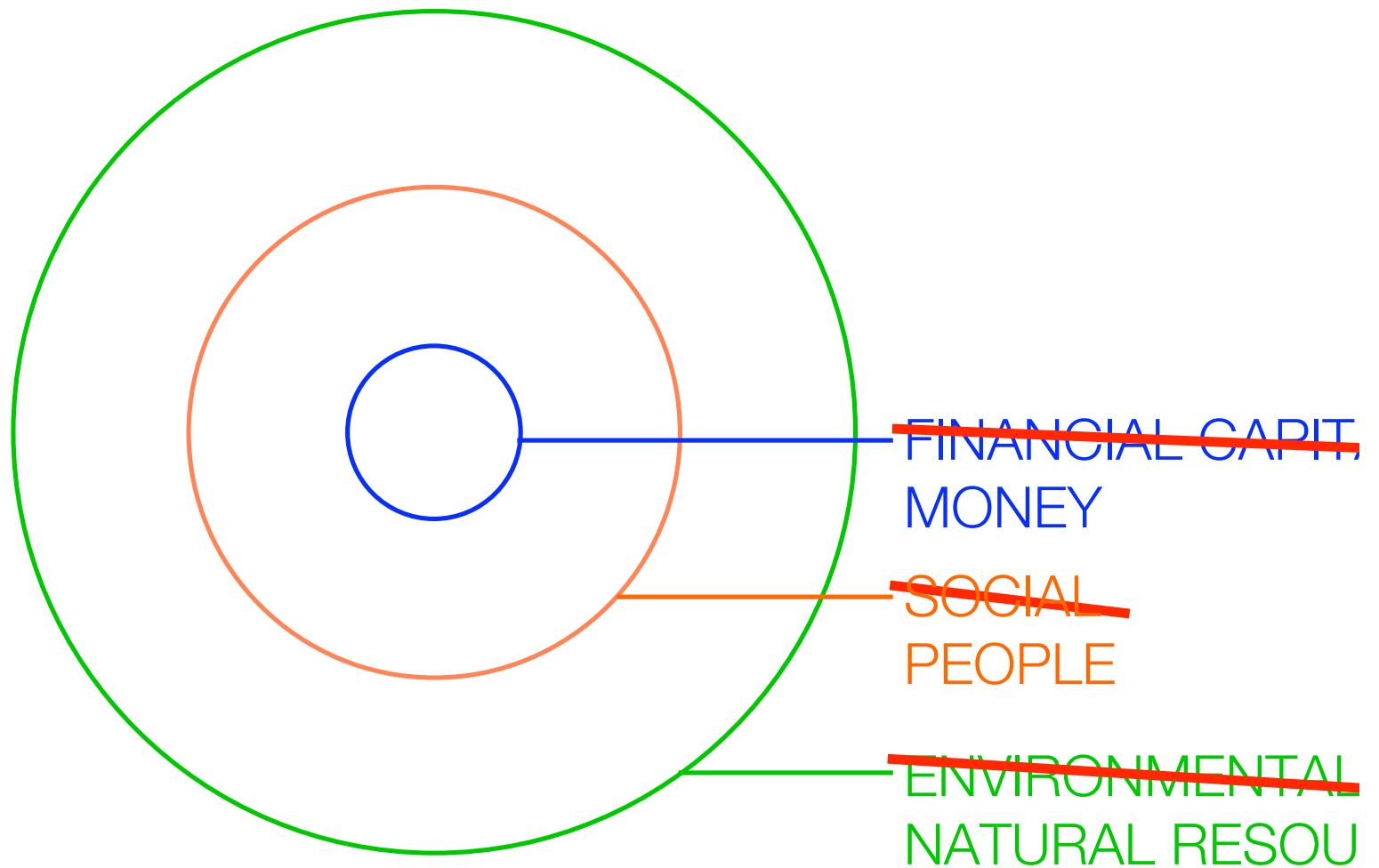
What is Sustainability?

In business terms:



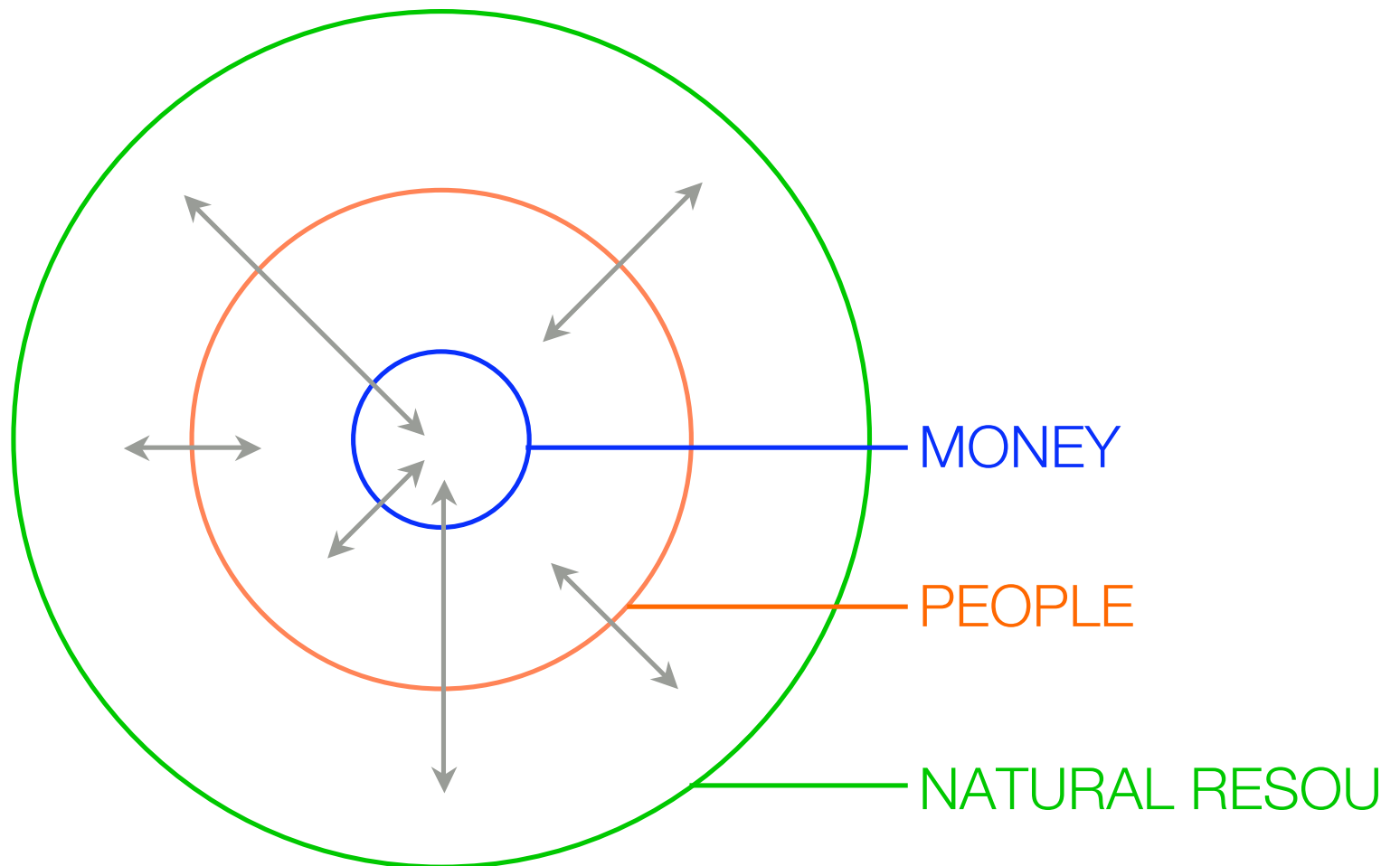
What is Sustainability?

In terms of society:



What is Sustainability?

They form a system:



What is Sustainability?

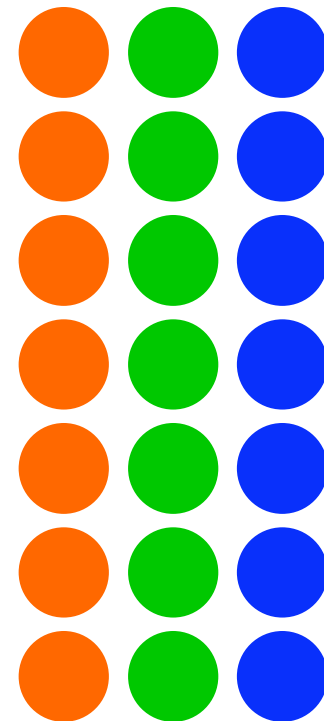
So, we need to understand society from a **systems perspective**:

- Diversity = Resiliency
- Centralization
- Decentralization
- Competition
- Cooperation
- Vitality
- Stakeholders

What is Sustainability?

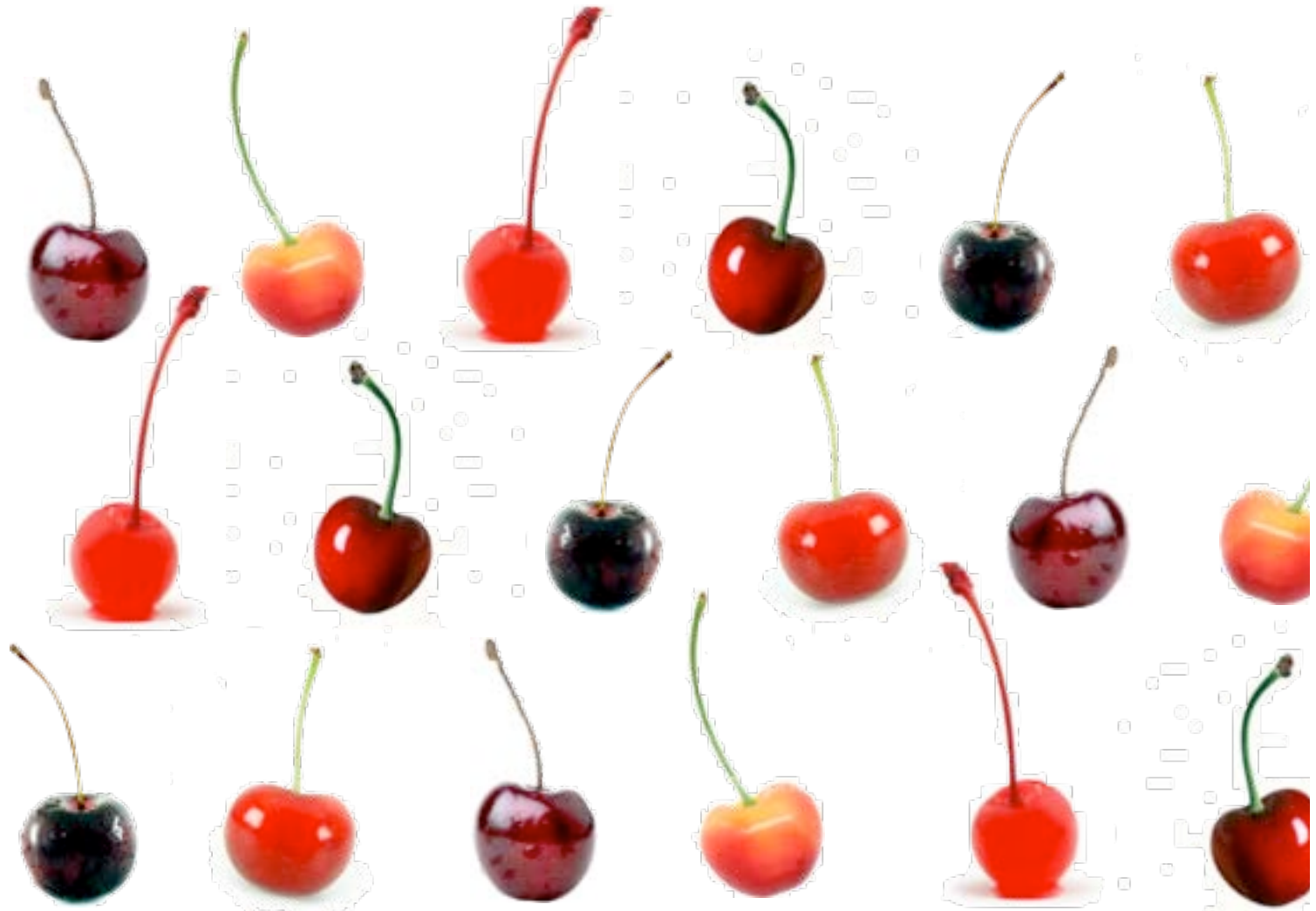
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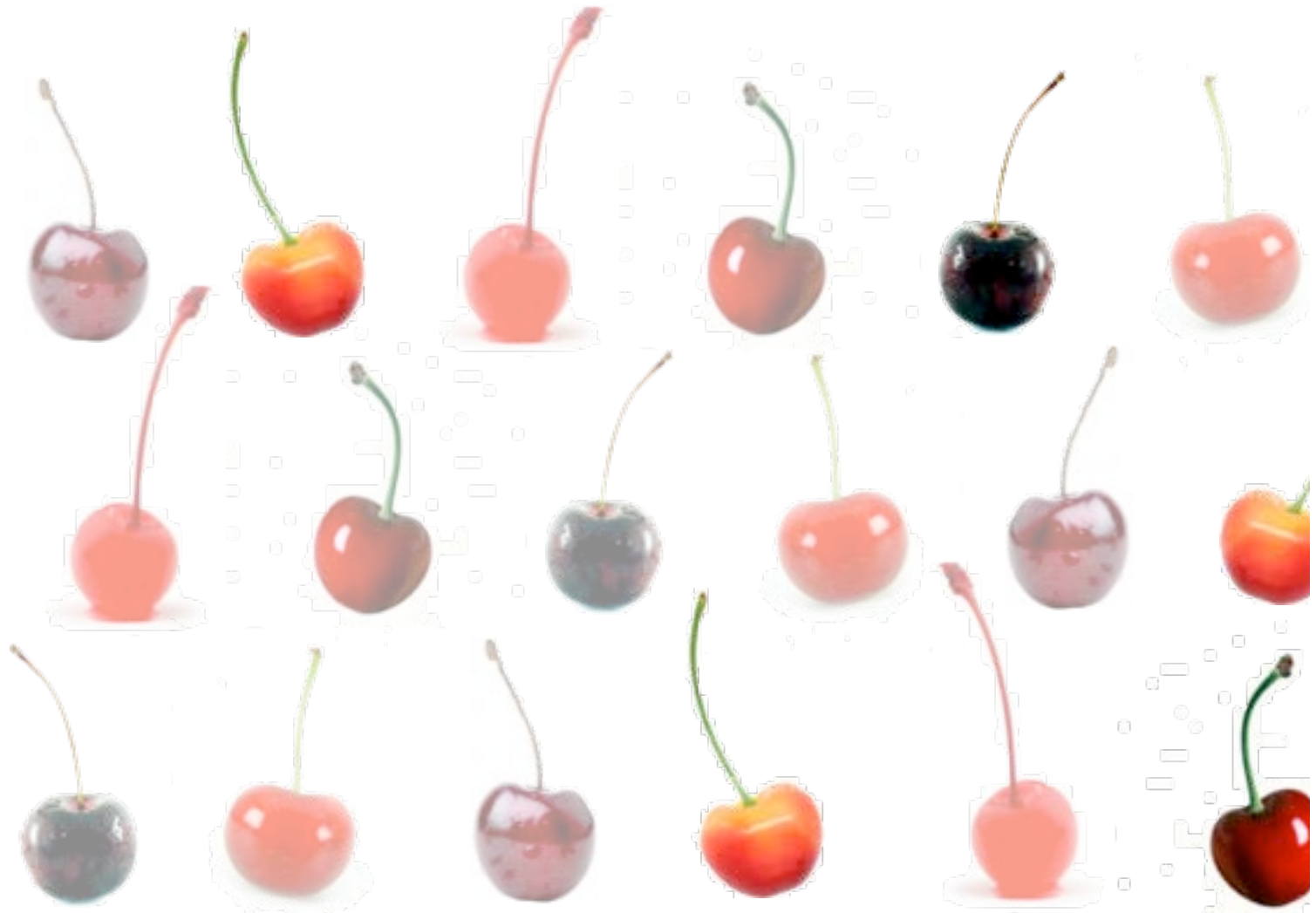
What is Sustainability?

Diversity = Resiliency



What is Sustainability?

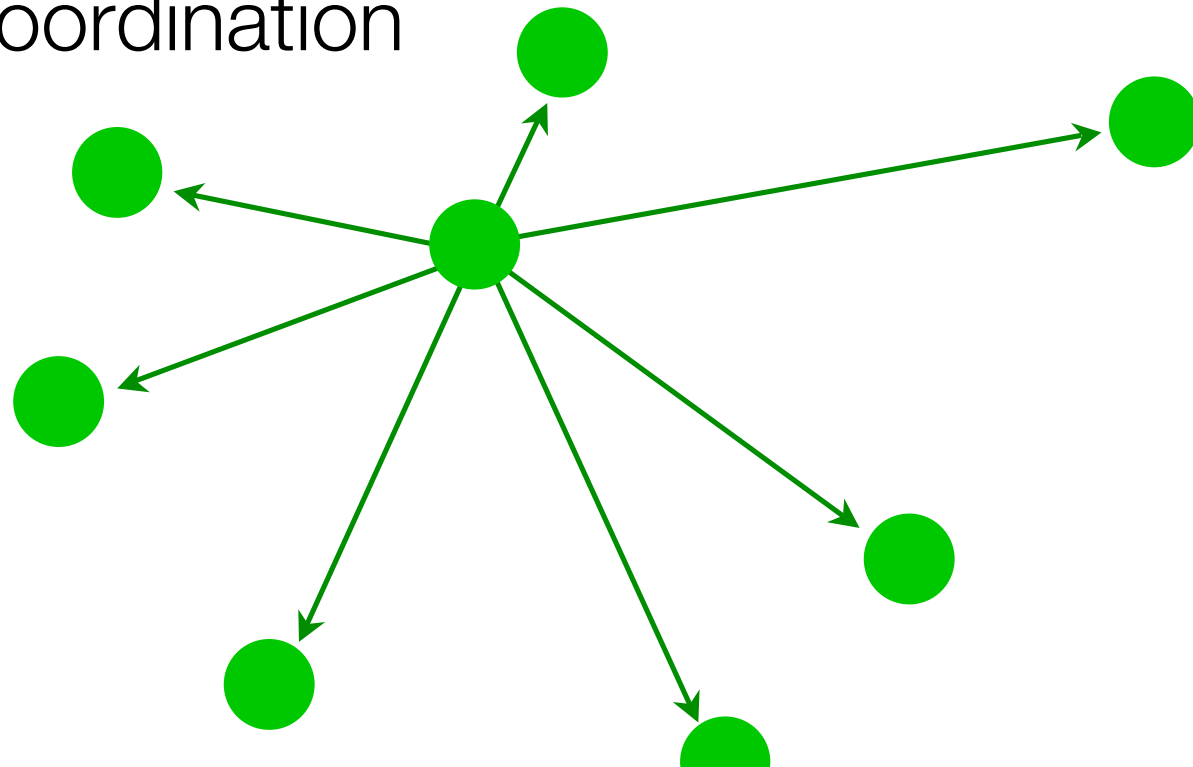
Diversity = Resiliency



What is Sustainability?

Centralization:

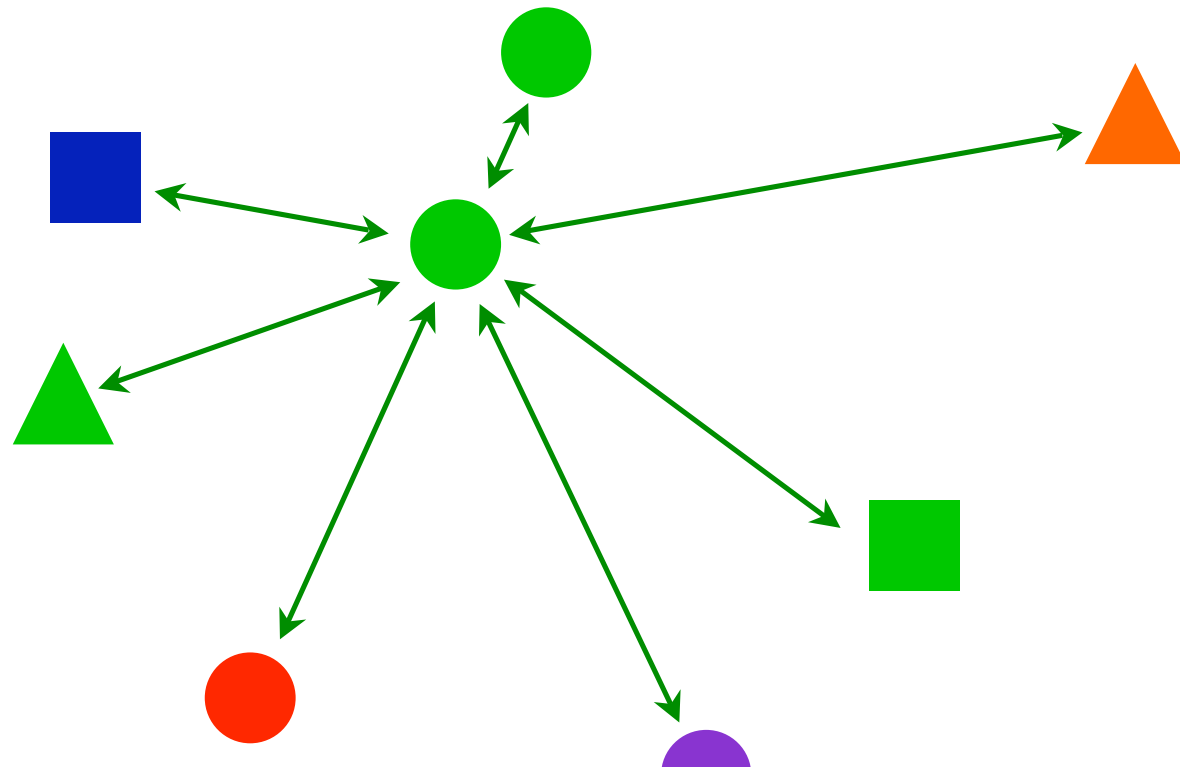
- Optimization and Efficiency
- Standardization
- Economies of Scale
- Coordination



What is Sustainability?

Decentralization:

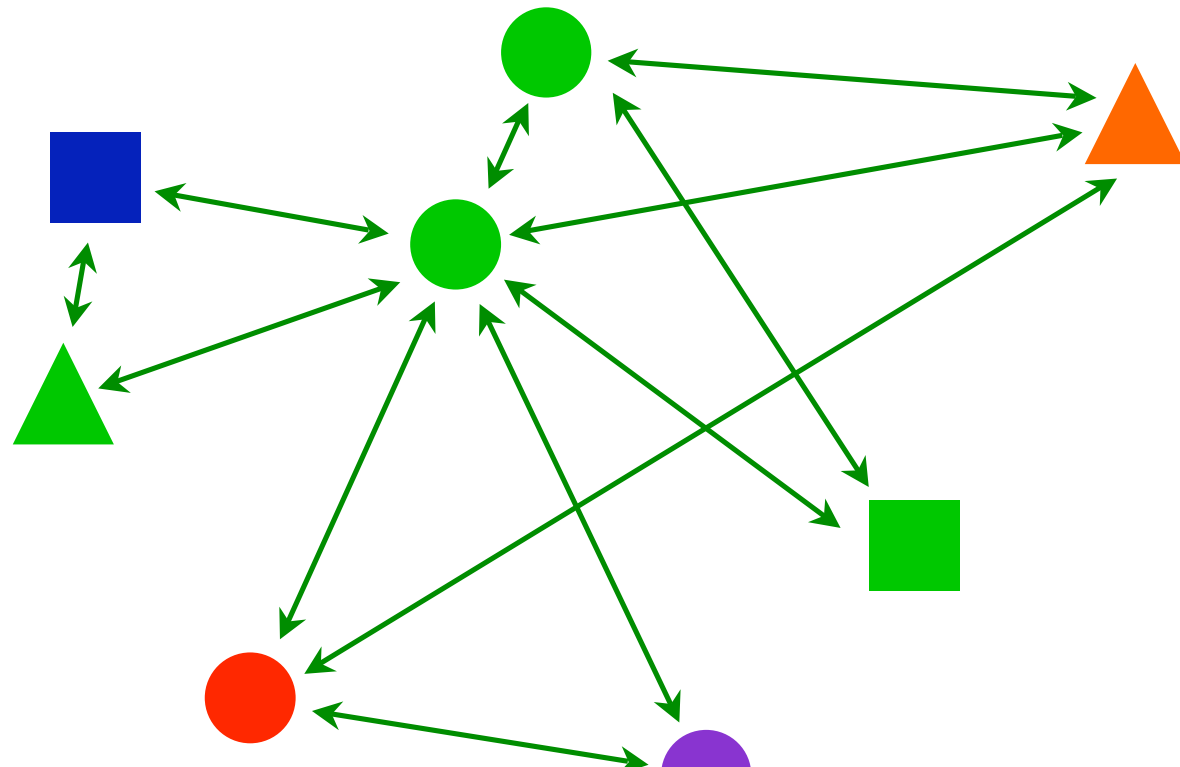
- Local Expertise and Appropriateness
- Higher/Quicker Response



What is Sustainability?

Decentralization:

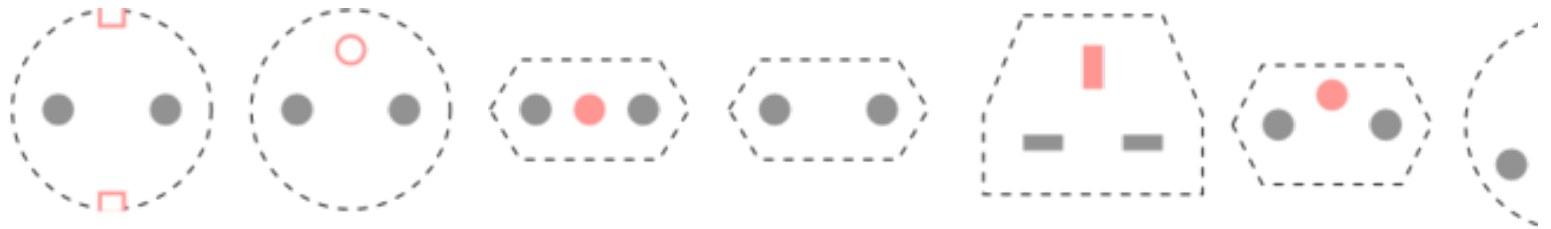
- Local Expertise and Appropriateness
- Higher/Quicker Response
- Resiliency and Robustness



What is Sustainability?

Competition:

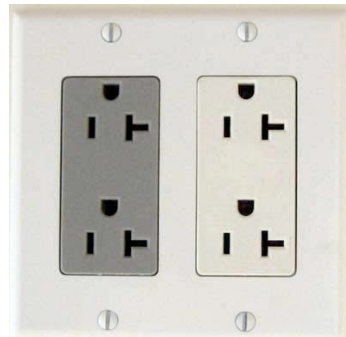
- Increases variety
- Creates new—often better—solutions
- Responds better to challenges
- Responds better to change
- Rewards better performance
- Enhances innovation



What is Sustainability?

Cooperation:

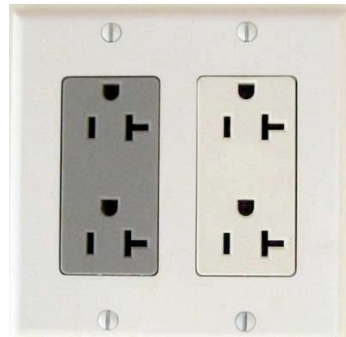
- Creates Standards
- Increases volume and scale
- Spreads “best practices”
- Increases likelihood of success
- Stabilizes markets



What is Sustainability?

Cooperation:

- Creates Standards
- Increases volume and scale
- Spreads “best practices”
- Increases likelihood of success
- Stabilizes markets
- Forms foundation for innovation

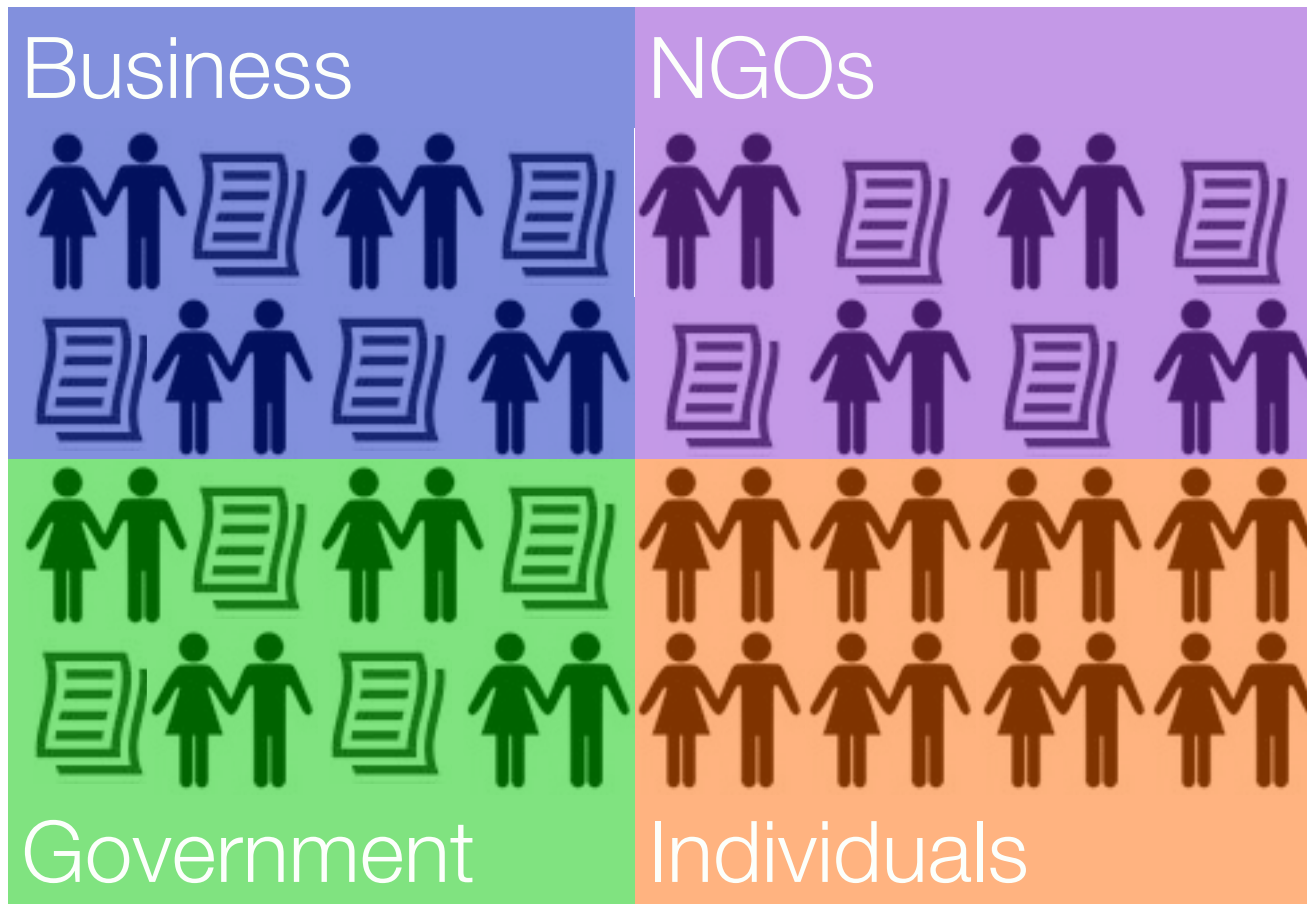


What is Sustainability?

Stakeholders:

Employees, Distributors, Partners,
Suppliers, Media, Investors, Clients

Organizations, Unions, Institutions



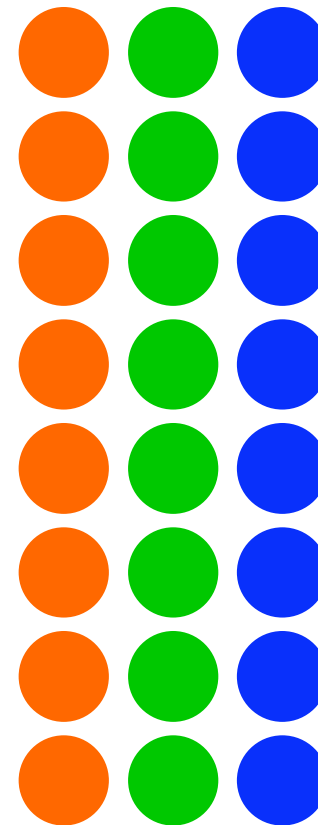
Courts, Departments, Lawmakers

Customers, Fans, Teams, Groups,

What is Sustainability?

So, we need to understand society from a **systems perspective**:

- Diversity = Resiliency
- Centralization
- Decentralization
- Competition
- Cooperation
- Vitality
- Stakeholders
- **Balance**



Sustainability Frameworks

What is a framework?

Sustainability Frameworks

What is a framework?

A perspective on Sustainability that organizes our understanding.

Sustainability Frameworks

What is a framework?

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What is a tool?

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What is a tool?

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What is a strategy?

Sustainability Frameworks

What is a framework?

A perspective on Sustainability that organizes our understanding.

What is a tool?

A mechanism to use to measure or evaluate sustainable impacts.

What is a strategy?

A design approach to lessen the negative impacts of something.

Sustainability Frameworks

These are the major frameworks:

Natural Capitalism

The Natural Step™

Cradle to Cradle

Holistic Management

Sustainability Frameworks

These are the major frameworks:

Natural Capitalism

The Natural Step™

Cradle to Cradle

Holistic Management

LCA (Life Cycle Assessment)

Total Beauty™

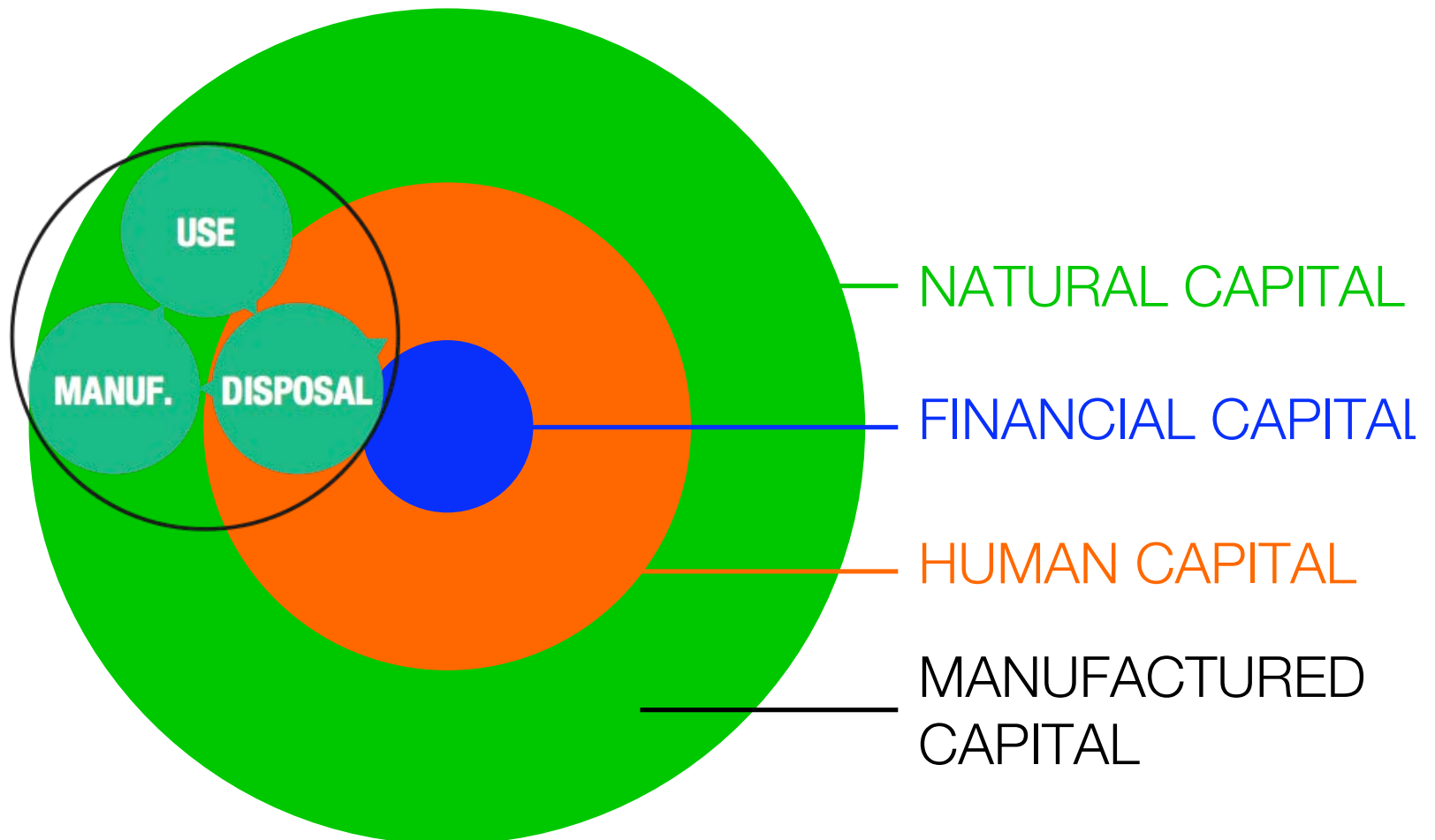
Biomimicry

SROI (Social Return on Investment)

Sustainability Helix

Sustainability Frameworks

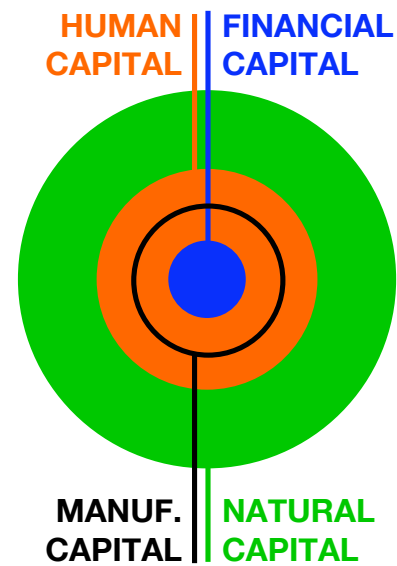
Natural Capitalism (eco-efficiency):



Sustainability Frameworks

Natural Capitalism (eco-efficiency):

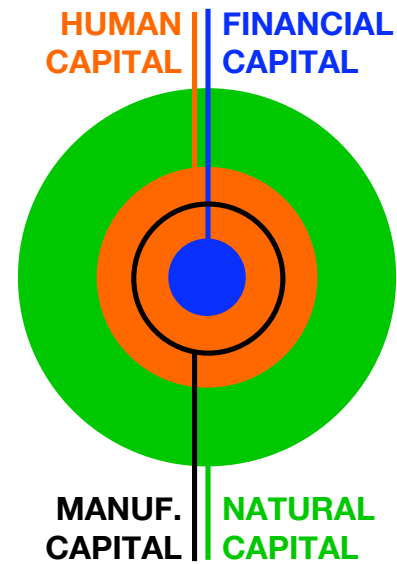
- **Radical Resource Productivity:** Buy time using resources radically more productively
- **Ecological Redesign:** Make use of Biomimicry
- **Service & Flow Economies:** Redesign all products and processes for sustainability
- **Investing in Natural Capital:** Restore Ecosystem Services



Sustainability Frameworks

Natural Capitalism (eco-efficiency):

- **Human Capital:** people & society
- **Natural Capital:** materials, energy, stability & diversity
- **Financial Capital:** money, profit, etc.
- **Manufactured Capital:** materials, energy, & IP



What is Sustainability?

It's not just about the environment. There are a myriad of social issues:

- **Alcohol**
- **Animal rights**
- **Board transparency**
- **Biodiversity**
- **Chemical accidents**
- **Child Labor**
- **Cultural Impact**
- **Death penalty**
- **Deforestation**
- **Drug support** (legalization, trade...)

Sustainability Frameworks & Tools

How about some examples...

Which is better?



What does “better” mean?



Answer:
How about no bag?

Which is better for the environment?



Toyota Prius



Hummer H2

Which is better for the environment?



Toyota Prius



Hummer H2



Which is better for the environment?



Toyota Prius



Hummer H2

Manufacturing
Transportation



48/45 2008 EPA mpg (city/highway)



11/17 2008 EPA mpg (city/highway)

Use

Disposal



~100K miles?

lifetime?

200K-300K miles?

Answer:
We don't really know

Dust to Dust Cost per Mile:							
	Smart ForTwo	Corolla	Camry	Civic	Prius Hybrid	Civic Hybrid	Hummer H
2008	0.583	0.748	2.167	2.867	2.191	2.943	3.621
2004	NA	0.732	1.954	2.867	3.25	3.25	3.027

"A "Dust to Dust" study by CNW Marketing Research of Bandon, OR <http://cnwmr.com/nss-folder/automotiveenergy/>

Which is better for the environment?



Paper Cup



Ceramic Mug

Which is better for the environment?



Paper Cup



1-69 uses

70 uses

71+ uses



Ceramic Mug



Answer:
It depends

Sustainability Strategies

These are the major design strategies:

Reduce

- Design for Use (Usability & Meaning)
- Dematerialization (Materials, Energy & Transportation)
- Substitution (Materials & Energy)
- Localization
- Transmaterialization
- Informationalization

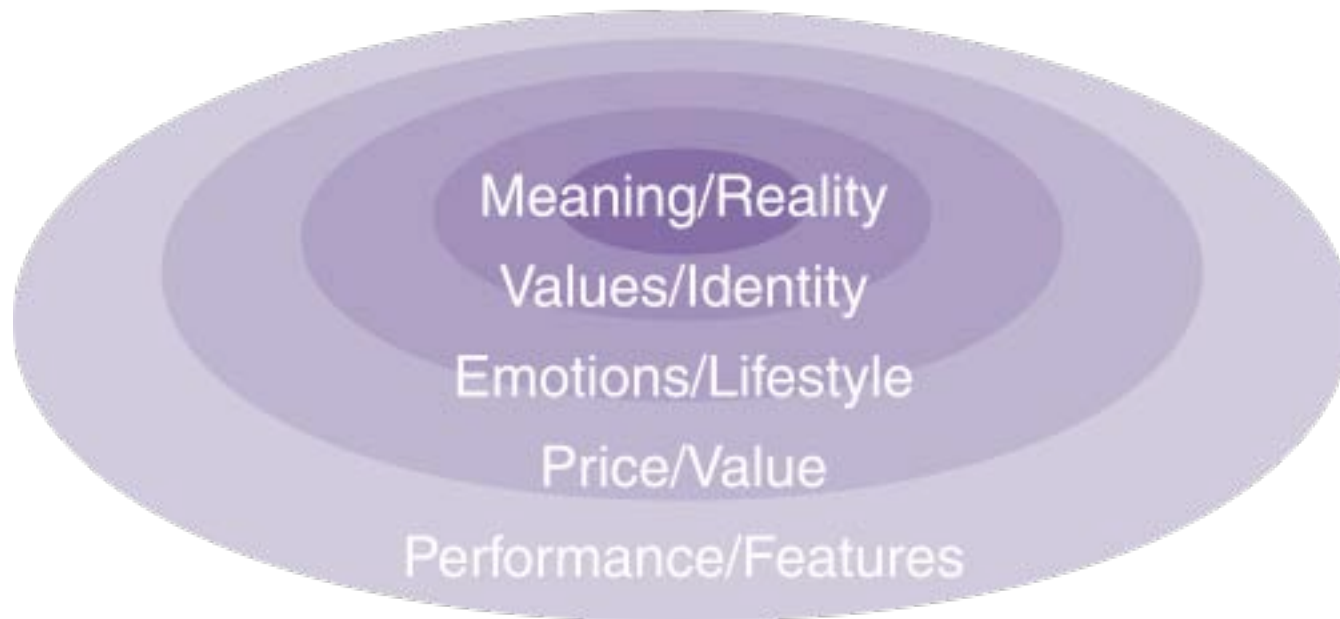
Reuse

Recycle

Sustainability Strategies

Design for Use

(Usability, Accessibility, Clarity & Meaning)



Sustainability Strategies

Dematerialization

(Materials, Energy & Transportation)



Apple iPhone
Apple Keyboard

Sustainability Strategies

Dematerialization (Materials, Energy & Transportation)

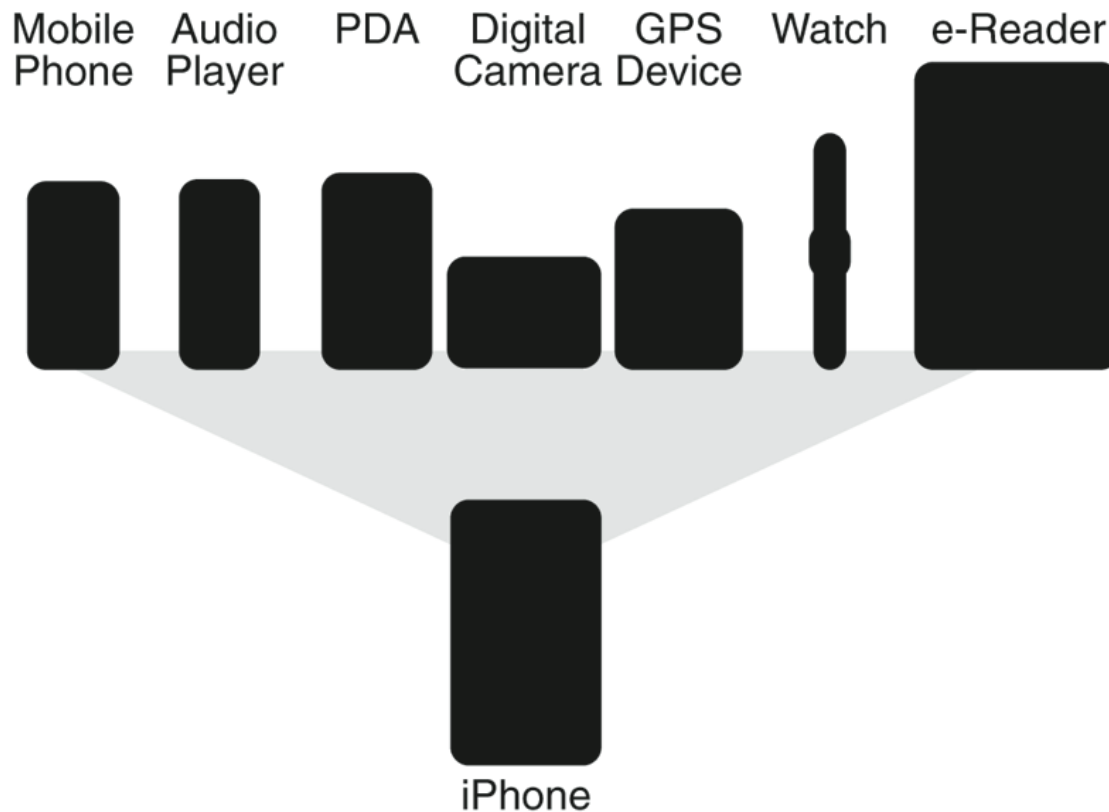


Apple packaging

Sustainability Strategies

Dematerialization

(Materials, Energy & Transportation)



Sustainability Strategies

Substitution

(Materials, Energy & Transportation)



Mirra chair,
Herman Miller

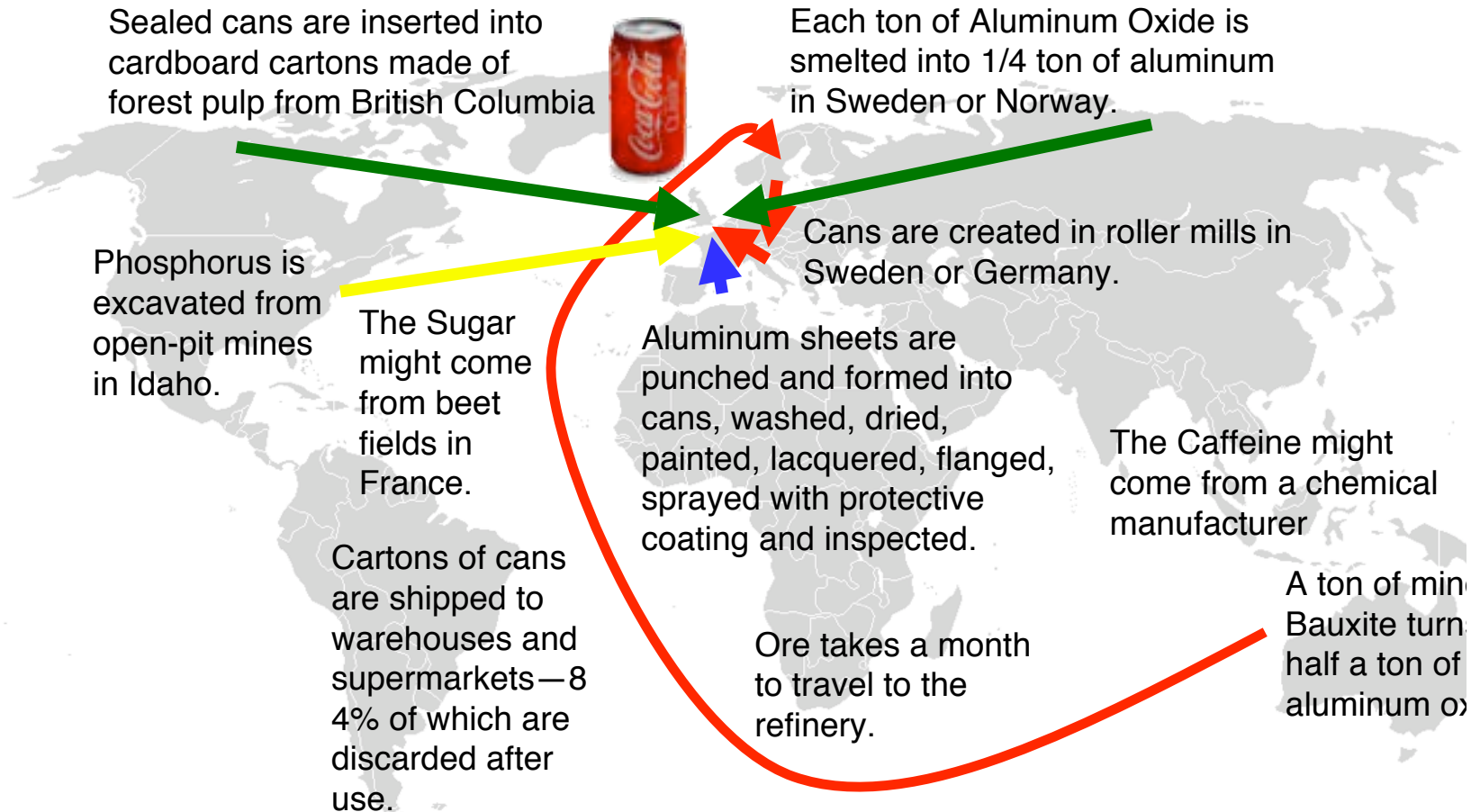
Less expensive,
less toxic, and
more sustainable:

- Raw materials
- Components
- Energy sources

Sustainability Strategies

Localization

(Materials, Energy & **Transportation**)



Lovins, et al.

Sustainability Strategies

Transmaterialization



Zip Cars

Sustainability Strategies

Transmaterialization



Interface FLOR
carpet

Sustainability Strategies

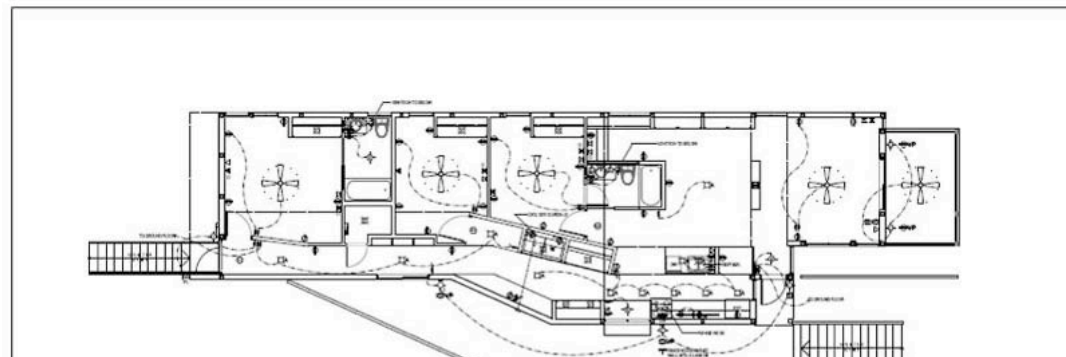
Informationalization



iTunes Music Store

Sustainability Strategies

Informationalization



Open Architecture
Network,
Architecture for
Humanity

Sustainability Strategies

These are the major strategies:

Reduce

Reuse

- Design for Durability
- Design for Reuse

Recycle

Restore

Sustainability Strategies

Design for Durability



- Higher quality/longer lasting
- Servicable/Repairable
- Upgradable
- Component service
- Rental system (components and/or offering)

Dyson vacuum

Sustainability Strategies

Design for Reuse (unintended)



ArtecnicatranSglass
vases

Sustainability Strategies

Design for Reuse (intended)

Reuse of: Materials, Energy, Components, and Functions

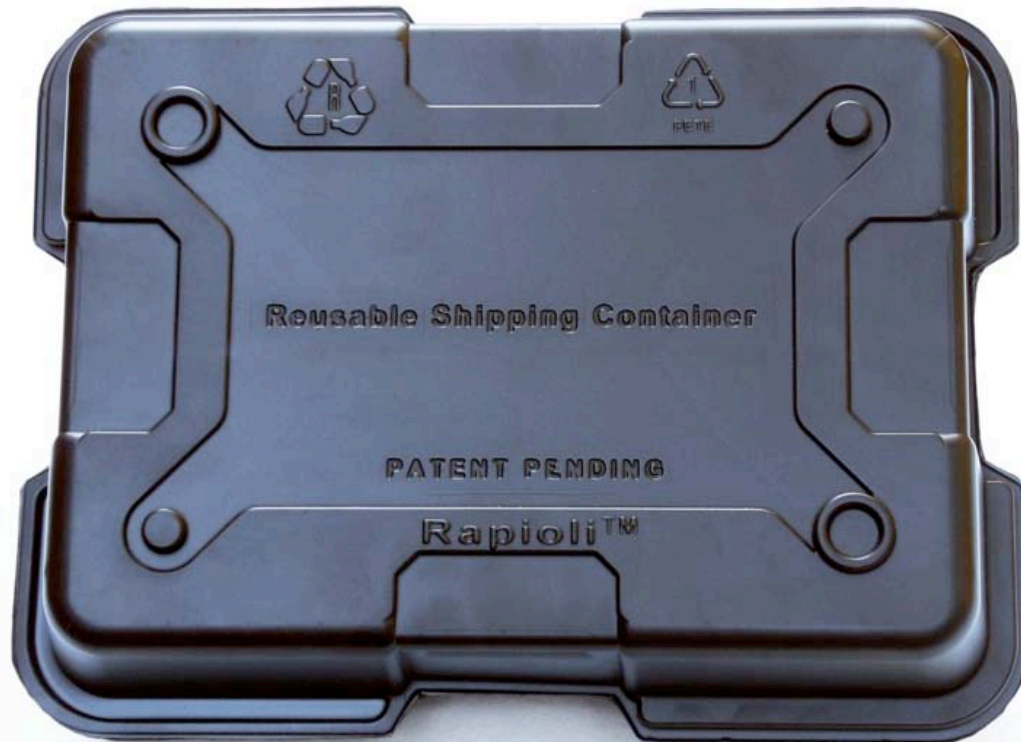


Maille condiment jars

Sustainability Strategies

Design for Reuse (intended)

Reuse of: Materials, Energy, Components, and Functions



Rapioli reusable shipping package

Sustainability Strategies

These are the major strategies:

Reduce

Reuse

Recycle

- Design for Disassembly
- Close the Loop
- Design for Effectiveness

Restore

Sustainability Strategies

Design for Disassembly

- Product redesign
- Labeled components
- Uni-material components



Rickshaw Zero bag

Sustainability Strategies

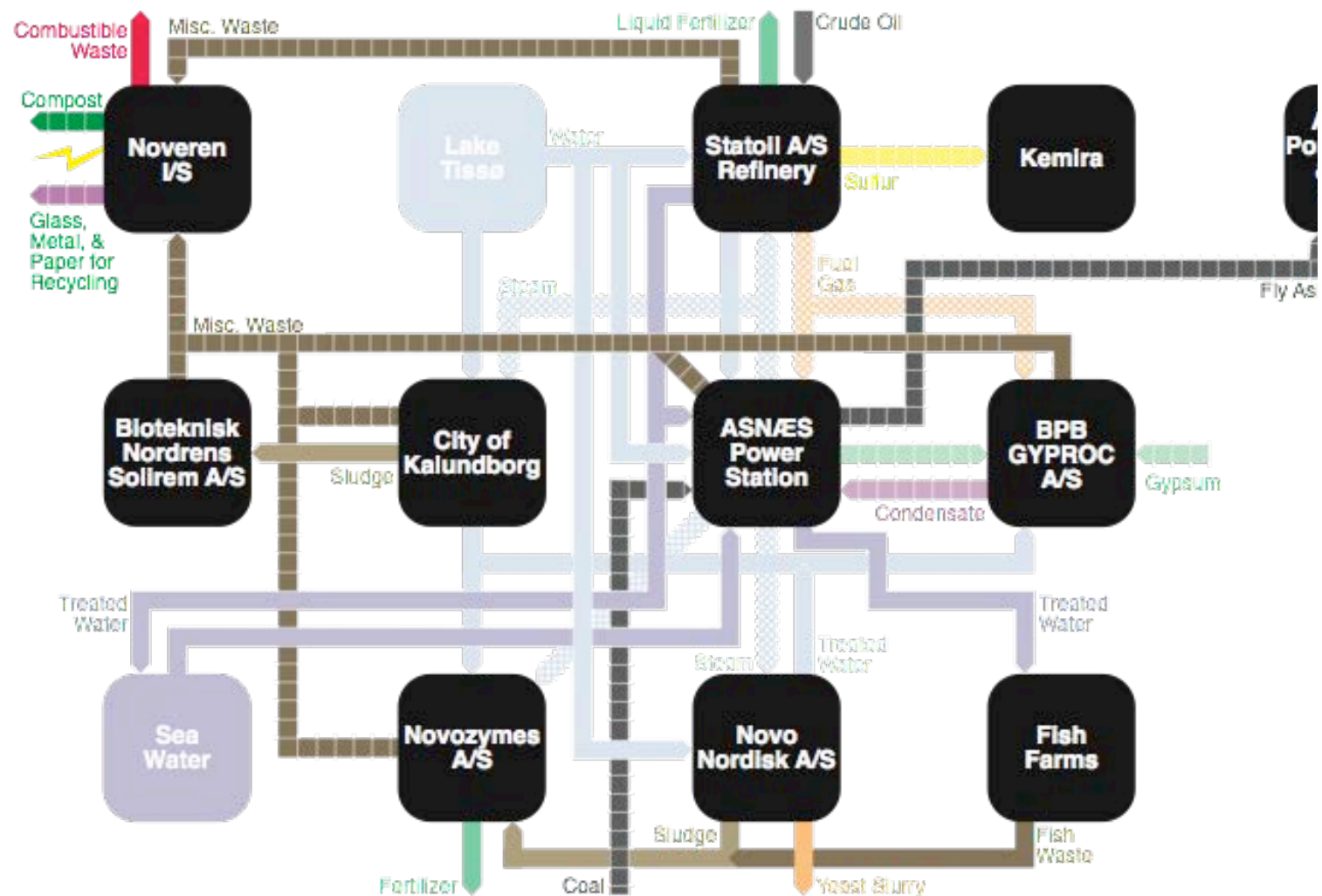
Design for Disassembly

- Use materials identification labels
- Avoid permanently attached, dissimilar materials
- Design for ease of disassembly (snap fits vs. screws)
- Use only one polymer type per product
- Use only one polymer-color combination per product
- If necessary, use compatible

From Eric Masanet,
UC Berkeley

Sustainability Strategies

Close the Loop



Kalundborg,
Denmark

Sustainability Strategies

Design for Effectiveness

- Process redesign
- Take-back programs
- Eco-industrial parks/industrial estates

Rickshaw Bags



Sustainability Strategies

These are the major strategies:

Reduce

Reuse

Recycle

Restore

- Design for Systems

Sustainability Strategies

Design for Systems

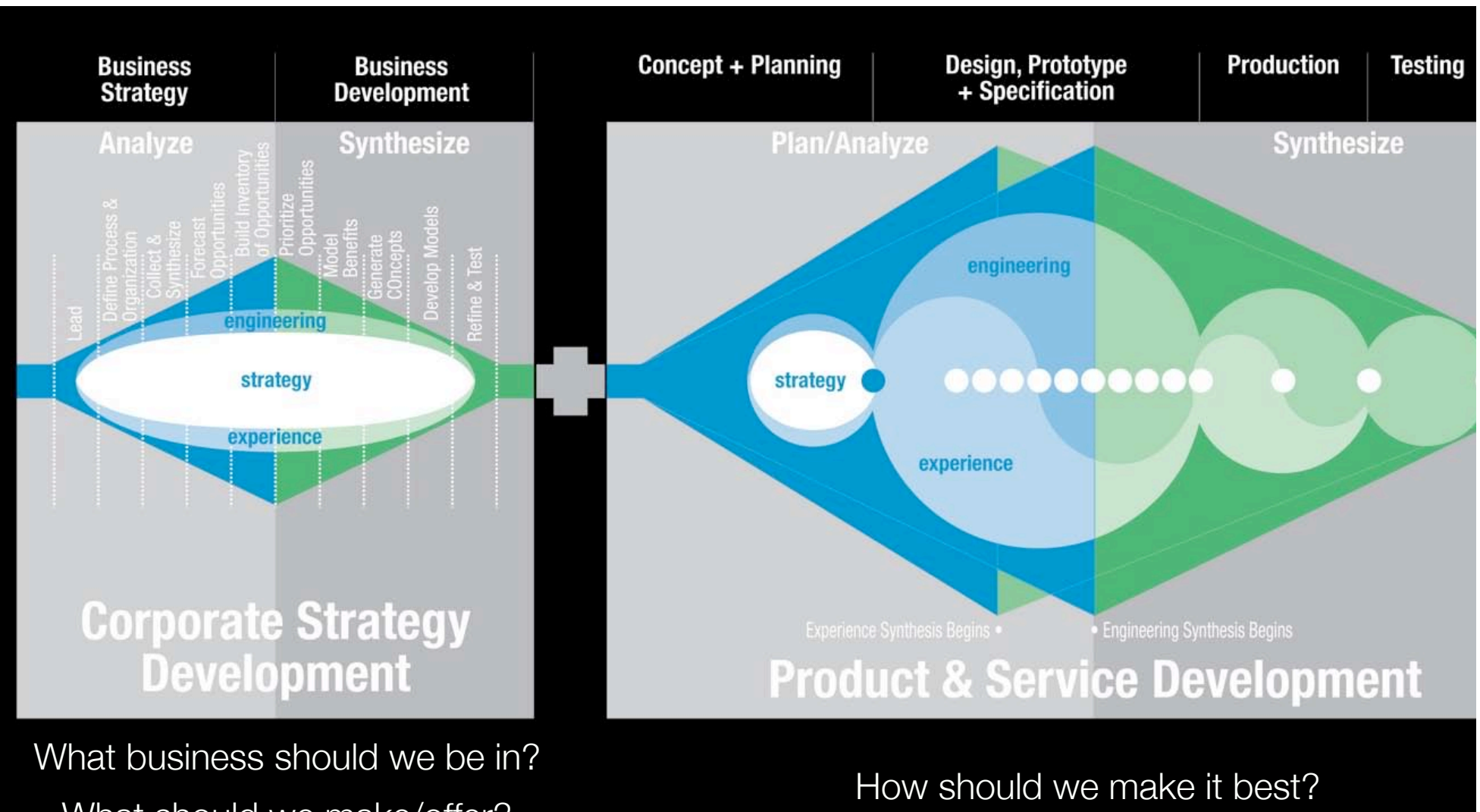


Curitiba, Brazil

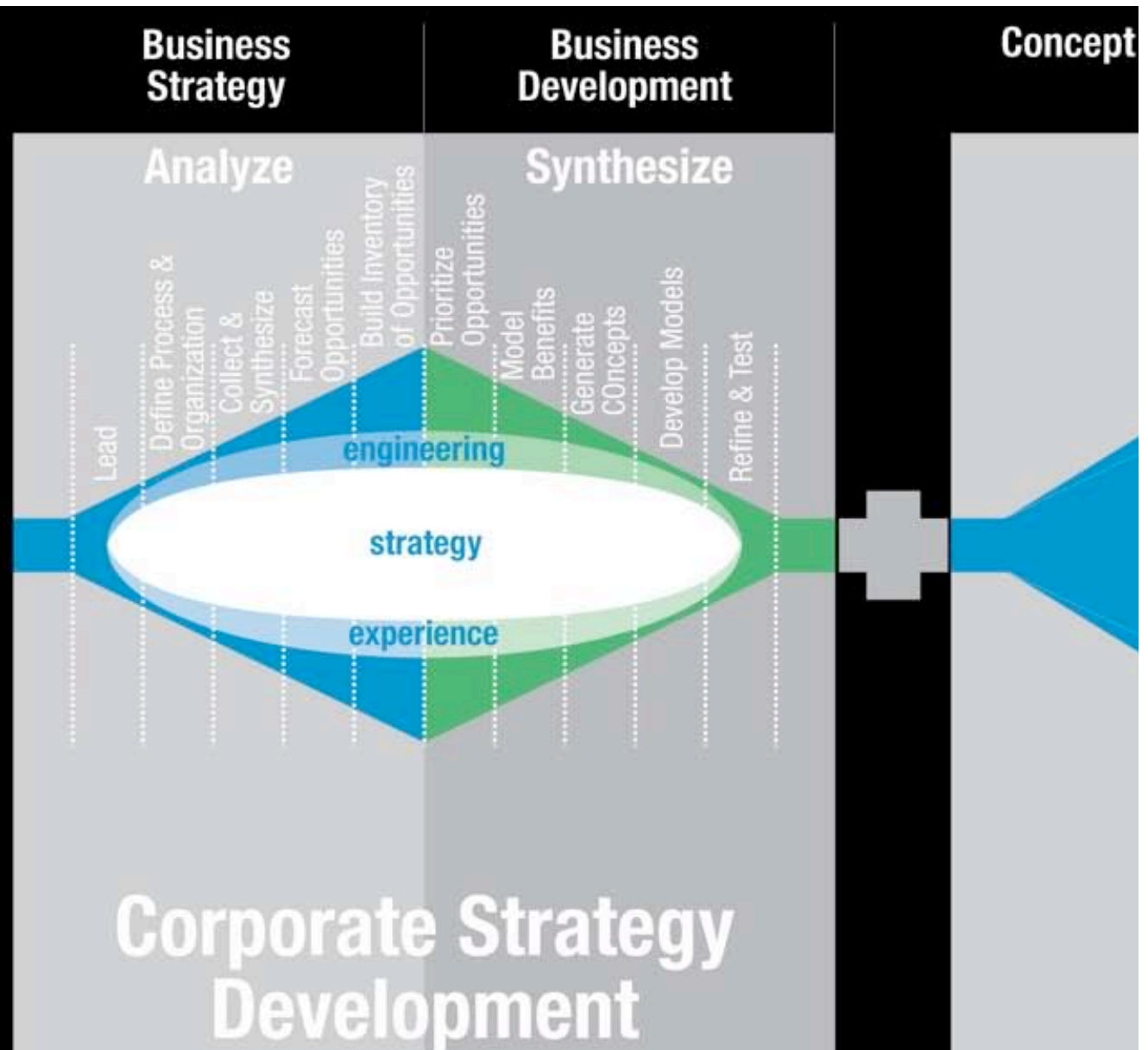
Sustainability Development Process

- User-centric (design and user research)
- Strategic/whole-systems-oriented
- Integrating frameworks and tools into the
process
- Focused on innovation
- Iterative/prototyping (experience, paper working, etc.)

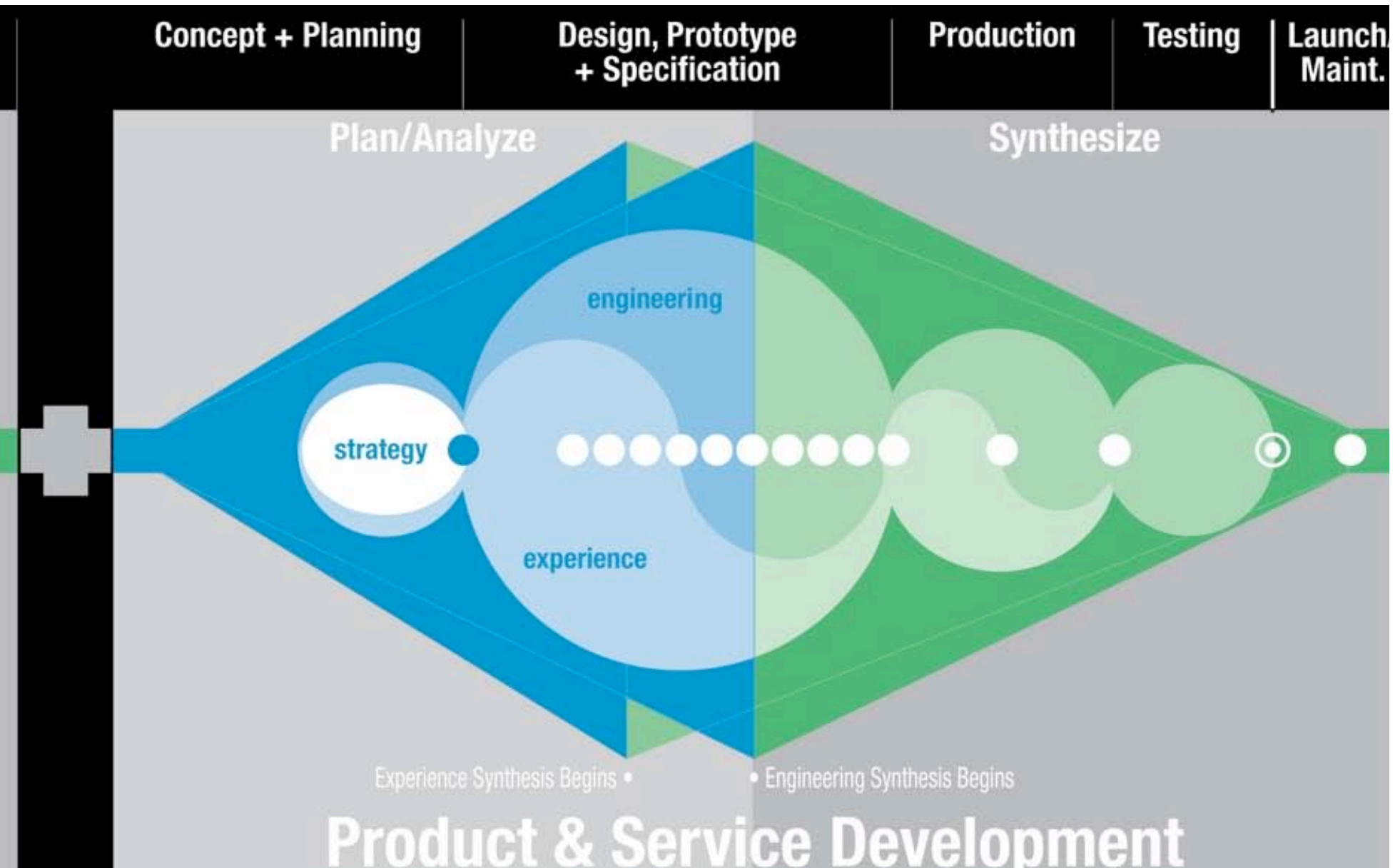
Sustainability Development Process



Sustainability Development Process



Sustainability Development Process



Sustainability Development Process

Measuring Results:

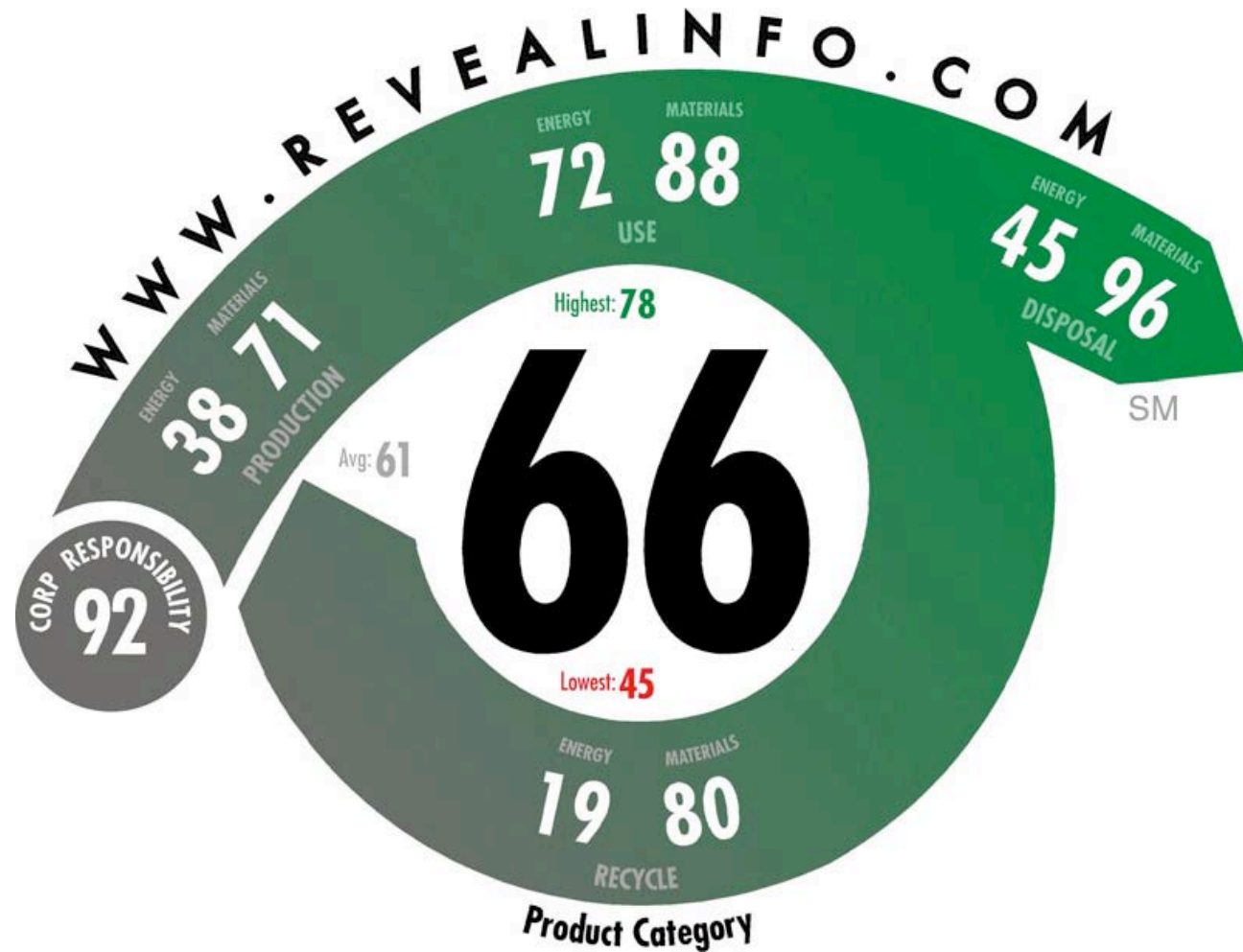
- Testing
- Labeling and Rating Systems
- Molecular-based LCA
- Tools
- Regulation (a tool)

Sustainability Development Process



GRI (Global Reporting Initiative) —redesigned by Covive

Sustainability Development Process



Reveal Rating System: revealinfo.com

Sustainability Development Process

Declaring Results:

- Green washing
- Does your brand reflect these values?
- Does your company reflect these values?
- Don't spend more declaring your results
than the results themselves are worth
- It may be easier to “sell” *efficiency* or
... ..

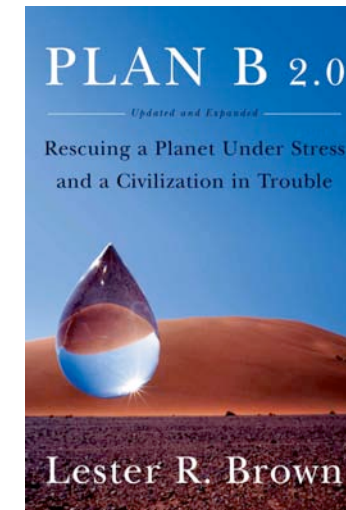
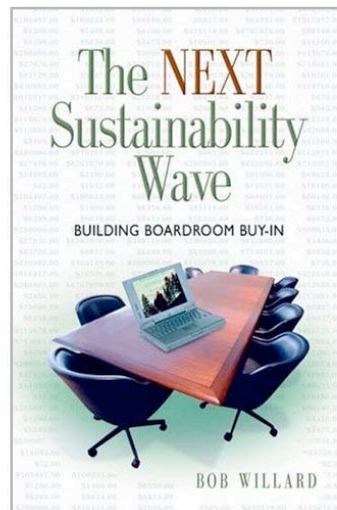
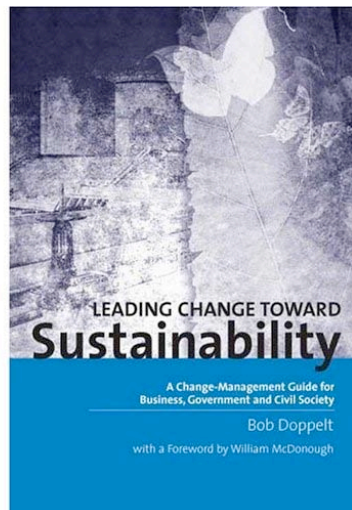
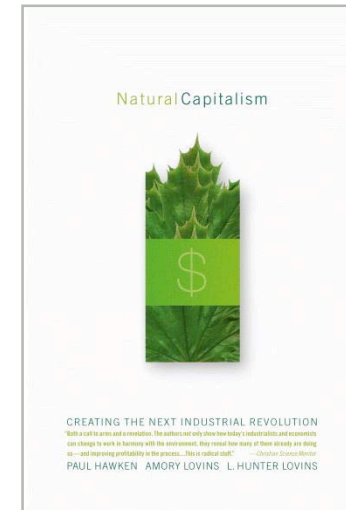
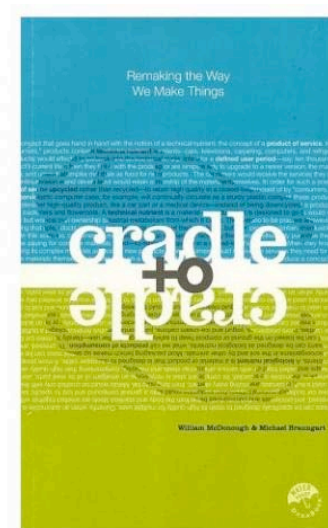
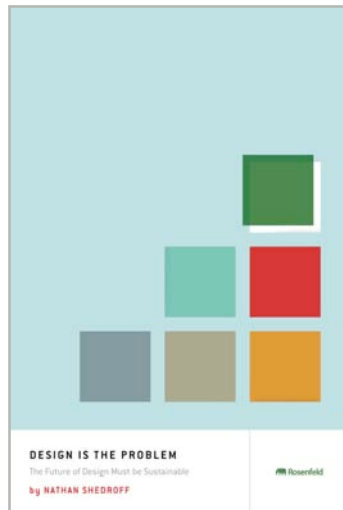
Sustainability Strategies

Summary/Checklist:

1. **Provide More** (value, meaning, performance)
for Less (materials and energy)
2. **Focus on Efficiency and Health**
3. **Use & Promote Local energy, resources, and labor**
4. **Don't use PVC**
5. **Design solutions to be savored**
6. **Don't spend more declaring your results than the value they provide**

Sustainability Strategies

Next Steps:



Sustainability Strategies

Now for the rest of the questions...