CLIMATE CHANGE IN HEALTHCARE: Driving Innovation through the hacking process

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TECHTOOLS - CEO  
INSPER – PROFESSOR TECHNOLOGICAL INNOVATION

www.linkedin.com/pulse/climate-change-healthcare-lucien-engelen
# Three Models for Innovation

<table>
<thead>
<tr>
<th>Corporate Innovation</th>
<th>Simi-Open Innovation</th>
<th>Open Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• New products are mostly incremental innovation of current products</td>
<td>• Balance between external and internal resources</td>
<td>• Designed for disruptive innovation</td>
</tr>
<tr>
<td>• Semi-independence of corporate structures and culture</td>
<td>• Cooperation and coopetition</td>
<td>• Maximum leverage of external resources to generate innovation</td>
</tr>
<tr>
<td>• Capacity to tackle projects of significance (time- and financial wise)</td>
<td>• Capacity to leverage resources of multiple origins</td>
<td>• Collaboration and cooperation in network structures</td>
</tr>
<tr>
<td>• Abundance of Human Resources and potential leadership</td>
<td>• Corporate resources collaborate with external network</td>
<td>• Interdisciplinary and multiple competences from non-obvious sources</td>
</tr>
<tr>
<td></td>
<td>• Use of partnerships to bring products to market</td>
<td>• Extensive use of partnerships to bring products to market</td>
</tr>
<tr>
<td></td>
<td>• Capacity to reinvent corporation and test new business models</td>
<td></td>
</tr>
</tbody>
</table>
# Types of Innovation

The Innovator’s dilemma (Clayton Christensen): how successful, outstanding companies can do everything “right” and yet still lose their market leadership – or even fail – as new, unexpected competitors rise and take over the market (ex. Encyclopedia Britannica vs. Encarta vs Wikipedia).

<table>
<thead>
<tr>
<th>Product / Solution Functionalities</th>
<th>Value Delivery Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kept</td>
<td>Reinforced</td>
</tr>
<tr>
<td>Modified</td>
<td>Eliminated of Altered</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kept</th>
<th><strong>Incremental Innovation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(“faster, better, cheaper”)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modified</th>
<th><strong>Modular Innovation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(same activities using a different delivery medium, different tools, different UI, etc.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Radical or Disruptive Innovation</th>
<th>Architectural Innovation</th>
</tr>
</thead>
</table>

**Corollary:** “best way for upstarts to attack established competitions is to disrupt them”.
iPod – An example of disruptive innovation

• The iPod entered the market for the first time in 2001. At that time, the iPod had a performance that was **inferior** to requirements of the market where it competed.

• It was when the **iTunes store** was introduced that the iPod kick-start its success career, as it got repositioned to compete in a different market (**music**, instead of the computing gadget), with a different business model altogether.

• Its **size**, **charm** and **elegance** made sales sky rocket. Other factors that influenced its success were an excelled **portability** and the landmark **easy-to-use** interface of Apple computing devices. Put altogether, where attributes transformed the the iPod in the king of a category it created for itself: the **personal jukebox**.
Auto-cannibalization as part of the survival strategy

The greatest challenge for most established businesses is to understand that conscious “auto cannibalization” of its “cash cow” products and services by new disruptive ones, at lower contribution margins in the short term, is indispensable if the organization wishes to prevail or say the least even survive in today’s competitive landscape.

Extreme conservatism protects old “players” and established procedures in today’s healthcare.

**Tsunami effect:** “when Dr. McCoy’s Tricorder becomes reality, it will be too late to keep on practicing medicine the traditional way...”
Examples of Innovation Models

Corporate Innovation

Simi-Open Innovation

Open Innovation

Hospitals discover their inner venture capitalist

By Beth Kutscher | April 9, 2016

Tom Gordon, retired CEO of Cedars-Sinai Medical Network, welcomes guests to the Techstars Healthcare Accelerator kickoff event at the Cedars-Sinai Innovation Space. The 11 startups accepted into the program were announced March 28 at the event.

When Cedars-Sinai Health System launched a program last year to help young companies get off the ground, it received 500 applications for 11 spots.
Corporate Innovation = implementation of creative ideas that generate value mostly via reduction of costs, increase of sales, or both
Corporate Ventures in Healthcare

Most Active Healthcare Corporate Venture Capital Investors
by Unique Companies Invested, Q1'11 - Q1'14

- Novartis Venture Funds
- Johnson & Johnson
- SR One
- Novo Ventures
- Pfizer Venture Investments
- MS Ventures
- Roche Venture Fund
- Kaiser Permanente Ventures
- Lilly Ventures
- Fletcher Spaght Ventures
- Astellas Venture Management
- Medimmune Ventures
Corporate Ventures in Healthcare

Healthcare Corporate Venture Capital Investments by Industry
as % of deals, Q1'11 - Q1'14

- Medical Devices & Equipment: 29%
- Drug Development: 24%
- Biotechnology: 21%
- Pharmaceuticals / Drugs: 8%
- Drug Discovery: 7%
- Drug Delivery: 5%
- Disease Diagnosis: 3%
- Other: 3%
Most Influential Corporate Ventures

Most influential healthcare corporate venturing divisions

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company name</th>
<th>Location</th>
<th>Corporate venturing name</th>
<th>Founded</th>
<th>Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Novo Nordic</td>
<td>Denmark</td>
<td>Novo Ventures</td>
<td>1967</td>
<td>$5bn</td>
</tr>
<tr>
<td>2</td>
<td>Johnson &amp; Johnson</td>
<td>US</td>
<td>Johnson &amp; Johnson Development Corporation</td>
<td>1973</td>
<td>$47bn</td>
</tr>
<tr>
<td>3</td>
<td>Amgen, Inc.</td>
<td>US</td>
<td>Amgen Ventures</td>
<td>1980</td>
<td>$1bn</td>
</tr>
<tr>
<td>4</td>
<td>Novo Nordisk</td>
<td>Denmark</td>
<td>Novo Ventures</td>
<td>2009</td>
<td>$1bn</td>
</tr>
<tr>
<td>5</td>
<td>Gedeon Richter</td>
<td>UK</td>
<td>GR One</td>
<td>1846</td>
<td>$400m</td>
</tr>
<tr>
<td>6</td>
<td>Astellas Pharma USA</td>
<td>US</td>
<td>Astellas Venture Partners</td>
<td>1993</td>
<td>$3bn</td>
</tr>
<tr>
<td>7</td>
<td>Pfizer</td>
<td>US</td>
<td>Pfizer Strategic Investments Group</td>
<td>1985</td>
<td>$25bn per year</td>
</tr>
<tr>
<td>8</td>
<td>Baxter</td>
<td>US</td>
<td>Baxter Ventures</td>
<td>2007</td>
<td>$1.2bn</td>
</tr>
<tr>
<td>9</td>
<td>Genentech</td>
<td>US</td>
<td>Genentech Ventures</td>
<td>2005</td>
<td>$2bn</td>
</tr>
<tr>
<td>10</td>
<td>Merck</td>
<td>US</td>
<td>Merck Ventures</td>
<td>2007</td>
<td>$1.2bn</td>
</tr>
<tr>
<td>11</td>
<td>Daiichi Sankyo</td>
<td>Japan</td>
<td>Daiichi Sankyo Ventures</td>
<td>2005</td>
<td>$3bn</td>
</tr>
<tr>
<td>12</td>
<td>Mitsubishi Tanabe Pharma</td>
<td>Japan</td>
<td>Mitsubishi Tanabe Pharma Ventures</td>
<td>2005</td>
<td>$3bn</td>
</tr>
<tr>
<td>13</td>
<td>Teijin Pharma</td>
<td>Japan</td>
<td>Teijin Research Venture</td>
<td>2005</td>
<td>$1bn</td>
</tr>
<tr>
<td>14</td>
<td>Astellas USA</td>
<td>US</td>
<td>Astellas Venture Partners</td>
<td>2005</td>
<td>$3bn</td>
</tr>
<tr>
<td>15</td>
<td>Medtronic</td>
<td>US</td>
<td>Medtronic Ventures</td>
<td>2003</td>
<td>$3bn</td>
</tr>
<tr>
<td>16</td>
<td>Biogen Idec</td>
<td>US</td>
<td>Biogen Ventures</td>
<td>2007</td>
<td>$250m</td>
</tr>
<tr>
<td>17</td>
<td>AstraZeneca</td>
<td>UK</td>
<td>AstraZeneca Ventures</td>
<td>2005</td>
<td>$1.2bn</td>
</tr>
<tr>
<td>18</td>
<td>Sanofi</td>
<td>France</td>
<td>Sanofi Ventures</td>
<td>2005</td>
<td>$200m</td>
</tr>
<tr>
<td>19</td>
<td>Novo Nordisk</td>
<td>Denmark</td>
<td>Novo Growth Equity</td>
<td>2007</td>
<td>$1bn</td>
</tr>
<tr>
<td>20</td>
<td>Merck KGaA</td>
<td>Germany</td>
<td>Merck KGaA Ventures</td>
<td>2009</td>
<td>$3bn</td>
</tr>
</tbody>
</table>

* Limited Partner interest.

Source: Global Corporate Venturing
GE Ventures (GE’s CVC)

HOW WE WORK

Thanks for thinking of GE Ventures. We are always looking for new partners, interested in working with us? See how we work.

We partner with startups to accelerate growth and commercialize innovative ideas in software & analytics, healthcare, energy and advanced manufacturing that will help drive better outcomes for our customers and society.
GE Ventures (GE’s CVC)

HOW WE WORK

Thanks for thinking of GE Ventures. We are always looking for new partners. Interested in working with us? See how we work.

INVESTING

We are innovation accelerators, spotting new trends and creating new opportunities that drive growth for our partners and GE.

NEW BUSINESS CREATION

READ MORE ABOUT NEW BUSINESS CREATION

LICENSING

SCALING

HOW WE WORK
WHERE WE INVEST
WHY WORK WITH US
GE Ventures (GE’s CVC)

HOW WE WORK

Thanks for thinking of GE Ventures. We are always looking for new partners. Interested in working with us? See how we work.

INVESTING

Our partners have access to over 50 years of proven technologies and can tap into GE’s intellectual property to find new ways to bring ideas to market faster.

READ MORE ABOUT LICENSING

NEW BUSINESS CREATION

LICENSING

SCALING

HOW WE WORK

WHERE WE INVEST

WHY WORK WITH US
GE Ventures (GE’s CVC)

HOW WE WORK

Thanks for thinking of GE Ventures. We are always looking for new partners, interested in working with us? See how we work

We are more than just a capital partner. We scale great ideas, connecting companies with the resources that allow them to reach new customers and expand in new markets.

GE Ventures Edge is a holistic and custom approach to supporting the professional development, operational and commercial excellence of our partner companies. We leverage the global scale, expertise and resources of GE to give our portfolio companies an Edge to build, grow and scale.

https://www.geventures.com
Developing and Managing Corporate Ventures

- Four business opportunity formats and the most effective way to organize each of them

<table>
<thead>
<tr>
<th>Degree of operational affinity with the firm</th>
<th>Strategic importance to the firm</th>
<th>1. Establish a new independent “venture”</th>
<th>2. Spin off into a new independent company</th>
<th>3. Abandon</th>
<th>4. Proceed with a small exploratory project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

- Resource transfer process and the role of the “Champion”

New Independent “venture” or spin-off

Resources from Mother company:
- Financial
- Physical
- Intellectual
- Human
Guaranteeing the success for “Corporate Ventures”

- **Increase origination sources of innovation**: new ideas are born and develop from “conversations”. The more people discuss, the better the ideas get.

- **Develop a process for collection and evaluation of ideas**: filter mechanism must be established in order to guarantee only the most promising ideas will be funded.

- **Prevent traditional executives from controlling budget**: risk averse executive will first protect their “departments” before risking into uncertain new projects.

• IDEO e o “Design Thinking” ([http://designthinking.ideo.com/](http://designthinking.ideo.com/))

• EXAGO e o “Idea Market” ([www.exago.com](http://www.exago.com))
Examples of Innovation Models

- Corporate Ventures
- Simi-Open Innovation
- Open Innovation
HACKING HEALTH IS A GLOBAL NON PROFIT ORGANIZATION
Hacking Health is a global movement to improve healthcare.

We choose to unite in the pursuit of a common mission: Breaking down barriers to innovation in healthcare.

In the face of increasingly complex health issues, we engage all stakeholders inside and outside the healthcare sector. By facilitating cross-disciplinary collaborations, we help generate fresh insights and creative solutions to current challenges. We find new ways to make the best ideas emerge and generate lasting impact.

In these days of fundamental societal transformation driven by technology, we bring together patients, healthcare professionals, physicians, technologists, designers, entrepreneurs, decision makers, business leaders, researchers, administrators and governments to work collaboratively and resolve tangible issues.

**FROM THE BOTTOM UP. BETTER. FASTER.**

Do you want to bring about meaningful change in healthcare? Are you looking to make a change in a complex system, to shift the focus to patients and solutions?

Welcome to Hacking Health.
The organization was founded to relentlessly spearhead improvements in healthcare. This goal remain our guiding beacon over time.

**WHERE ARE WE?**

- **2011**
  - IT ALL STARTED WITH AN IDEA: WHAT IF WE COULD HACK HEALTHCARE?
  - Canada: Montreal, Toronto, Edmonton, Vancouver

- **2012**
  - BRINGING HACKATHONS TO HEALTHCARE

- **2013**
  - LAUNCHING HH CAFÉS TO BUILD COMMUNITIES
  - Canada: Montreal, Toronto, Edmonton, Vancouver

- **2014**
  - SETTING UP CROSS BORDER COLLABORATIONS
  - Canada: Ottawa, London, Winnipeg, Saskatoon, Calgary, Whitehorse, Quebec, Edmonton, South Africa, Cape Town, Hong Kong

- **2015**
  - BUILDING A REAL INTERNATIONAL MOVEMENT - 21 active chapters
  - Together we are stronger. Local leaders chose to unite and build a global movement together, rather than working in isolation. We learn from each other, share insights and network, and go further.

- **2016**
  - EXPANDING NATIONAL & INTERNATIONAL PRESENCE & IMPACT - 45 active chapters
  - Mexico City: Monterrey, Guadalajara
  - South America: Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Lima, Bogota, Medellin, Chile
  - Spain: Barcelona, Valencia, Madrid, Bilbao
  - France: Bordeaux, Lyon, Nice, Le Havre
  - UK: London, Manchester, Birmingham
  - Australia: Sydney, Melbourne, Canberra
  - Canada: Montreal, Toronto, Edmonton, Vancouver

**EXEMPLARY GROWTH OF HACKING HEALTH CITIES**

- **2013:** 4 cities
- **2014:** 13 cities
- **2015:** 26 cities
- **2016:** 55 cities

**HACKING HEALTH**
HOW WE GOT WHERE WE ARE

PROGRESSIVELY BUILDING ECOSYSTEMS OF INNOVATION

Events are a way to connect, engage, educate, inspire, but the ultimate goal is to transform healthcare. Hacking Health leaders and communities tackle this endeavor one step at a time, relentlessly growing in impact and maturity towards that final vision. Ultimately, Hacking Health leaders act as brokers of innovation in their communities.

STEP 1
BUILD COMMUNITY
Connect stakeholders: healthcare professionals, patients, developers, engineers, designers, clusters, entrepreneurs, investors.

STEP 2
SHARE KNOWLEDGE
Allow these communities to meet in person and exchange by hosting year round events. We help actors teach others about technology, healthcare and creativity through Cafés, Conferences, Workshops.

STEP 3
ENABLE COLLABORATIVE ACTION
Partner with other organizations to enable collaborative action which act as catalysts: design days, ideathons, hackathons, design challenges, cooperations.

STEP 4
ACCELERATE IMPACT
Facilitate collaborative action and project implementation - this is made possible through the strong connections now established between participants and partnering institutions & companies. This is also where accelerators and incubators help or create some startups.

HACKING HEALTH
In all cities and regions, Hacking Health systematically engages and works hand-in-hand with established actors. Together, as complementary actors, we achieve stronger results. We’re here to re-energize partners with new tools, resulting in modern approaches to our partners’ own missions. We’re not just getting individuals to work together. We’re fostering collaboration between organizations, too.
Examples of Innovation Models

- Corporate Ventures
- Simi-Open Innovation
- Open Innovation

TechTools Group
SCOUTING & ENABLING INNOVATION
The largest global Corporation do not know how to exploit all the potential IPable content it develops.

Demand for Innovation to Improve Competitiveness in the Market

New IP > Increased Competitiveness

Potential IP > Waste

Startup Ecosystem

New companies & products

Corporation's IPs in the rough

TechTools Innovation Model

Corporate venture builder
Open and semi-open innovation: in search of "out of the box" value creation.

Large corporate structures focus on cost control.
Collaborative Value Creation: Corporate Venture + Start-up Community

Value Proposition and Barriers to New Entries Built Together by both Ecosystems working together (Corporate + Start-Up)