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Shaping the Digital Landscape
A show of hands . . .
Complexity ...
. . . we manufacture it in pico seconds . . .
and make new discoveries every minute of everyday . . .
“Every 2 days, we create as much information as we did since the dawn of civilization to 2003.”

- Eric Schmidt, Google
Immigration Roadmap
Early Education Support System
IT Challenges

- Speed at which technologies/processes are changing and volume of changes.
- Too much data and variety: social media, video, voice, text, etc.
- Implementing a cohesive IT architecture.
- Budget/resource constraints: new IT funding models to sustain core services/ support innovation/ facilitate growth.
- Hiring/retaining qualified staff.
- Training/education.
- Increased reliance on out-sourcing: managing and integrating highly specialized functions.
- New standards for security: balancing openness, security, and agility.
- Changing regulatory requirements, laws, standards.
- Growing diversity of user support: mobile, cloud, visualization, analytics, etc.
- Improving/measuring user (student/researcher) outcomes.
- Organizational bureaucracy and silo-ing.
- Cultural resistance to change. Fear of failure.
Drowning in Data and Options

Velocity
Volume
Variety
Veracity
but biological change - *evolution* - often requires millions of years.
Two Clocks

The rapid pace of progress

The slow pace of evolution
The uneven rate of change between biology and complexity causes a gap to occur.
What happens when complexity races ahead of the brain's ability to understand it?
Every organization and society reaches a “cognitive threshold.”
When complexity makes knowledge difficult to attain, we substitute knowledge with unproven beliefs.
What is a belief?

- Unproven.
- Cognitively inexpensive.
- Small and large.
Ancient Beliefs
Over time, complexity causes beliefs to dominate, and knowledge takes a back seat.
Blood-letting
We become susceptible to unproven claims, and follow false prophets.
Decisions/policies are shaped by irrational beliefs, rather than knowledge and fact.
Mayan Fetishism and Sacrifice
There’s another reason complexity leads to gridlock.
When organizations are young, problems are simple, easily managed by linear processes and solutions.
Over time problems become larger, more complex: the number of wrong solutions exceed the number of right ones.
We enter a "High Failure-Rate Environment"
According to Dr. Yaneer Bar-Yam:

“A complex environment demands picking the right choice in order to succeed. If there are many possibilities that are wrong, and only a few that are right, we have to be able to choose the right ones in order to succeed.”
A Reoccurring Pattern

• The first sign complexity is outpacing our cognitive abilities is gridlock. We encounter a High Failure-Rate Environment.

• The second sign is the inability to distinguish unproven beliefs from facts.

• The third is decision-making and policy become irrational/political.
“We live in a time when we have Paleolithic emotions, Medieval institutions, and God-like technology.”

Dr. E.O. Wilson
How can we break the cycle?
The highest instrument of our genetic inheritance is our ability to preview future consequences, then act to shape outcomes.
We were born with the advantage of foresight. No organism has as extensive an ability to generate imaginary scenarios, quickly prioritize those scenarios, then act, in advance, to avoid danger as the human species.
Foresight and Innovation To The Rescue!
SYSTEMIC INNOVATION
The Art of Fast Adaptation.
Six Simple Steps
Step 1: Identify the user need/challenge.

Step 2: Categorize product/service solutions into MARKET-DRIVEN or MOONSHOT innovations.

Step 3: Develop 2 distinct processes: criteria, funding, approvals, launch plan, metrics for success, life cycle management, etc., for each innovation type. Include “pre-mortems.”
Step 4: Align talent according to predispositions and innovation type.

Step 5: Evangelize, evangelize, evangelize.

Step 6: Systematize and institutionalize.
Build an adaptive, innovative culture.
Sounds simple.
SIMPLE
is not the same as
EASY
Step 1
Identify the user challenge/need.

OUTWARD-facing:
- a) New users/markets
- b) Partners
- c) Competition
- d) Tech/Science Trends
- e) Demographic/Social Trends

INWARD-facing:
- a) Departments
- b) Divisions/Sites
- c) Current Users
Take an early stand. What is our position?
DON’T SWEAT THE DETAILS,

THESE COME LATER
Step 2
Categorize product/service solutions into MARKET-DRIVEN or MOONSHOT innovations.

MARKET-DRIVEN:
answer EXISTING market need INCREMENTAL!

MOONSHOT:
create NEW market need DISRUPTIVE!
Step 3
Create 2 distinct processes

MARKET-DRIVEN
- Fast Development
- Vertical Applications
- Low or No Regulatory Req.
- Known Outcomes/Schedule
- Low Failure / Low Risk
- Small, Short-term Investment
- Fast Adoption
- No or Low IP
- Quantifiable ROI
- Incremental Margin Impact
- Low or No Threat
- Services/Products
- Offensive or Defensive

MOONSHOT
- Slow Development
- Horizontal Application
- Large Regulatory Req.
- Unknown Outcomes/Schedule
- High Failure/High Risk
- Large, Long-Term Investment
- Slow Adoption
- Defensible IP
- Unquantifiable ROI
- High Margin Impact: Leadership
- Potential to Cannibalize Services
- Offensive: “First Strike”
Why Both Matter...

ABOVE PARITY

TOMORROW’S GROWTH:
MOONSHOTS = HIGH DIFFERENTIATION =
HIGH MARGINS / LEADERSHIP POSITION

PARITY

- 1 - 2 - 3 - 4 - 5 - 6 - 7

BELOW PARITY

TODAY’S GROWTH:
RAPID, INCREMENTAL MARKET-DRIVEN
INNOVATIONS
(price is the de facto differentiator)
SINGLE PROCESS?

MARKET-DRIVEN
too slow to market:
chase competitors and markets
- fall behind

MOONSHOT
rush to market:
failure to achieve
market share, leadership,
forecasted ROI
Market-Driven Innovations: speed, speed and more speed.

“Chickens in, Pies out!”
2 Categories of Market-Driven Innovations: vertical and horizontal applications

MICRO
- Narrow Vertical Market Appeal
  - Sports App

MACRO
- Broad Horizontal Market Appeal
  - Distance Learning
The closer to the market the decision, the faster Market-Driven innovations move.
What about Moonshots?
Moonshots are not “market-driven” so they do not originate in marketing. The vast majority of Moonshots come from Research & Development, IT, supply chain, etc.
Moonshot Examples

APPLE: Personal computing, smart phones, etc.
UPS: Customer access to real-time IT tracking data
DELL Made-to-order, consumer-direct.
FED Ex Hub and spoke shipping.
TOYOTA SMED: Single minute die exchange
SALESforce.com: cloud computing
Moonshots are a high risk, high return, endeavor.
We have successful models for high failure rates:

- Venture Capital
- Baseball
- Other
The antidote for more failures than successes:

- Clear criteria for TRIAGE at every level.
- Overall investment similar for both approaches.
Not all failure is desirable, but some is necessary. Which kind?
6 Types of Failure
by Dr. Jamer Hunt


STRUCTURAL FAILURE: Cuts deeply but does not permanently damage. Example: Windows Vista.

GLORIOUS FAILURE: Botched, exhilarating blaze of glory. Example: Jamaican bobsled team.

COMMON FAILURE: Everyday errors, easy to recover from. Example: running late, over-cooking dinner, forgetting a phone call.

VERSION FAILURE: Small failures that lead to incremental improvements over time. Example: Linux operating system.

PREDICTED FAILURE: Failure that is recognized as an essential part of a process. Example: prototyping, adolescence, scientific endeavors.
Predicted Failure = Necessary Failure
ANYONE WHO HAS NEVER MADE A MISTAKE HAS NEVER TRIED ANYTHING NEW.

Albert Einstein
Myth of the “scalable” budget

Due to budget cuts, the light at the end of the tunnel has been turned off.
Similar to government “entitlement programs,” Moonshot budgets must be protected.
Step 4
Align talent according to predispositions

RACERS - vs - CLIMBERS

Market-Driven Profile
Expert multi-tasker, impatient, verbal, intuitive, sociable, politically ambitious, seeks audience, high-energy, judgmental, opportunistic, visually-oriented, cross-cultural, holds meetings, competitive, performance-oriented, sometimes harsh, course-correct on the go, thrives on change, takes action, easily frustrated by process and protocol, practical.

Moonshot Profile
Persistent, analytical, methodical, planner, future oriented, resilient, failure-tolerant, detail-oriented, focused, deep science/technical knowledge, high empathy, enjoys quiet, preference for written communications, thorough, nonpolitical, nurturing, loyal, evidence-driven, highly structured, prefers not to travel, process-focused, deliberate, rarely or never initiates meetings or conf. calls, often idealistic.
Who are the Racers? The Climbers? Do We Have The Right Talent?
GROW

- Are the skills, experience, knowledge available in-house? If not, can I grow them? How, and how fast?
- Are there resources in other divisions I can tap?
- Do current or new partners make sense? Who?

NO

- Are there known “behavioral” issues which will prevent in-house talent from succeeding?
Step 5
Evangelize, evangelize, evangelize.
Alignment is Leverage Strategies, Platforms, Processes, Approvals, Oversight, etc.
Once again,
simple, but not easy.
Step 6
Systematize and institutionalize forward thinking
Reconnaissance is not a part-time job.
Establish a continuous pipeline of innovation: one example

<table>
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<th>RECONNAISSANCE: IDEAS &amp; TRENDS</th>
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| NEW VENTURES:                   |
| Research/Evaluate              |
| VET and Quantify Opportunity   |
| (Triage)                       |
| Accelerate Proof of Concept    |
| Educate: Internal Staff        |
| Obtain Necessary Approvals    |
| Support                        |
| Seamless Hand-Off              |
| Metrics/Tracking               |
| Other                          |

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<tr>
<th>HAND-OFF: TO EXISTING PROCESS, DEPARTMENTS, PERSONNEL</th>
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Attributes of successful reconnaissance and venture teams

1. **AUTONOMY**: arms-length relationship to Mother Ship.
2. **CHEMISTRY AND LEADERSHIP**: courageous, adventuresome, action-oriented, rogue, etc.
3. **CLARITY**: scope, processes, criteria, metrics, responsibilities, expectations
4. **AUTHORITY**: commitment from highest levels of company
5. **BUILD ON EARLY SUCCESS**
6. **FAILURE MANAGEMENT PLAN**
7. **DEFINED RESOURCES**: including cooperation of depts., groups, external partners and experts.
Expectation of Success

Even the most successful venture capital companies plan for an 80-90 percent failure rate. The “wins” are so significant, they more than compensate for a disproportionate number of losses.
A.J. Khubani, founder of Telebrands

10,000 prospective products
1,000 due diligence
100 test market
10 qualified for As Seen On TV
Q.

What is our strategy for...
Cloud-based Team Collaboration Tools
Facial Recognition
Virtual Reality and Data Visualization
Big Data and Predictive Analytics
What condition has red eye, pain, inflammation, blurred vision, floating spots and sensitivity to light?

Possible diagnosis
- Uveitis: 91%
- Iritis: 48%
- Keratitis: 29%

What actions were taken? What treatments were prescribed? What was the outcome?

Family history, patient interview, physical exam, current medications

Learn from results over time

Physician notes, medical journals, clinical trials, pathology results, blogs, Wikipedia

Supports iterative dialogue to refine results

Present responses with confidence

Generates and evaluates hypothesis

Analyzes large volumes of unstructured data

Understands natural language questions
Nanobots and Robotics
Drones
Surveillance
How much, how far?
3-D Printing
Embedded Sensors
CyberSecurity
Holograms
Go-anywhere Mobile Apps

There's an app for that!
The Internet of Things
Brain Fitness
• 23,000 students: 2x academic achievement after 4 years.

• Seniors (over 60) cognitive ability of 35 year-olds.

• Mayo Clinic: brain fitness improves memory 1 decade’s worth.

• Evidence brain fitness fends against Alzheimer's and other degenerative diseases.
In conclusion . . .
How adaptive and innovative are we?

1. How low in the organization is a person authorized to say “NO?” How high do they have to go to get a “YES?” HIPPO?

2. Is risk-taking rewarded? If so, how?

3. Are disruptive “Moonshots” required to meet the same ROI/risk standards as a “Market-Driven” ideas? Do both use a single process for approval, funding, evaluation?
4. What infrastructure and talent is in place to lead/maintain forward-thinking?

5. How do we leverage user, channel, and partner data/history to garner new insights?

6. What is our innovation “metabolism rate?” How much innovation can we handle? How fast?
“The first person to live to be 1,000 years old is alive today.”

Dr. Aubrey de Grey
University of Cambridge
More people
More data
More ways
“Adapt or die.”

Billy Beane
General Manager
Oakland Athletics
Lastly,
the top attributes of high-performing organizations and societies

2. Empirically-based decisions/policy.
4. Predictive and preemptive.
Q&A
Thank you