Innovation @ 50x

Steve Blank
@sgblank
www.steveblank.com

Disruption

In Telecom

Blackberry

Apple

Disruption

In the Automobile Business


Ford
GM
CHRYSLER


Audi
BMW
PORSCHE
OPEL


TESLA


TOYOTA
HONDA
The Power of Dreams
SUBARU
NISSAN
mazda
SUZUKI

Disruption

In the Utility Business

Nuclear

Wind

Coal

Solar

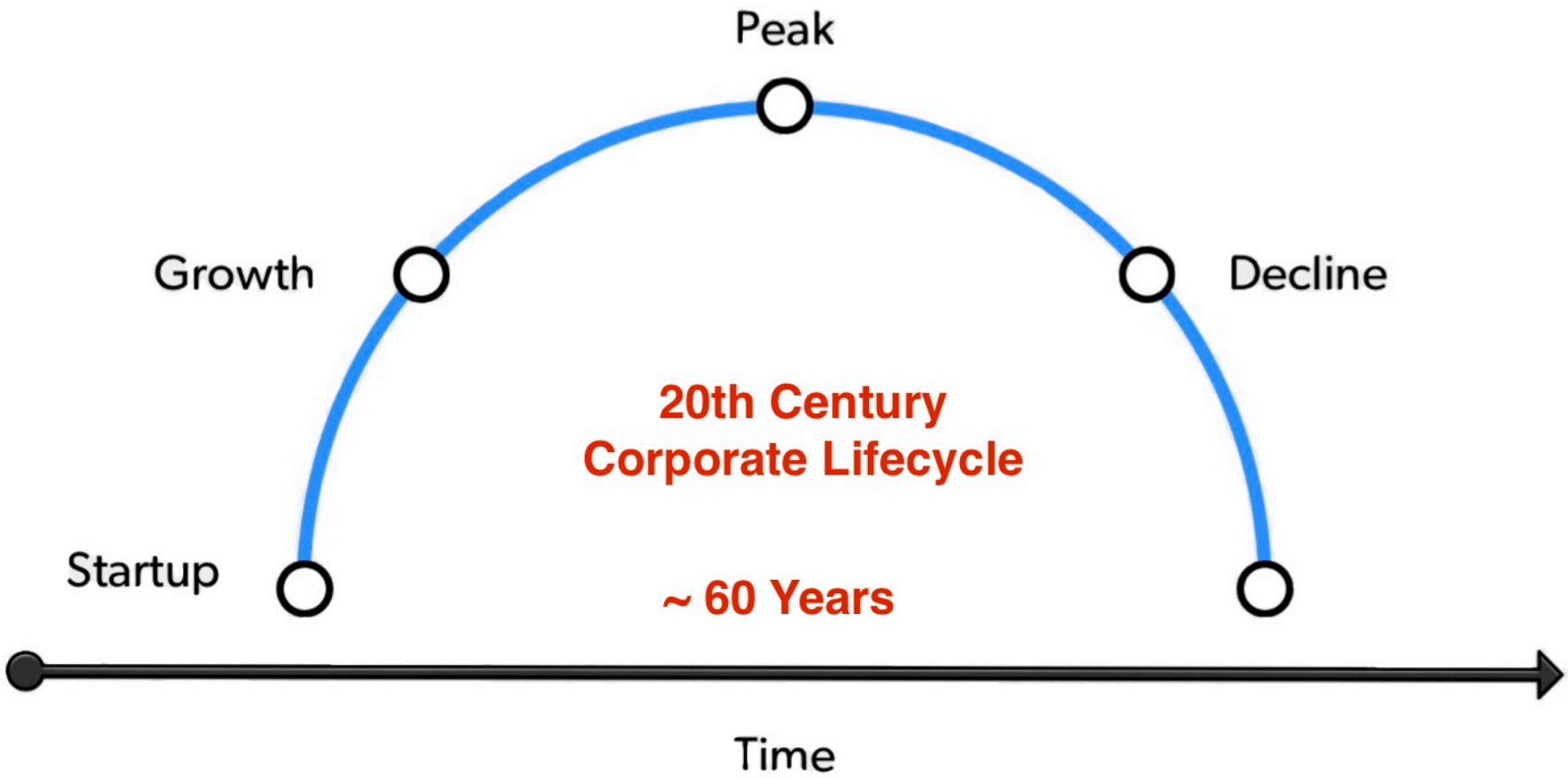
Wind

Utility Scale Batteries

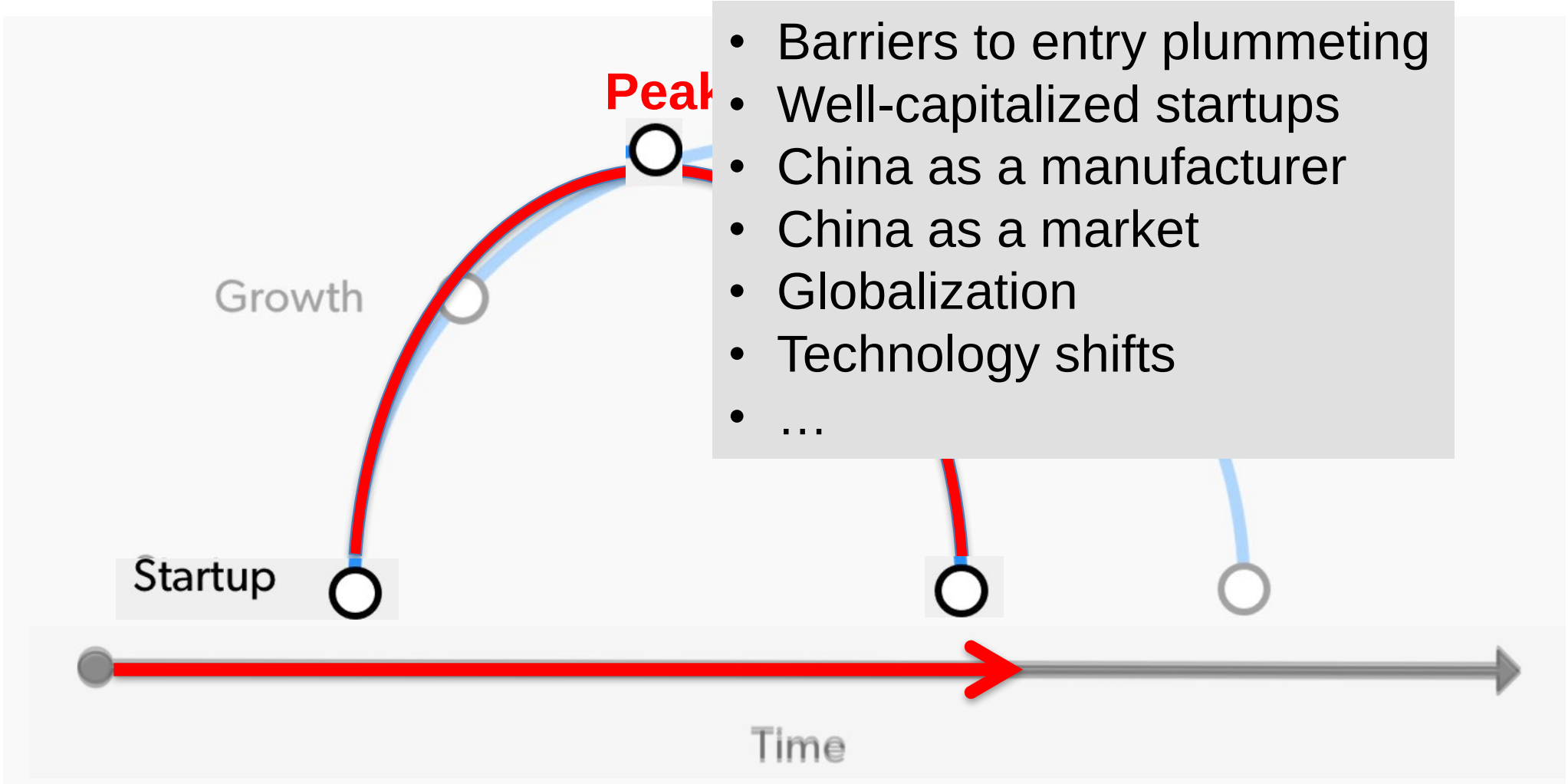
Solar

Grid Tied Cars

20th Century Corporate Lifecycle

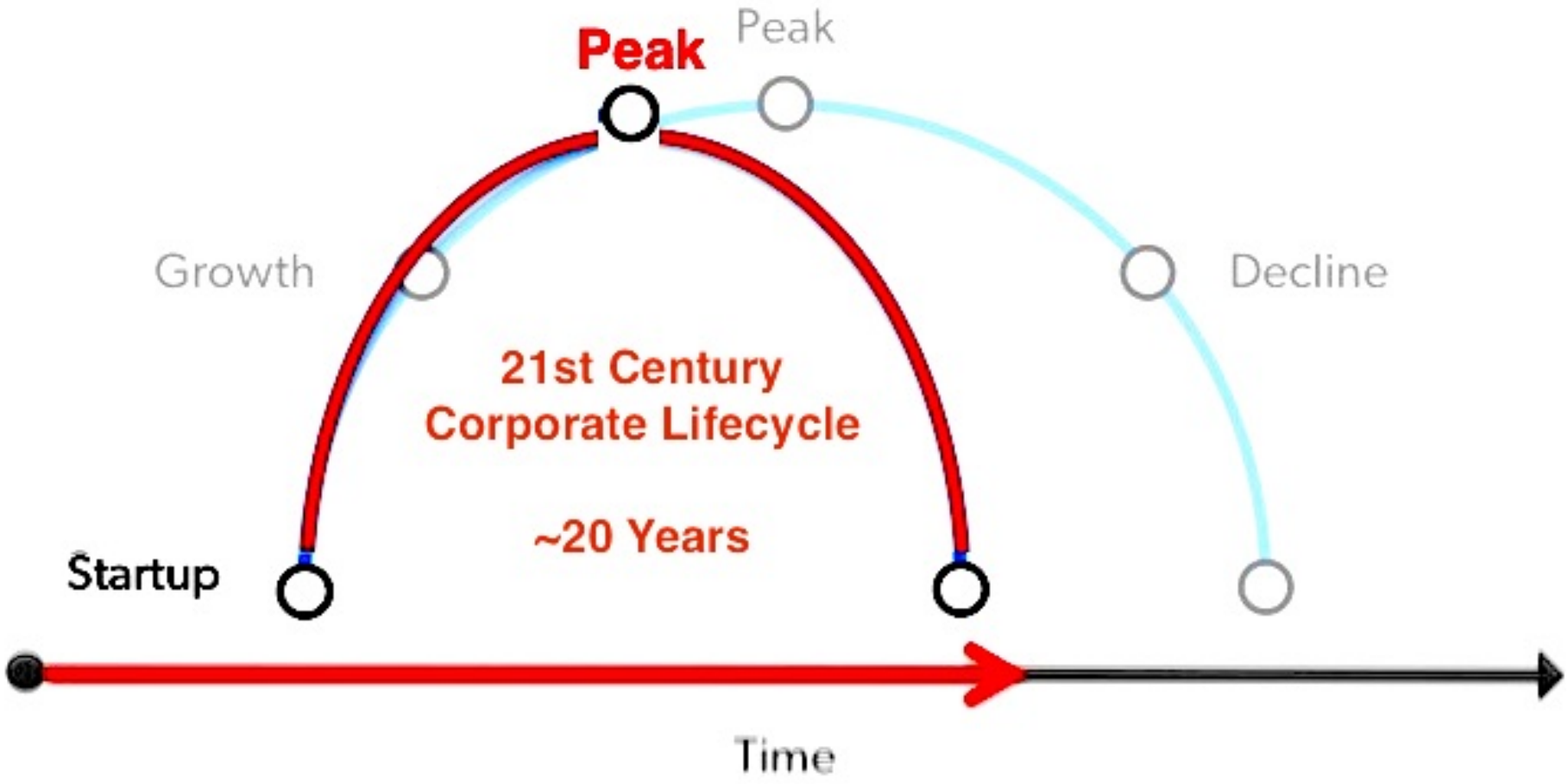


The New Normal…
Continuous Disruption



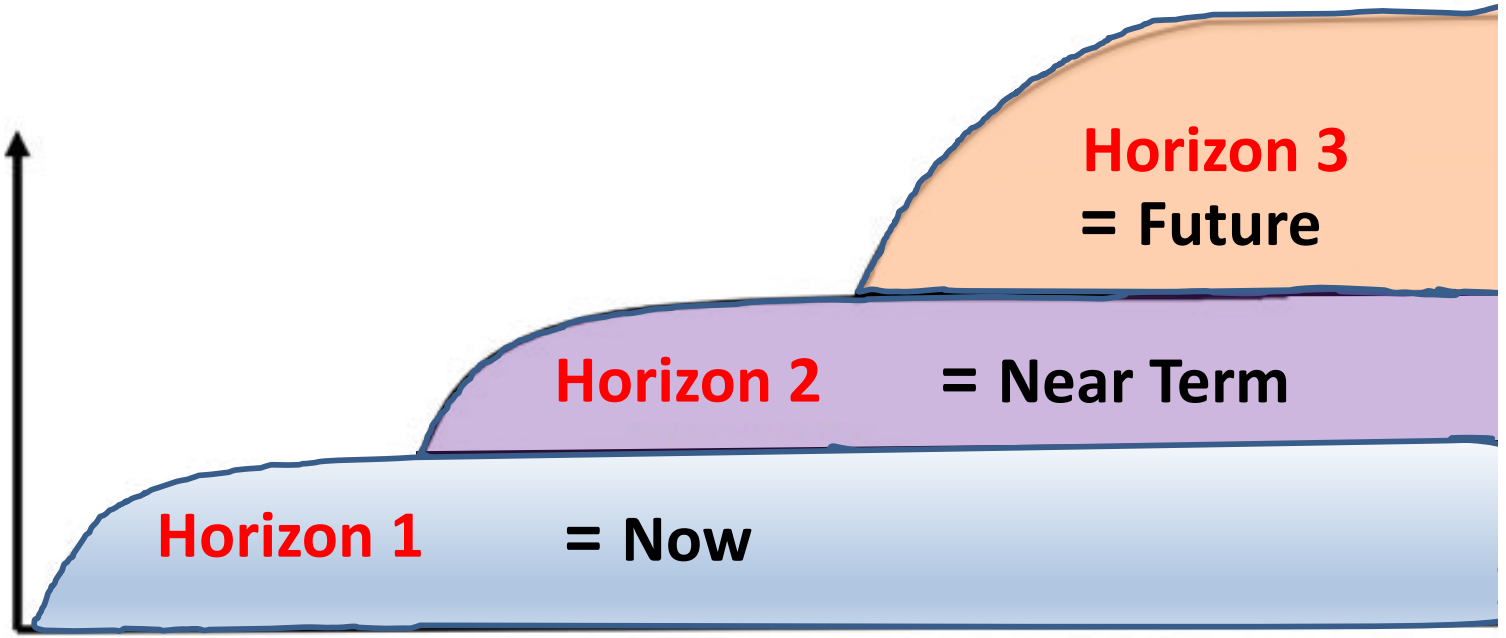
- Barriers to entry plummeting
- Well-capitalized startups
- China as a manufacturer
- China as a market
- Globalization
- Technology shifts
- …

21st Century Corporate Lifecycle



Types of
Innovation In Large Companies

Continuous Innovation Enables the Business

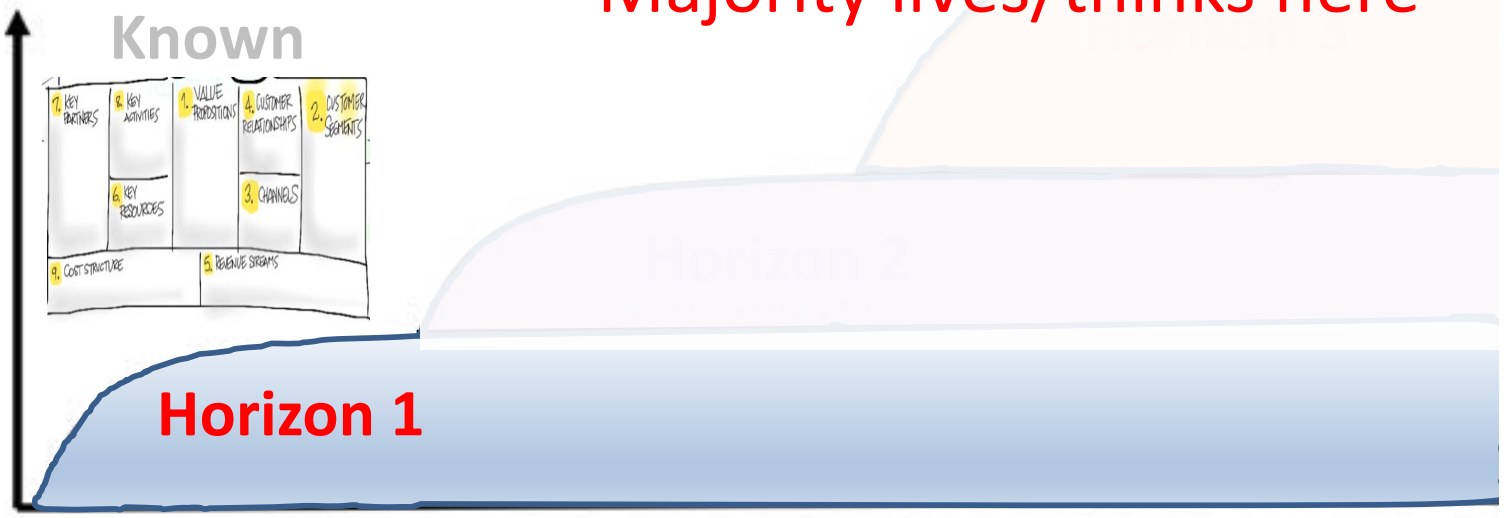


Continuous Innovation means innovating on all three horizons simultaneously

Source: Baghai, Coley, White

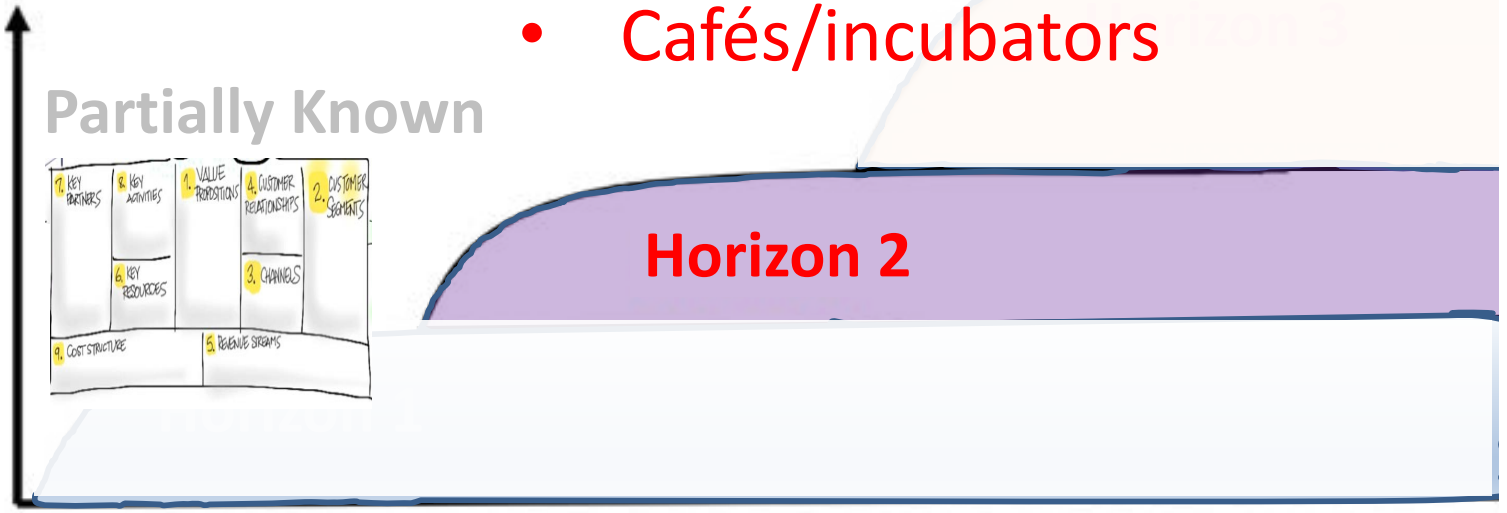
Horizon 1 is Execution

- Believes problem understood
- Believes requirements understood
- Execution of budget and schedule
- Majority lives/thinks here



Horizon 2 Expands/Enhances Existing Capabilities

- Quick hits – small teams
- Proto or product done internally
- Cafés/incubators

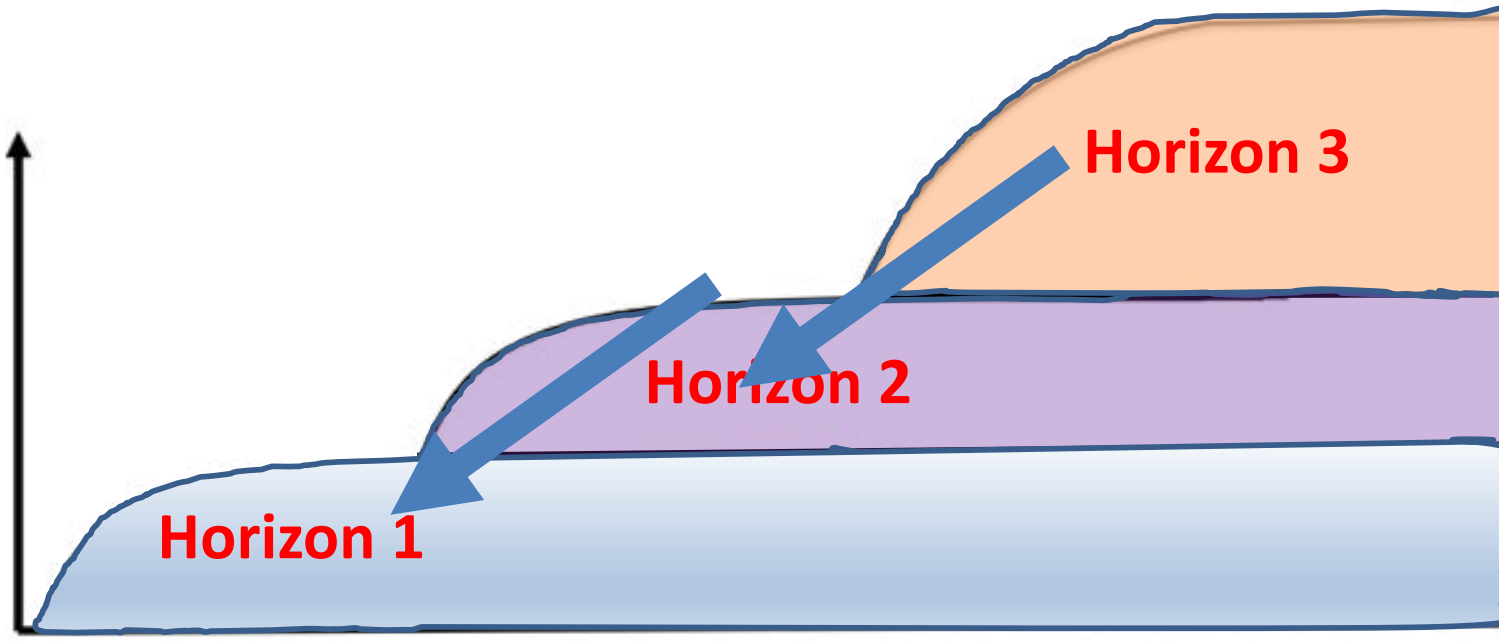


Horizon 3 Creates New Capabilities

- *Unknown* Requirements
- Not a program of record
- It's where the business will and needs to be

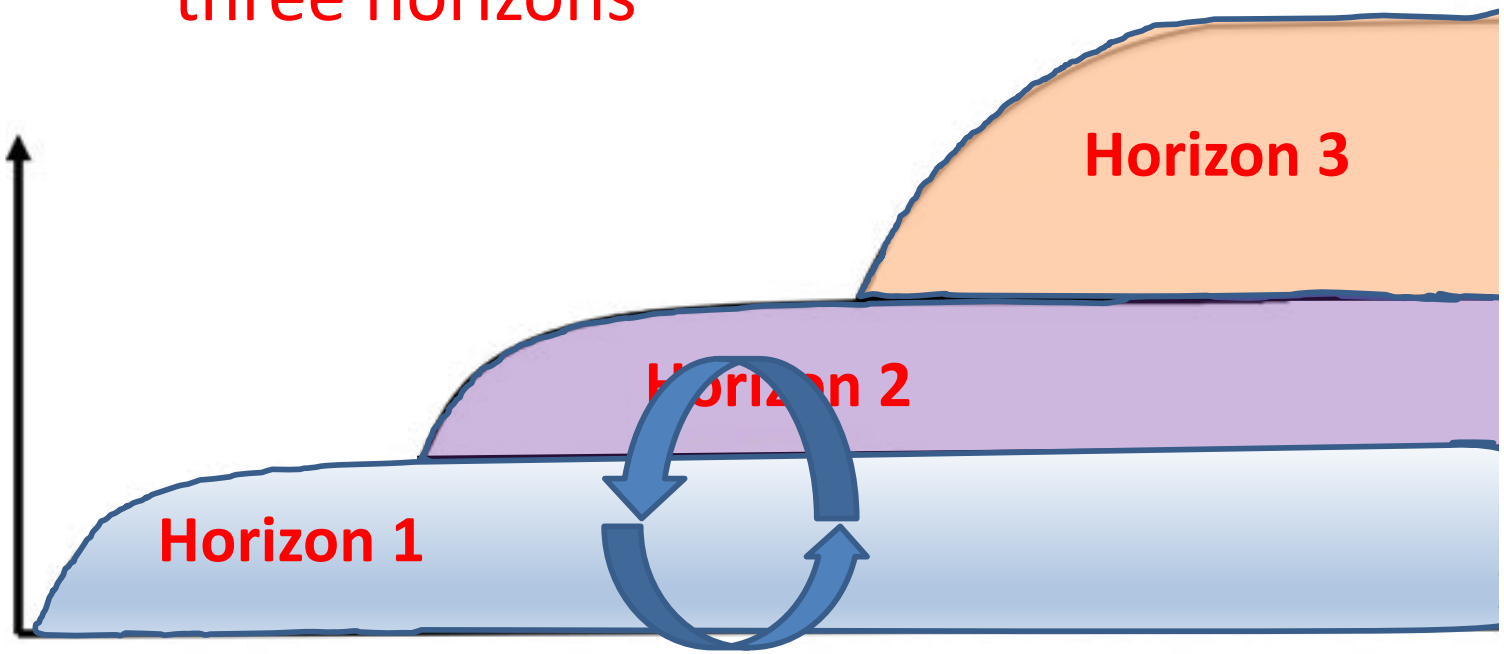
Innovation Enables the Mission

- *Yesterday's breakthrough is todays tool*
- Companies need all three Horizons
- People, processes are different

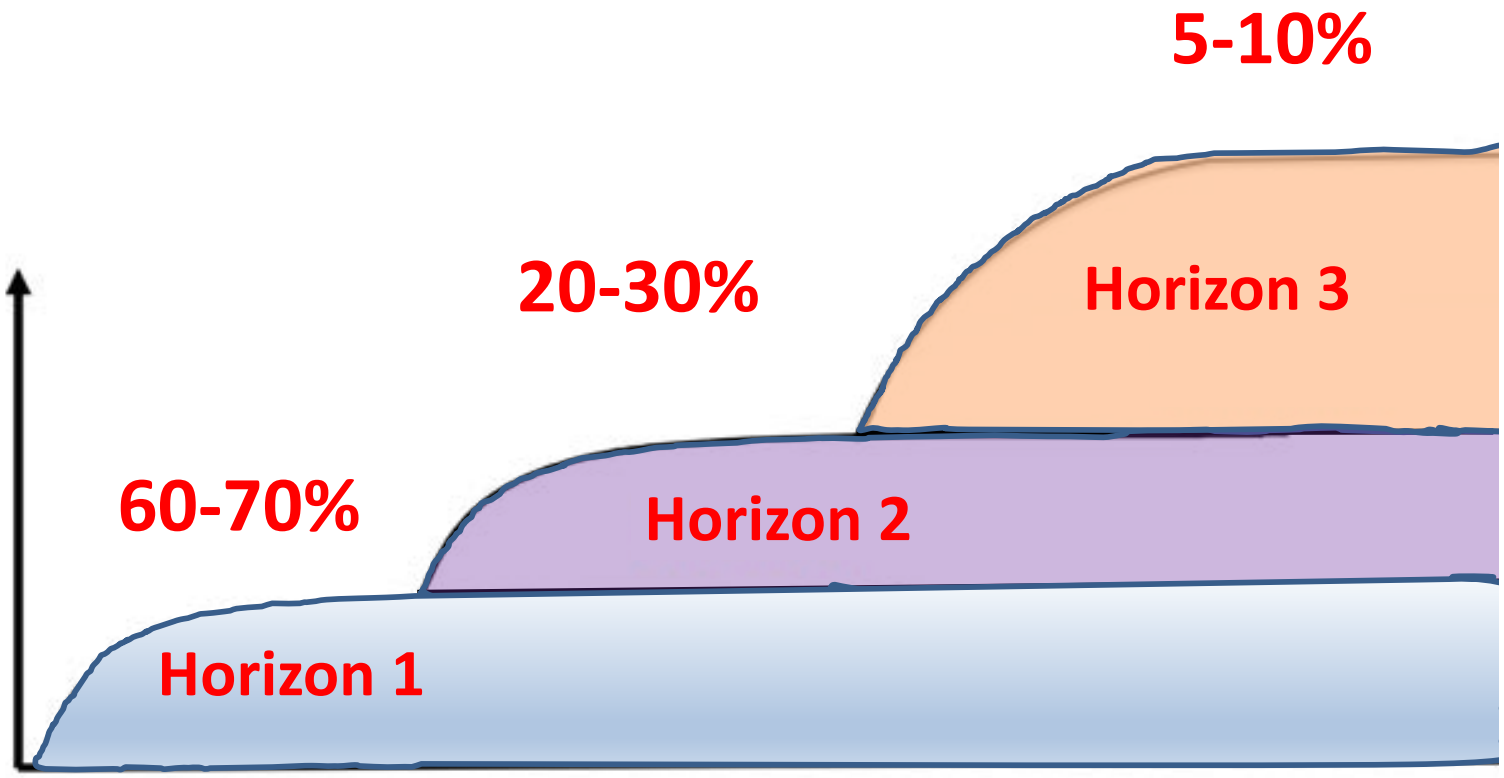


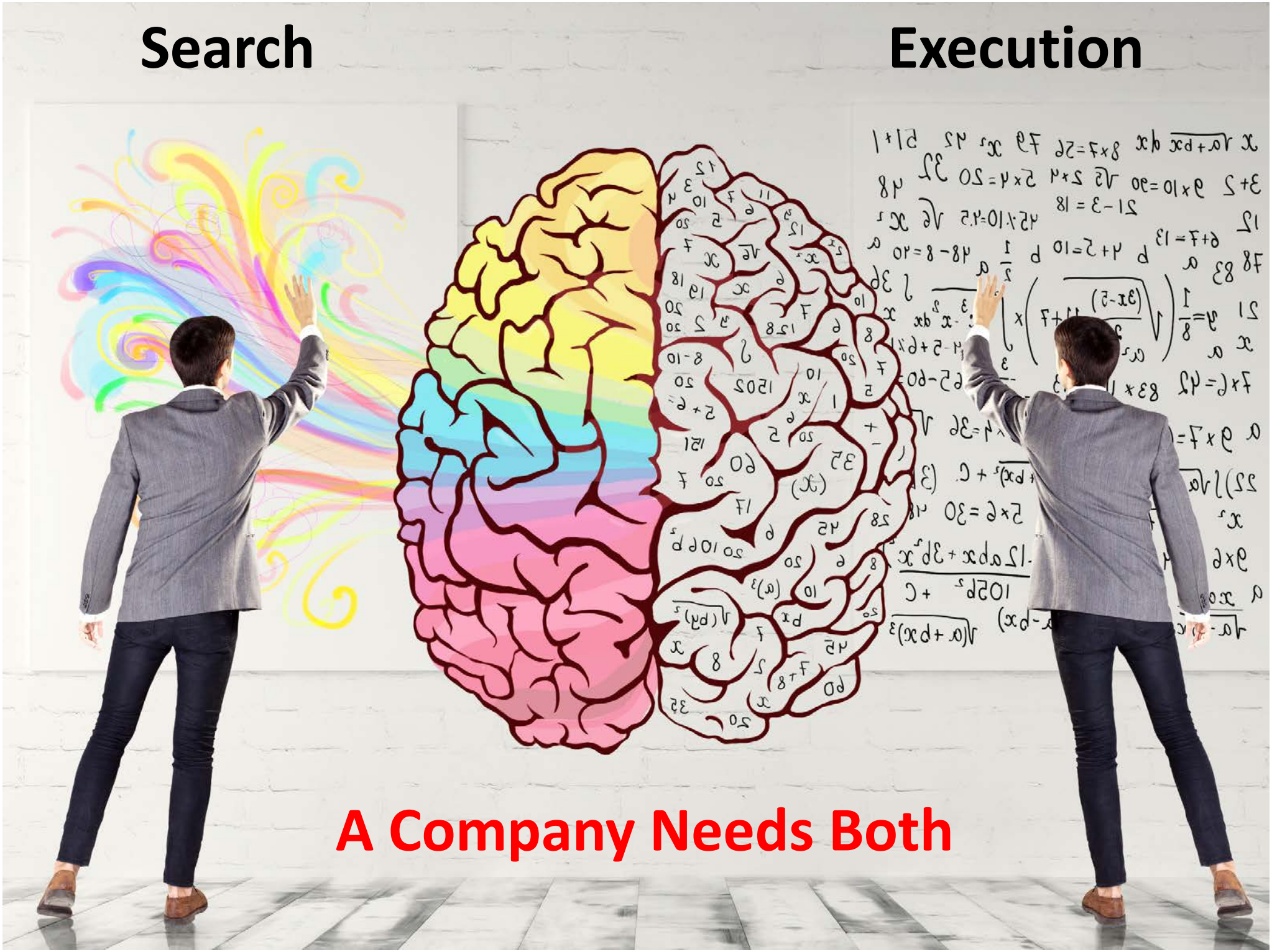
Innovation Occurs in All Three Horizons

- There isn't the innovation group
- We now have tools for innovation – different than those for execution
- Customer obsession is paramount in all three horizons

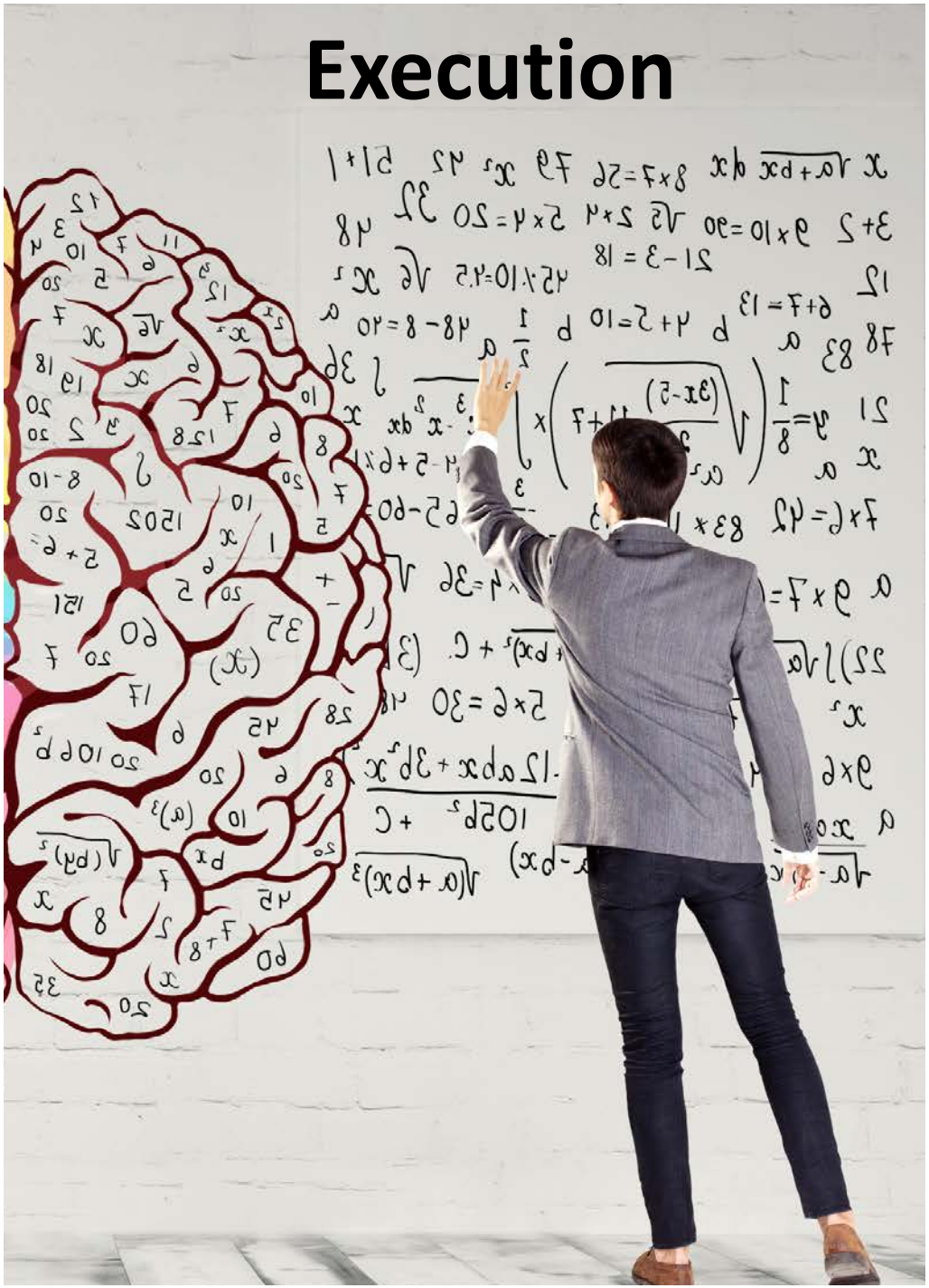


R&D Spending Across the Horizons

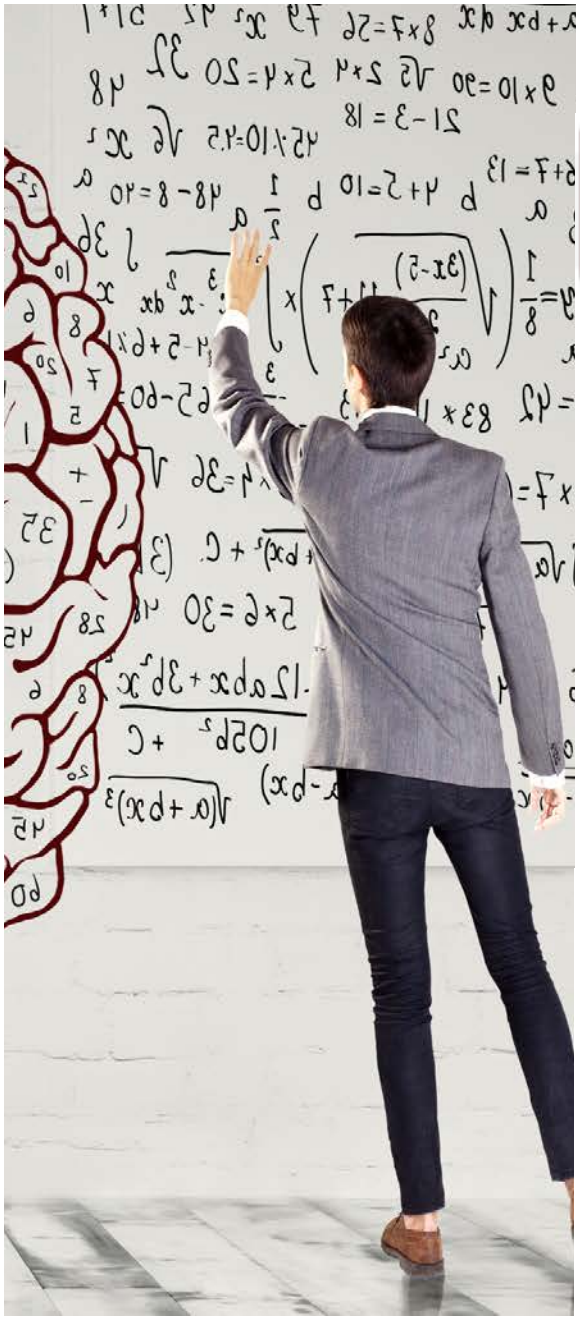


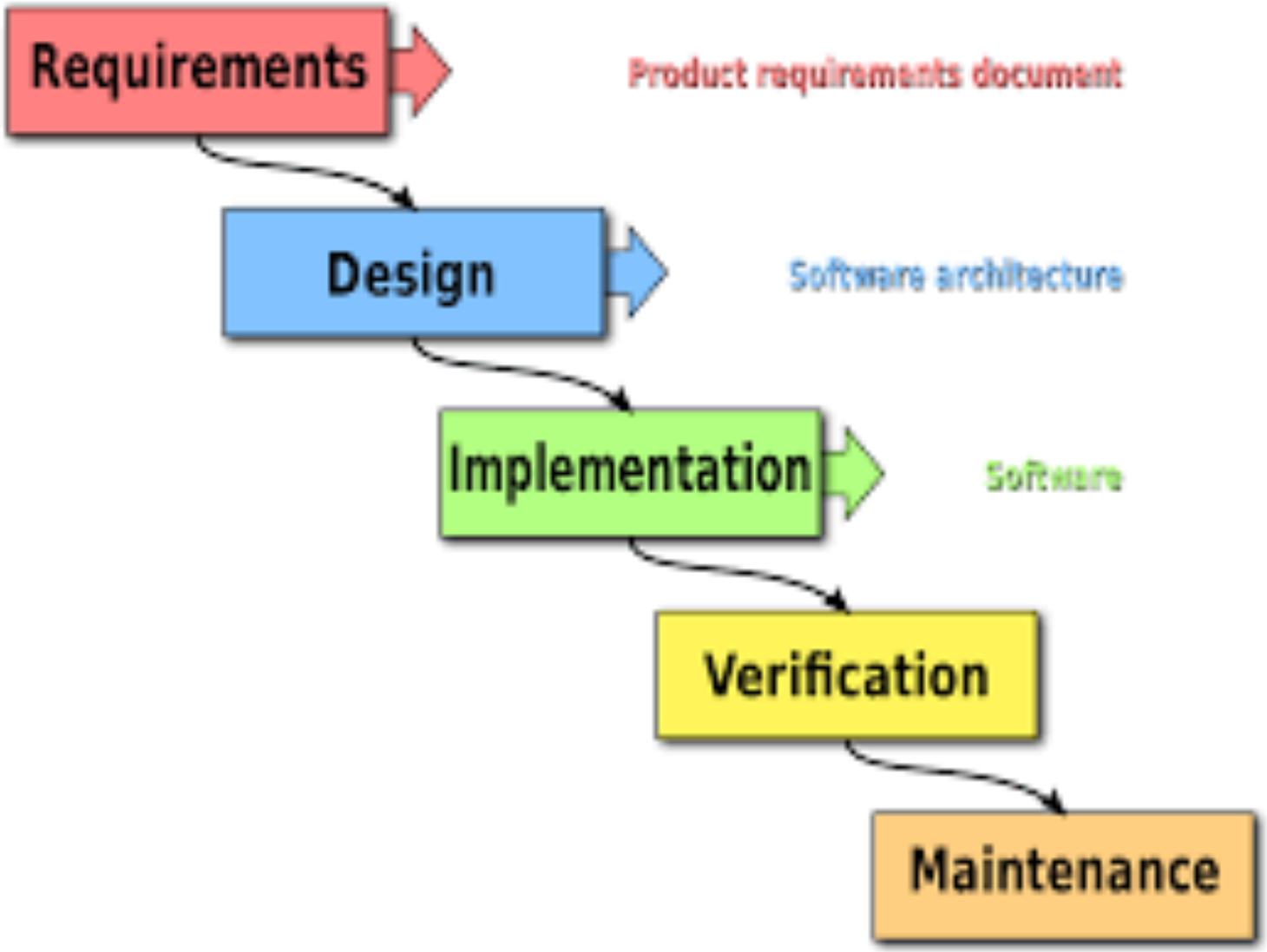

Search
Execution
A Company Needs Both

- **We have tools, people, budget, process to build and acquire for known requirements**



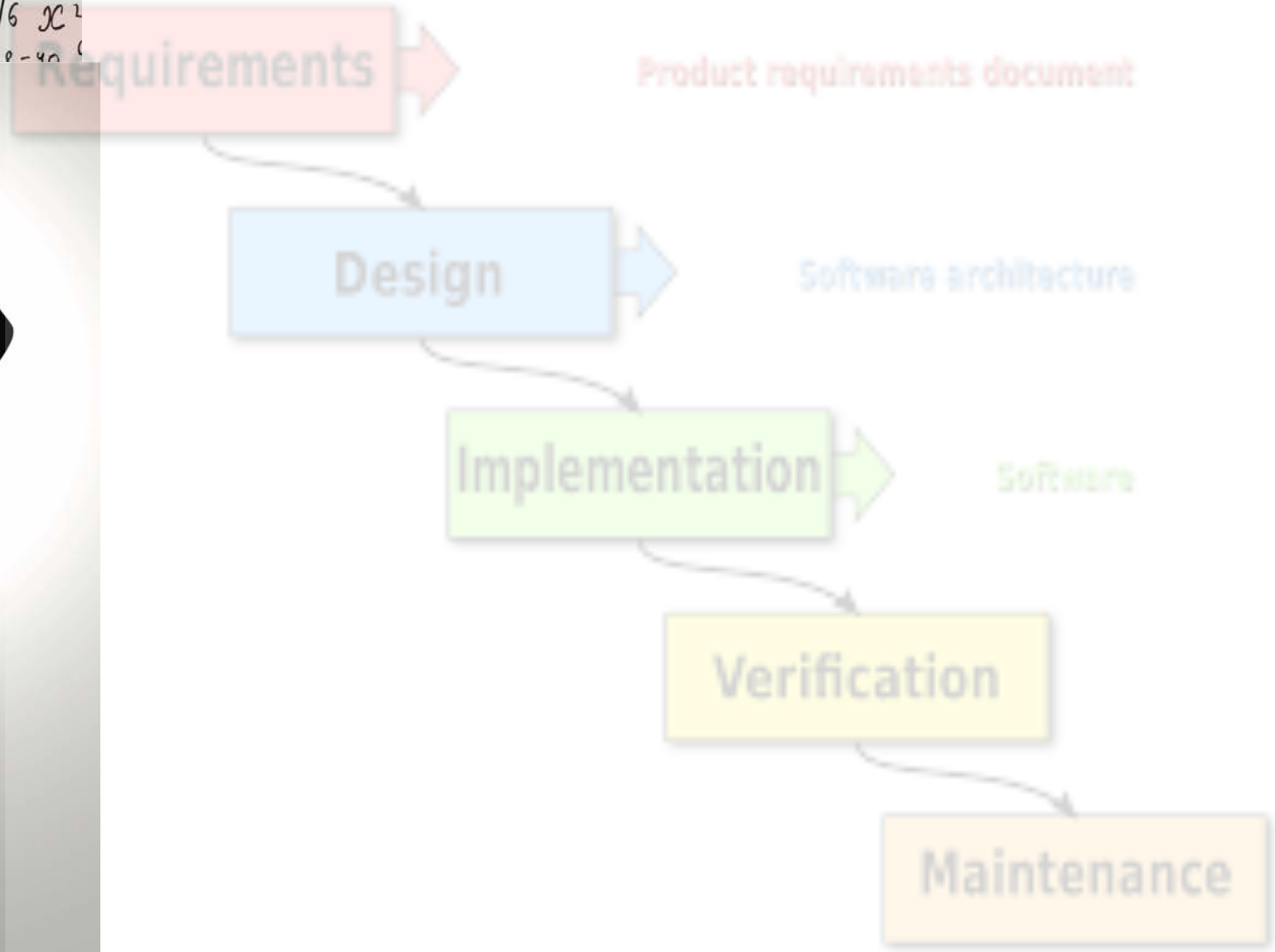
Execution – if Problem and Solution are Known



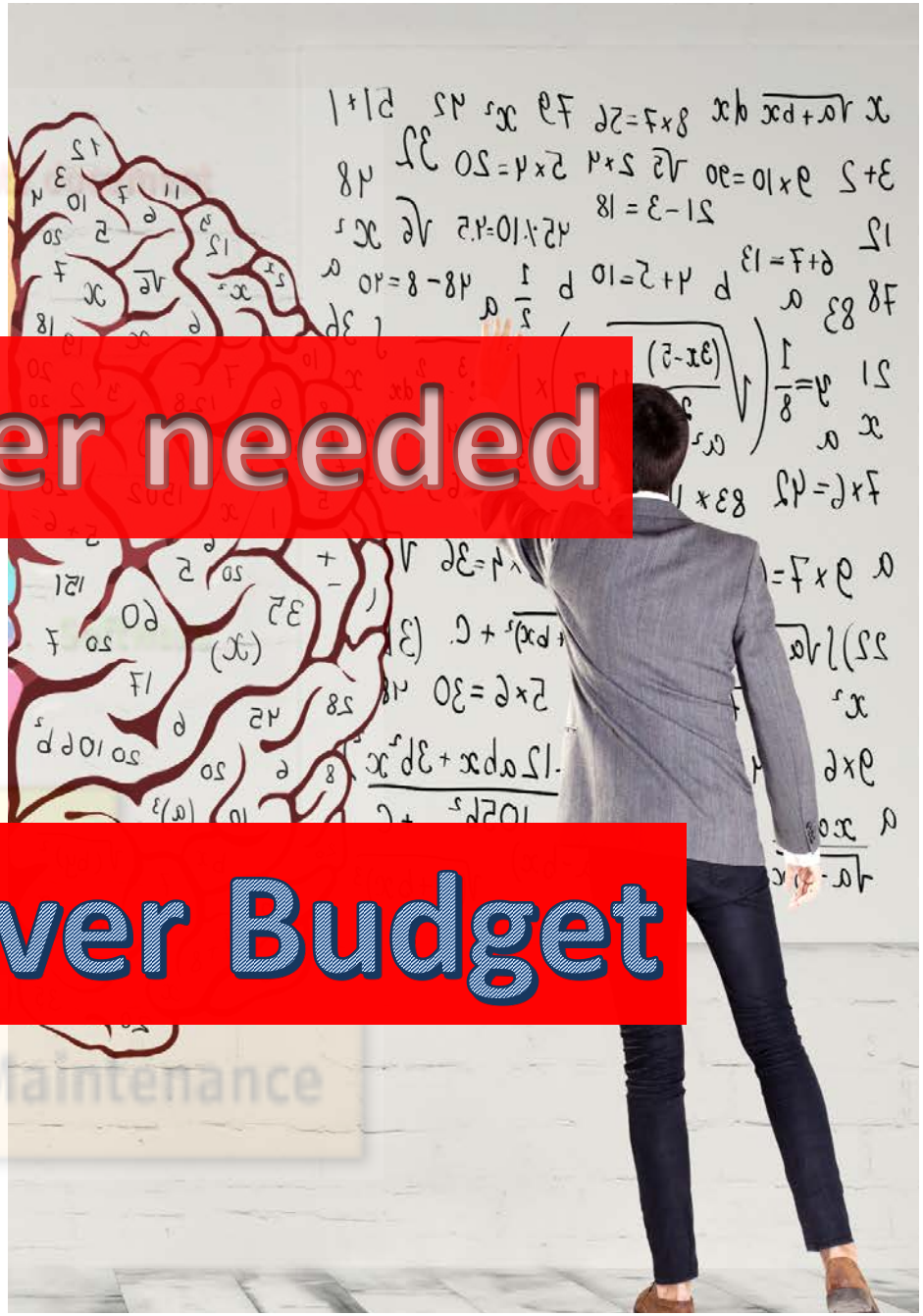


Execution – if Problem and Solution are Known

You're A Hero



if Problem and Solution are Unknown

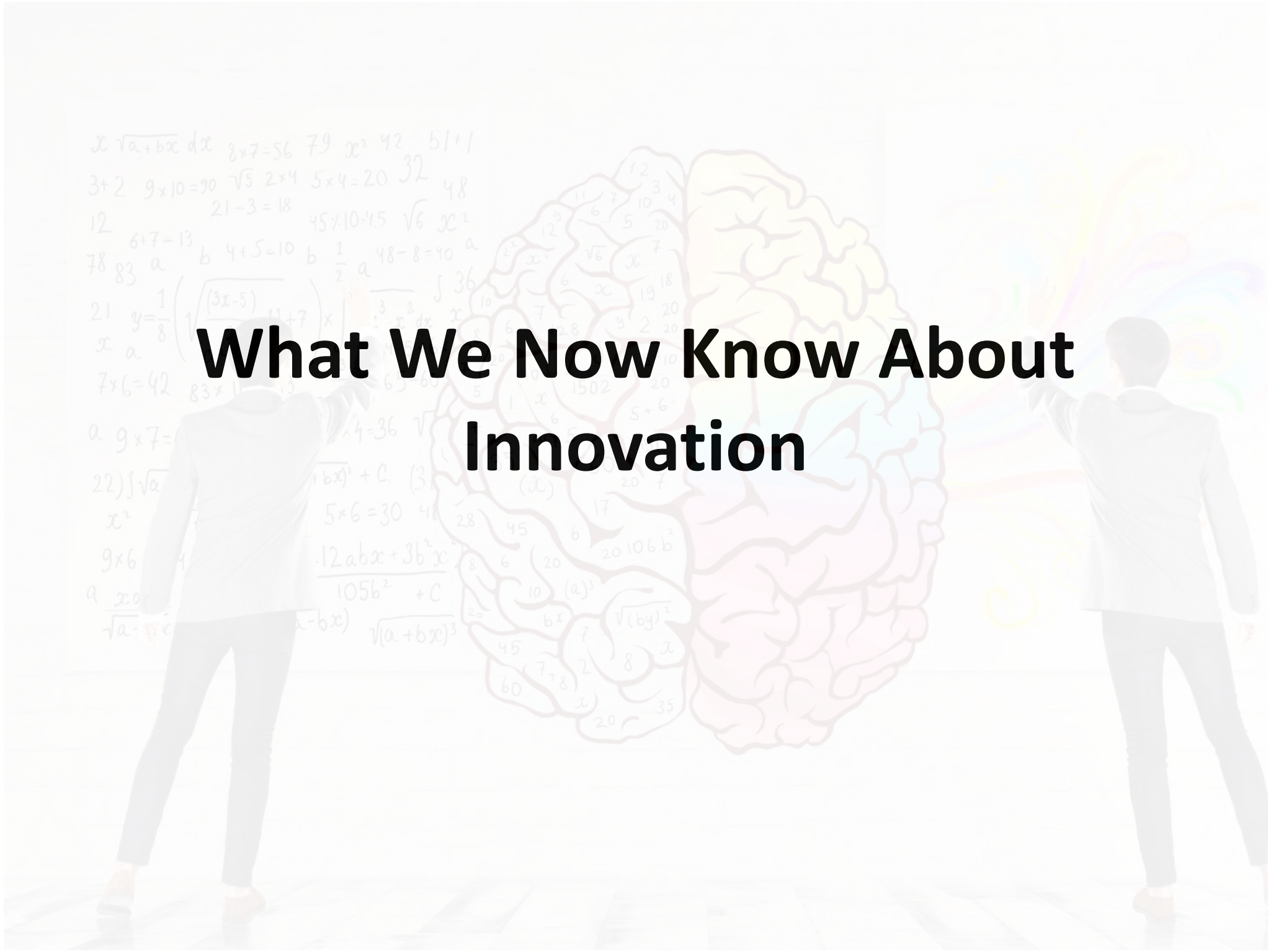


No longer needed

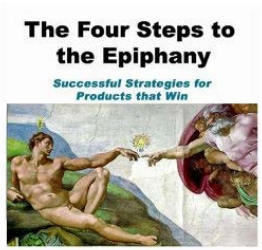
Over Due

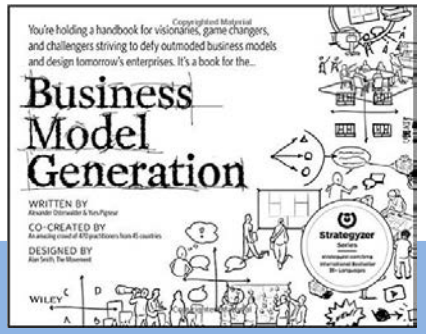
Over Budget

What We Now Know About Innovation



Lean Gets Theory





Customer Development
2003
Blank

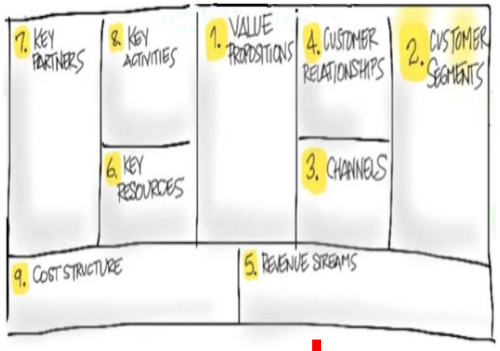
Business Model Canvas
2010
Osterwalder

Agile Engineering
2011
Ries

HBR Cover
2013
Blank

Three Parts of Lean Startup

Part 1



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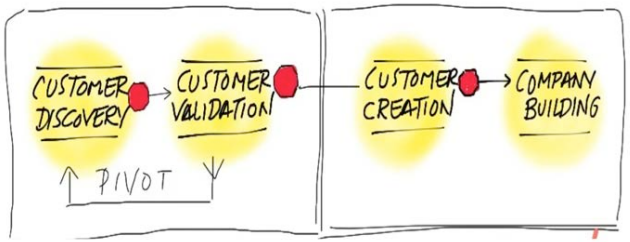
Part 2



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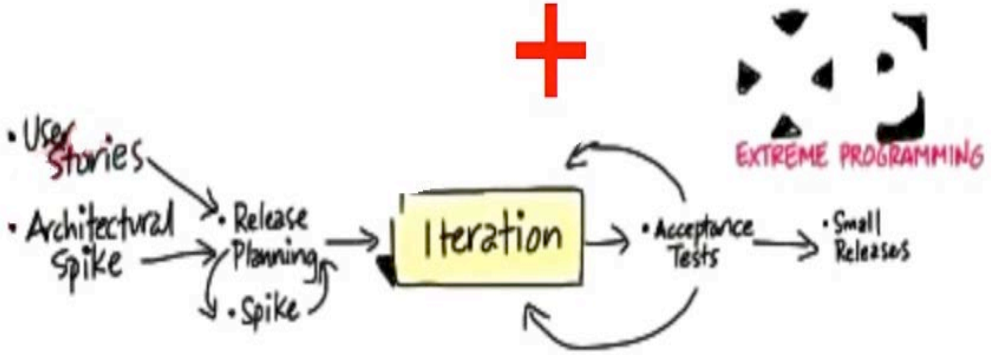
Part 3



1. Frame Hypotheses

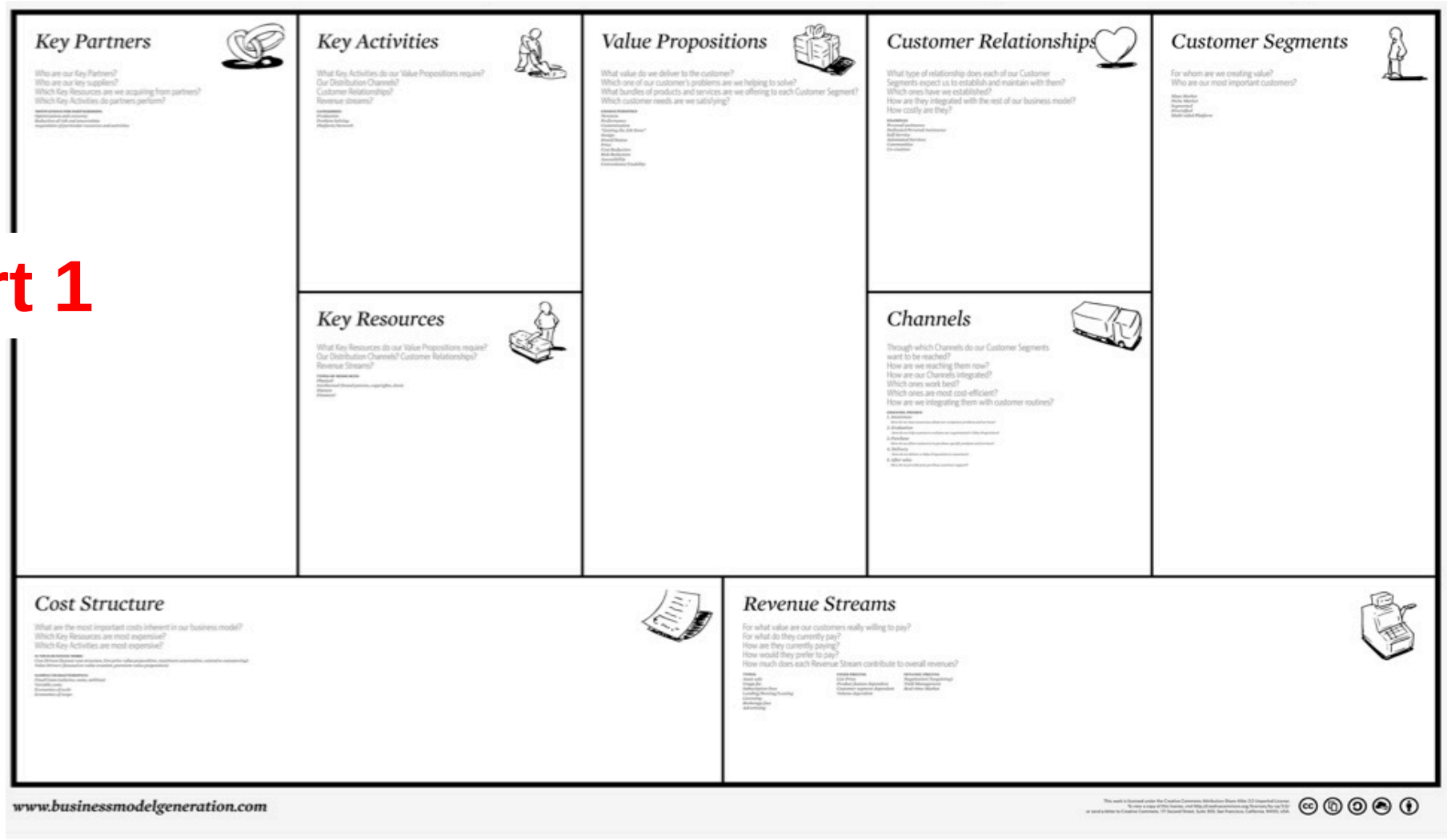
- Frame Hypotheses ➔

1. Frame Hypotheses

- Frame Hypotheses ➔ Business Model Canvas

Business Model Canvas

Part 1



Source: Alexander Osterwalder- Business Model Generation

Business Model Canvas

Partners

Who are our key partners?
Suppliers?

What are we getting from them?
Giving them?

Activities

What key activities do we need to be expert in?

Resources

What key resources do we need to own or acquire?
Financial? Human?

Value Proposition

How are we solving each customers pains/gains?

How?

What product/service features match their needs?

Customer Relationships

how does the team get "Buy-In" from all the beneficiaries?

Channel

How will we deploy the product to widespread use?
What constitutes a successful deployment?

Customer Segments

Who are our most important customers?
Stakeholders?

What are their pains/gains?

What job do they want us to get done for them>

Costs

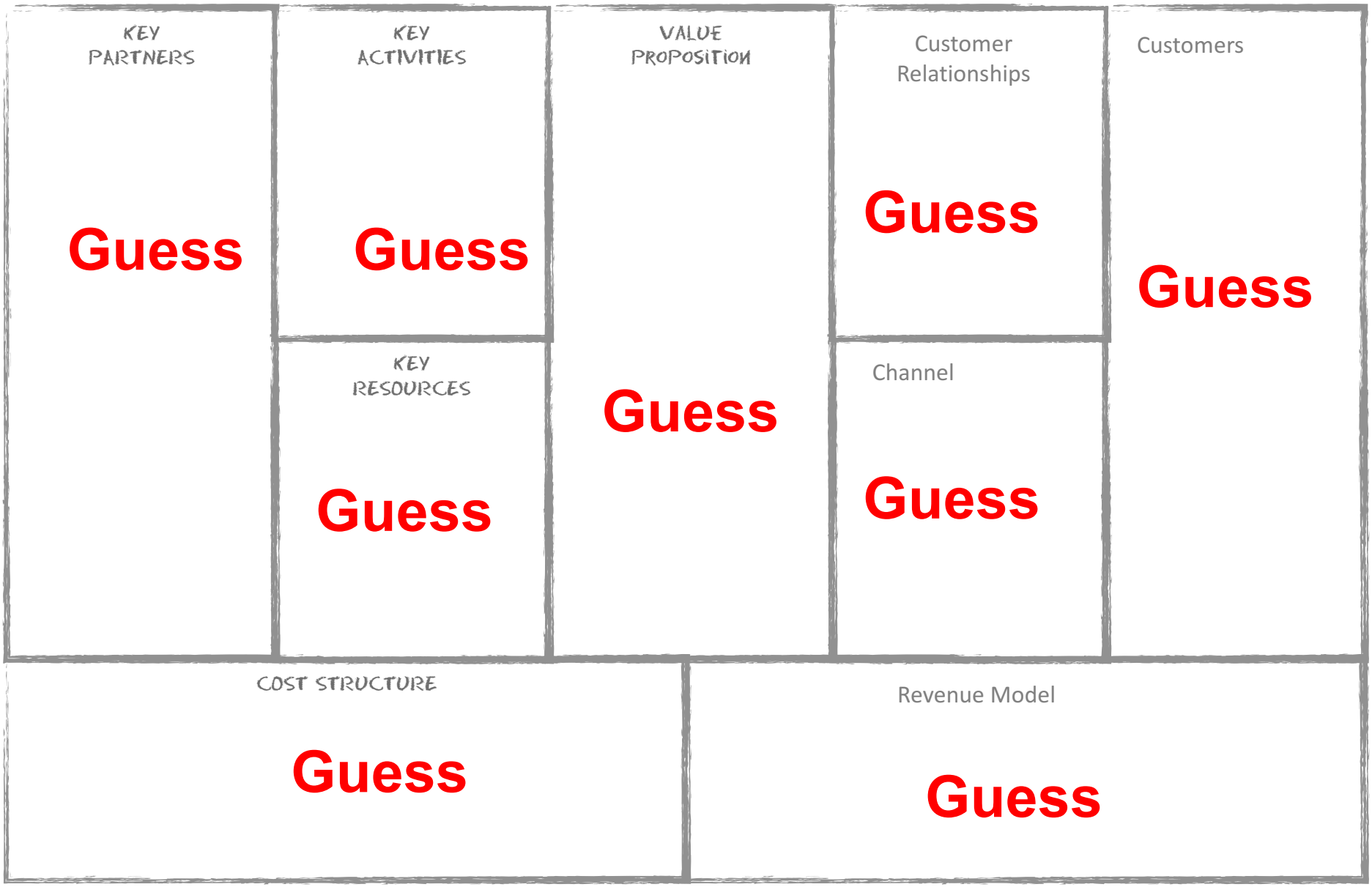
What is the Budget/Cost?

Revenue Streams

What is the revenue model?
What are the pricing tactics?

Source: Alexander Osterwalder- Business Model Generation

9 Guesses



Source: Alexander Osterwalder- Business Model Generation

1. Frame Hypotheses

- Frame Hypotheses → Business Model Canvas → **Operating Plan + Financial Model**

Execution

2. Test Hypotheses

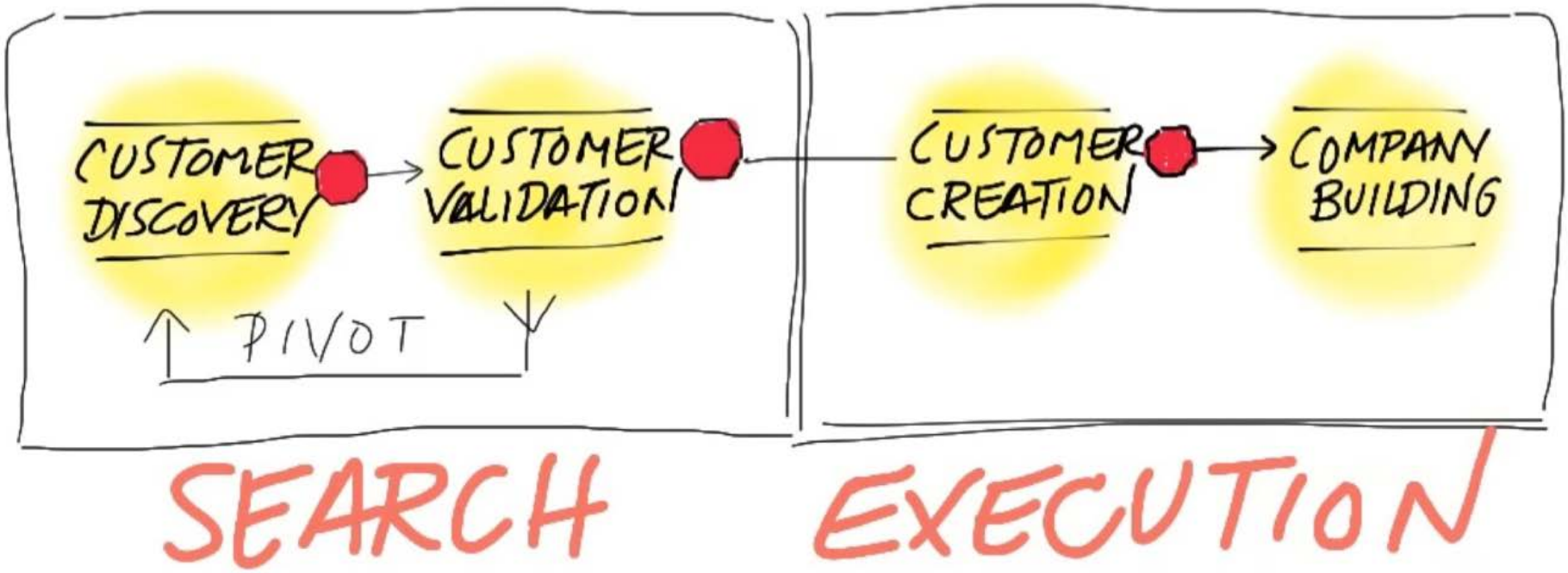
- Frame Hypotheses ➔ Business Model
- Test Hypotheses ➔ Customer Development

Lean Innovation Principles

- Problem understanding comes first
- A good idea is not enough - you need a Business Model
  - What are the underlying assumptions
  - Move forward incrementally, iteratively with experiments
  - Gather evidence
- Validate, Invalidate or modify your hypotheses

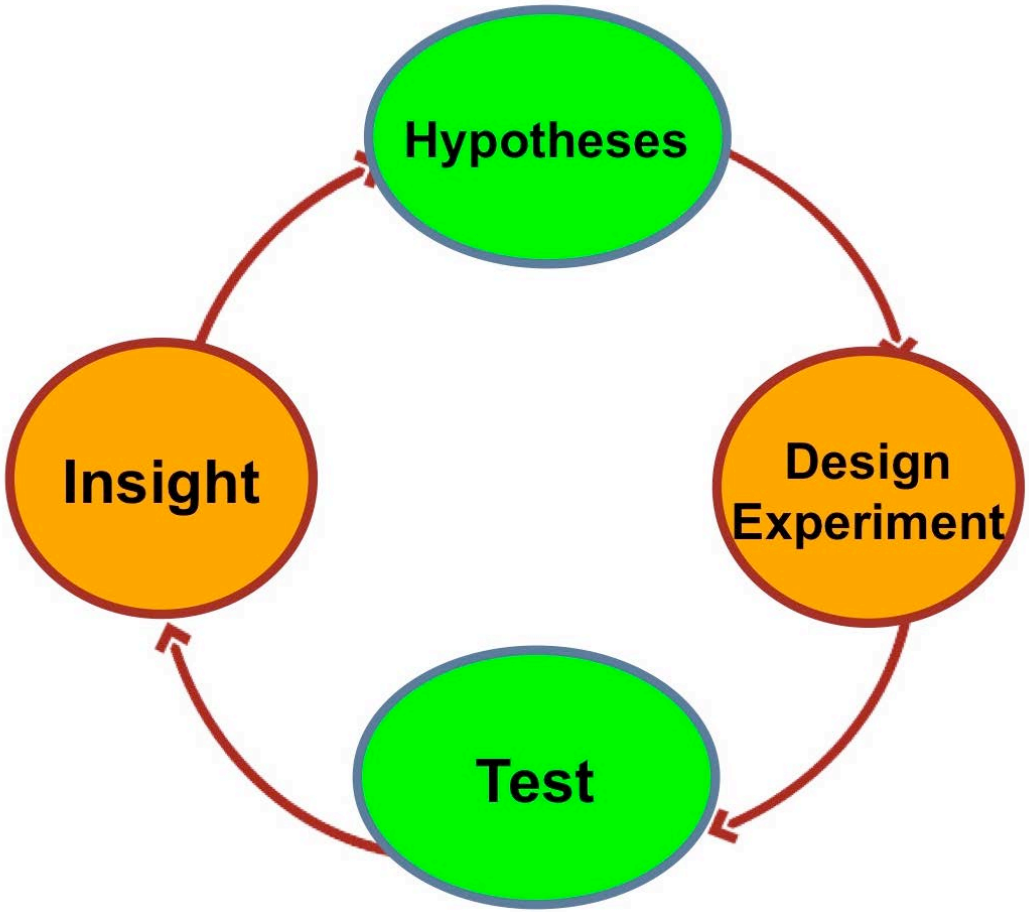
2. Test Hypotheses

- Frame Hypotheses ➔ Business Model
- Test Hypotheses ➔ Customer Development



Customer Development is *how* you search for the mission model

Customer Development is
Hypothesis Testing



Customer Development

- Continuous cycle of customer interaction
- Rapid hypothesis testing about problem, customer needs, solution, ...
- Extreme low cost, low burn, tight focus
- Measurable gates for investors/management

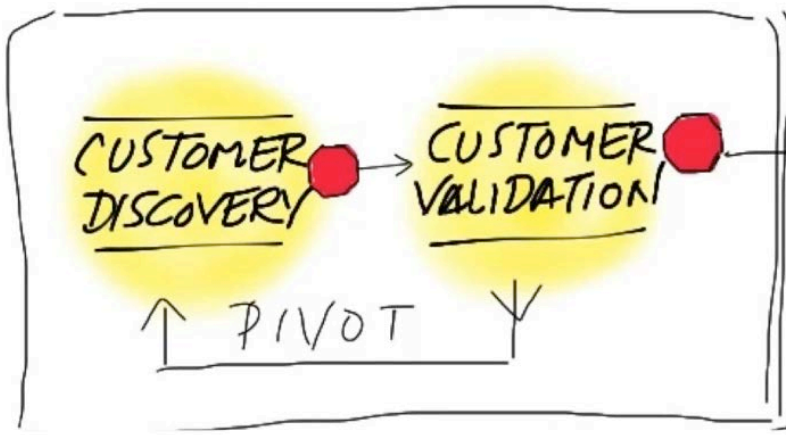
3. Build Incrementally & Iteratively

- Frame Hypotheses → Business Model
- Test Hypotheses → Customer Development
- Build the product incrementally & Iteratively → Agile Engineering

The Minimum Viable Product (MVP)

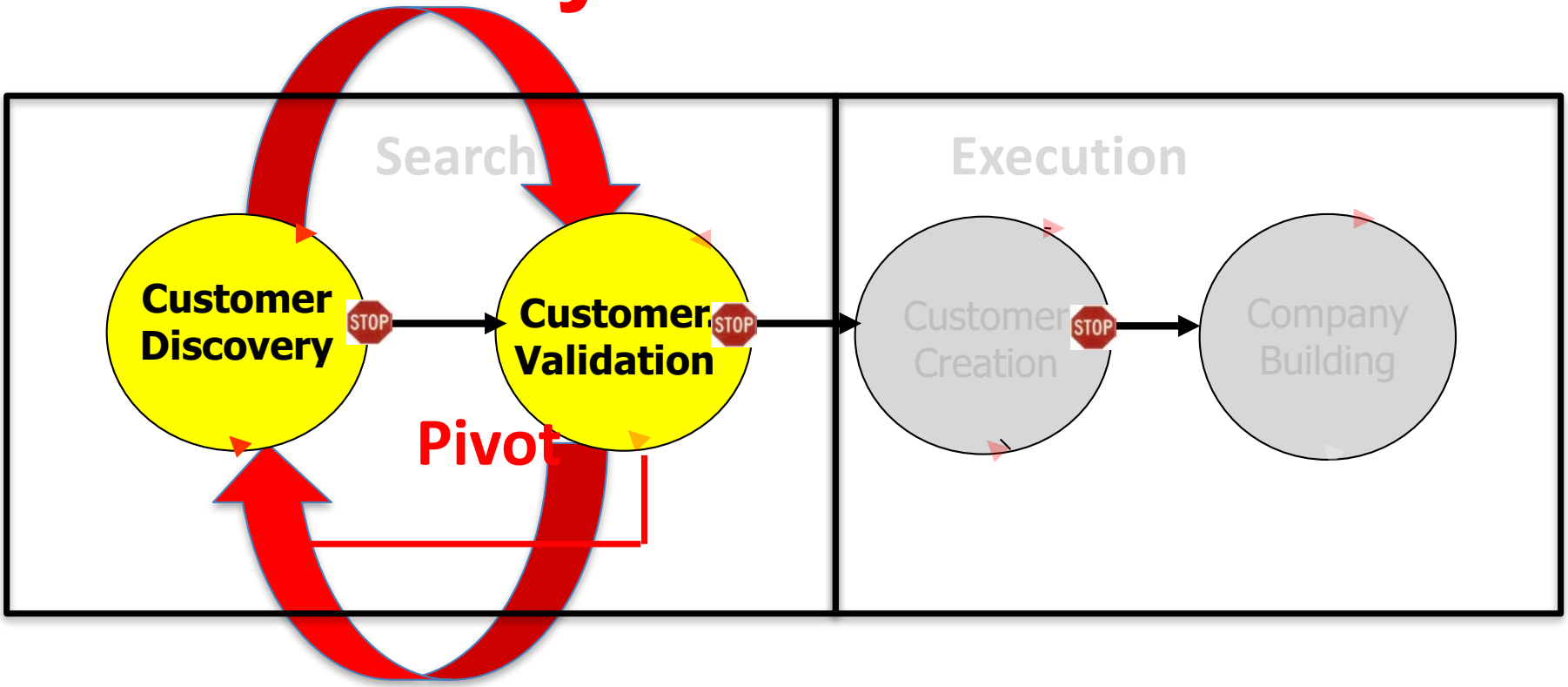
- Smallest feature set that gets you the most …
  - learning, feedback, failure, orders, …
  - incremental and iterative
- It is not a prototype
- It is not a deployable version with the fewest features
- It is what enables a test of a hypothesis
- It may be a drawing, a slide, a wireframe, clickable workflow, etc…

The Pivot



- *Definition:* A substantive change to one or more of the business model canvas components
- Iteration without crisis
- Fast, agile and opportunistic
- Weeks and <$100K

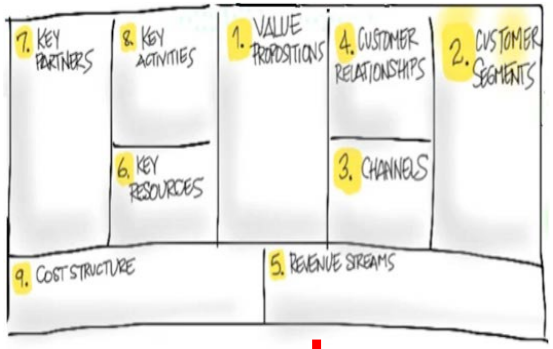
Pivot Cycle Time Matters



- Speed of cycle minimizes cash needs
- Minimum feature set speeds up cycle time
- Near instantaneous customer feedback drives feature set

Elements of Lean Startup

Part 1



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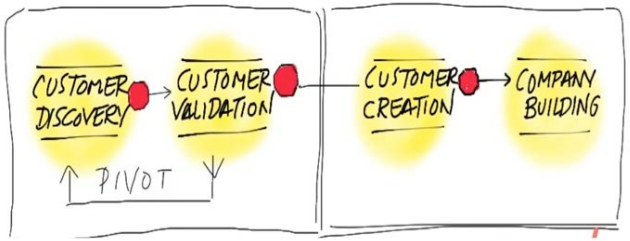
Part 2



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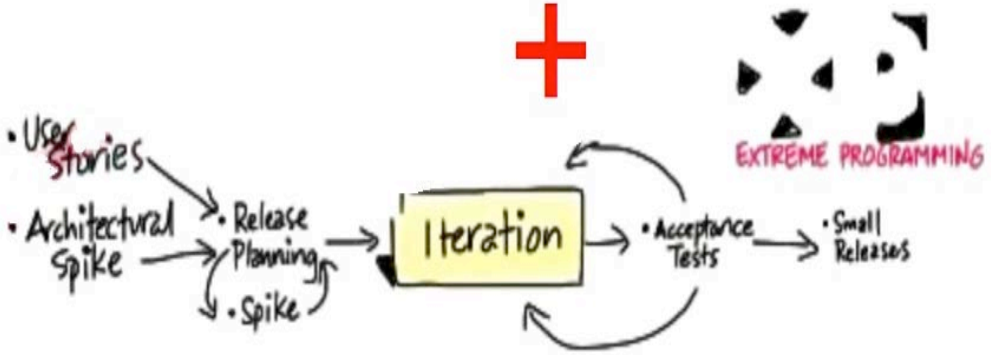


Search

- **Lean means we now have tools and process to build for <u>unknown</u> requirements**

Innovation in Companies can be taught

Lean Gets Practice

~350,000 on-line students
Udacity.com

STANFORD UNIVERSITY

Lean LaunchPad For Students 2011

1250+ teams
Taught in 75 Universities

NSF

CORPS NSF Innovation Corps

I-Corps @ NSF For SBIR/STTR 2012

1,200+ teams
Taught by 53 Universities

NIH National Institutes of Health

I-Corps @ NIH For Life Sciences 2014

NATIONAL SECURITY AGENCY · UNITED STATES OF AMERICA

I-Corps @ NSA 2015

Hacking for Defense/ Diplomacy 2016

Corporate Innovation

- **Accelerator** – 7 weeks for new teams pursuing unplanned H3 and H2 innovations

- **Bootcamp** – 1 week for existing/resourced teams pursuing H2 and H1 innovations

- **Workshop** – 2 days for everyone
  - Teach a shared language of innovation

- **Coaching** – helping teams stay lean

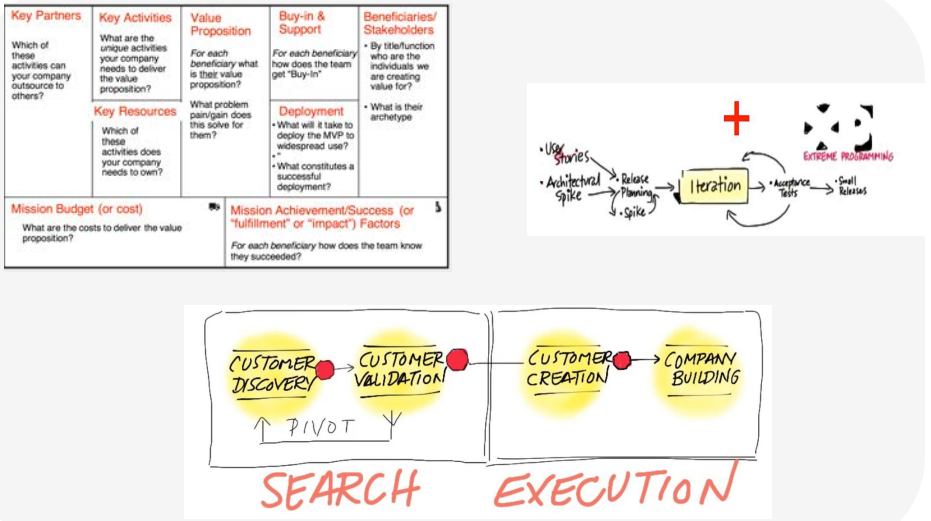
How Do We Teach Lean?

Lean LaunchPad/I-Corps/H4D

I-Corps - Teach Lean Startups to Teams

- A curriculum to teach repeatable/scalable processes to help teams do extraordinary things in an impossibly short period of time

Curriculum



Key Concepts

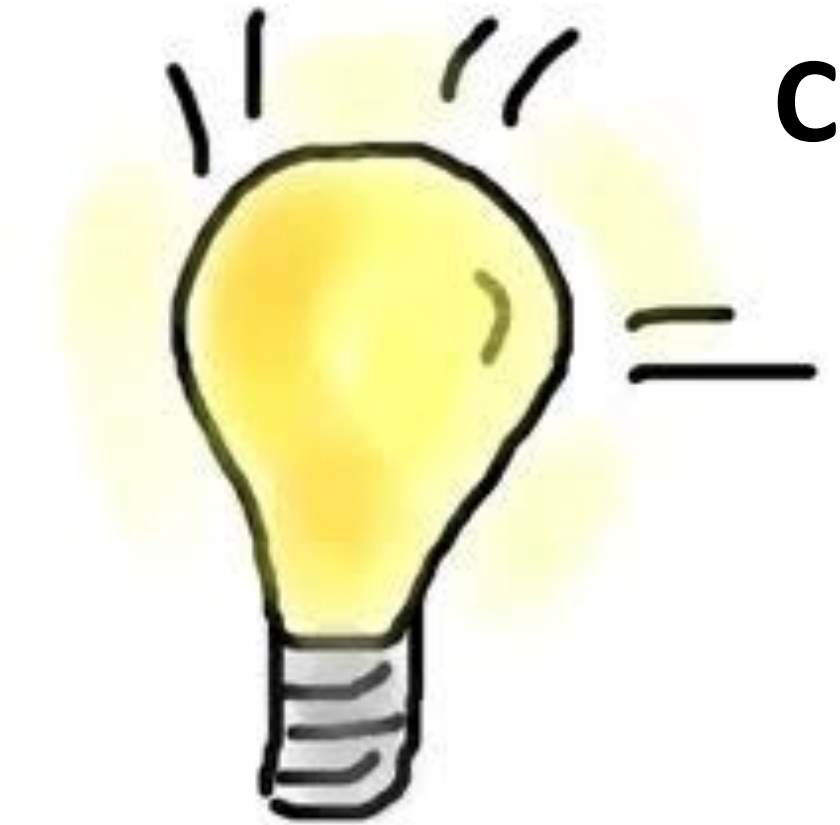
Principles

- Get out of the building
  - 5-15 interviews/*week*
- Build Minimal Viable Products weekly
- Goal is to gather *evidence* to validate/invalidate/modify hypotheses

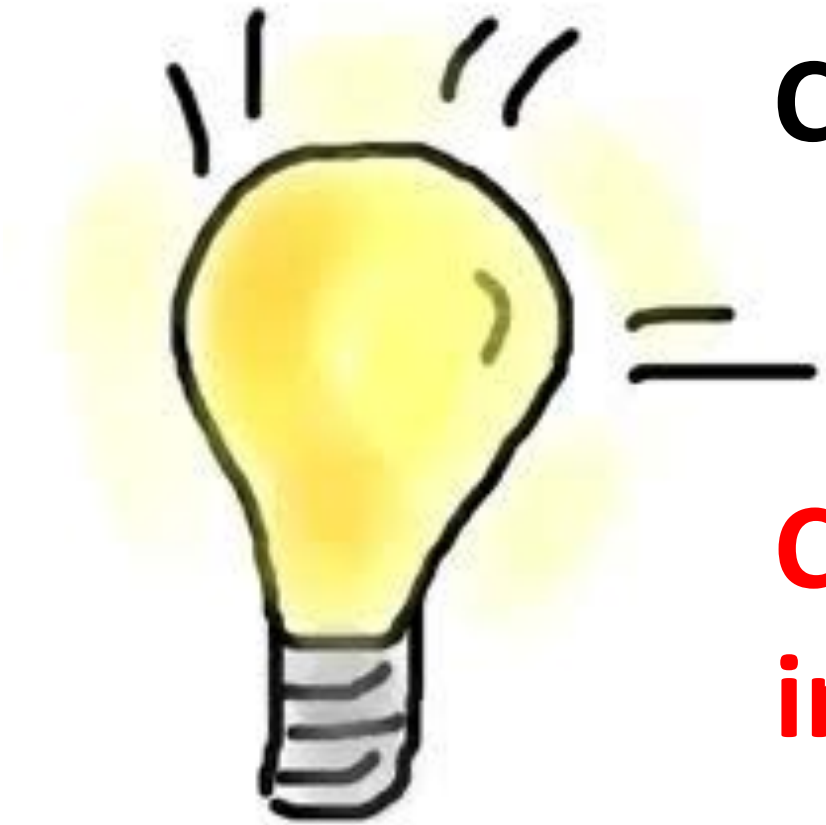
Lean LaunchPad/I-Corps/H4D
Pedagogy

- Flipped Classroom
  - lectures are homework, homework is classwork
- Teams present in front of peers weekly
- Teams have mentors/advisors
- Speed/Urgency = good enough decision making
- Evidence-based, not opinions

How Do I Make This Work in My Company?



Innovation in Companies is not like startups



Innovation in Companies is not like startups

Copying them results in Innovation Theater

Why Innovation In Companies Are Different

Goals

	Startups	Companies	Government
Goal	Liquidity	Market Share, Revenue, Profit	Mission Success/ Achievement

- Companies start with a different goal

Source of Innovation

	Startups	Companies	Government
Goal	Liquidity	Market Share, Revenue, Profit	Mission Success/ Achievement
Source of Innovation	Internal	Internal, Partner, License, Acquire	Internal, Contractor

- Innovation in companies comes from a variety of sources

Product Development Methodology

	Startups	Companies	Government
Goal	Liquidity	Market Share, Revenue, Profit	Mission Success/ Achievement
Source of Innovation	Internal	Internal, Partner, License, Acquire	Internal, Contractor
Product Development Methodology	Lean	Agile, Waterfall	Waterfall, Contract spec's

- And while startup implementation is Lean, companies often still use waterfall development

Scope of Activities

	Startups	Companies	Government
Scope of Activities	Anything	Anything Legal	ONLY things authorized by law

- Uber, Airbnb, Tesla all started by breaking the law
- You're limited to what's legal

Individual Rewards

	Startups	Companies	Government
Scope of Activities	Anything	Anything Legal	ONLY things authorized by law
Individual Reward	Large $$$, Pride	Small $, pride, promotion	Mission pride/promotion

- Incentives in startups are large $$$'s

Innovation Speed

	Startups	Companies	Government
Speed	Rapid agile/lean dev only limited by funding	agile dev limited by corporate processes and funding. Pivots and failure counter to established culture. 1.5 or more slower than startups	limited by gov't contract processes and funding. Pivots and failure counter to established culture and contracting. 9x or more slower than startups Can be as rapid as a startup in a a crisis

- Startup teams operate at irrational speed
- Companies are limited by process, KPI's and culture

Funding Innovation

	Startups	Companies	Government
Funding	Risk Capital (Angel/VC)	Internal – Horizon 1&2 existing Horizon 3 R&D	Internal – Horizon 1&2 existing, Horizon 3 – RDT&E UFRs (compete with herd)

- Startups have formal Horizon 3 funding process
- Companies have formal Horizon 1/2 funding process
  - ➢ Little headroom for Horizon 3 capabilities

Using Partners for Innovation

	Startups	Companies	Government
Funding	Risk Capital (Angel/VC)	Internal – Horizon 1&2 existing, Horizon 3 R&D	Internal – Horizon 1&2 existing, Horizon 3 – RDT&E UFRs (compete with herd)
Resources/ Partners	Cash constrained	Politics/ bureaucracy constrained	Politics/ bureaucracy/ legal constrained

- Often little room for partner creativity
- Silicon Valley Innovation Outposts for companies

Using Outside Resources

	Startups	Companies	Government
Funding	Risk Capital (Angel/VC)	Internal – Horizon 1&2 existing, Horizon 3 R&D	Internal – Horizon 1&2 existing, Horizon 3 – RDT&E UFRs (compete with herd)
Resources/ Partners	Cash constrained	Politics/ bureaucracy constrained	Politics/ bureaucracy/ legal constrained
Acquisition of external resources	Just get it done	Budget and finance processes	Formal rigid contracting process. TechFar and OTA for special cases

- Little room for using external resources

Cost of Failure

	Startups	Companies	Government
Who it impacts and Cost of Failure	Founders & Investors End of company, loss of investment	Individual program leaders Quarterly report Reduced market share & earnings + personnel reassignment	Not felt by the program manager - impact may not be felt for months or years Mission failure = people die + personnel reassignment

- For Horizon 1 projects impacts the bottom line
- Risk avoidance inhibits Horizon 3 projects

How Hard is It to Innovate?

	Startups	Companies	Government
Who it impacts and Cost of Failure	Founders & Investors End of company, loss of investment	Individual program leaders Quarterly report Reduced market share & earnings + personnel reassignment	Not felt by the program manager - impact may not be felt for months or years Mission failure = people die + personnel reassignment
Level of Effort	1x	**2-3x** a startup (external + Internal customers)	**3-4x** a startup (external + Internal customers + legal)

- Innovation in companies is 2-3x harder than a startup

How Do We Innovate?

	Startups	Companies	Government
Innovation Model	VC's run a portfolio of bets	License, acquire, buy or build	Build or contract Innovation Pipeline

- Innovation can be done multiple ways

How Do We Teach Innovation?

	Startups	Companies	Government
Innovation Model	VC's run a portfolio of bets	License, acquire, buy or build	Build or contract Innovation Pipeline
Accelerator Model	Demo Days for Funding Ie. Y-Combinator, Techstars,	Validated Value Proposition and *Business* Model for Horizon adoption ie. NSF I-Corps	Validated Value Proposition and *Mission* Model for problem/pathway to solution + deployable MVP Ie. I-Corps@NSA

- "That's how startups do it" is a recipe for innovation failure
- Companies need *their own* innovation playbook

There is nothing more
powerful than an idea
whose time has come.

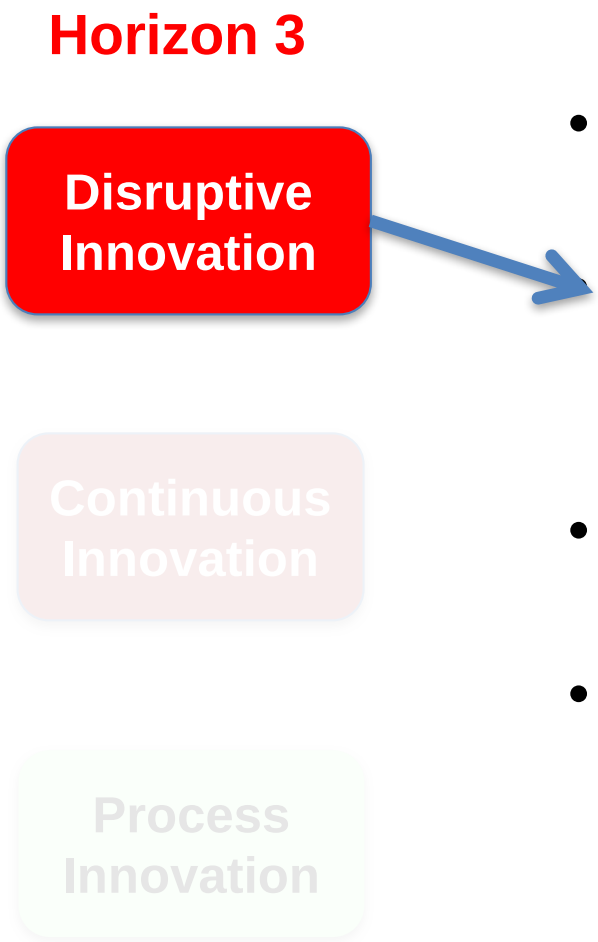
backups

Horizon 3 Initiatives
Start as Innovation Engines

New/Disruptive Innovation

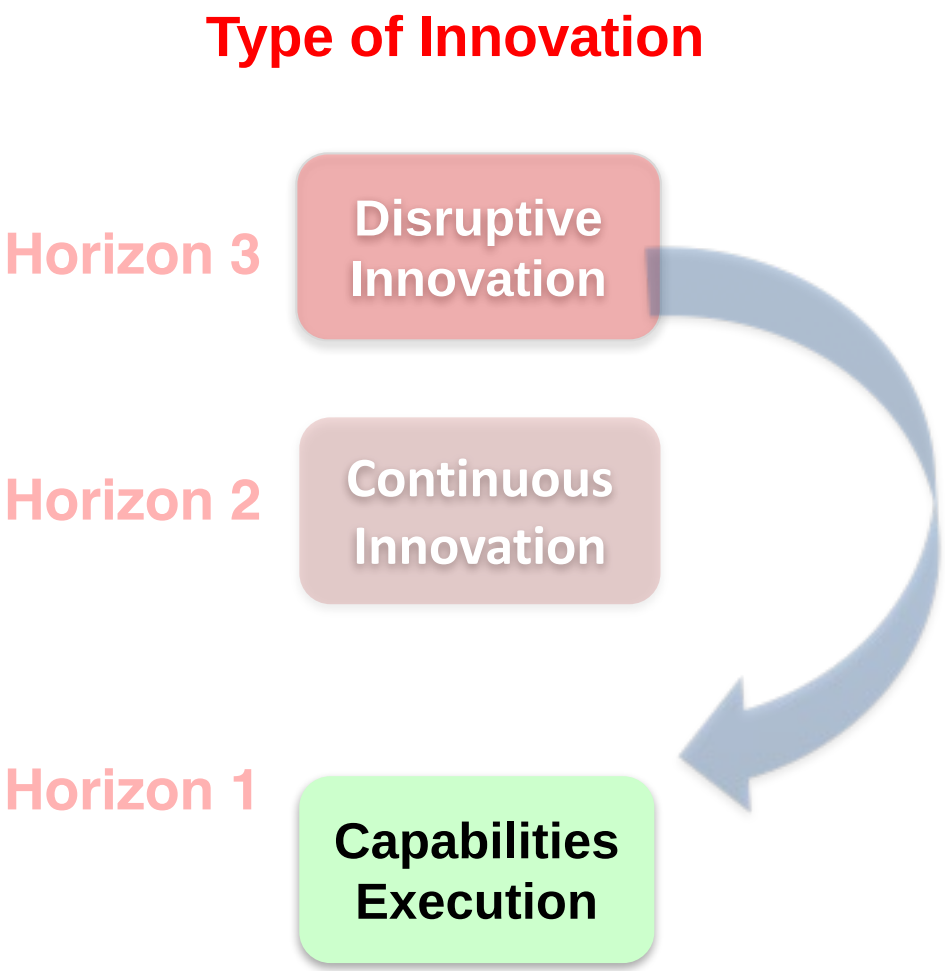
- Disruptive
- Business Model Innovation
  - Better/faster/cheaper
- Innovation *requires* no restrictions by plans, procedures or processes
- Success = finding a repeatable and scalable business model
- Grows and scales

Horizon 3 Needs To Leave Home



- Physically separate from existing org
- Need their own plans, procedures, policies, incentives and KPI's
- They operate with speed and urgency
- Goal is to find a repeatable and scalable mission model

Integrating Innovation as an Integral Part of Capabilities

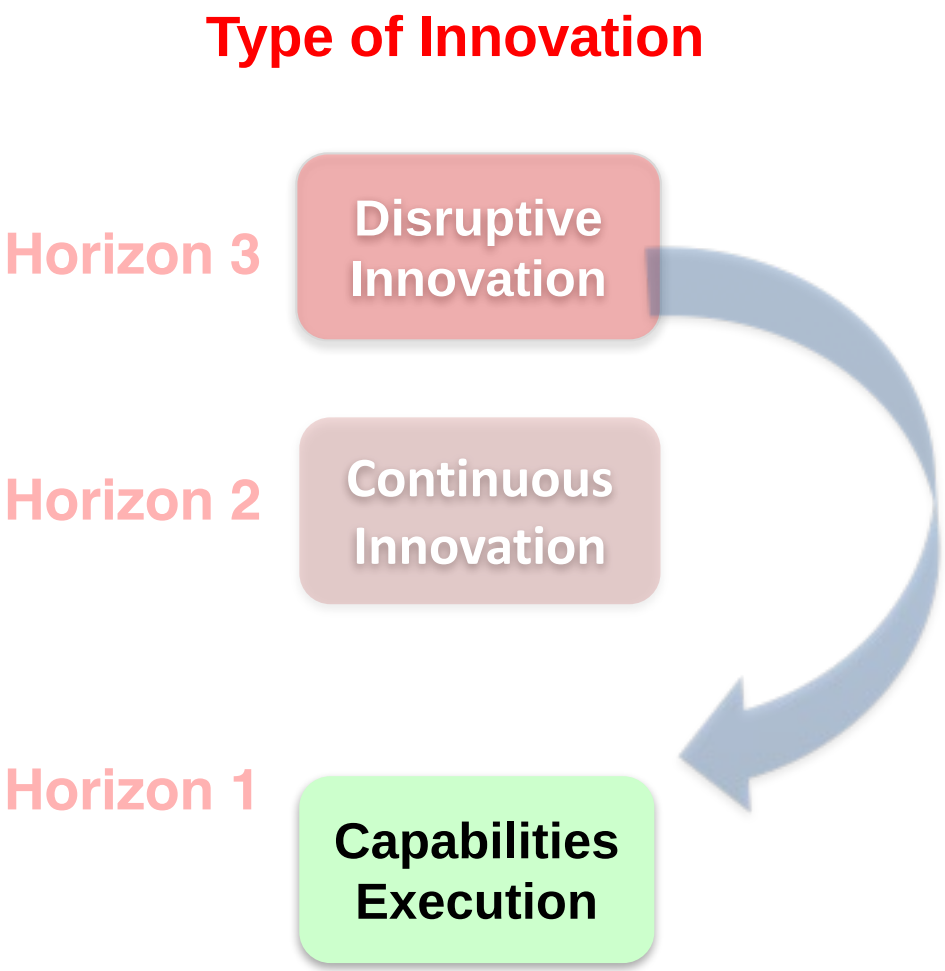


Problem:

- Innovation initiatives are by definition unbudgeted and unplanned
- To capabilities it looks like one more thing thrown over the transom

Solution: Capabilities Mentors (at minimum) and optimally part of the Innovation Teams

Innovation Success Creates “Debt”

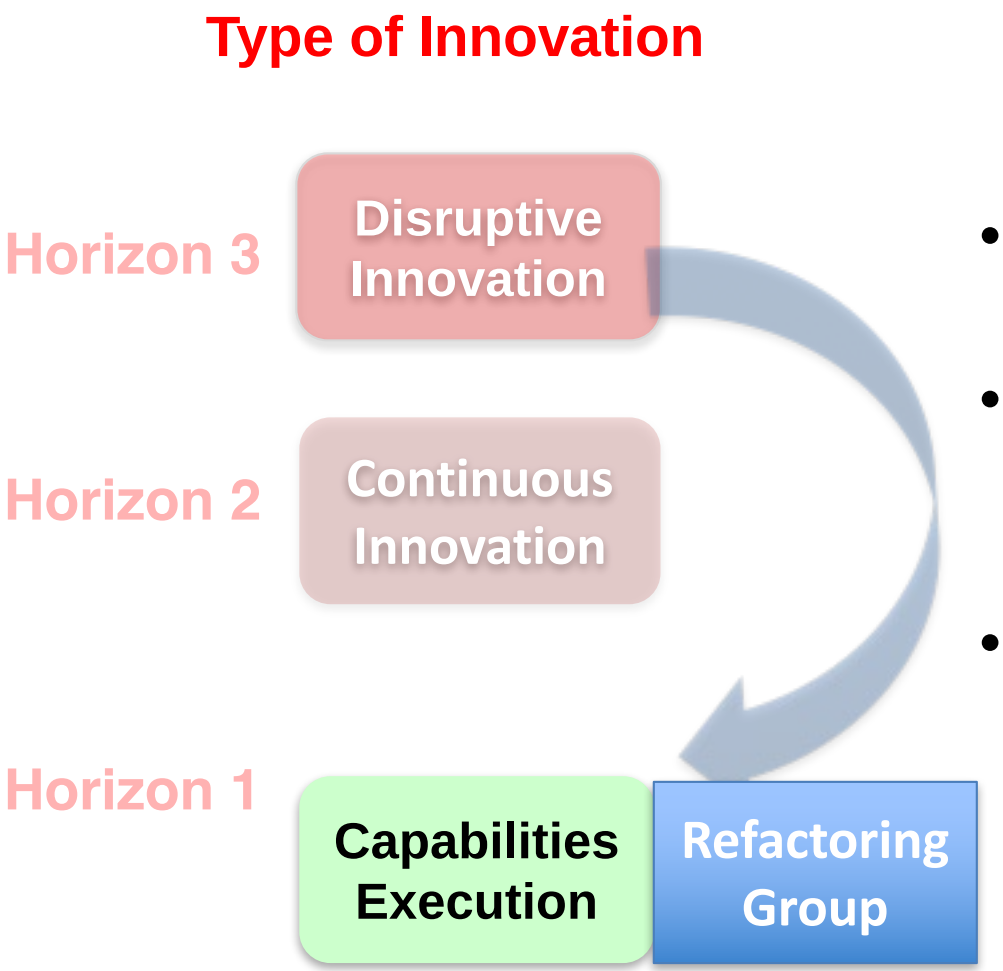


Success creates

- Technical shortcuts which add up and become what is called *Technical debt*
- People/process shortcuts are *Organizational debt*

Problem: Non-standard code and tools, innovation developers are hackers

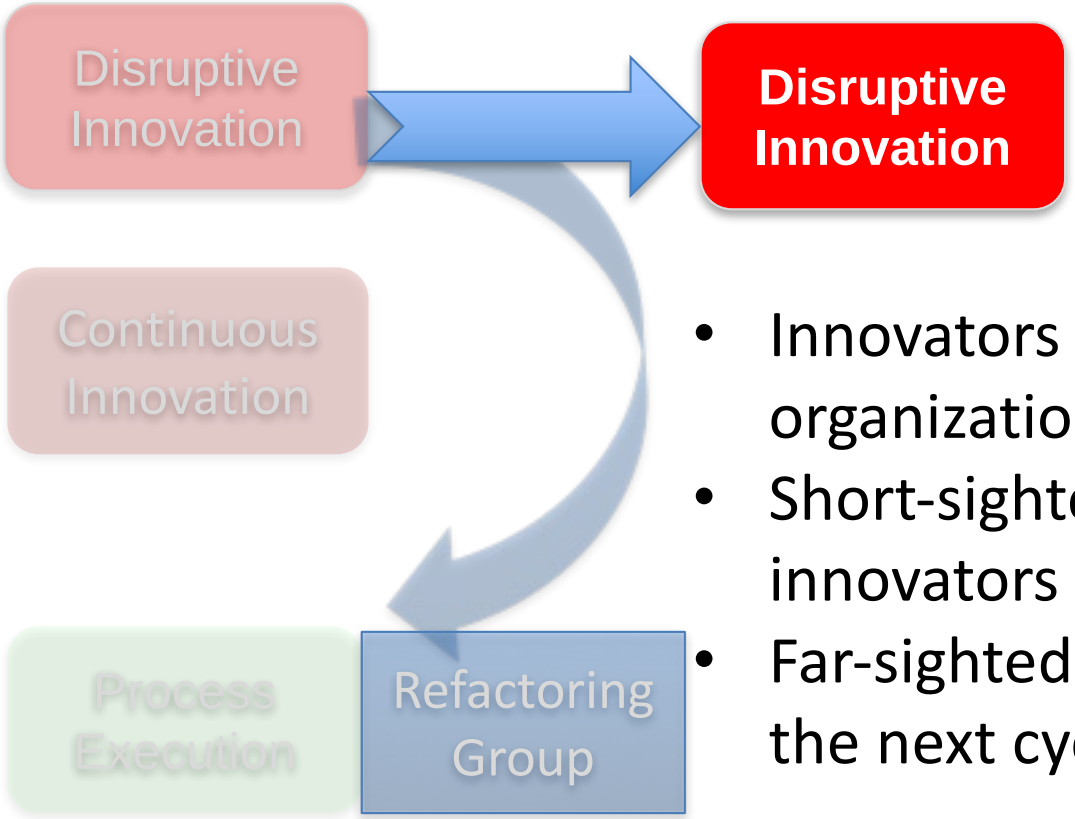
Innovation Becomes Execution



- Success means scale
- Scale *requires* plans, procedures, processes, incentives, KPI's
- Innovation needs to becomes execution
- **Solution:** A small refactoring group "cleans up" Horizon 2/3 debt by restructuring it

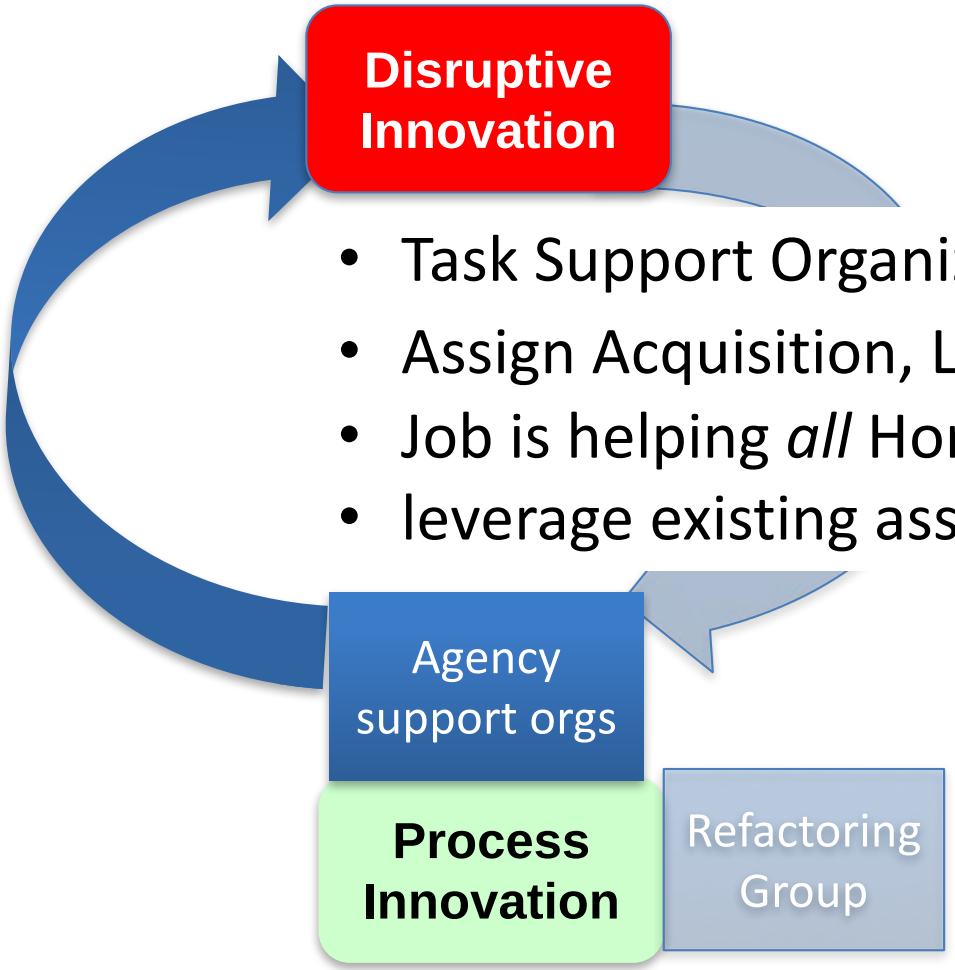
Innovators Leave or Start New Initiatives

Type of Innovation



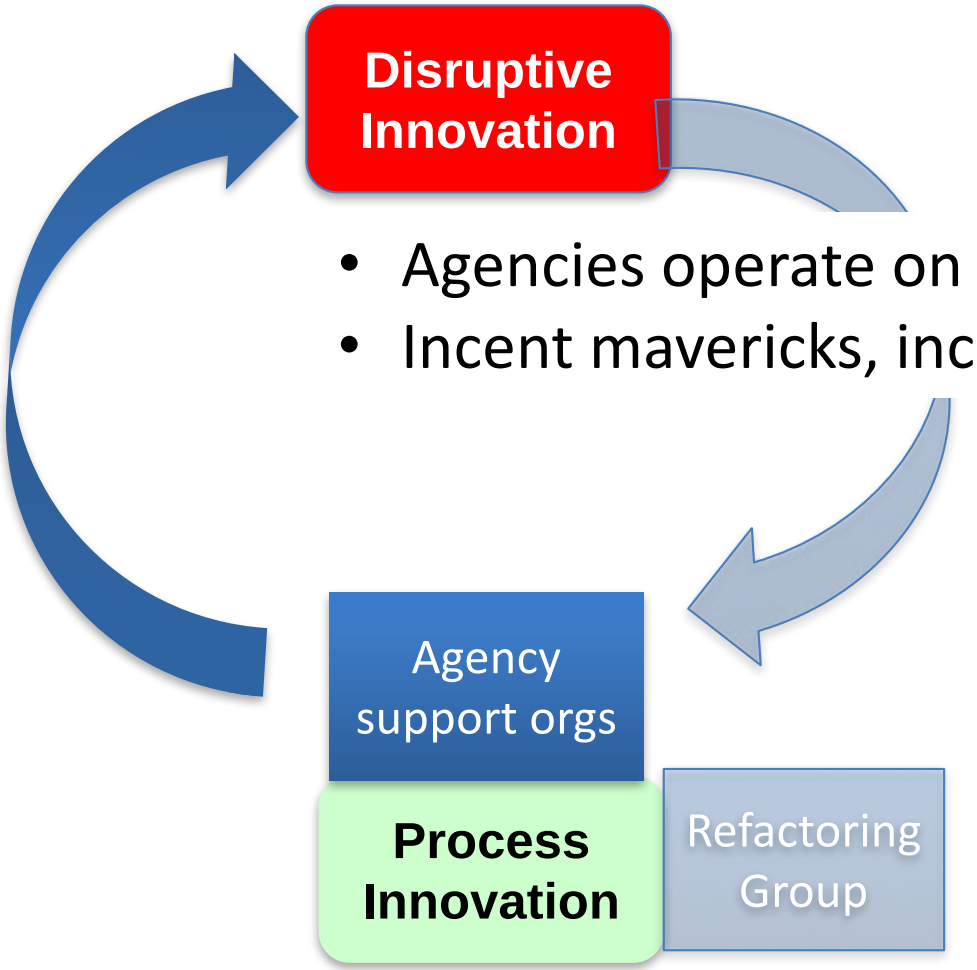
- Innovators don’t fit in execution organizations
- Short-sighted agencies innovators leave
- Far-sighted agencies they start the next cycle of innovation

"Get to Yes"
Agency support of Innovation in All 3 Horizons



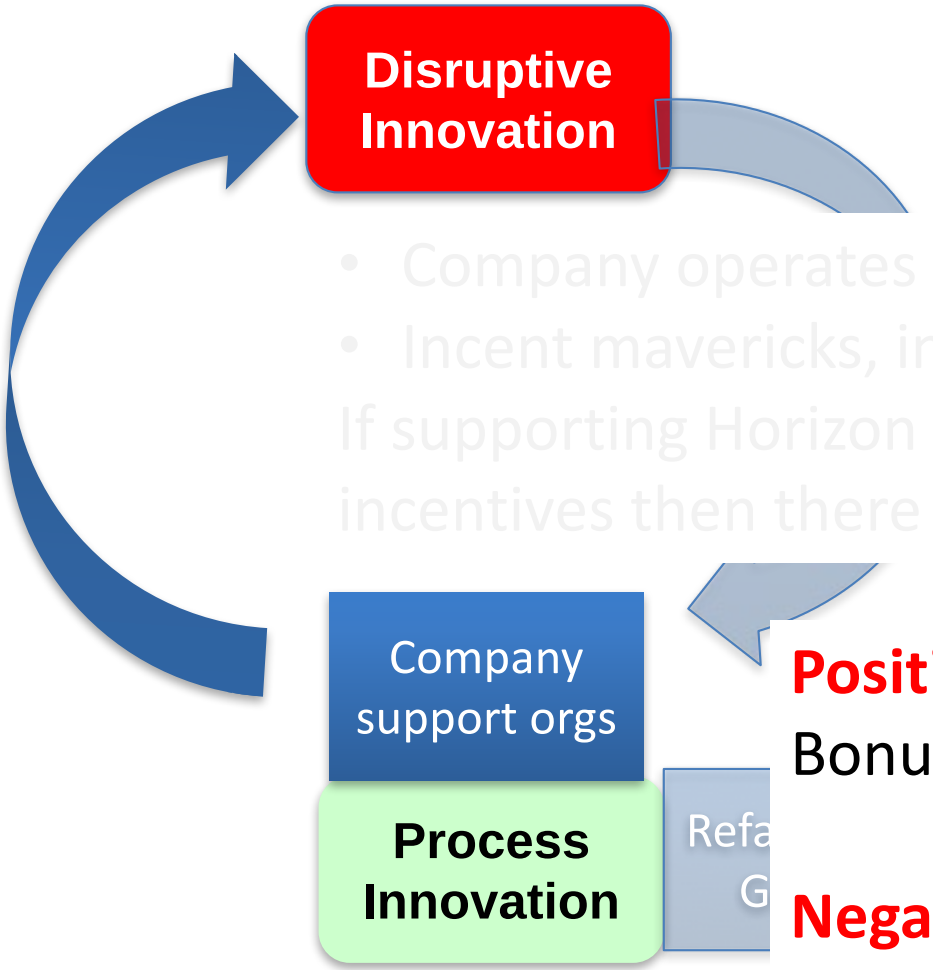
- Task Support Organizations to work *inside* Horizon 2/3
- Assign Acquisition, Legal, Security, etc.
- Job is helping *all* Horizon projects "get to yes"
- leverage existing assets and capabilities is critical

Agency Incentives & Goals
In support of Innovation in All 3 Horizons



- Agencies operate on goals and incentives
- Incent mavericks, incent support, incent adoption

Agency Incentives & Goals
In support of Innovation in All 3 Horizons



- Company operates on goals and incentives
- Incent mavericks, incent support, incent adoption

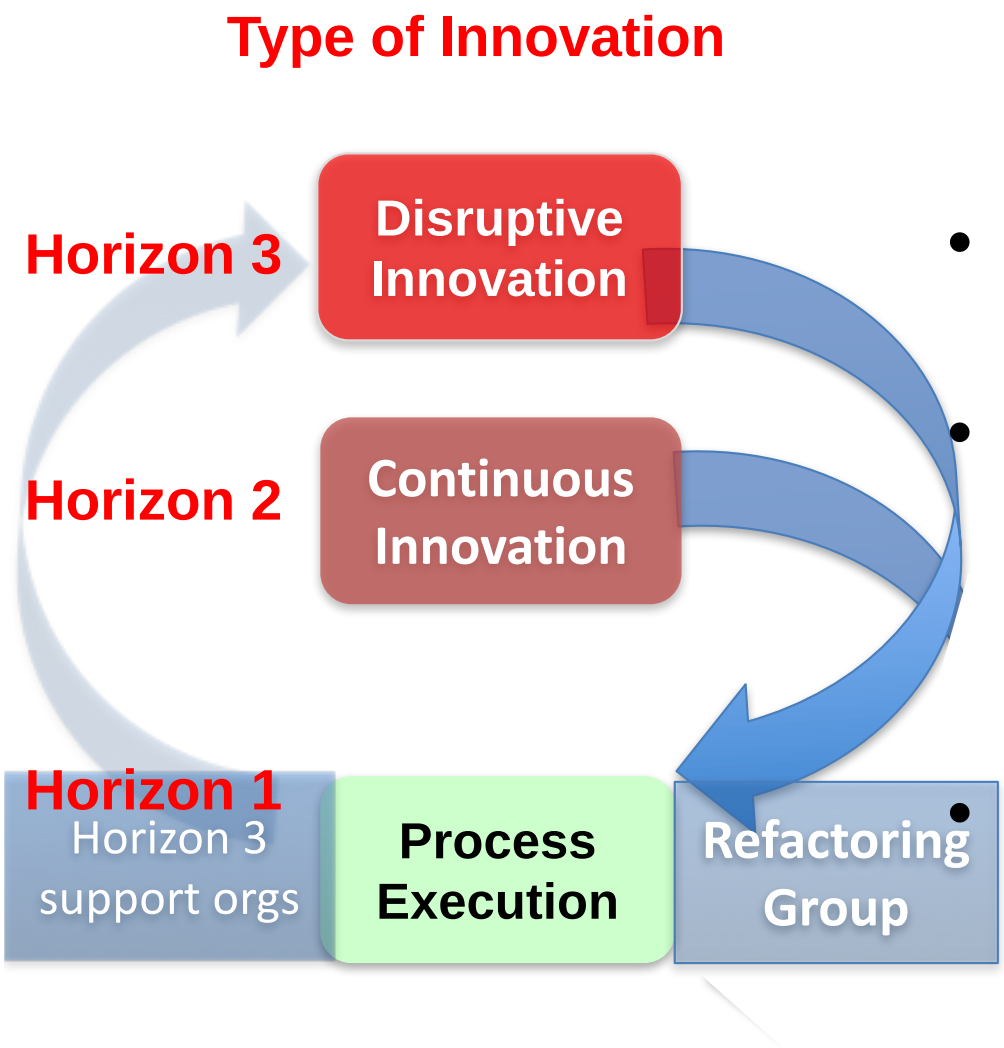
If supporting Horizon 2/3 is not part of Company goals & incentives then there is no real commitment to innovation

Positive – Financial Awards, Performance Bonuses, & Honorary Awards

Negative – You can lose product funding

Innovation Becomes Execution

Horizon 1 Adopts Horizon 2 & 3



- Success means scale
- Scale *requires* plans, KPI's procedures, processes, incentives
- Innovation becomes execution

Intrapreneurs are (Good) Rebels

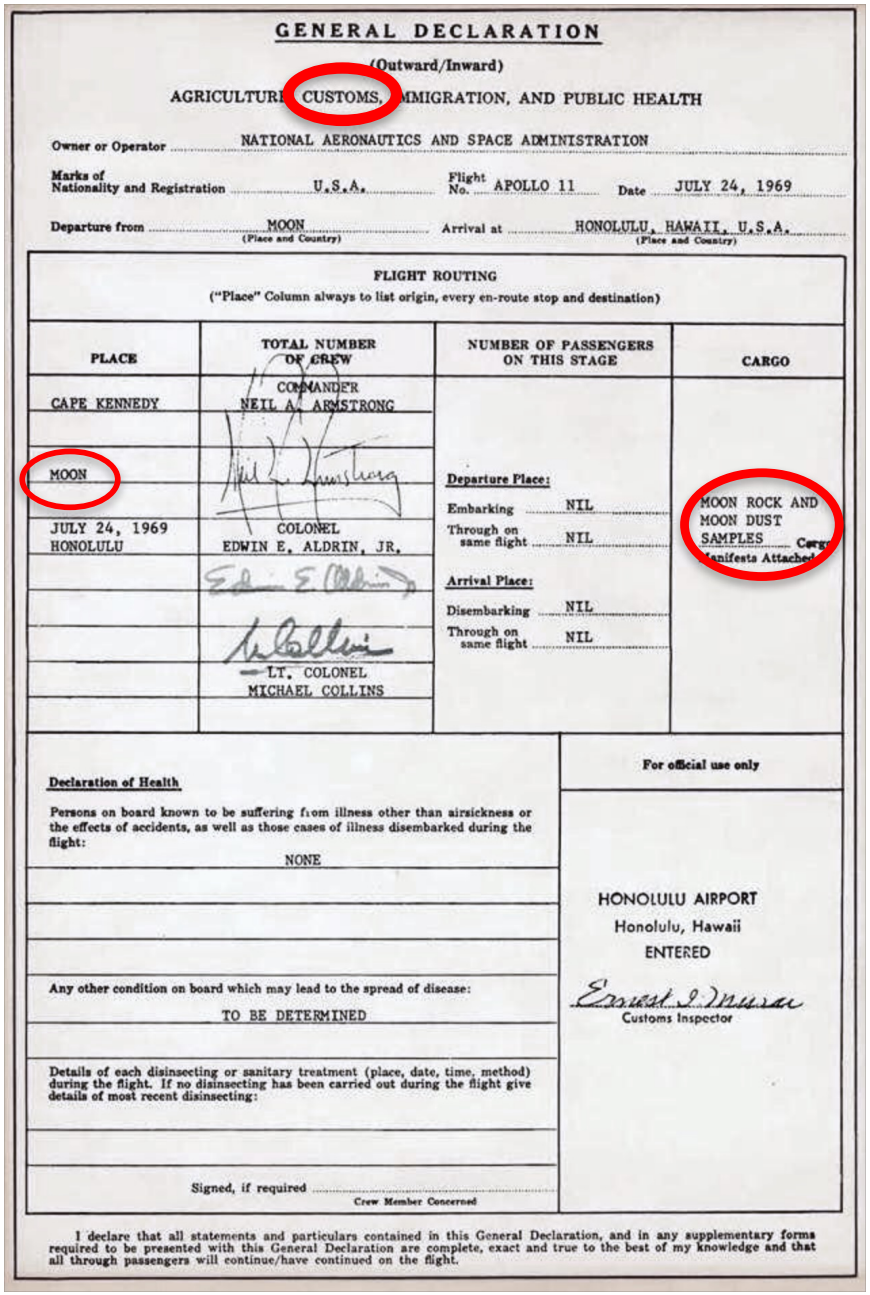
Bad Rebels	Good Rebels
Break Rules	Change Rules
Complain	Create
Assertions	Questions
Me-focused	Mission-focused
Anger	Passion
Pessimist	Optimist
Energy-sapping	Energy-generating
Alienate	Attract
Problems	Possibilities
Vocalize Problems	Socialize Opportunities
Worry That	Wonder if
Point Fingers	Pinpoint Causes
Doubt	Believe
Social Loner	Social

Source: Carmen Medina www.rebelsatwork.com

When Horizon 3 Innovation Meets Horizon 1 Process and Procedures

Horizon 3 Project

Horizon 1 Management



GENERAL DECLARATION

(Outward/Inward)

AGRICULTURE, CUSTOMS, IMMIGRATION, AND PUBLIC HEALTH

Owner or Operator: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Marks of Nationality and Registration: U.S.A. Flight No. APOLLO 11 Date: JULY 24, 1969

Departure from: MOON (Place and Country) Arrival at: HONOLULU, HAWAII, U.S.A. (Place and Country)

FLIGHT ROUTING

("Place" Column always to list origin, every en-route stop and destination)

PLACE	TOTAL NUMBER OF CREW	NUMBER OF PASSENGERS ON THIS STAGE	CARGO
CAPE KENNEDY	COMMANDER NEIL A. ARMSTRONG		
MOON		Departure Place: Embarking NIL; Through on same flight NIL	MOON ROCK AND MOON DUST SAMPLES Cargo Manifests Attached
JULY 24, 1969 HONOLULU	COLONEL EDWIN E. ALDRIN, JR.	Arrival Place: Disembarking NIL; Through on same flight NIL	
	LT. COLONEL MICHAEL COLLINS		

Declaration of Health

Persons on board known to be suffering from illness other than airsickness or the effects of accidents, as well as those cases of illness disembarked during the flight: NONE

Any other condition on board which may lead to the spread of disease: TO BE DETERMINED

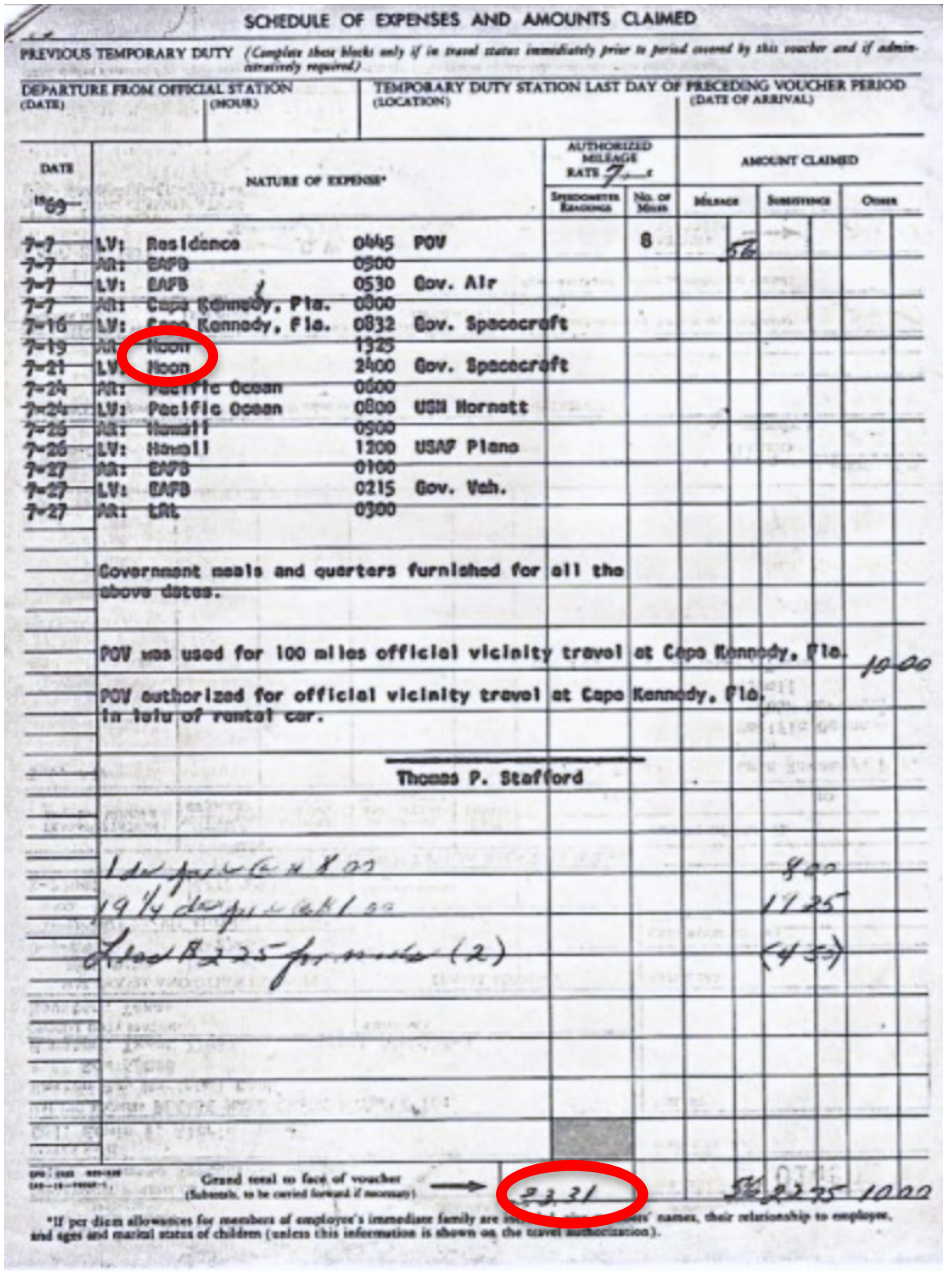
Details of each disinsecting or sanitary treatment (place, date, time, method) during the flight. If no disinsecting has been carried out during the flight give details of most recent disinsecting:

Signed, if required ..... Crew Member Concerned

For official use only

HONOLULU AIRPORT
Honolulu, Hawaii
ENTERED
Ernest J. Murai
Customs Inspector

I declare that all statements and particulars contained in this General Declaration, and in any supplementary forms required to be presented with this General Declaration are complete, exact and true to the best of my knowledge and that all through passengers will continue/have continued on the flight.



SCHEDULE OF EXPENSES AND AMOUNTS CLAIMED

PREVIOUS TEMPORARY DUTY (Complete these blocks only if in travel status immediately prior to period covered by this voucher and if administratively required.)

DEPARTURE FROM OFFICIAL STATION (DATE) (HOUR) | TEMPORARY DUTY STATION LAST DAY OF PRECEDING VOUCHER PERIOD (LOCATION) | (DATE OF ARRIVAL)

DATE 1969	NATURE OF EXPENSE*			AUTHORIZED MILEAGE RATE 7 cents: Speedometer Readings	No. of Miles	AMOUNT CLAIMED: Mileage	Subsistence	Other
7-7	LV: Residence	0645	POV		8	56		
7-7	AR: CAFB	0800						
7-7	LV: CAFB	0530	Gov. Air					
7-7	AR: Cape Kennedy, Fla.	0800						
7-16	LV: Cape Kennedy, Fla.	0832	Gov. Spacecraft					
7-19	AR: Moon	1325						
7-21	LV: Moon	2400	Gov. Spacecraft					
7-24	AR: Pacific Ocean	0600						
7-24	LV: Pacific Ocean	0800	USS Hornett					
7-25	AR: Hawaii	0900						
7-26	LV: Hawaii	1200	USAF Plane					
7-27	AR: CAFB	0100						
7-27	LV: CAFB	0215	Gov. Veh.					
7-27	AR: LRL	0300						

Government meals and quarters furnished for all the above dates.

POV was used for 100 miles official vicinity travel at Cape Kennedy, Fla. 10.00

POV authorized for official vicinity travel at Cape Kennedy, Fla. in lieu of rental car.

Thomas P. Stafford

1 day per G.S.A. 8.00

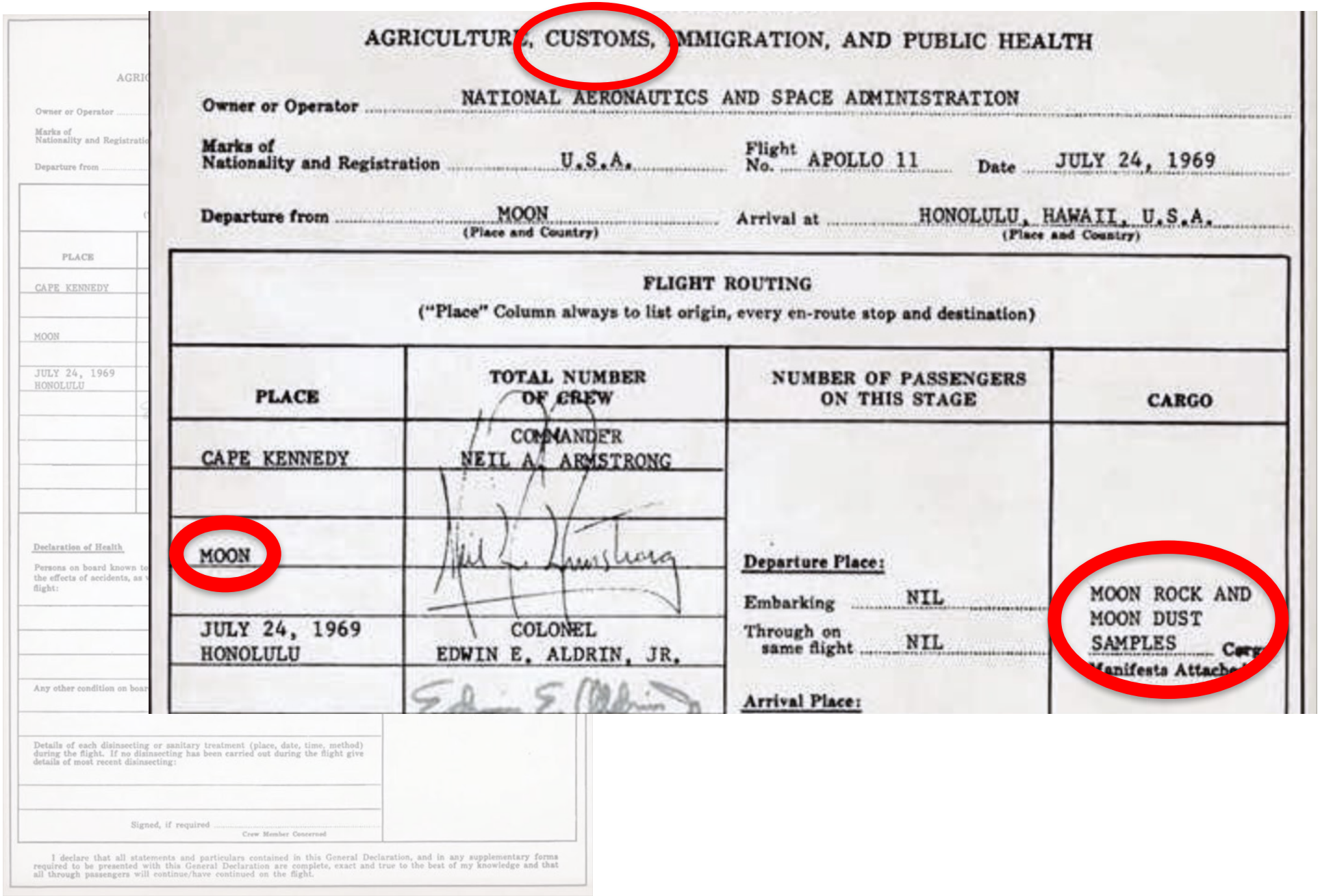
19½ days per G.S.A. 17.25

Lead B-225 for mile (2) (4.50)

Grand total to face of voucher (Subtotals, to be carried forward if necessary) → 23.31 $ 225 10.00

*If per diem allowances for members of employee's immediate family are [illegible] names, their relationship to employee, and ages and marital status of children (unless this information is shown on the travel authorization).

Horizon 1 Management



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FLIGHT ROUTING

("Place" Column always to list origin, every en-route stop and destination)

PLACE	TOTAL NUMBER OF CREW	NUMBER OF PASSENGERS ON THIS STAGE	CARGO
CAPE KENNEDY	COMMANDER NEIL A. ARMSTRONG		
MOON		Departure Place: Embarking ..... NIL Through on same flight ..... NIL	MOON ROCK AND MOON DUST SAMPLES ..... Cargo Manifests Attached
JULY 24, 1969 HONOLULU	COLONEL EDWIN E. ALDRIN, JR.	Arrival Place:	

Declaration of Health

Persons on board known to the effects of accidents, as well flight:

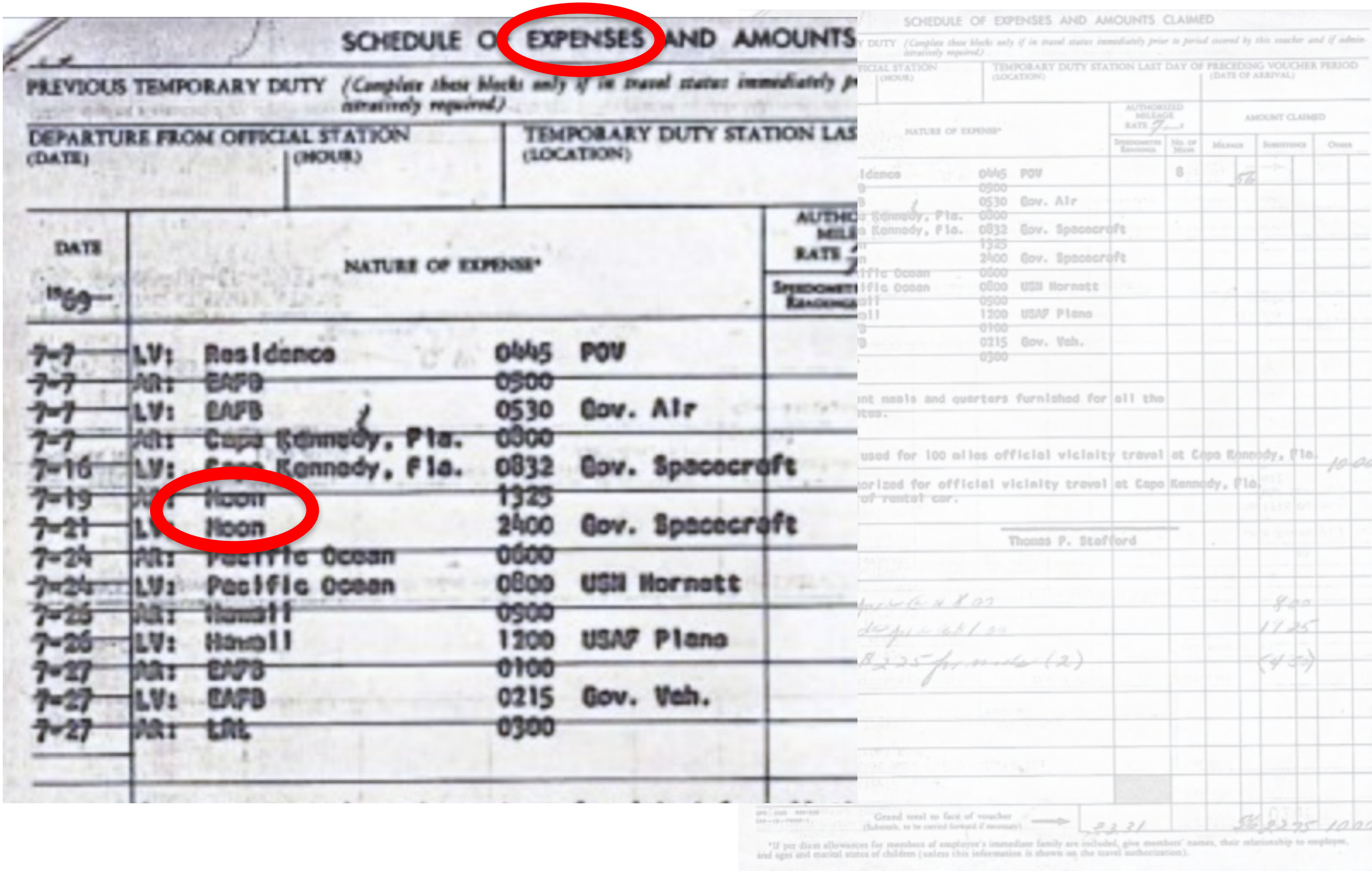
Any other condition on board

Details of each disinsecting or sanitary treatment (place, date, time, method) during the flight. If no disinsecting has been carried out during the flight give details of most recent disinsecting:

Signed, if required ..... Crew Member Concerned

I declare that all statements and particulars contained in this General Declaration, and in any supplementary forms required to be presented with this General Declaration are complete, exact and true to the best of my knowledge and that all through passengers will continue/have continued on the flight.

Horizon 1 Management



SCHEDULE OF EXPENSES AND AMOUNTS CLAIMED

PREVIOUS TEMPORARY DUTY (Complete these blocks only if in travel status immediately prior to period covered by this voucher and if administratively required.)

DEPARTURE FROM OFFICIAL STATION (DATE)	(HOUR)	TEMPORARY DUTY STATION LAST DAY OF PRECEDING VOUCHER PERIOD (LOCATION)	(DATE OF ARRIVAL)

DATE 1969	NATURE OF EXPENSE*			
7-7	LV:	Residence	0445	POV
7-7	AR:	EAFB	0500	
7-7	LV:	EAFB	0530	Gov. Air
7-7	AR:	Cape Kennedy, Fla.	0800	
7-16	LV:	Cape Kennedy, Fla.	0832	Gov. Spacecraft
7-19	AR:	Moon	1325	
7-21	LV:	Moon	2400	Gov. Spacecraft
7-24	AR:	Pacific Ocean	0600	
7-24	LV:	Pacific Ocean	0800	USN Hornett
7-26	AR:	Hawaii	0900	
7-26	LV:	Hawaii	1200	USAF Plane
7-27	AR:	EAFB	0100	
7-27	LV:	EAFB	0215	Gov. Veh.
7-27	AR:	LRL	0300	

...nt meals and quarters furnished for all the ...tes.

...used for 100 miles official vicinity travel at Cape Kennedy, Fla.

...orized for official vicinity travel at Cape Kennedy, Fla. ...of rental car.

Thomas P. Stafford

Grand total to face of voucher (Subtotals, to be carried forward if necessary)

*If per diem allowances for members of employee's immediate family are included, give members' names, their relationship to employee, and ages and marital status of children (unless this information is shown on the travel authorization).

Continuous Innovation Requires Change

Requires the adoption of:

- *new corporate culture*
- *new organizational structure*, and *employee incentives*
- *Innovation Horizons* withh acceptable risk level, and *innovation KPIs*