

SRI International

Impact and Challenges of New
Technologies in the 21st Century

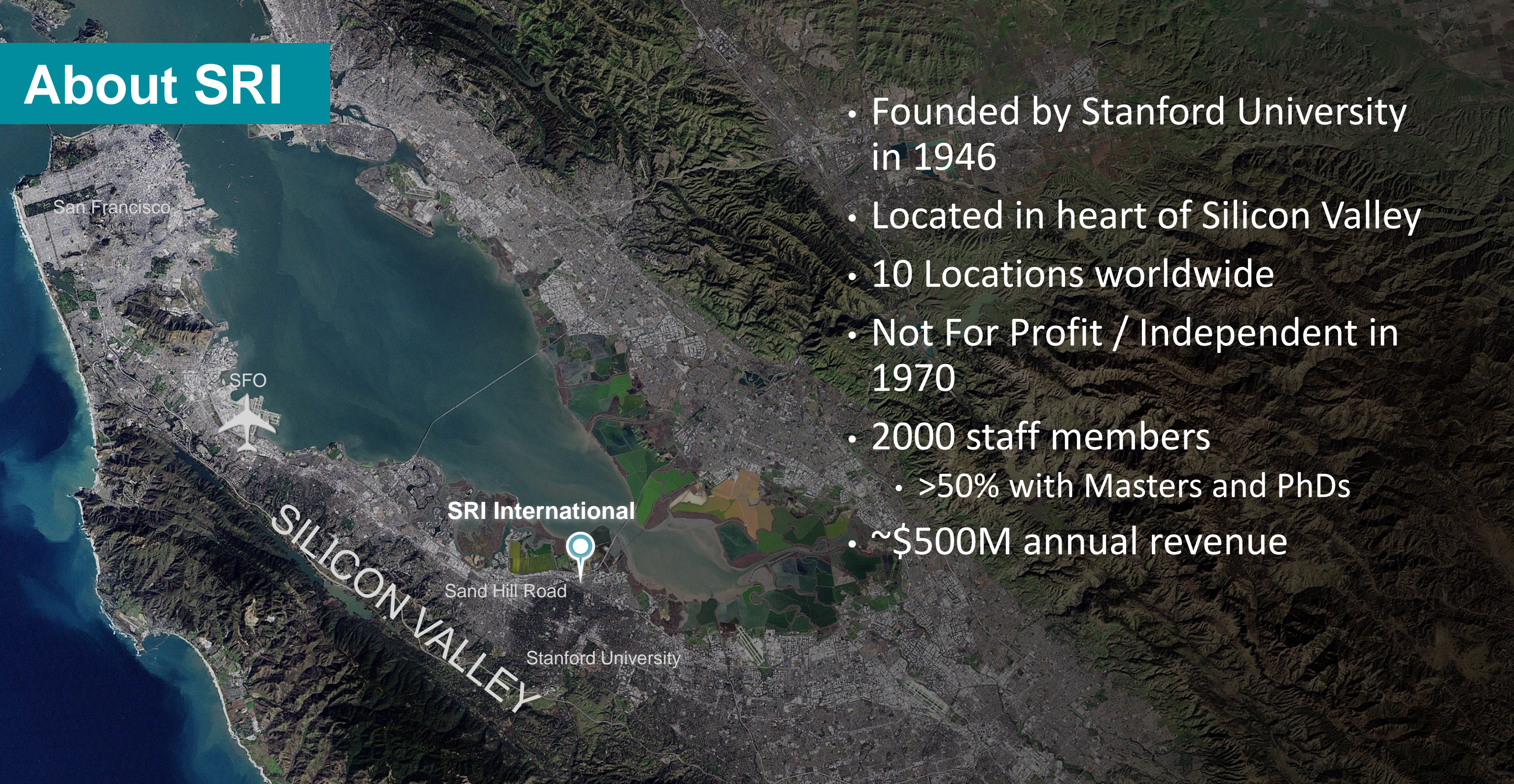


Robert Pearlstein
Vice President, Global Business Development
Barcelona, Spain – November 27th, 2018

SRI International[®]

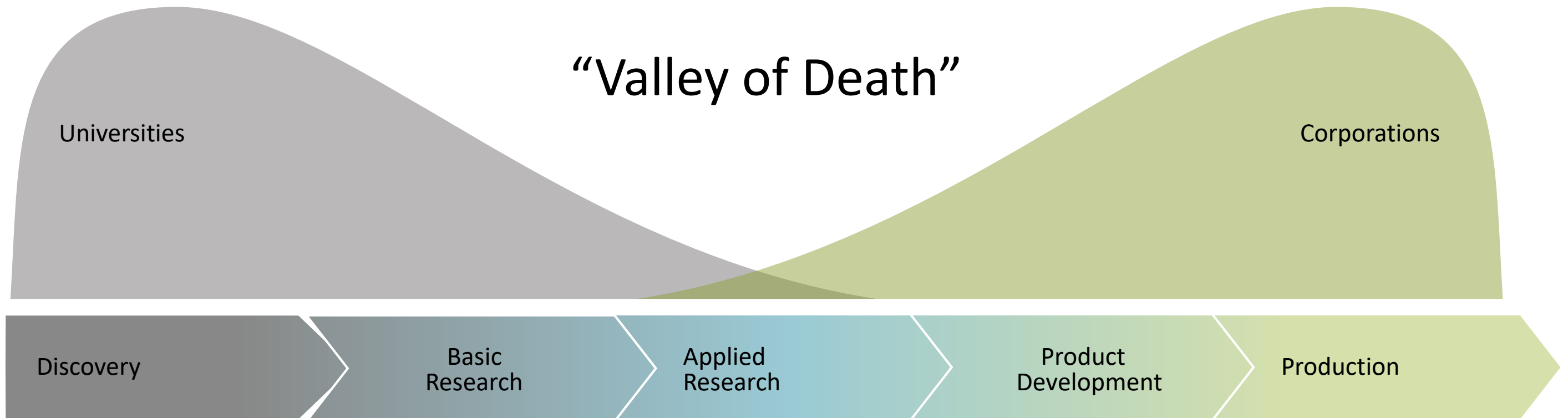
About SRI

- Founded by Stanford University in 1946
- Located in heart of Silicon Valley
- 10 Locations worldwide
- Not For Profit / Independent in 1970
- 2000 staff members
 - >50% with Masters and PhDs
- ~\$500M annual revenue



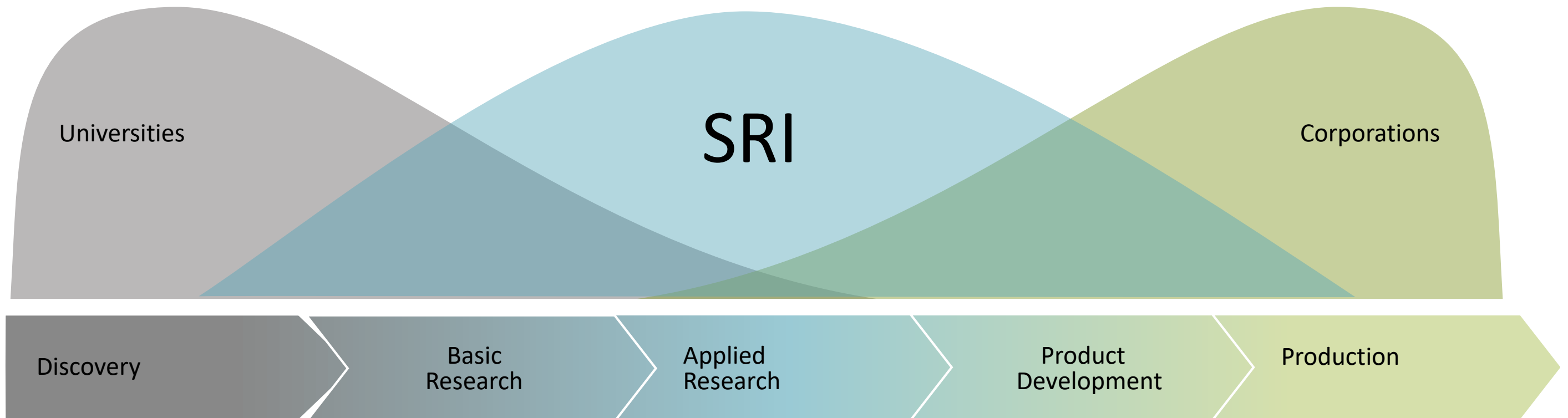
Bridging Basic Research to Commercialization

Easy to describe, very challenging to do!

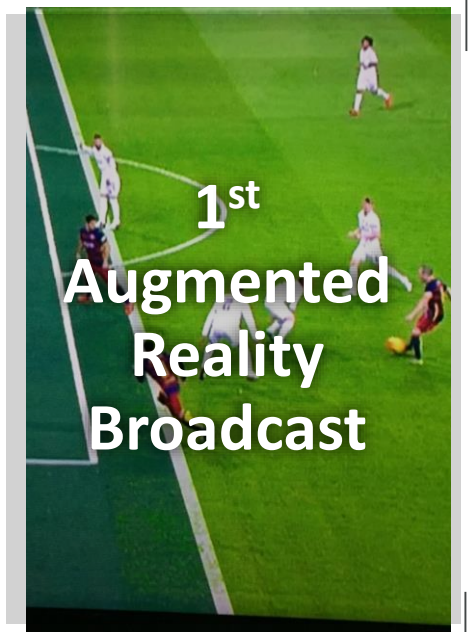
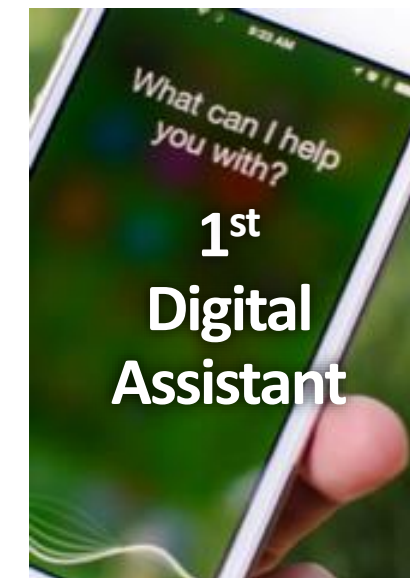
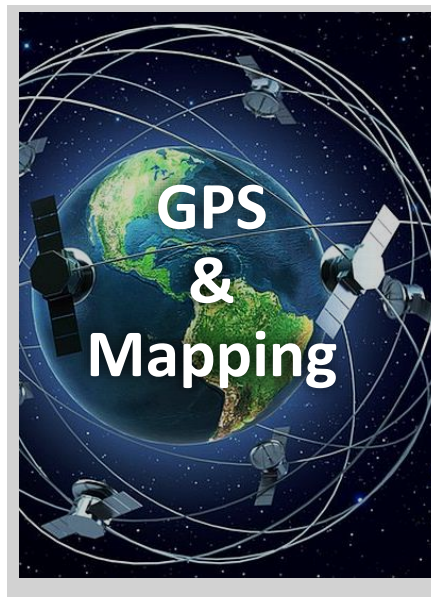
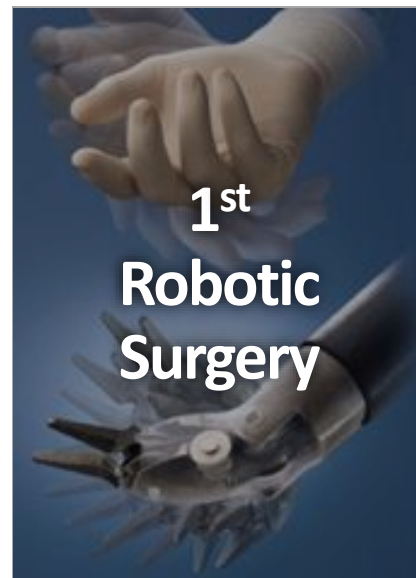
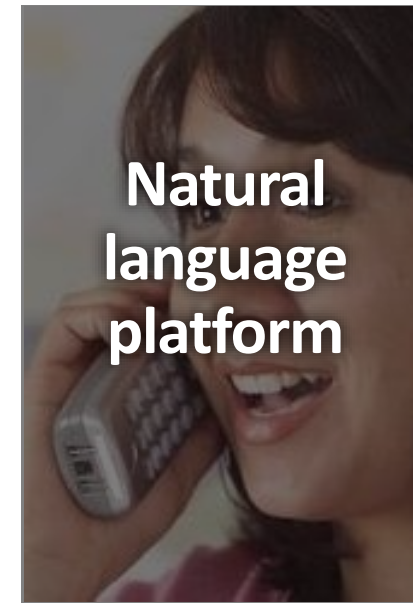
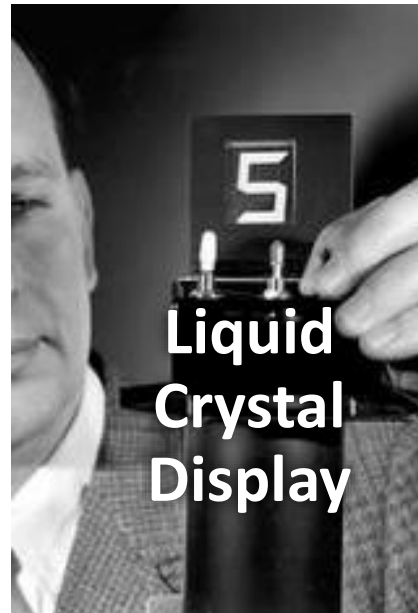
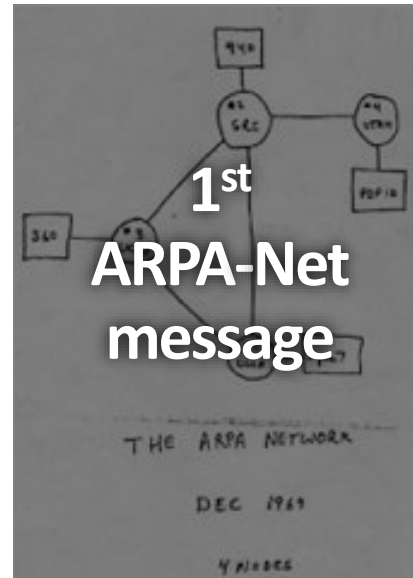
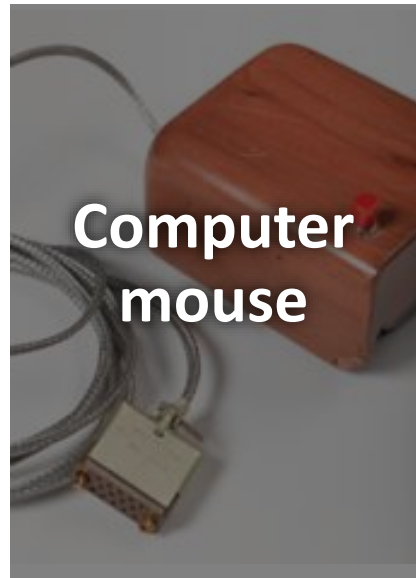


Bridging Basic Research to Commercialization

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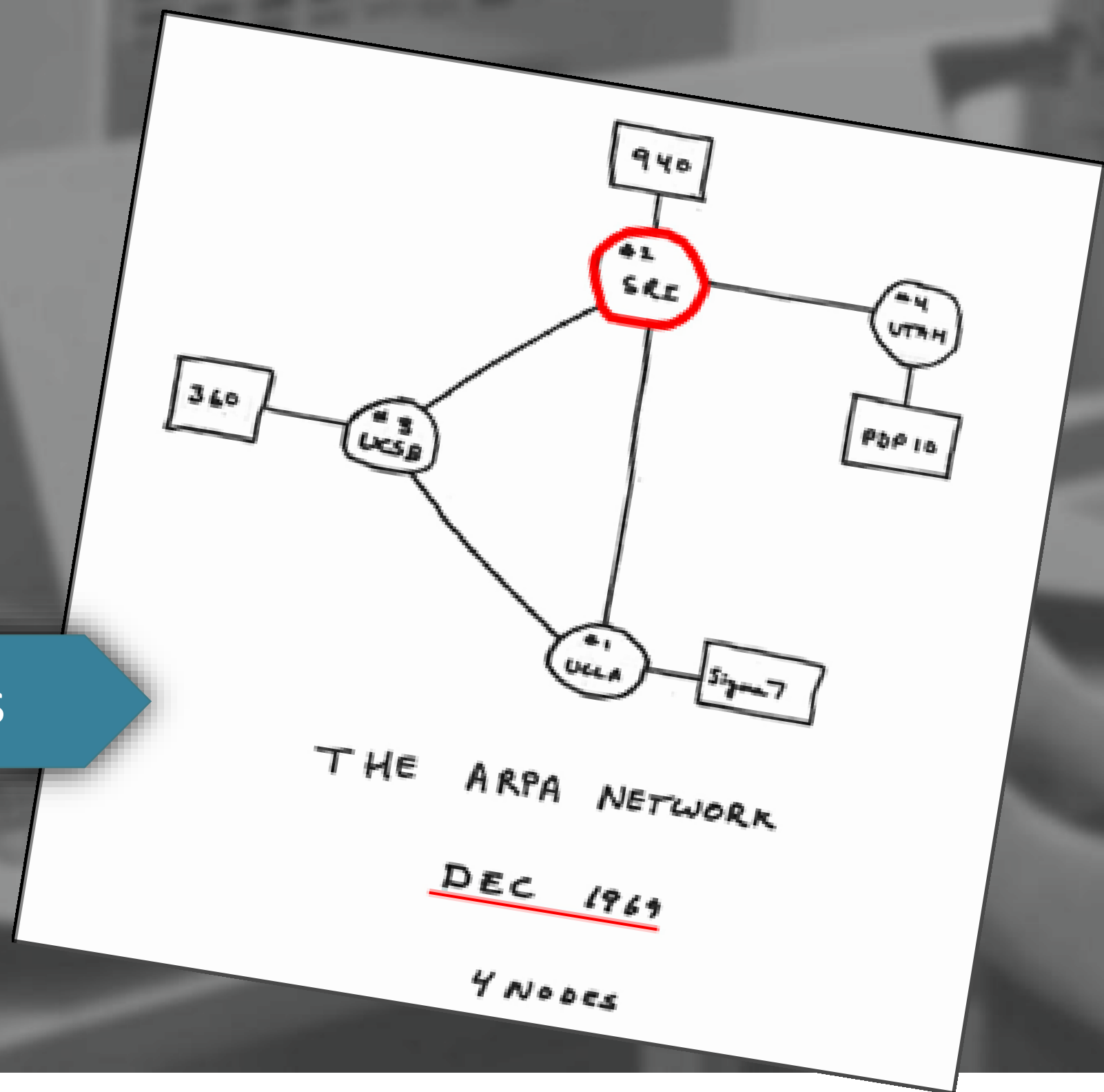


SRI's innovations...



Our Legacy of World-changing Innovations

First ARPA-net Nodes





Grand Challenge!





Interdisciplinary Platforms & Teams

Motobot – 8 Months to POC

A.I. & Computer Science	Speech & Vision Technology	Robotics & Automation	Sensing & Devices
<ul style="list-style-type: none">Machine learningVirtual AssistantsStructured analysisKnowledge representationWorkflow automationActivity recognitionCyber & securityTrusted systemsData analyticsAutomated reasoningCyberphysical systems	<ul style="list-style-type: none">Speech recognitionTranslationLanguage analyticsEmotion and stateSpeaker IDNatural languageImage processingPerceptionVisual searchAugmented/Virtual realityObject and activity recognitionBiometricsComputational imaging	<ul style="list-style-type: none">ManipulationMobilityActuatorsAutomation systemsMachine learningPerceptionSLAMMicro-robotsElectro-active materials	<ul style="list-style-type: none">Multi-spectral imagersMedical devicesRF, RadarsChemicalOptics and LasersMolecular/DNAInput and gesturePhysiological monitoringSensor Fusion

SRI Technology Platforms

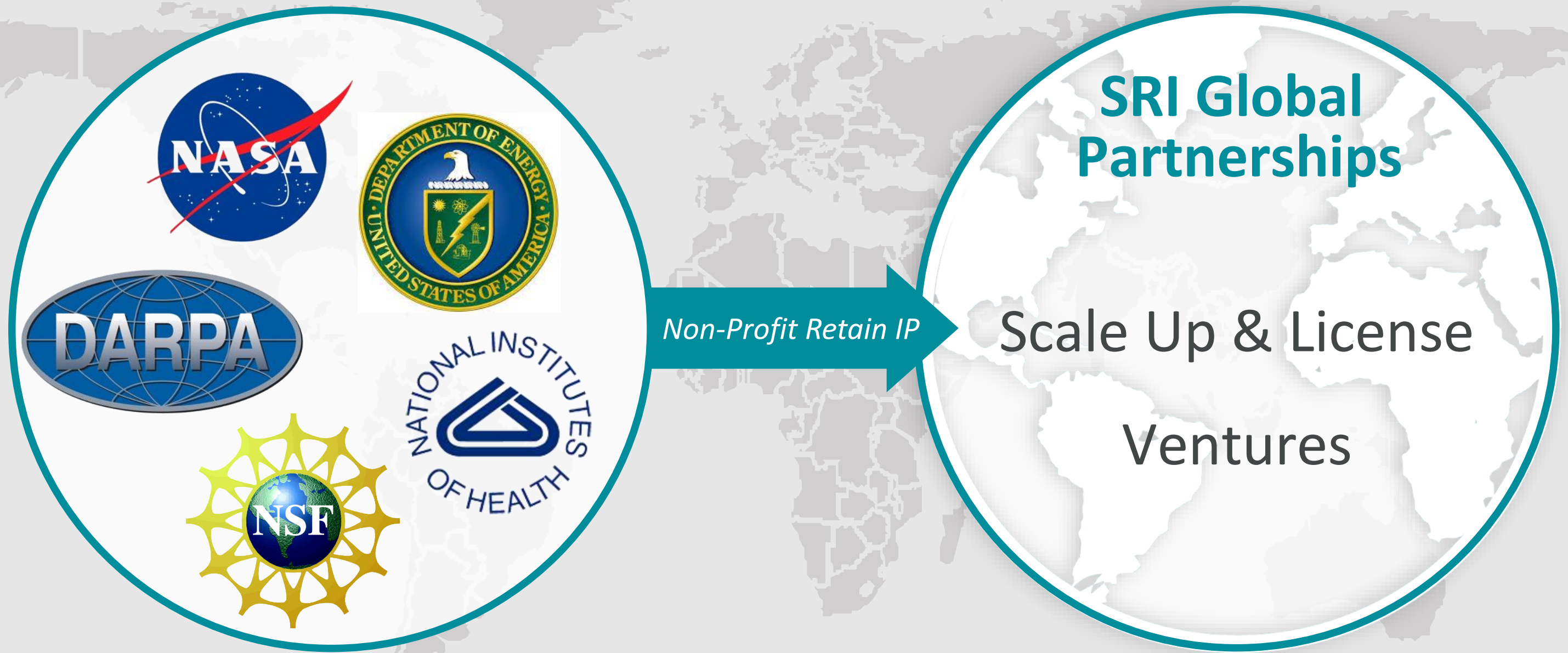
Combine and Customize

Unique Client Solution



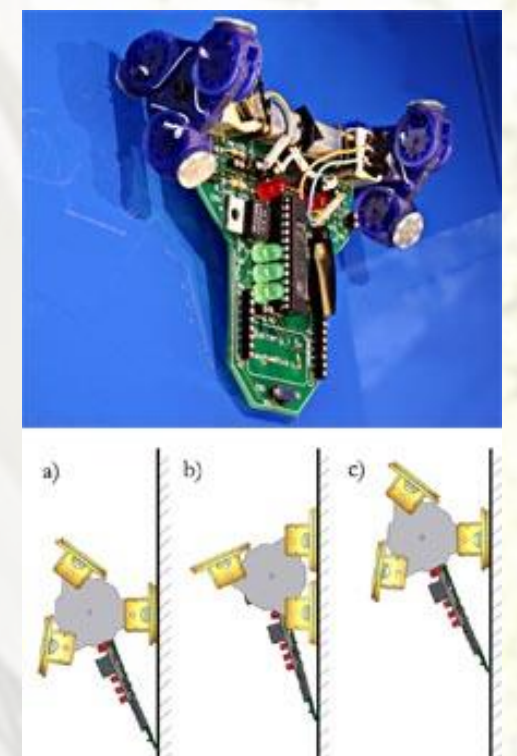
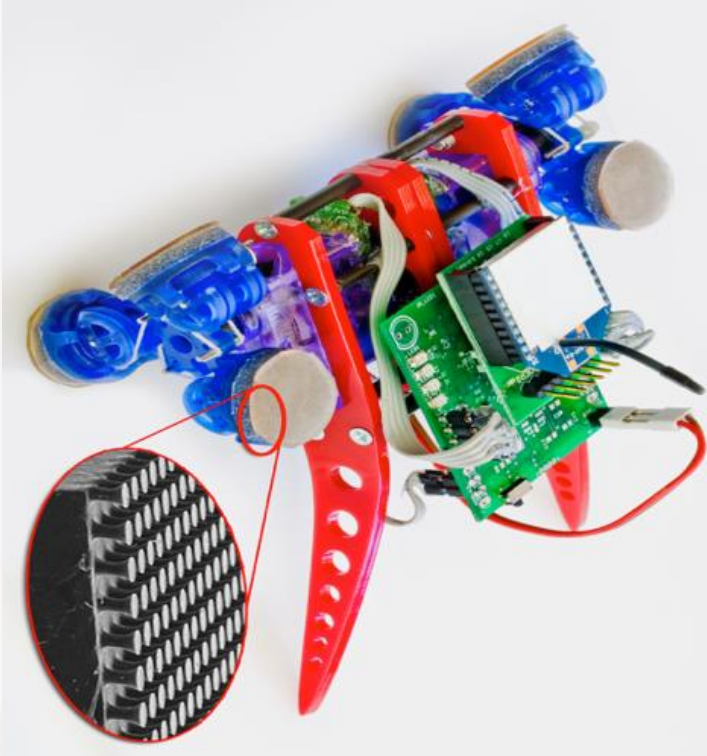
あなたを越えるために生まれてきた。

Converting Government Investment to Market Impact





Wall climbing robot



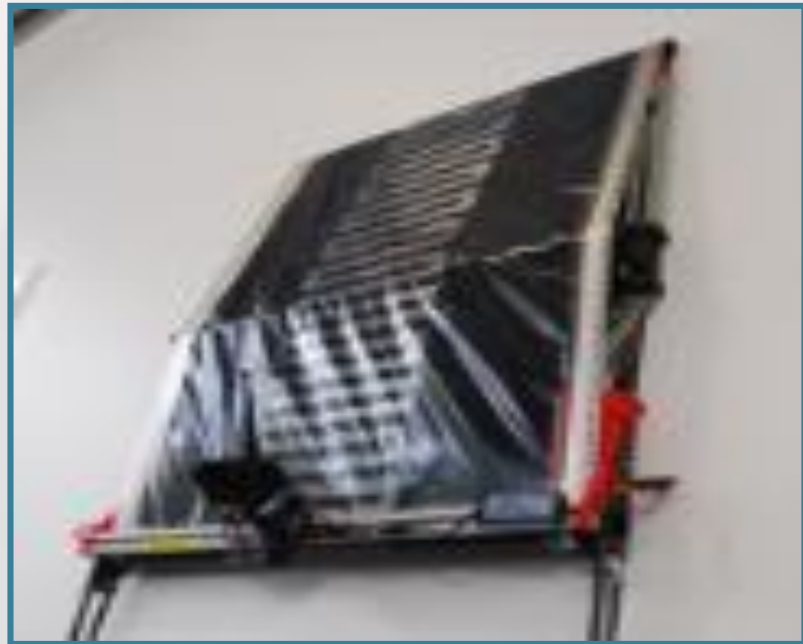
Teams from



Electroadhesion: Different Markets



- Uses electrostatic attractive of positive and negative charges
- Control an object's "stickiness"



Surveillance Drones



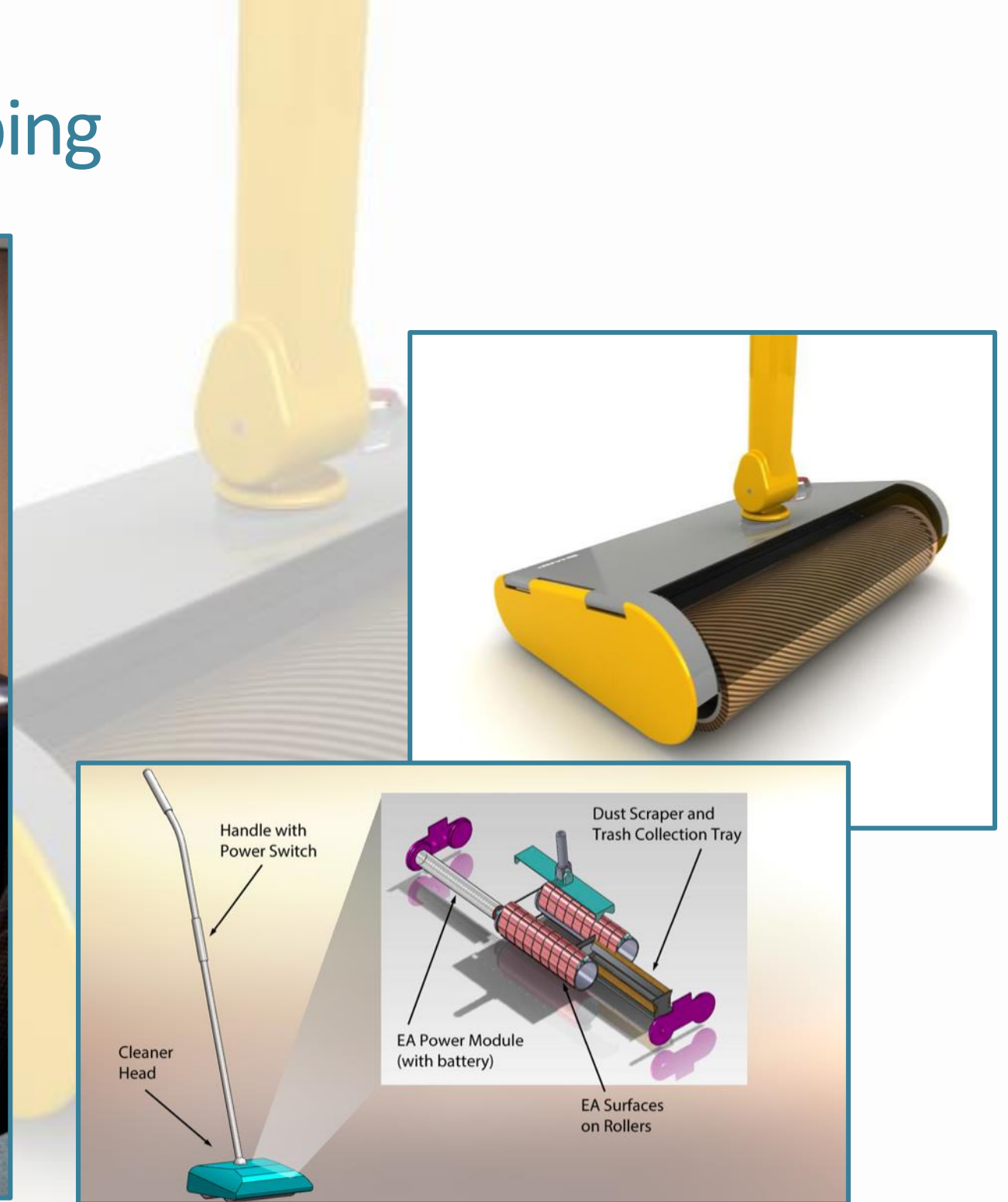
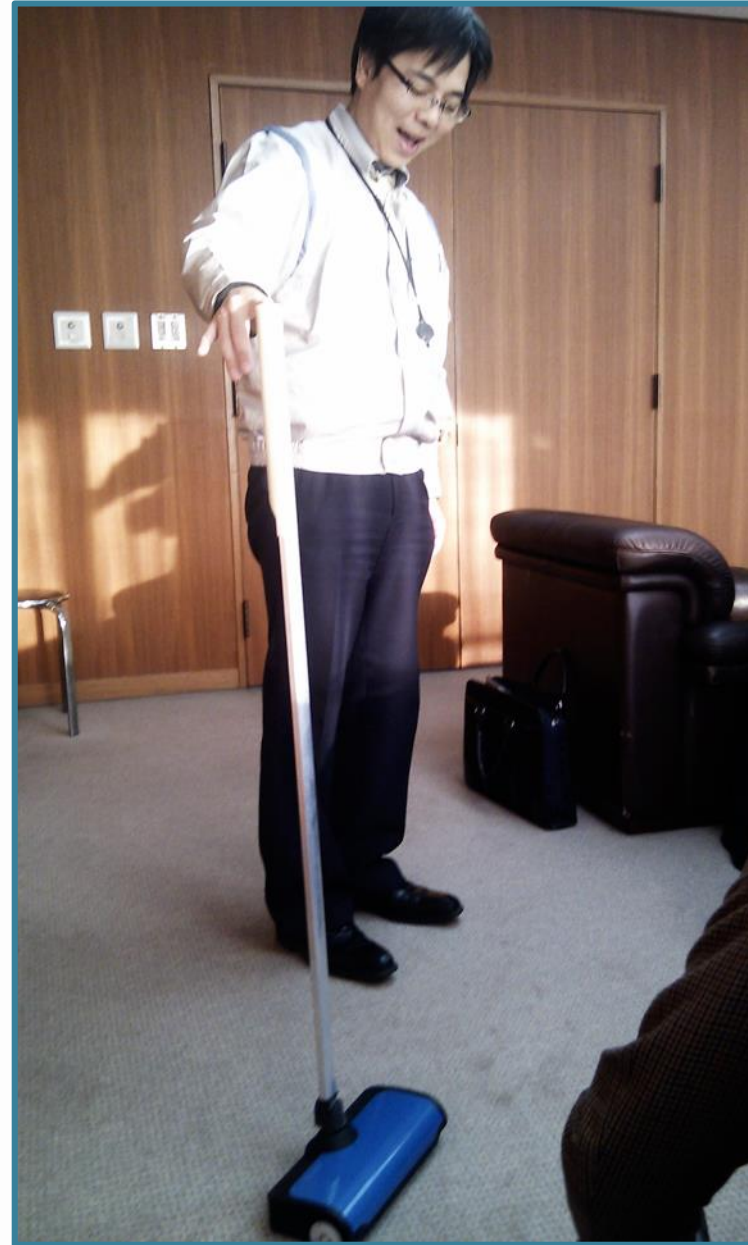
1997: \$6,600,000



2017: < \$6,600

20 Years: $\div 1000$

Application: Electroadhesion for Sweeping



Application: Electroadhesion for Manufacturing



Application: Delivery Logistics



ELECTROADHESION
delivers to the challenge...





Is now a good time
for innovation?



Best time in history for
making major contributions
through innovation.



**7 billion people now
moving to
10 billion people in 2050**

Source: UN ESA.

3 billion new middle class consumers



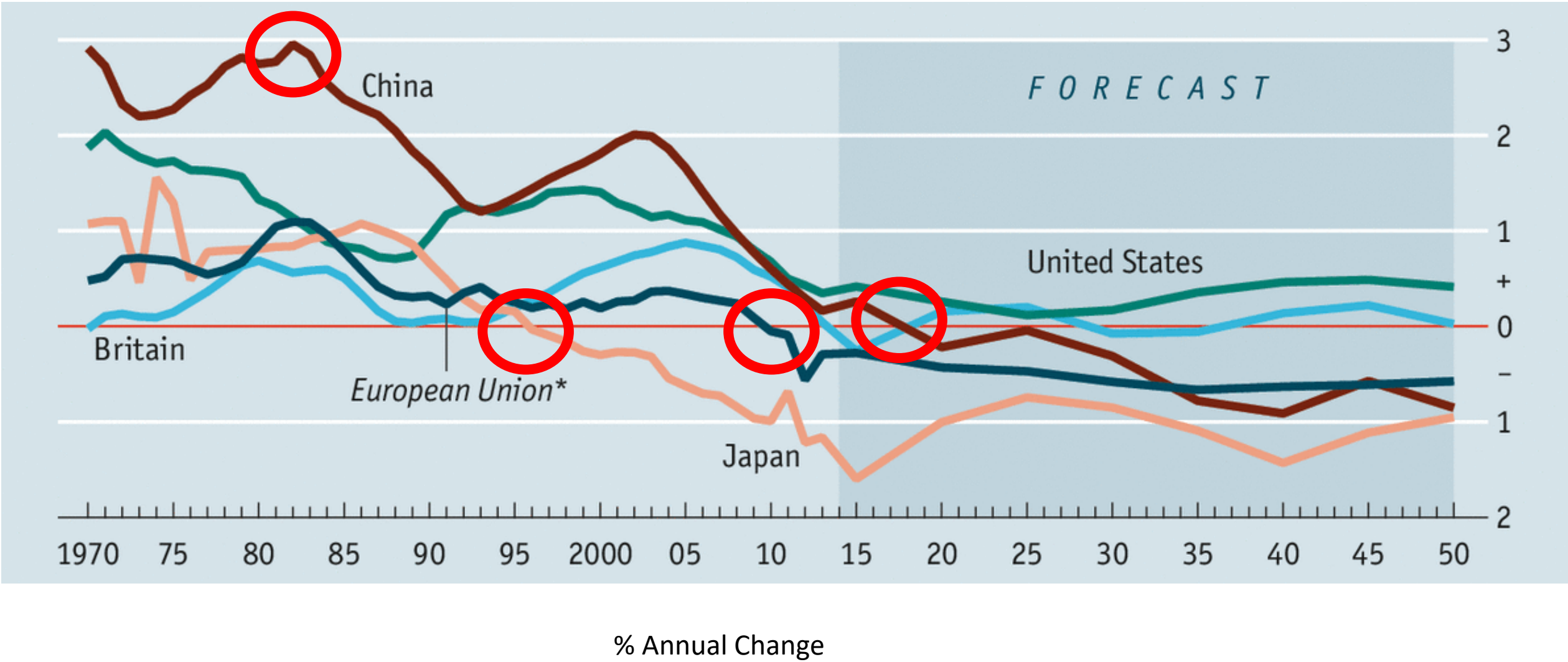
An aerial night view of a city skyline, likely Shanghai, featuring several prominent skyscrapers with illuminated facades. The sky is a deep blue, and the city lights create a warm, orange glow. The text "Two out of every Three people living cities by 2050" is overlaid in white.

Two out of every Three
people living cities by 2050

76 years
Life Expectancy
by 2050



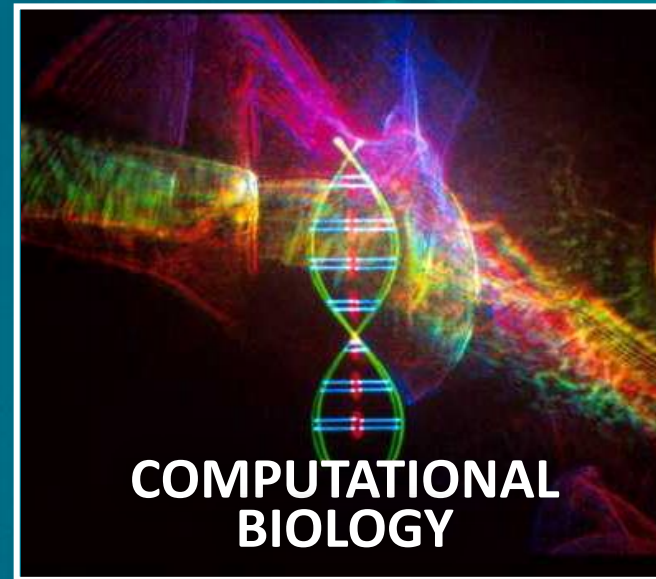
Fewer Workers



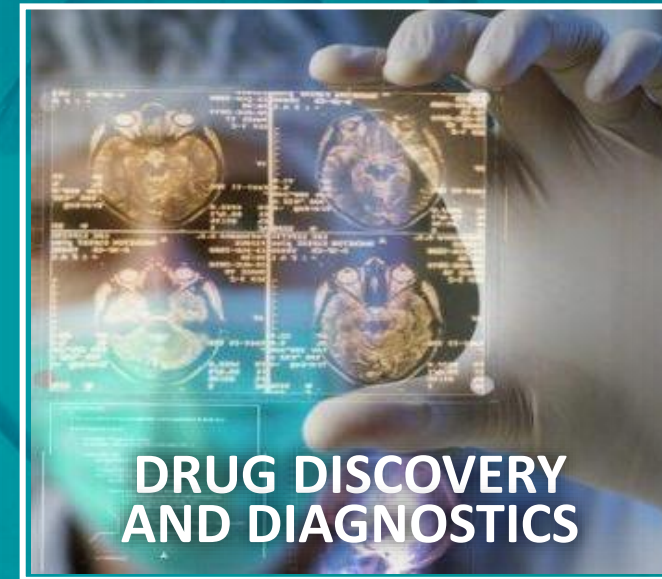
Source: World Bank, The Economist



INTERNET OF THINGS



**COMPUTATIONAL
BIOLOGY**



**DRUG DISCOVERY
AND DIAGNOSTICS**



INTELLIGENT SERVICES



DIGITAL EDUCATION



**DIGITAL
MANUFACTURING**

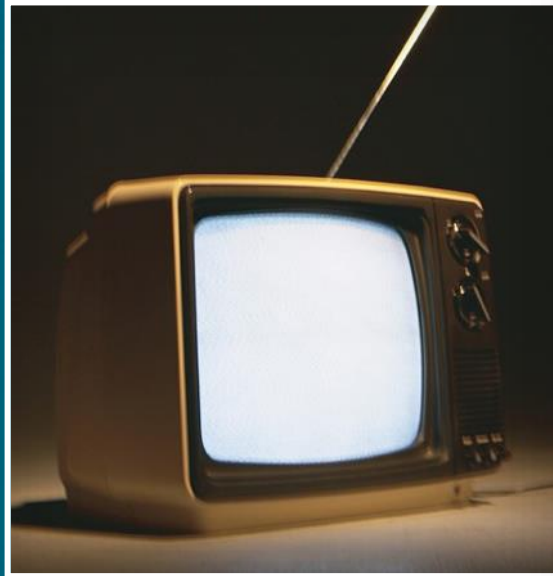


RENEWABLES

Pace of innovation is accelerating



89
YEARS



38
YEARS



14
YEARS



5
YEARS



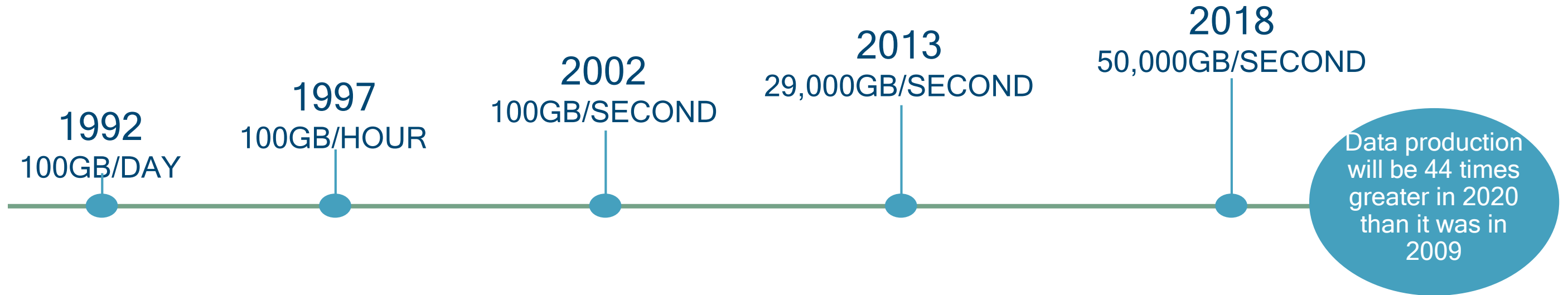
2.5
YEARS

Time to reach 150 million users

Data Generation Accelerating



Let's Look At "Big Data"



WE CREATE
2,500,000,000,000,000,000
bytes of data daily

90%

of the world's data today has been created in the last 2 years

AI Applications Across Industries



MANUFACTURING

- Predictive maintenance or condition monitoring
- Warranty reserve estimation
- Propensity to buy
- Demand forecasting
- Process optimization
- Telematics



RETAIL

- Predictive inventory planning
- Recommendation engines
- Upsell and cross-channel marketing
- Market segmentation and targeting
- Customer ROI and lifetime value



HEALTHCARE & LIFE SCIENCES

- Alerts and diagnostics from real-time patient data
- Disease identification and risk stratification
- Patient triage optimization
- Proactive health management
- Healthcare provider sentiment analysis



TRAVEL & HOSPITALITY

- Aircraft scheduling
- Dynamic pricing
- Social media – consumer feedback and interaction analysis
- Customer complaint resolution
- Traffic patterns and congestion management



FINANCIAL SERVICES

- Risk analytics and regulation
- Customer Segmentation
- Cross-selling and up-selling
- Sales and marketing campaign management
- Credit worthiness evaluation



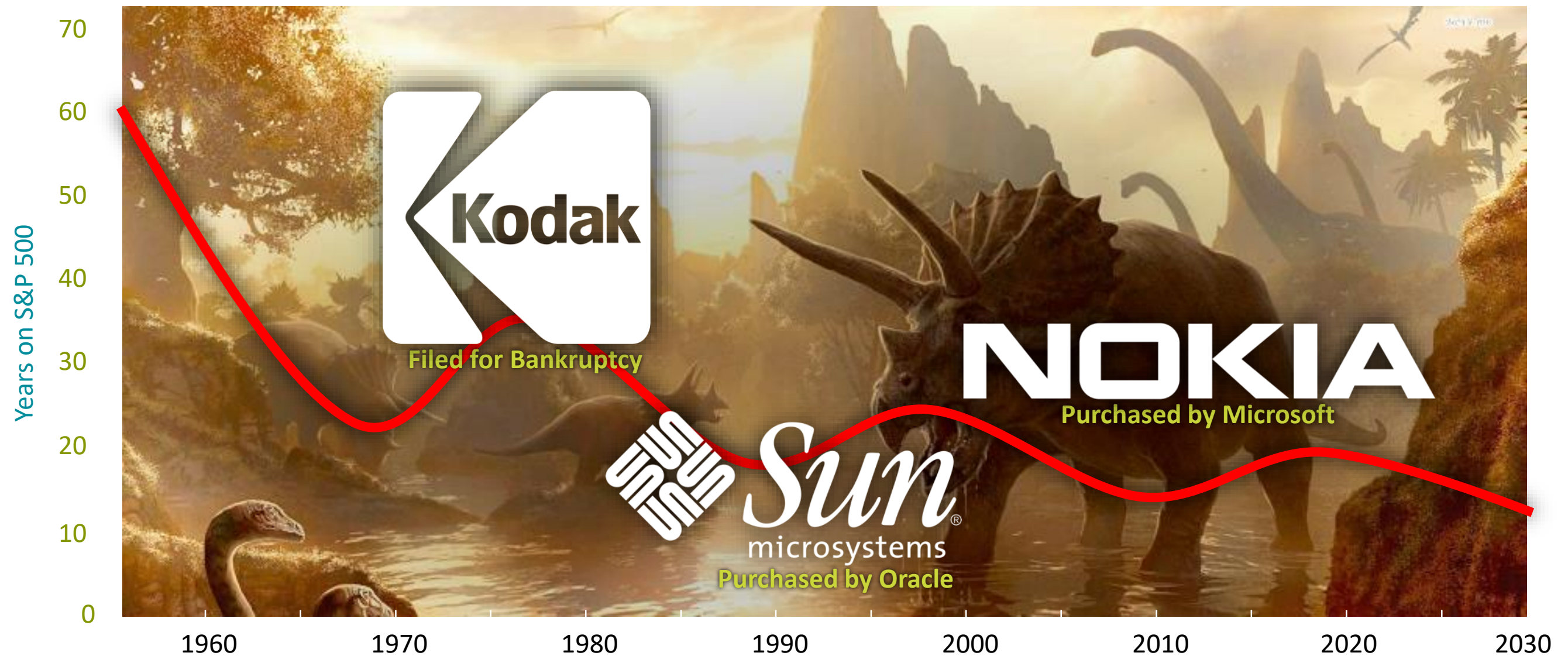
ENERGY, FEEDSTOCK & UTILITIES

- Power usage analytics
- Seismic data processing
- Carbon emissions and trading
- Customer-specific pricing
- Smart grid management
- Energy demand and supply optimization

Source: <http://www.tcs.com/>

A Case for Change

Innovate or Die: Large Corporations are Failing



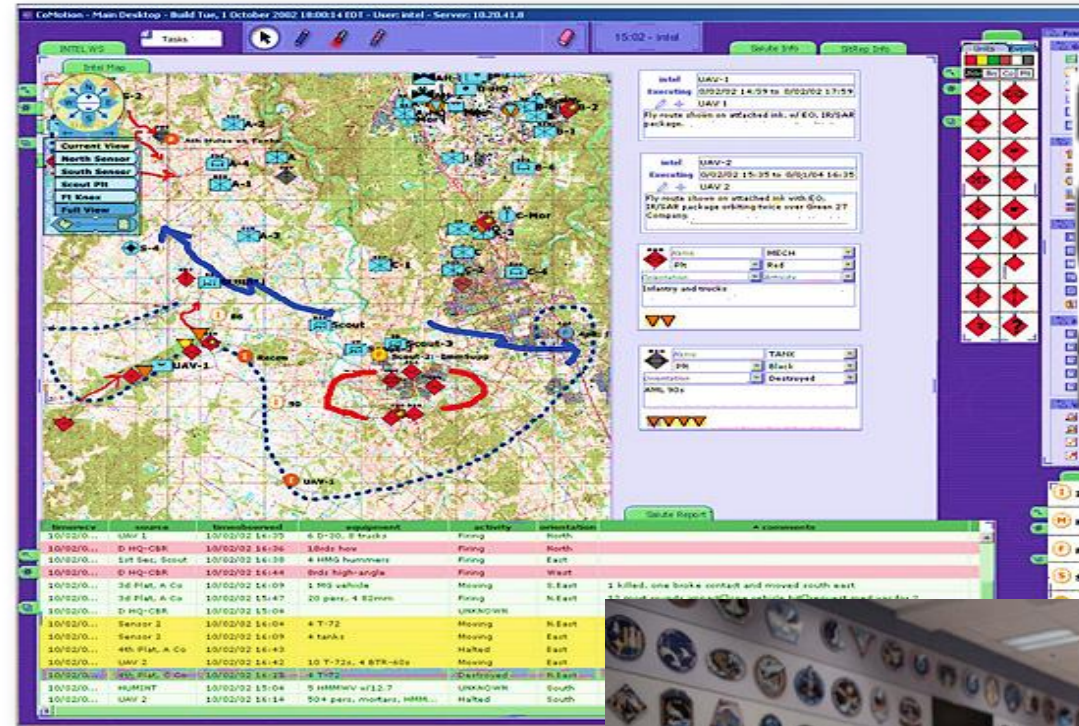
Source: Richard Foster & Sarah Kaplan, *Creative Destruction*, 2001.



Origins of SIRI

Cognitive Assistant that Learns and Organizes

USED IN A MISSION CONTROL ROOM



Virtual Personal Assistant Applied



AUTO



Health

Chat

Hi John. Welcome back. What are you looking for today?

I'm interested in boot cut

I found 3 pairs of denims in bootcut. Which one are you interested in?

Talk

Send

for all 7 mankind

WOMEN'S DENIM VIEW ALL

sort by size sort by wash sort by price

ORIGINAL BOOTCUT IN DISTRESSED DEL AZUL \$198.00

MID RISE BOOTCUT IN SPRING BLUE \$189.00

KIMIE CURVY BOOTCUT IN CALIFORNIA DEL SOL \$198.00

PLAY AUDIO

RETAIL



BANKING

LOLA ASSISTANT

you?

what is my checking balance

YOU

The available balance in your Checking account (Luis New Checking/6483) is \$9.86.

and savings

YOU

The available balance in your Savings account (Savings/3786) is \$2.01.

how about money market

YOU

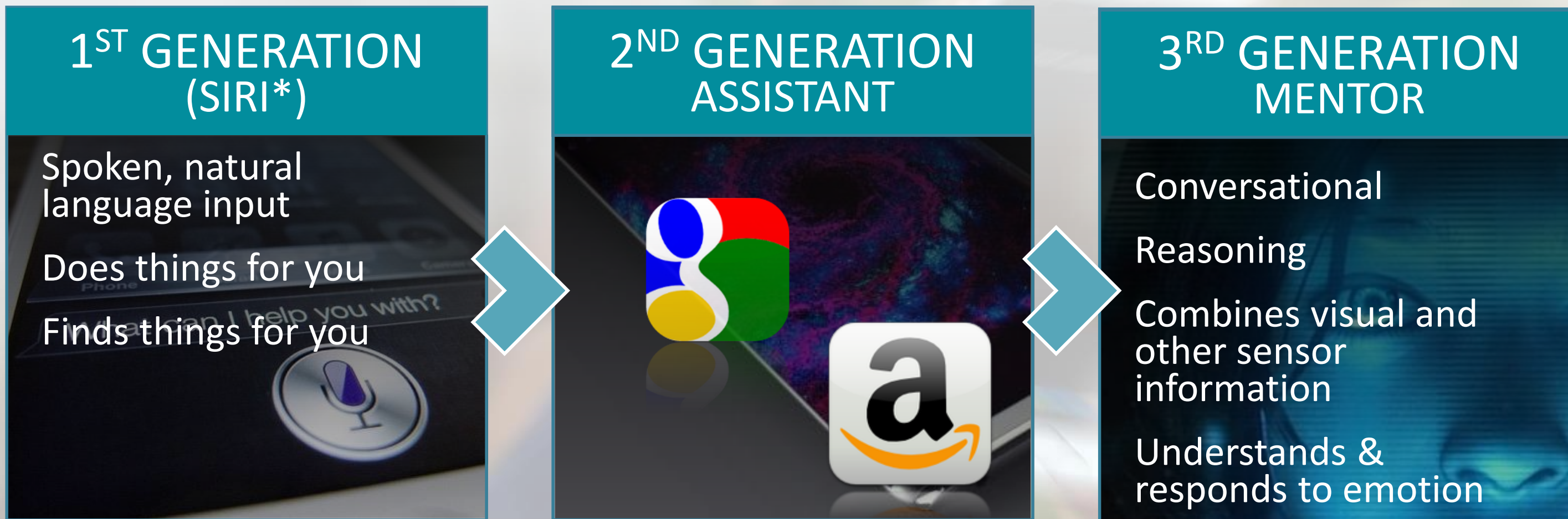
The available balance in your Money market account (Money Market/9539) is \$866.54.

SEND

PUSH TO TALK

SRI's Virtual Personal Assistant (VPA)

Software that acts like a human assistant




** Incubated at SRI; acquired by Apple, 2010*



INNOVATION HOW DO YOU GO ABOUT IT?





What is your
definition of
Innovation?



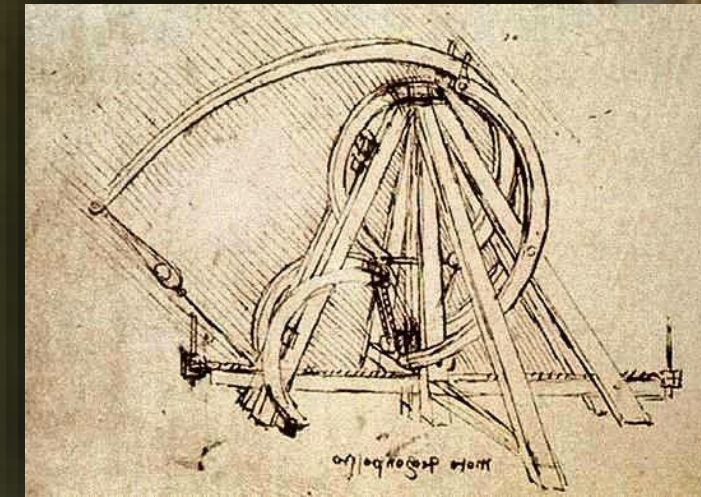
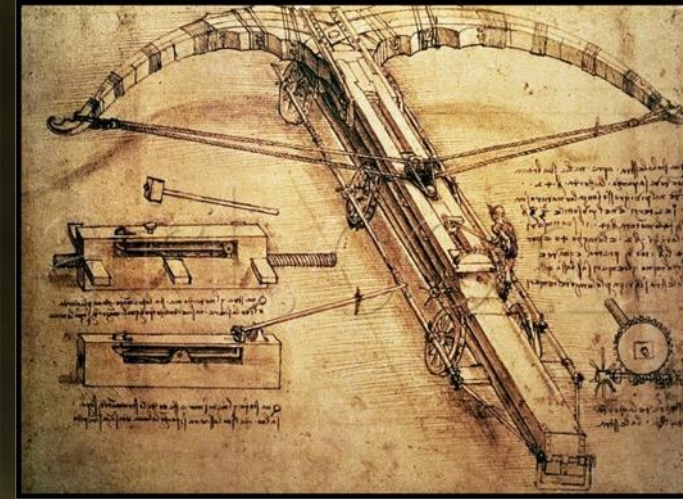
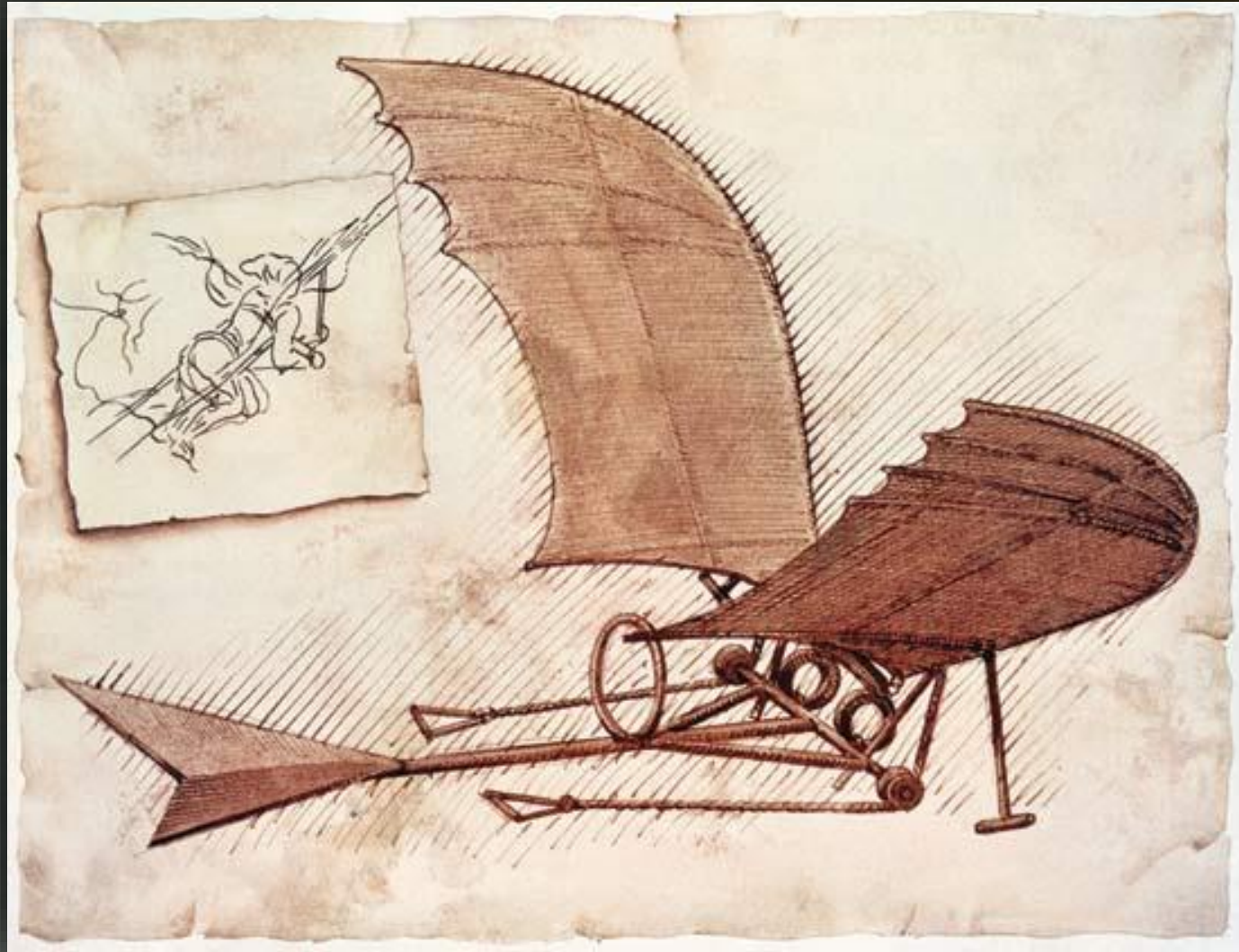
A Simple Definition

*Innovation is the creation and delivery of new customer value
to the marketplace, with a sustainable business model.*

More than Science and Technology

Adapted from: *Innovation*, Curtis R. Carlson & William W. Wilmot. 2006

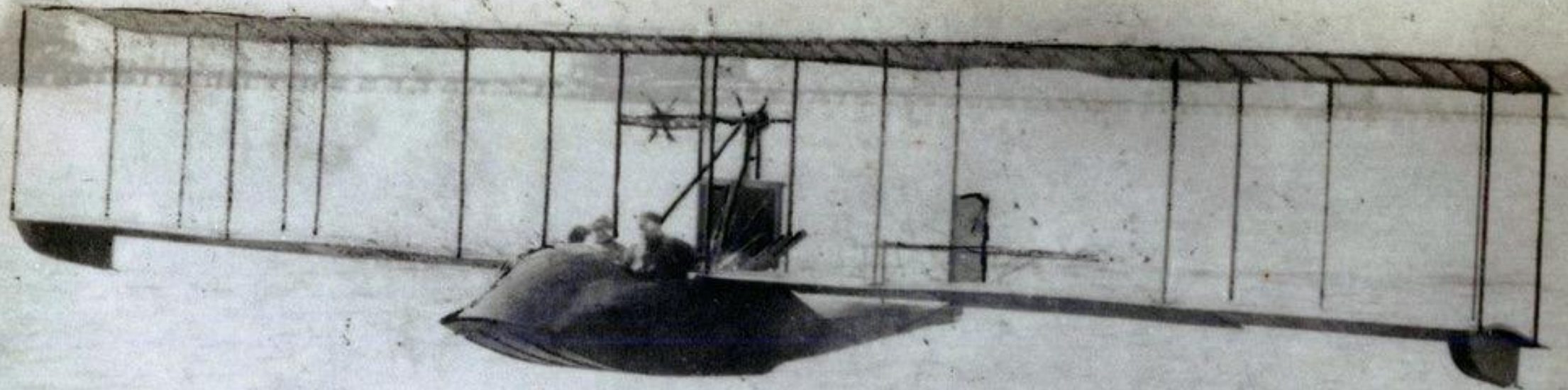
Invention



Leonardo da Vinci, circa 1485

Innovation

Tony Jannus conducted the United States' first scheduled commercial airline flight on **1 January 1914** for the St. Petersburg-Tampa Airboat Line.



Value Proposition Components

Important
Customer

NEEDS

APPROACH

BENEFITS-PER-COST

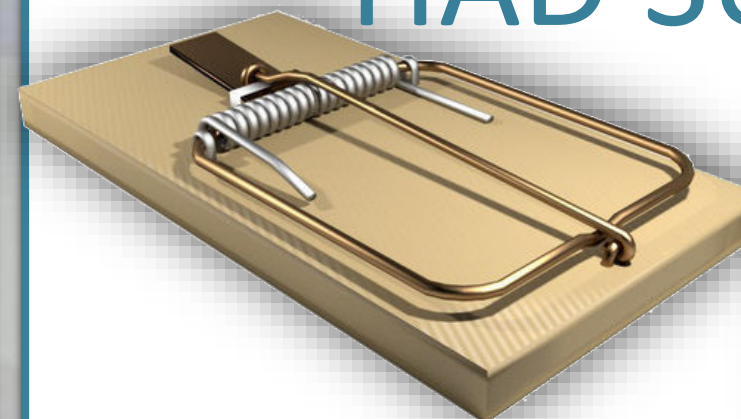
COMPETITION AND ALTERNATIVES



US Patent Office
has issued over
6000 patents for
mouse traps

\$78.99

■ **ONLY 2 HAVE
HAD SUCCESS**



Deep Science & Technology Creates Effective Barrier



**GRAPHICS AND
AI PROCESSORS**



**SYNTHETIC
INSULIN**



**RECOMMENDATION
ENGINE**

Successful **INNOVATION** is rarely the result of luck or lone genius ... it is a disciplined, continuous improvement process with a focus on:

- Solving important problems
- Look outside to different markets, industries for new ideas + opportunities
- Identify the right partners
- Iterating & having an effective Business Model



■ Abundant Robotics



Increased population
more food



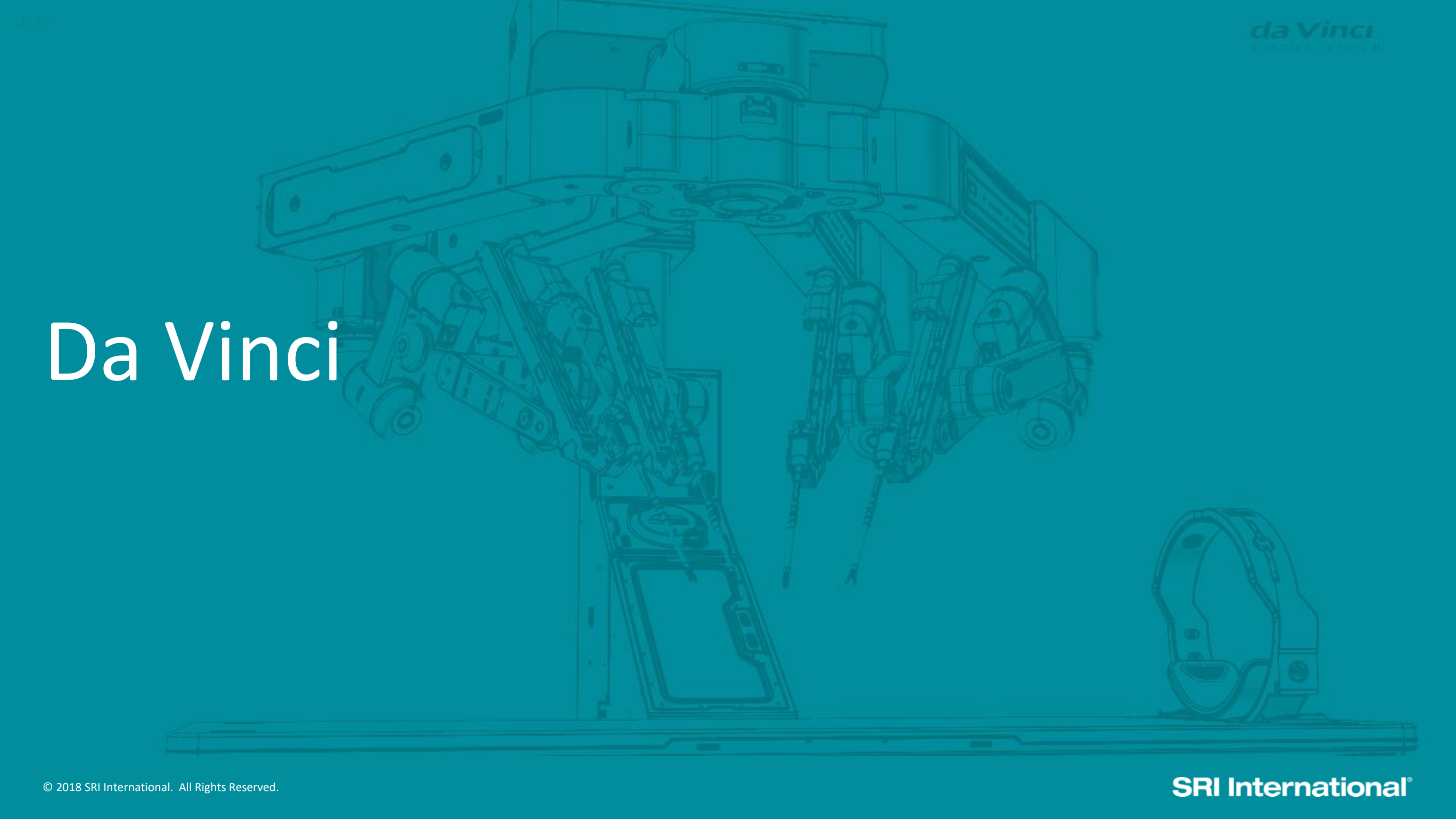
Labor
shortage



Global
warming

Abundant Robotics: Apple Picking





Da Vinci

Medical Robotics Systems

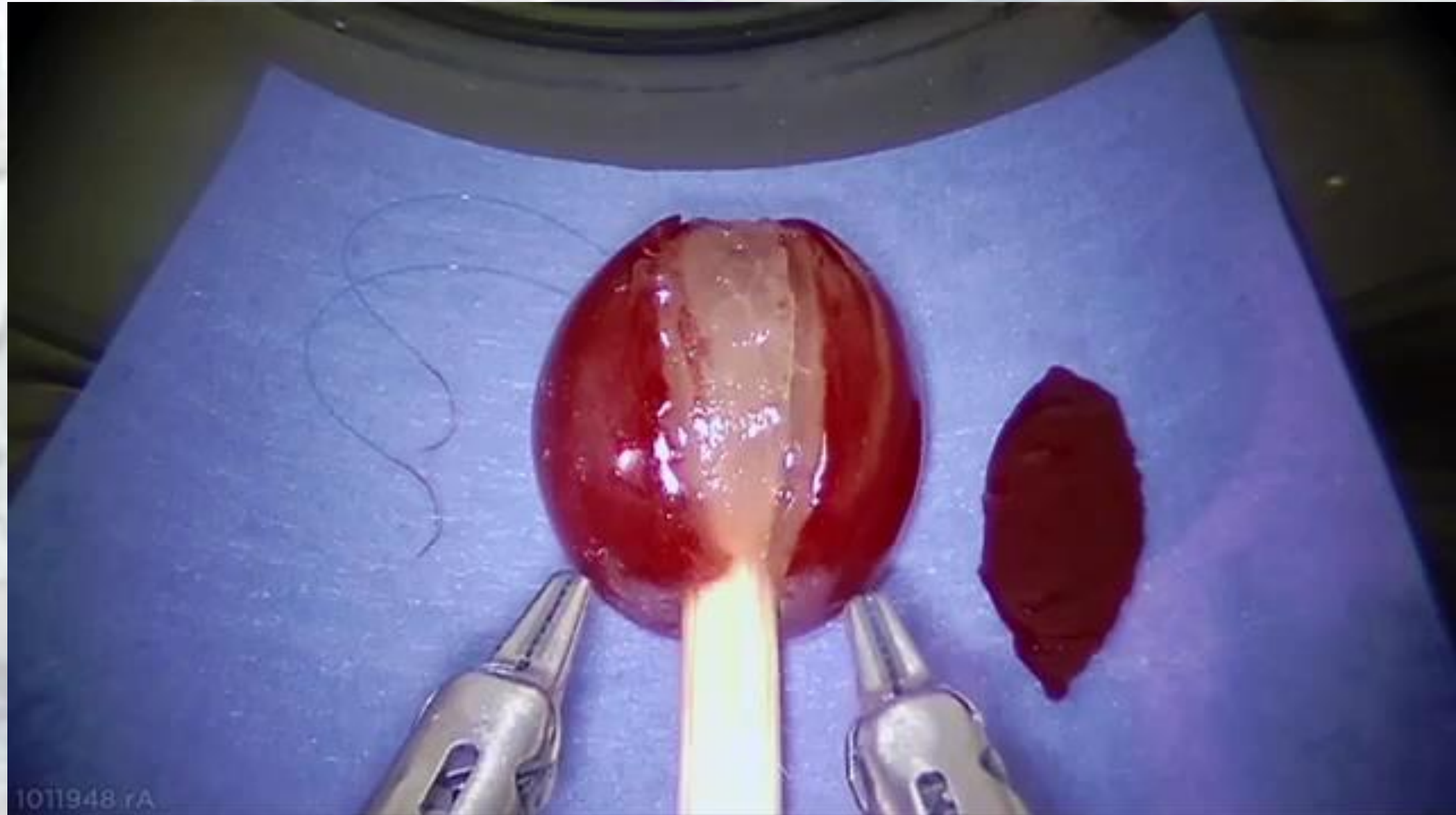
SRI innovations help patients recover faster, with fewer complications

da Vinci
SURGICAL SYSTEM

Trauma Pod



Da Vinci System







- Mines keep having to go deeper
- Typically in more remote locations (up in mountains or jungles)
- Harder to get young people to work in mines



Utilizing
**TELE-OPERATED
ROBOTS**
eliminates this
risk while
improving the
quality of life of
the miners.



SRI worked with ENAEX to build the Robominer ...



Leveraged SRI Strengths in ...

- Teleop
- Stereo Vision
- Manipulation
- Navigation

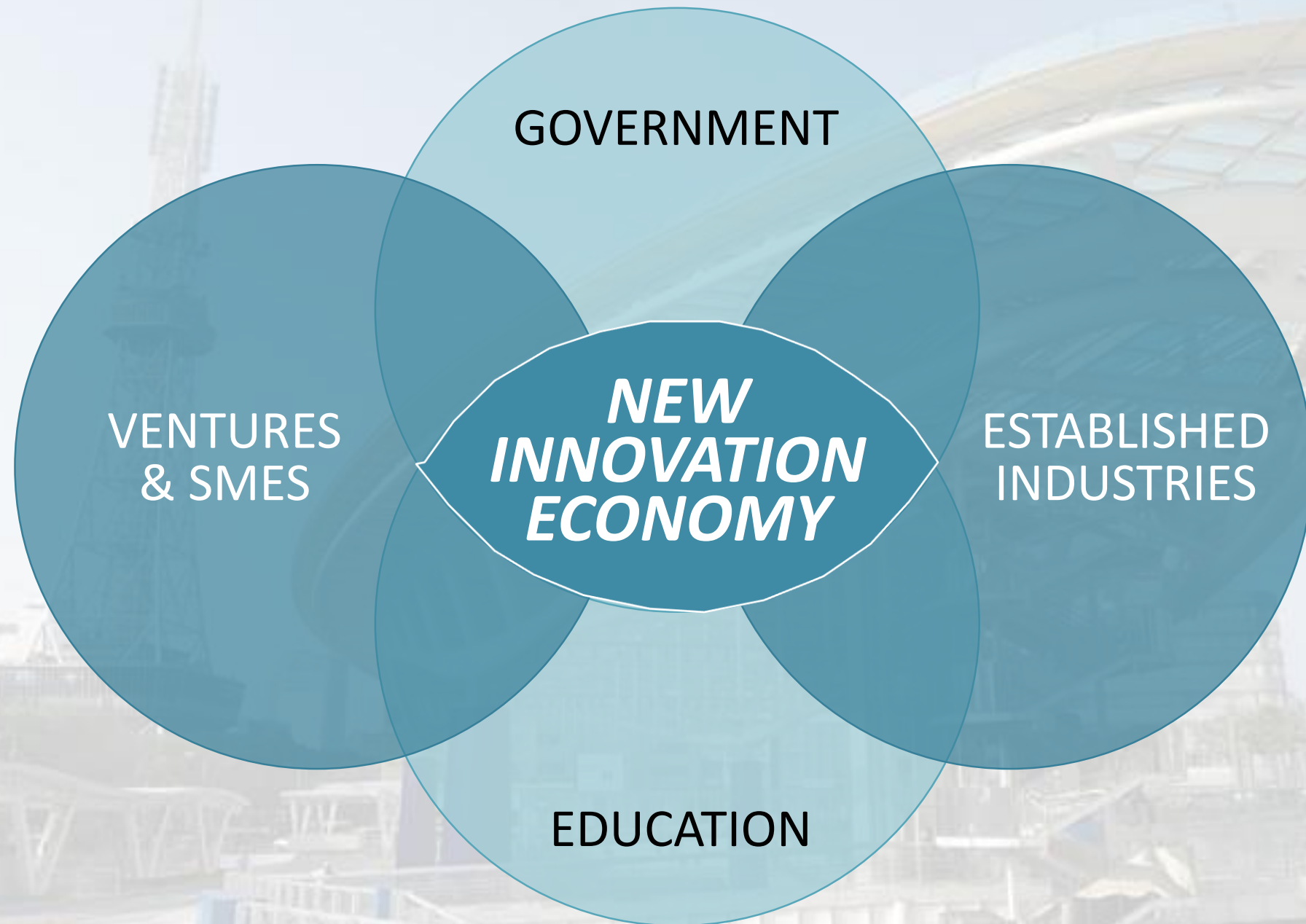


Emerging technologies, globalization are bring incredible opportunities for innovation.

Big ideas alone are not enough.



Catalonia is Great Place for Innovation



Building a Bridge with Silicon Valley Makes Sense

If you were building a movie industry where would you go?

Similarly for **Tech, Biotech, Cleantech** or any emerging tech sector – relationship with Silicon Valley will open new opportunities





eurecat!
Technology Centre of Catalonia

+

SRI

+



YOU

SUMMARY

Focus on important **market needs**

TECHNOLOGY must go to market
and offer new value

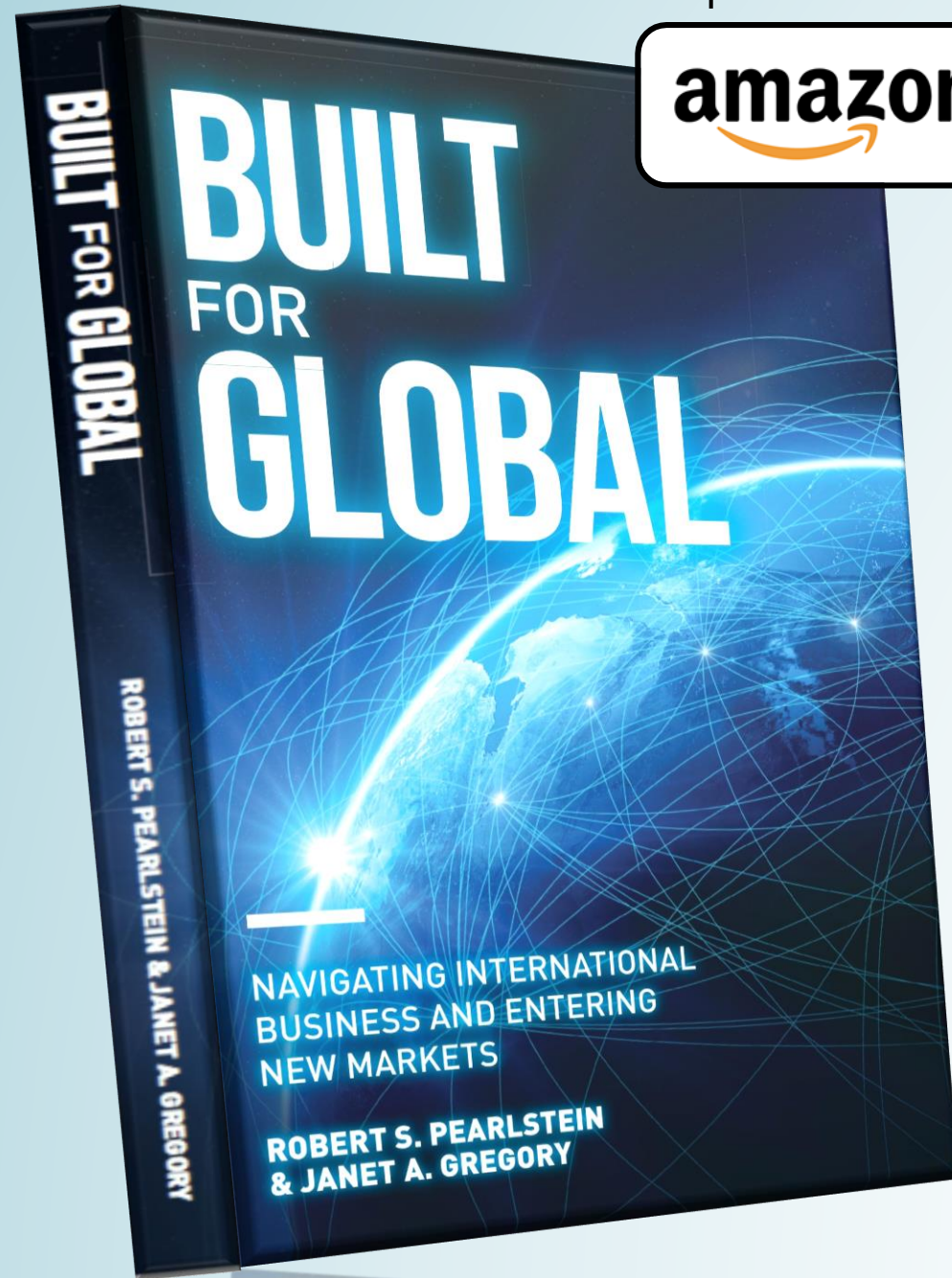
All projects need value proposition: **NABC**

DEEP SCIENCE and **TECHNOLOGY**
help protect business model

Look outside your geography, industry & **partner up**

Available in print & kindle

amazon



- **HOW DO YOU TAKE ADVANCED TECHNOLOGY TO REACH NEW INTERNATIONAL MARKETS?**
- **STEPS TO IDENTIFY IMPORTANT MARKET & CUSTOMER NEEDS?**
- **HOW TO CREATE VALUE; MAXIMIZING OPPORTUNITY & MINIMIZING RISK?**
- **HOW DO YOU CONNECT WITH PARTNERS FROM DIFFERENT MARKETS?**

SRI International®