

New Models for Advanced R&D and Open Incubation for today's Modern Companies

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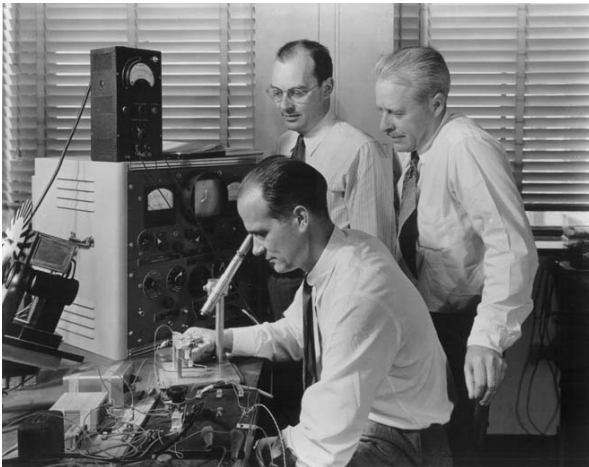
Things have changed since the world famous Bell Labs Model

Transistor and Diode, Semiconductors, MOSFET
Error Correction Codes
Unix, C, and Operating Systems TDMA, CDMA,
and Cellular Standards
WaveLan / Optical Fiber communications

August 28, 2008, Alcatel-Lucent announced it was pulling out of basic science

We have learned a lot about R&D over the past 50 years

Science & Technology



→
50+ years

Product & Service
And Scale

Google



R&D Process for Product Development is well understood.

Methods:

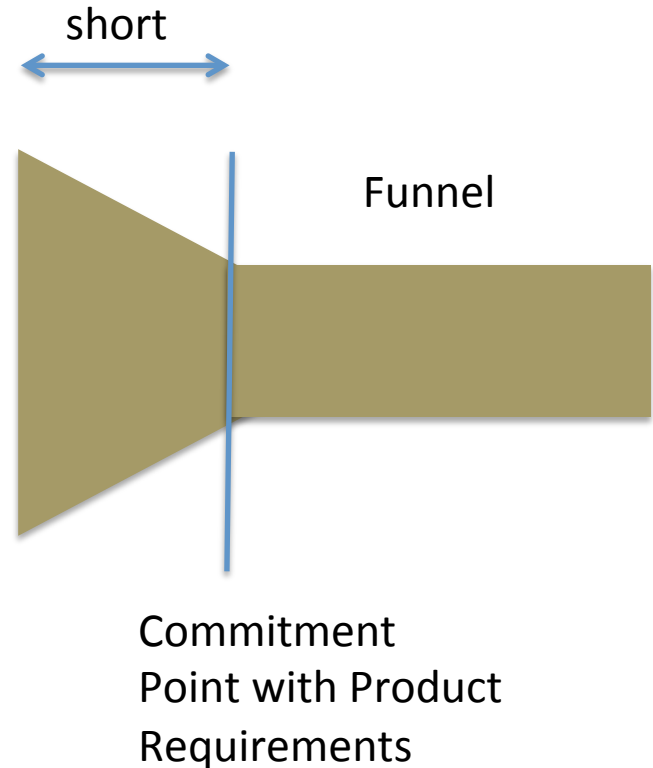
- Train schedules
- Platforms/
Products
- Gates
- Funnels
- PRD
- Agile vs.
Aggregate
Planning

Measures:

- Cycle time
- Market Share
- Quality
- Fully Allocated
Cost



Keep
Technology
Risk in "Labs"



However, our understanding of Adv. Development is still less clear

Long timeframes

How to define project?

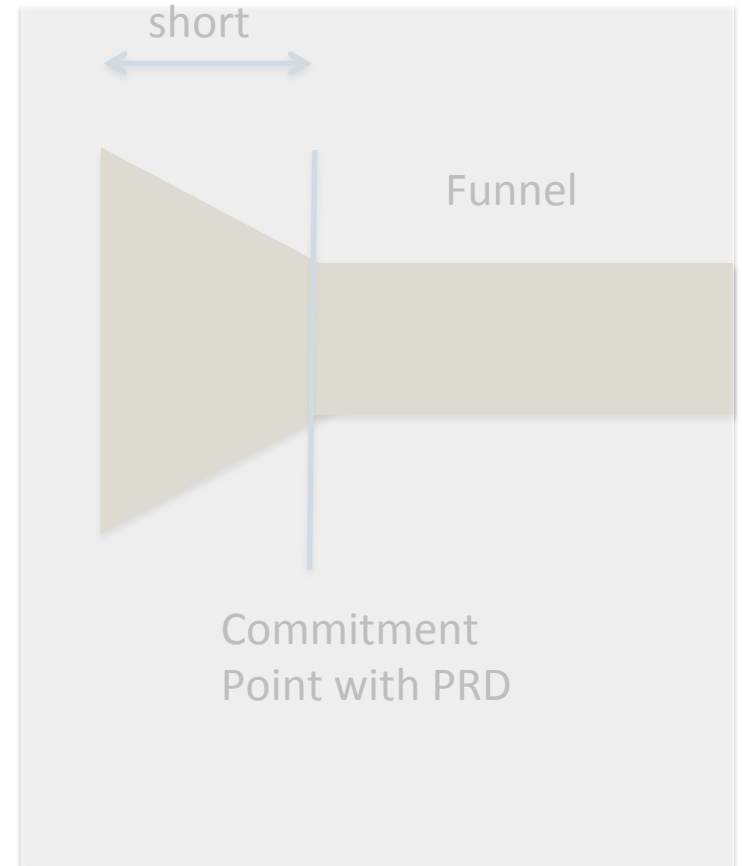
How to measure?

Bell Labs model
does not work anymore?

How do modern firms
manage Advanced R&D today

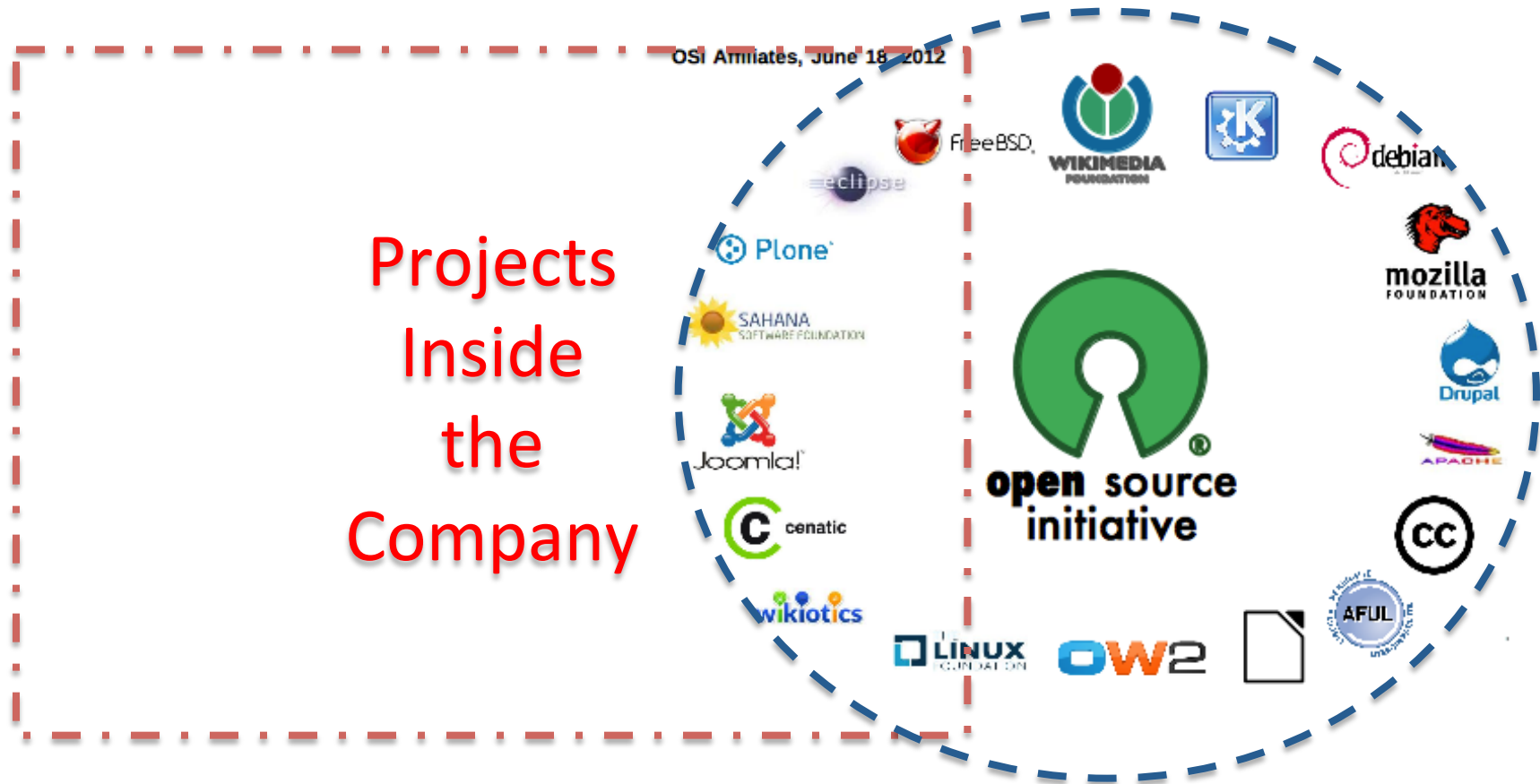


Keep
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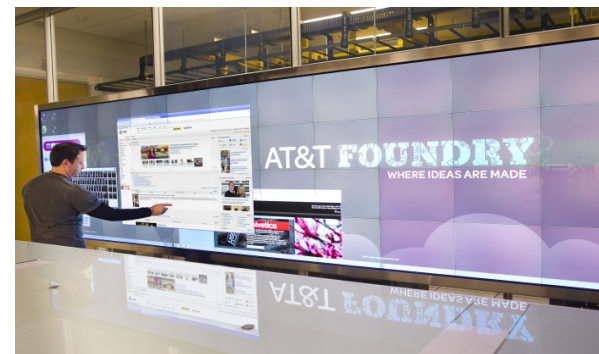


All firms believe Advanced R&D is critical, but measures and processes differ widely.

And since then: Open Source Trend



And also since then: Regional and Corporate Incubators Trend



Corporate and Public Accelerators

So given this landscape:

- undefined long term projects
- open source
- incubation/venture as partners

How do modern firms organize and measure their advanced work?

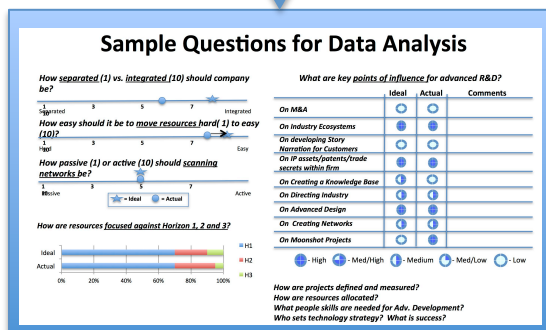
Sample Participants

Company Name	HQ Location	Founding Date	Size	Revenue (2013)	Patents
VMware	Palo Alto, CA, USA	1998	14,300	\$5.2B	
Google: Adv. R&D and Research	Mountain View, CA, USA	1998	52,000	\$49.8B	51,000+ (patents and pending, MIT Tech Review 11/29/2013)
Cisco	San Jose, CA, USA	1984	74,000	\$48.6B	
Ericsson	Stockholm, Sweden	1876	115,000	\$39.5B	35,000+
Huawei	Shenzhen, China	1992	140,000+	\$40B+	30,240+
Coca Cola	Atlanta, GA, USA	1886	700,000	\$46.9B	NA

Information from company website and annual reports

Identifying R&D Models

Literature Review to
Develop Questions and
Points of Influence for R&D



Results Common
to All

Differences
and intentions
lead to new
Model Categories

Model 1

...

Model N

- Common Results
- Basic Models
- Possibilities of Mixtures

Results Common To All

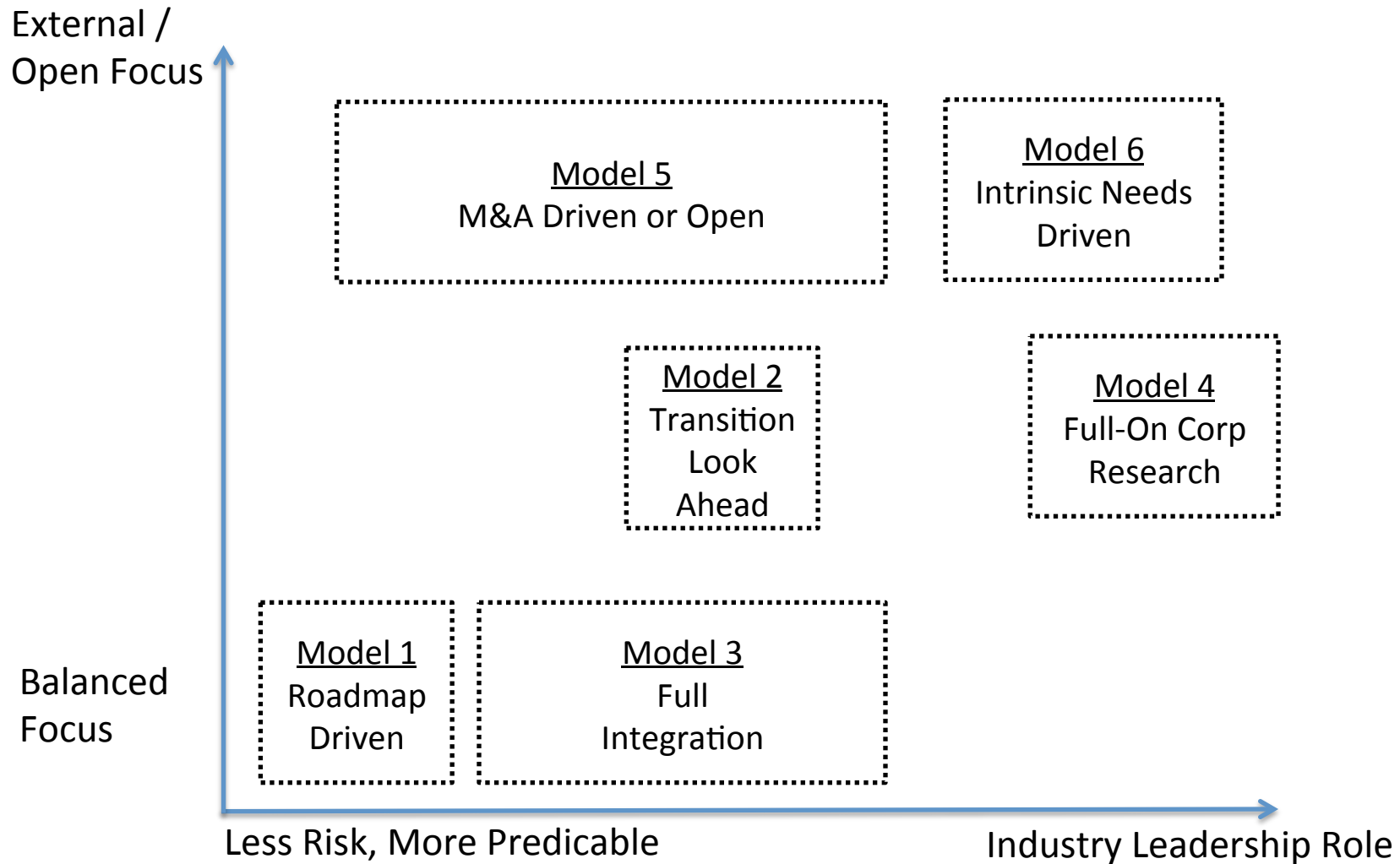
Topics where all firms agree:

- All firms believe in similar Horizon Level allocations:



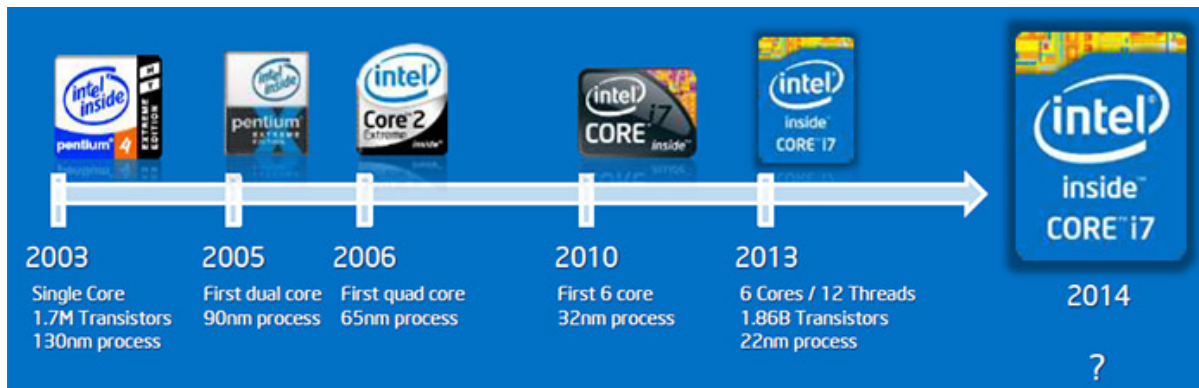
- Soft skills and innovation culture matters
- University & networks:
 - both sensing (listening) and active (directing)

Observed Patterns:



Model 1: Roadmap-Driven

Example: Processor Roadmap

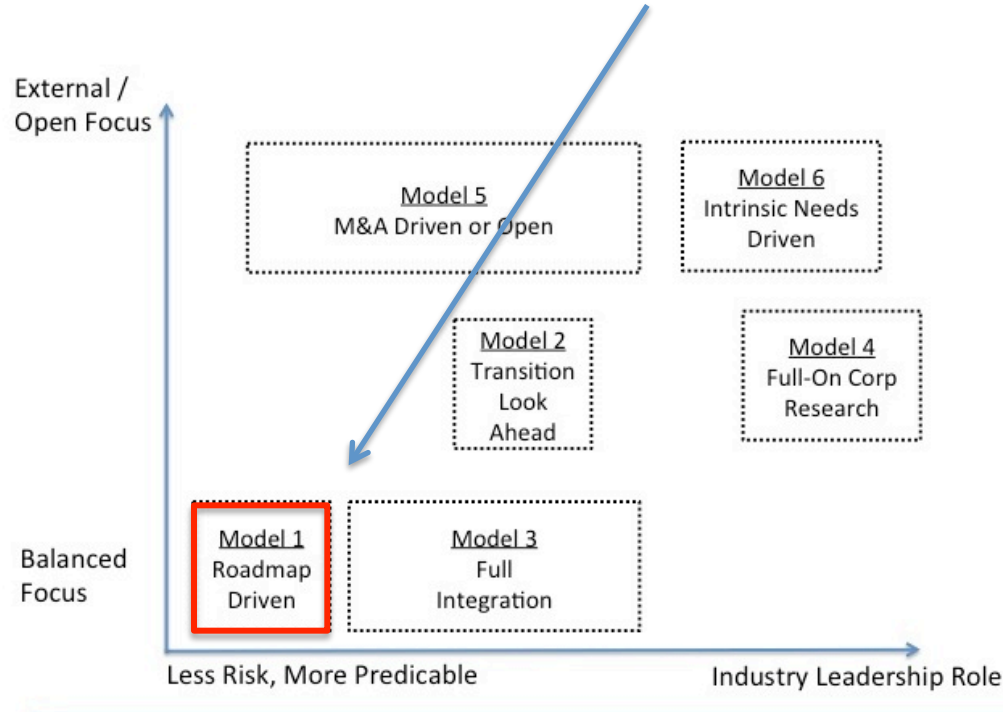


Features and
Performance
Target of 2018?

- Process
- Requirements
- Advance problems
- Tools

Model 1: Roadmap-driven Adv. R&D

Example:



Characteristics / Quotes:

Focus on existing roadmaps

Success is to “use” in next generation product

Achieve “better performance” or other key purchase criteria

Main Points of Influence on firm:

M&A

Customer Story Narration

IP Assets

Advanced Design

Standards,

External Industry Leadership,

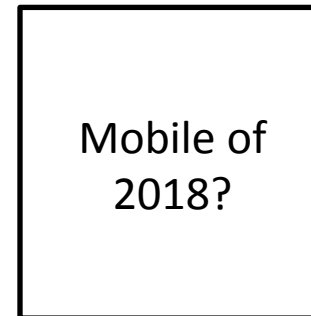
Moonshots

Competence: Predictable Product Line

Model 2: What if the next market transition is not on directly on the roadmap?



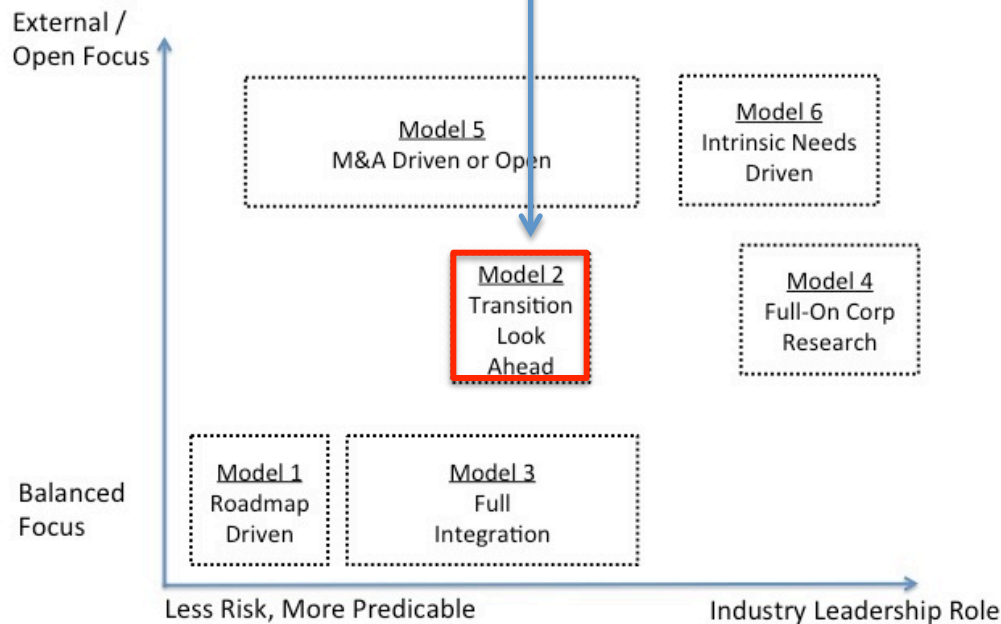
Desktop



Mobile of
2018?

Model 2: Market Transitions and Blindside Avoidance

Examples:



Characteristics / Quotes:

Groups decide their own projects with signals from:

- Pilot studies
- BU or CTO priorities
- External: start-ups and academic
- Demo days or open interfaces to suppliers, customers, universities

Projects must be relevant to core competencies.

Success is to external awareness, market perception including Business week, Forbes.

Main Points of Influence on firm:

M&A

Customer Story Narration

IP Assets

Advanced Design

Standards

External Industry Leadership

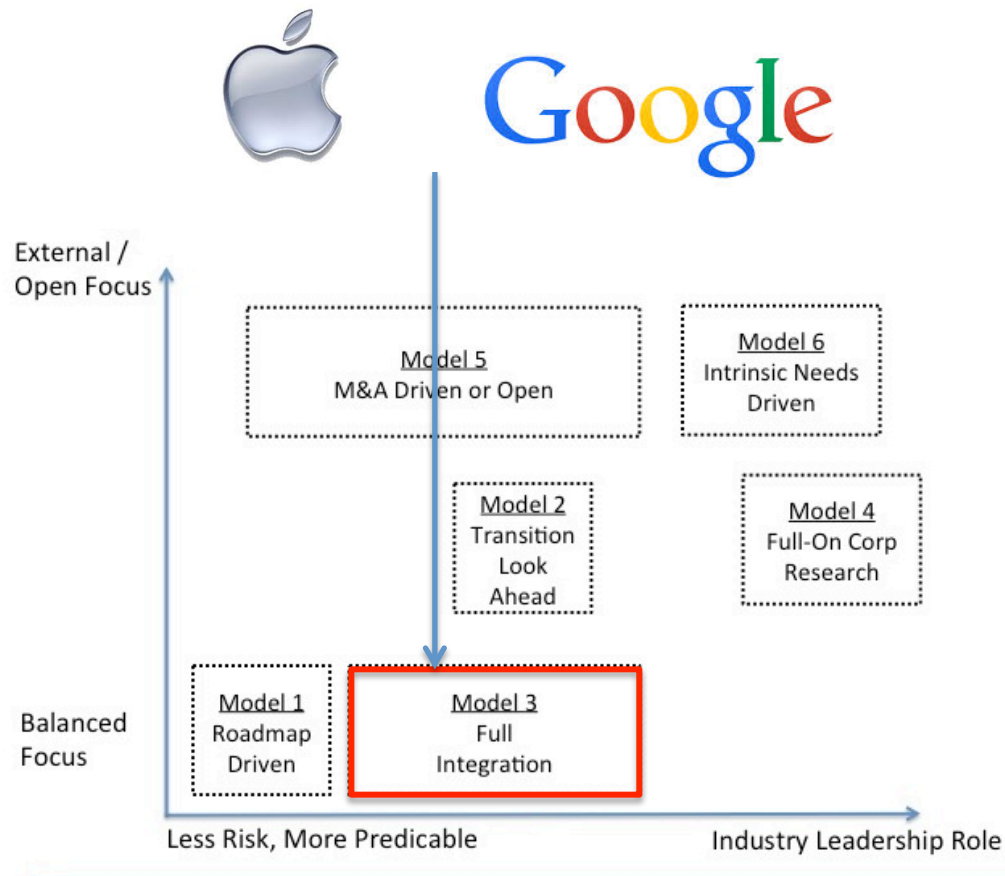
Moonshots

Model 3: What about developing Integrated Products/Services



Model 3: Fully Integrated Adv. R&D

Example: Google Mainstream R&D, Apple, many modern market leaders



Characteristics / Quotes:

R&D Groups have lots of freedom:

Managers each choose own portfolio, 1-2 of 5 should have higher risk.

- * “a team can do what it wants”
- * “multiple teams need buy-in”
- * “must have some failures”

Success: a) some must fail, b) people say “wow”, we did not know that was possible, c) absence of complaints, and d) no competitors .

Main Points of Influence on firm:

M&A

Customer Story Narration

IP Assets

Advanced Design

Standards

External Industry Leadership

Moonshots

Model 4: A Focus on 10X

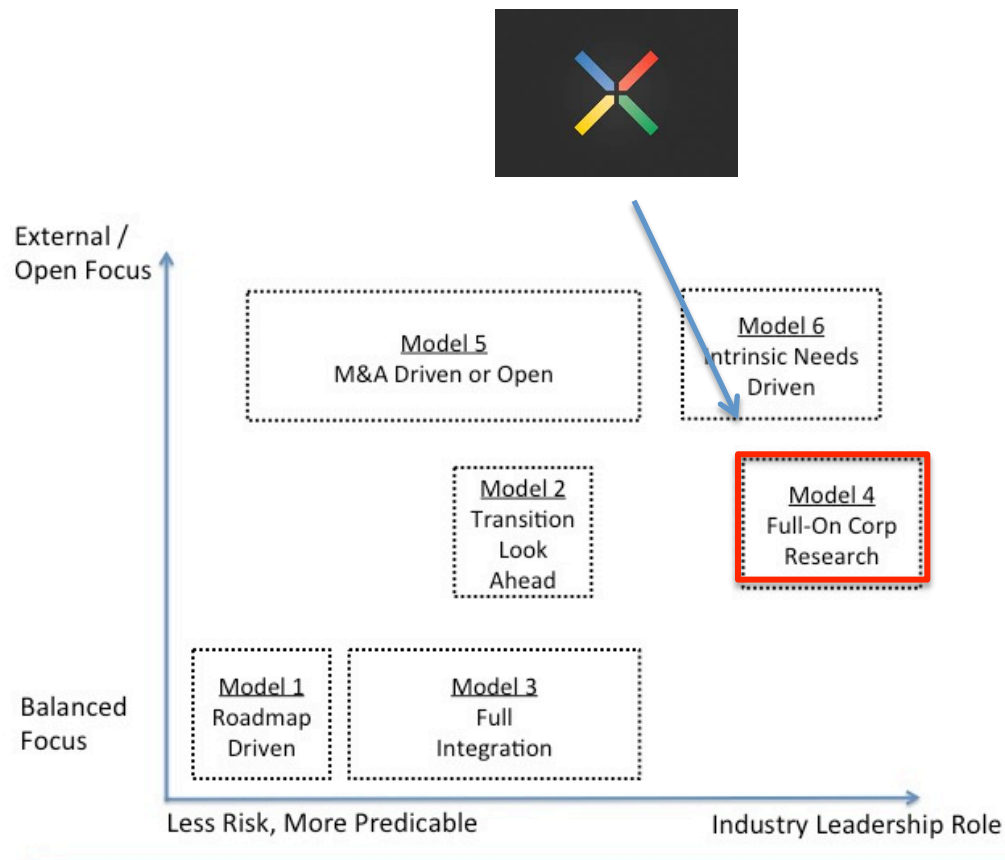


Mainstream Google
Product Development

Google X

Model 4: Full-On Corporate Research

Example Google Research: Separate from mainstream R&D.



Characteristics / Quotes:

Complete independence. No accountability. **Project should stay away from R&D.**

“If you can not afford it, don’t do it”
“Only for true market leaders (who can not be followers of other players)”
“Projects are 10X game changers”

Success: 10X impacts, others reference you, consider big changes.

Main Points of Influence on firm:

M&A
Customer Story Narration
IP Assets
Advanced Design
Standards
External Industry Leadership
Moonshots

Model 5: M&A Focused



CTO Organization Owns
Corporate Development

Supplemented with:

- Fellows (freedom for Skunkworks)
- Corp. Tech. Development (100 people)

Why:

- * Market Transitions
- * Performance
- * Replenish Talent

The Ubiquisys logo, consisting of the word "Ubiquisys" in a blue sans-serif font.



The Meraki logo, consisting of the word "Meraki" in a blue sans-serif font.

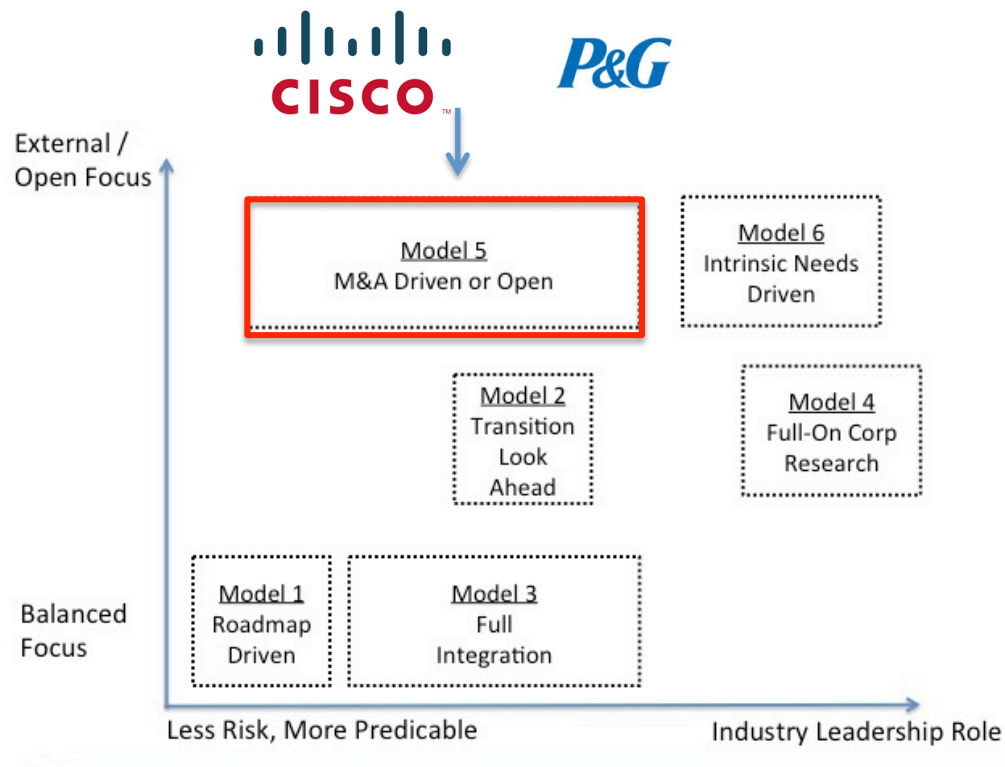


The Altiga Networks logo, featuring the word "ALTIGA" in a blue serif font above the word "NETWORKS" in a blue sans-serif font.



Model 5: M&A-Driven Adv. R&D and Open Models

Example: Cisco. Also applied to open models like Proctor & Gamble's C&D



Characteristics / Quotes:

High Focus on M&A

Supplemented with:

- Engineering Fellows (Skunkworks in BUs)
- Parallel Advanced Development

Allow Spin-Ins.

Success: Market share and ease of entry in new markets.

Main Points of Influence on firm:

M&A

Customer Story Narration

IP Assets

Advanced Design

Standards

External Industry Leadership

Moonshots

Model 6: Intrinsic Need-Driven Adv.



Syrup, Bottling, Distribution, Vending Machines,

R&D

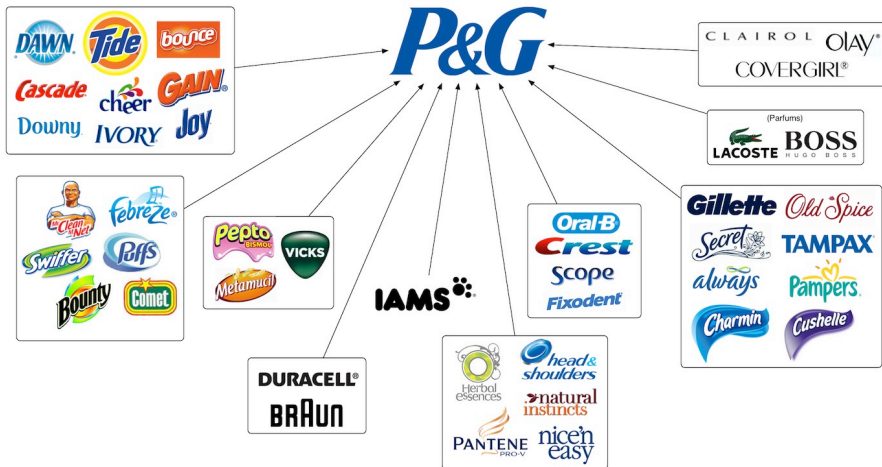
Top List of "Intrinsic Needs" at top of business level

- Health
- Environment
- Clean shirts

Informs Advanced R&D Projects:

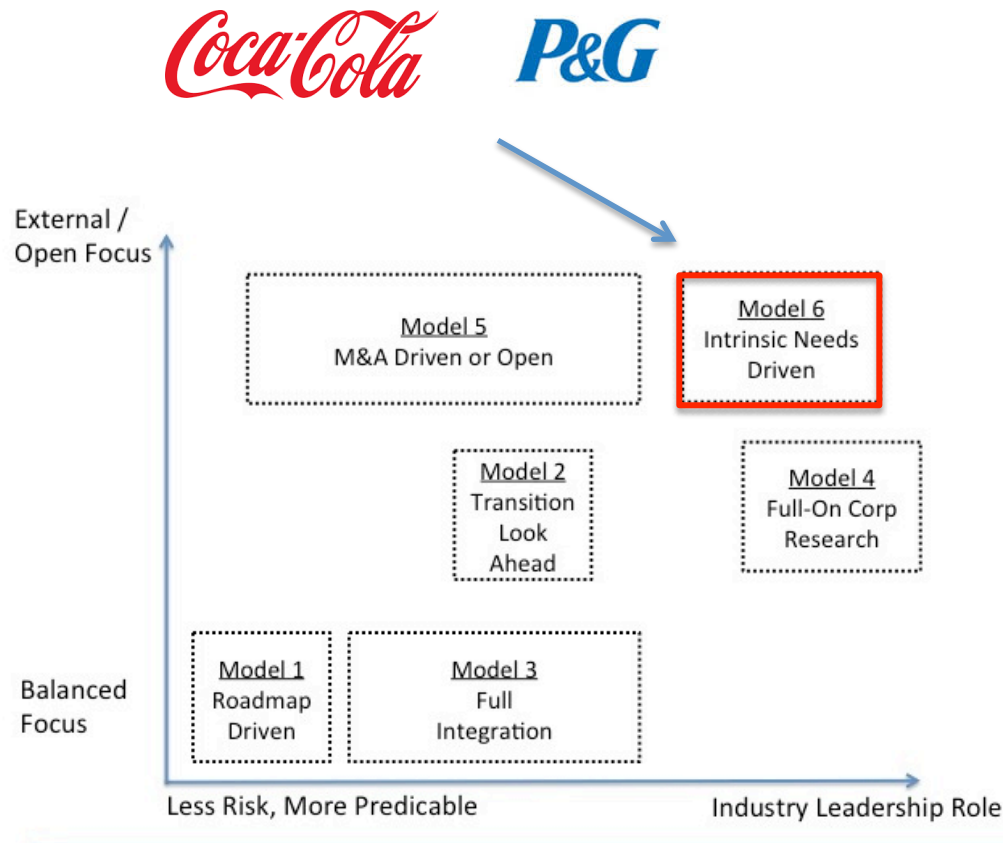
- Product
- Packaging
- IT

Effects Supplier Networks, Licensing, and M/A



Model 6: Intrinsic Need-Driven Adv. R&D

Example: Coca-Cola, other global firms with strong brands



Characteristics / Quotes:

Starts with **intrinsic needs** of customers and society.

Goal is a) increased volume of sales, next product, localize in new markets.

Yearly planning cycle based on intrinsic needs and focus groups with customers. Leads to product, package, and IT solutions.

Experiment, customer test stabilize.

Success: Business unit adoption

Main Points of Influence on firm:

M&A

Customer Story Narration

IP Assets

Advanced Design

Standards

External Industry Leadership

Moonshots

Leaders vs. Competitors

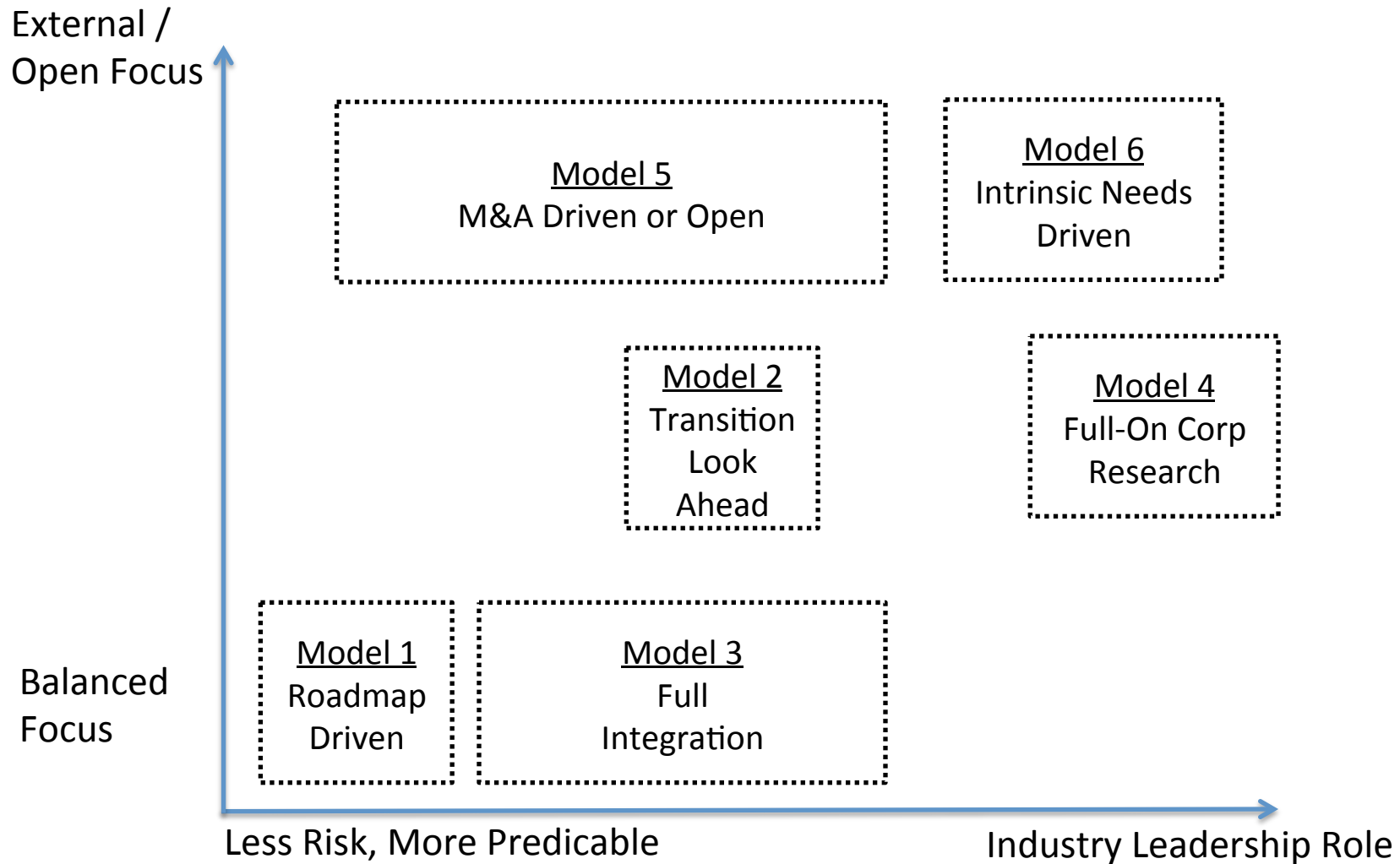
Competitor in Pack

- Fast follower
- Fast cycle times
- Prioritized features
- Leverage cost advantage

Leader

- No one to follow / copy
- Target on back, other copy
- Expectations of being a global citizen
- Must disrupt status quo and/or disrupt self

Observed Pattern of 6 Adv. R&D Models



Summary of Advanced R&D Models

Model	Characteristics	Budgeting/Prioritization	Metrics/Success Measures
Model 1 – Roadmap Driven	<ul style="list-style-type: none"> Focus on IP and Advanced Design of H1 Areas 	<ul style="list-style-type: none"> Business units own/manage budgets 	<ul style="list-style-type: none"> Measures: Number of Patents, Adoption in Next Product, Performance/Differentiation
Model 2 – Market Transitions/ Blindspot Avoidance	<ul style="list-style-type: none"> Focus on Customer Story Narration, Standards, Demonstrating Industry Leadership and push to H2 	<ul style="list-style-type: none"> Adv. R&D uses central budget. Adv. R&D sets own direction with signals from CTO, Bus, and many external sources. Quarterly review cycle, central CTO coordinates with BUs CTOs 	<ul style="list-style-type: none"> Measures: Standards body influence, Number of customer meetings and public (business) articles. External awareness, customer perception of technical leadership, and awareness of market transitions.
Model 3 – Fully Integrated	<ul style="list-style-type: none"> H1, H2, and even some H3 within each R&D group. Focus on IP, Advanced Design, and some Moonshots. 	<ul style="list-style-type: none"> Central CTO and executives set R&D budgets. R&D Groups have lots of freedom. Mix of low risk with high risk projects within each group. 	<ul style="list-style-type: none"> Measures: Adoption in Next Product, Demonstrate competitive differentiation, Number of Patents. “Wow”, we did not know that was possible. Some projects must fail.
Model 4 – Full On Corporate Research	<ul style="list-style-type: none"> IP Assets, External Industry Leadership, Moonshot. For industry leadership, H3 Focus 	<ul style="list-style-type: none"> Complete independence. CEO / Central CTO with centrally allocated budgets “If you can not afford it, don’t do it 	<ul style="list-style-type: none"> Projects have 10X game changing potential, Number of Patents, External awareness. Progress towards achievable game changers.
Model 5 – M&A Driven/Open	<ul style="list-style-type: none"> M&A focus with Market Transition Focus, IP Assets, Moonshots. Need strong channels and effective acquisition process 	<ul style="list-style-type: none"> CTO also leads Corp Development, BUs all have CTOs Centralized budgeting, influenced by Engineering Fellows (Skunkworks in BUs) Parallel Advanced Development (Corp) Spin-Ins. 	<ul style="list-style-type: none"> Market share, Ease of entry in new markets., Number of Patents, Success/speed in acquisition integration.
Model 6 – Intrinsic Needs Driven	<ul style="list-style-type: none"> Brand driven and intrinsic need driven. For industry leadership IP Assets, Advanced Design, External Industry Leadership, 	<ul style="list-style-type: none"> Yearly planning cycle rooted in intrinsic needs and focus groups with customers. Leads to product, package, and IT solutions. 	<ul style="list-style-type: none"> Measures: Business Unit Adoption, Next Product, Performance/Differentiation, Effect on brand perception. IP or trade secret generation.

Evolution of Corporate Incubation and Acceleration

~~Space~~



~~Money~~

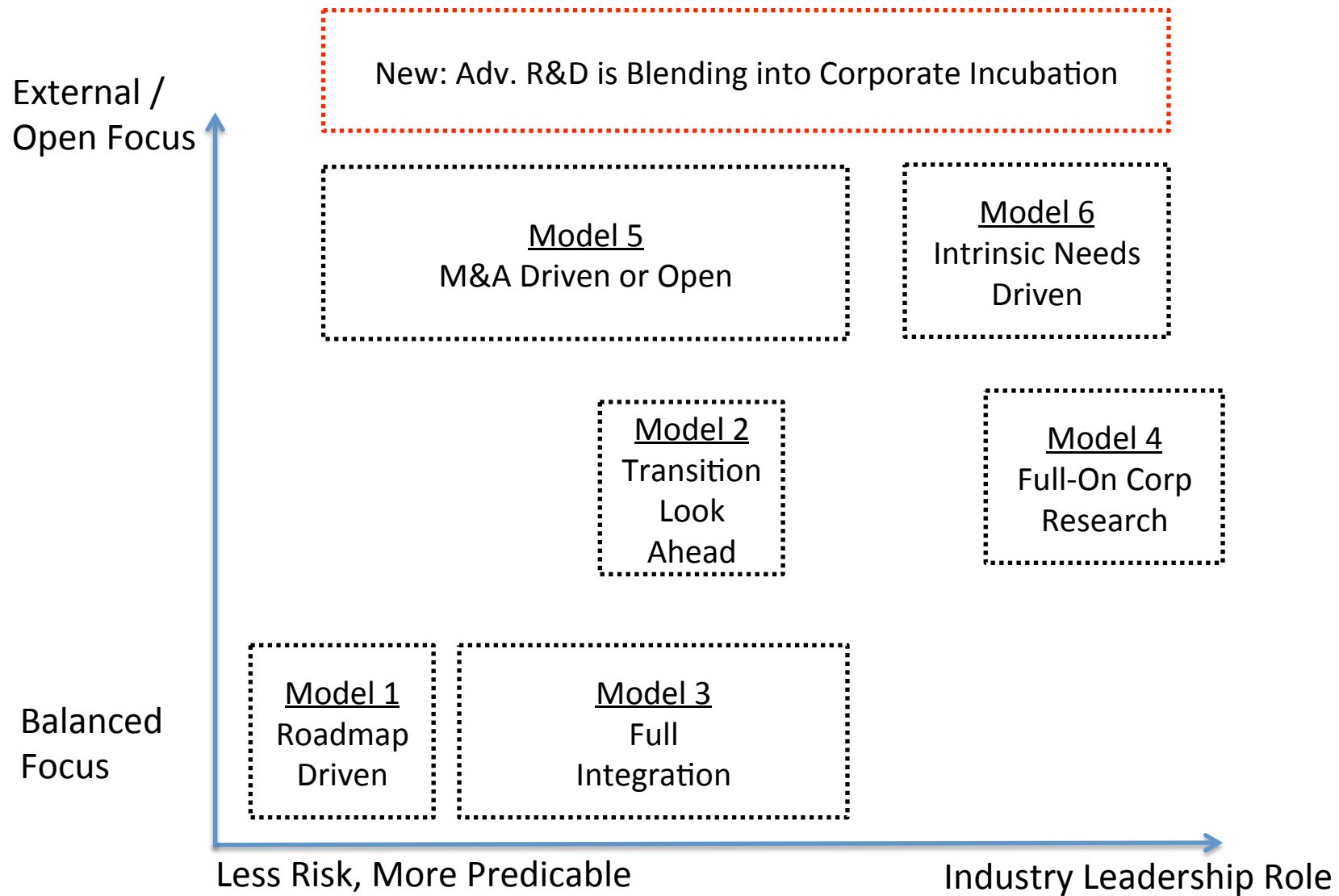


Corporate Synergy



Coca-Cola
Bridge

- No Money
- ATT: Inside problems
- Coke: Branding and Connections to suppliers/ customers
- Big Lifts: Spotify, Call Drops, Video Bills
- Rewards to firms:
 - More happy customers,
 - Better product/services,
 - and maybe a few \$\$\$



Looking ahead at Corporate Adv. R&D:

- ❑ Follower versus Leader considerations
- ❑ Open Innovation Considerations
- ❑ Role of Incubation and Corporate Synergy
- ❑ Where do you want to place bets (models)?
- ❑ Do the measures and funding structures match?

Thank You

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