The Transformative Role of AI in the IP Industry

rapid alpha

SIGIR 2024 Conference Keynote Address

About Me

A Career of Bringing Innovation to the Market

Rapid Alpha

Building "World Domination Plans"

- Predictably deliver solutions customers love
- Construct product roadmaps that win
- Build predictable innovation initiatives
- Multiply the ROI on innovation initiatives

Patent Portfolio Management

Patent portfolio of 5,600 patents & applications

Licensing, patent sales, spinout companies

Investment Fund Modeling

Identifying innovation investment opportunities in support of capital raises for:

- Invention Science Fund I, II
- Deep Science Fund
- Grey Sky Ventures

Publications & Contributions

- IAM: Trade secrets in M&A negotiations
- ICC Intellectual Property Roadmap 2020
- Keiretsu Capital: Exit Strategy Workbook

Supporting Industry

- I3PM Committee Chair for Risk Management
- Trade Secret (TS25) Standard Founding Member
- CEIPI Ambassador (USA)
- Keiretsu Capital Exit Team

Accolades

- IAM300 Strategy 2017, 2018, 2019, 2020, 2021, 2022, 2023
- IAM Strategy 300 Global Leader 2021, 2022, 2023
- Top 25 Healthcare Investors 2024

Topics

A Need for a Paradigm Shift

The current IP market is too restrictive

Data: Innovation Fuel

Overcoming the errors of the past

Data in the Innovation Ecosystem

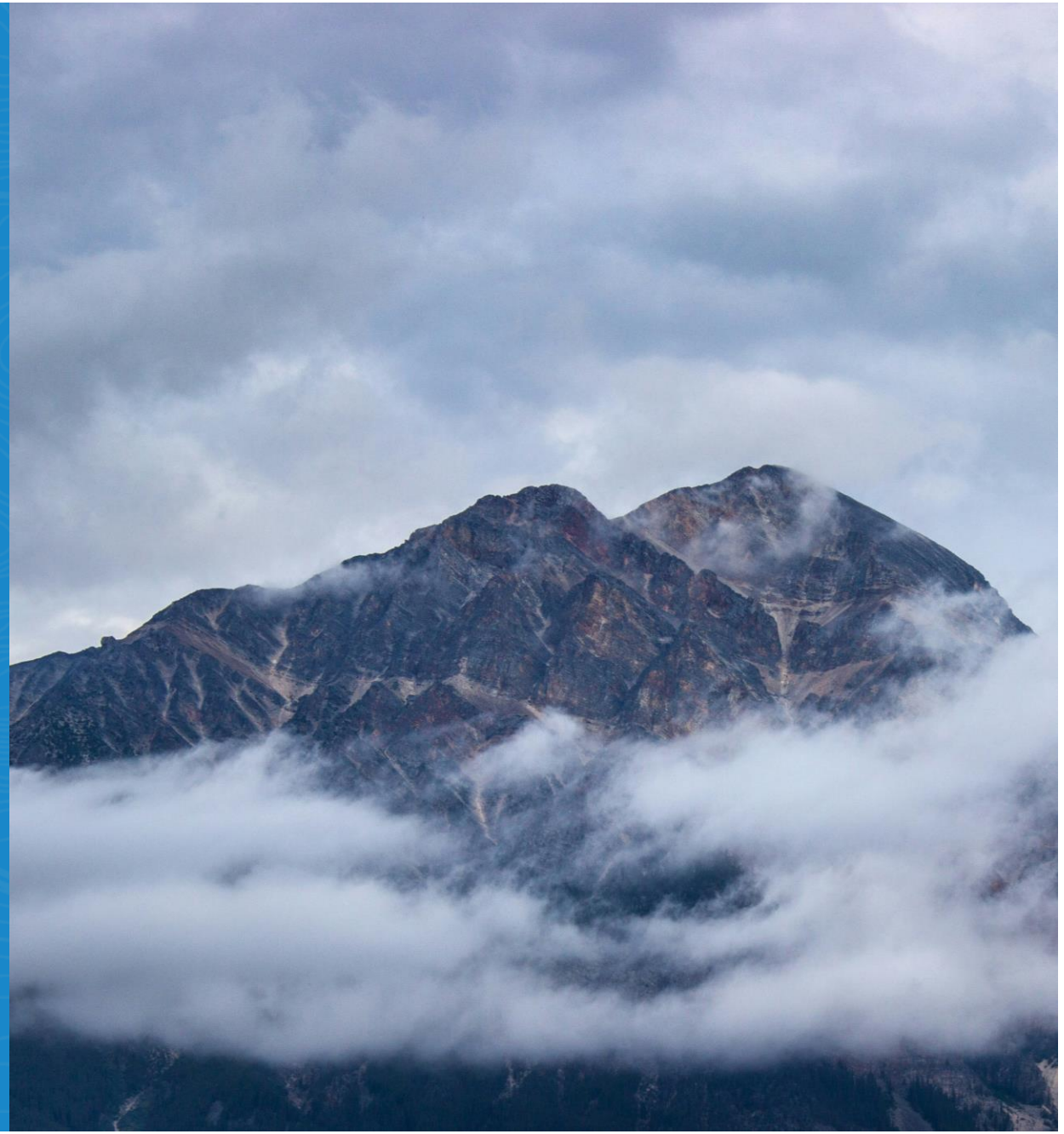
Expanding the role of IP Data Science

The 2024 Innovation Paradigm

Incentivizing software services & content curators

A Need for a Paradigm Shift

The current IP market is too restrictive



“Data is the new Oil

- Clive Humby, 2006

IP is in its digital infancy

Confusion around adoption is rampant

Customers are demanding:

- A single location for their data
- To have and trust their own data
- More Human in the Loop
- Key to delegating and productivity
- A vision!

The challenges for developers remain:

- Data costs are huge
- More time on cleaning data than developing
- Adoption rates for real solutions face barriers

IP Rights are Viewed as Insurance

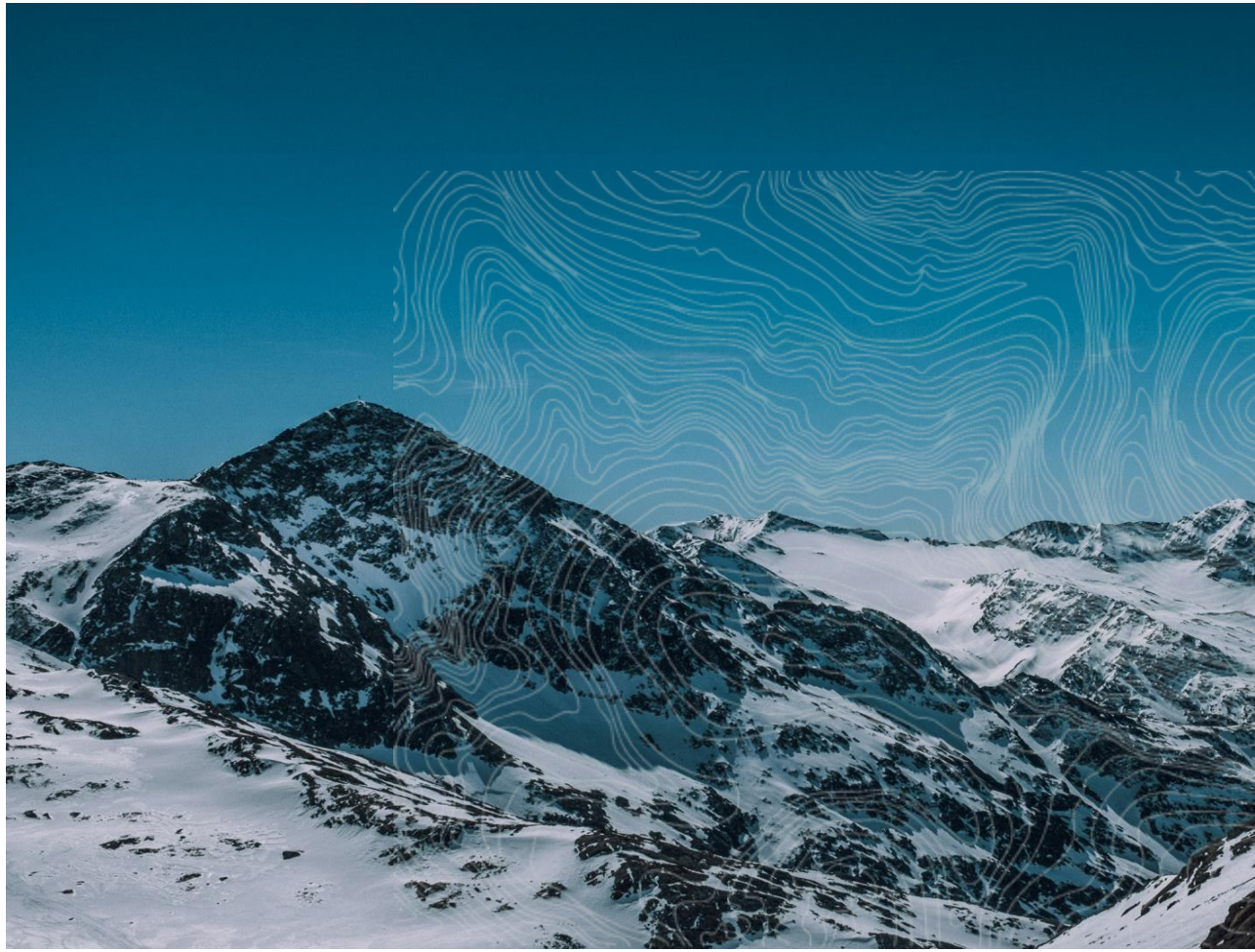
A paradigm shift is needed to realize the future of IP

Would you protect a

$3 Billion dollar idea

the same way as a

$10 Million dollar idea?



A paradigm shift is needed.

Uncertainty in IP value instruments cap the Return on Investment for software developers digitizing IP software offerings

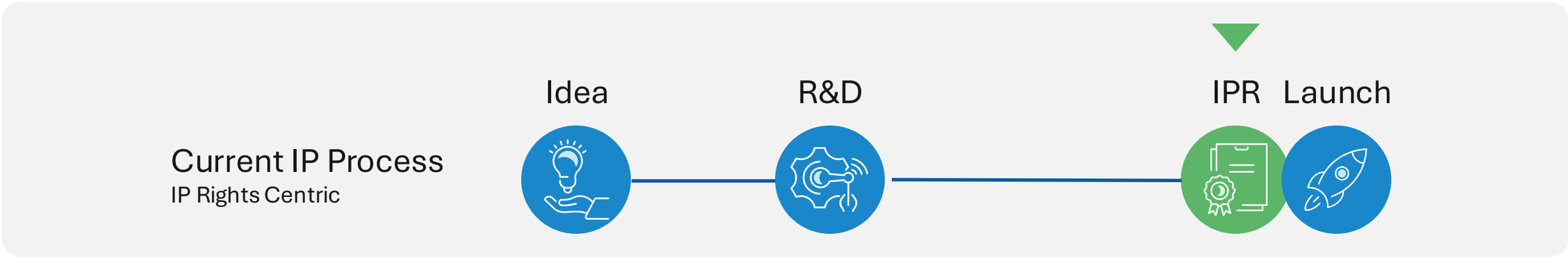
Price ranges for IP Rights practitioner services:

1. Patent Search: **$300 - $3500***
2. Patent Application: **$2,000 – $12,000***
3. Office Action Response: **$1800 – 3400***
4. Patent Freedom to Operate: **$15k – 25,000***

*Prices do not reflect pharma pricing which are higher due to the known larger importance of IPRs to pharma products

Caps on IP Rights practitioner prices limit:

- The unit price for software solutions
- Magnify upfront database costs for developers
- Foster development of ineffective “general” sol’ns
- Limit marketing budget



Can we realize an IP revolution with this business model?

$166 to $500

/ month

/ user

Cost of the common search tool

Data: Innovation Fuel

Overcoming the errors of the past

Spark an Innovation Revolution

Tools exist to more reliably predict market outcomes for new innovation initiatives

- Innovation creates new economic opportunities
- Innovation has the capacity to improve the quality of life
- Plays a key role in addressing Global Challenges

Innovation services are high ticket items

Industry Overview:

$10k - $30k

Technical Landscape:

$30k – $100k

Comprehensive Report:

$100k – $500k

Innovation Programs:

$150k+

Data is Innovation Fuel

Humans are built to recognize patterns and solve problems

Data plays a critical role in:

- Vital to employee productivity
- Vital to business success
- Key to delegating and productivity

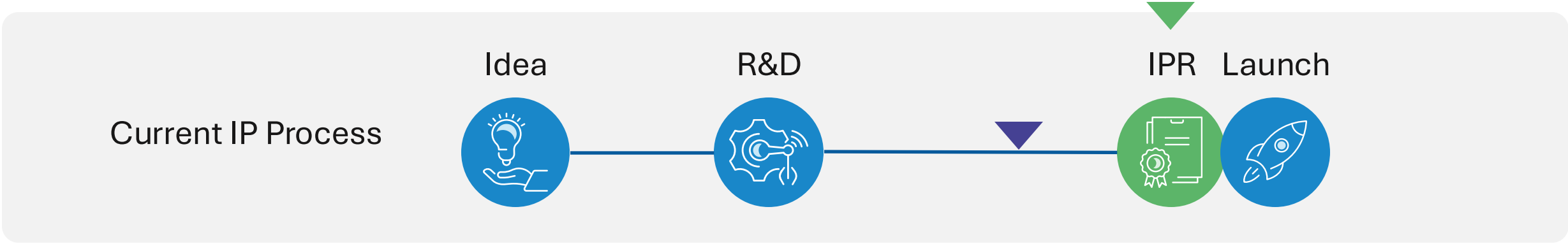
Corporate vision multiplies data impact:

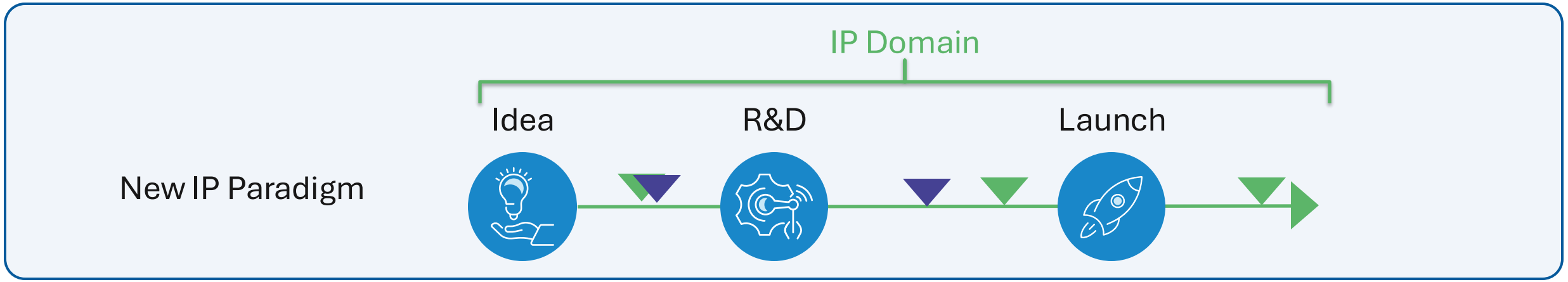
- Inspired by a vision
- Vision as a north star
- Skills to make the business case

The Next Revolution

Apply the complete IP skillset to the entire innovation ecosystem

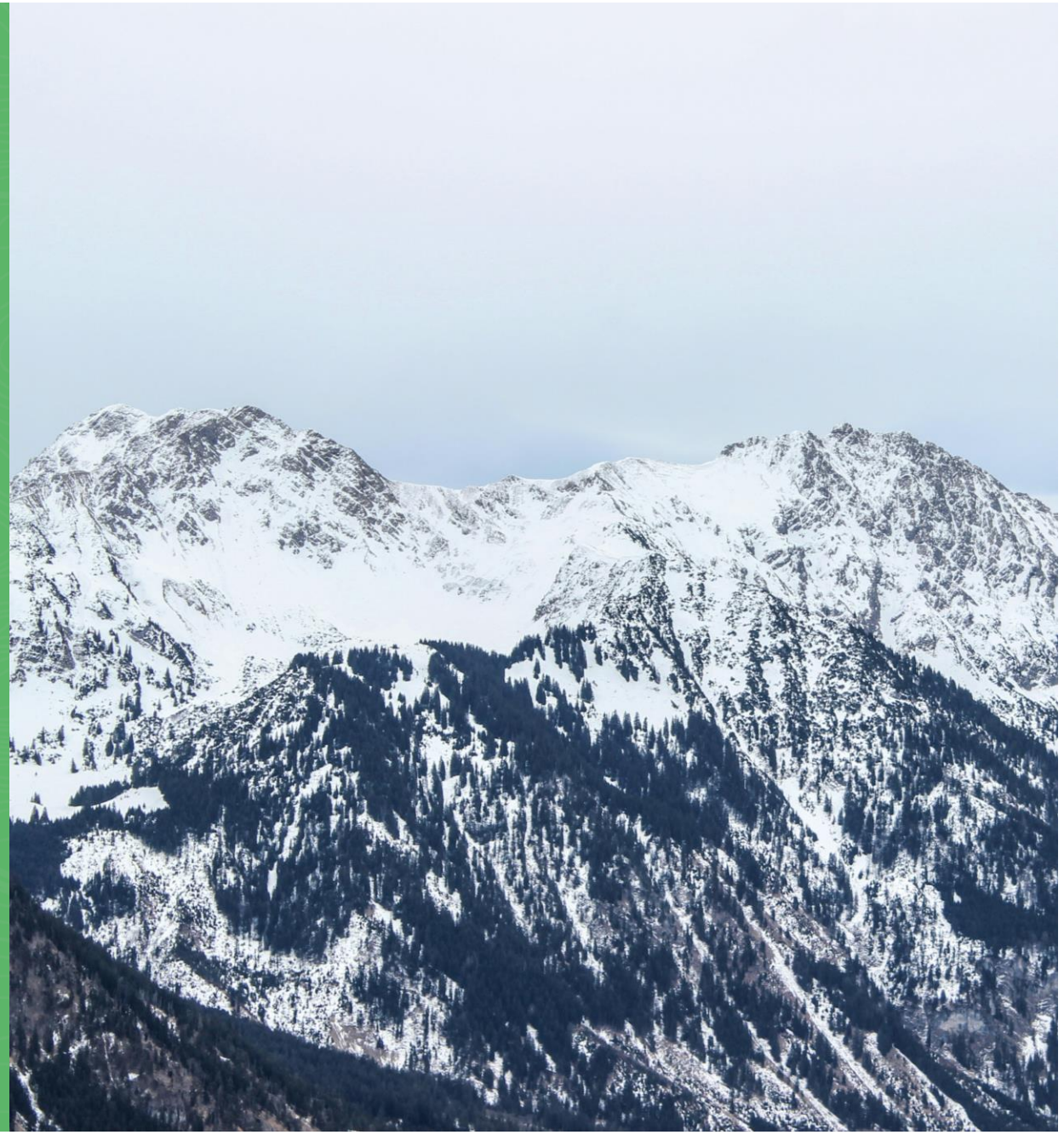
- Leverage IP's intersection with services that quantify value
- Deliver tools to build world models and predict innovation outcomes
- Shift IP solutions from the end of the product cycle to deliver tools across the innovation ecosystem





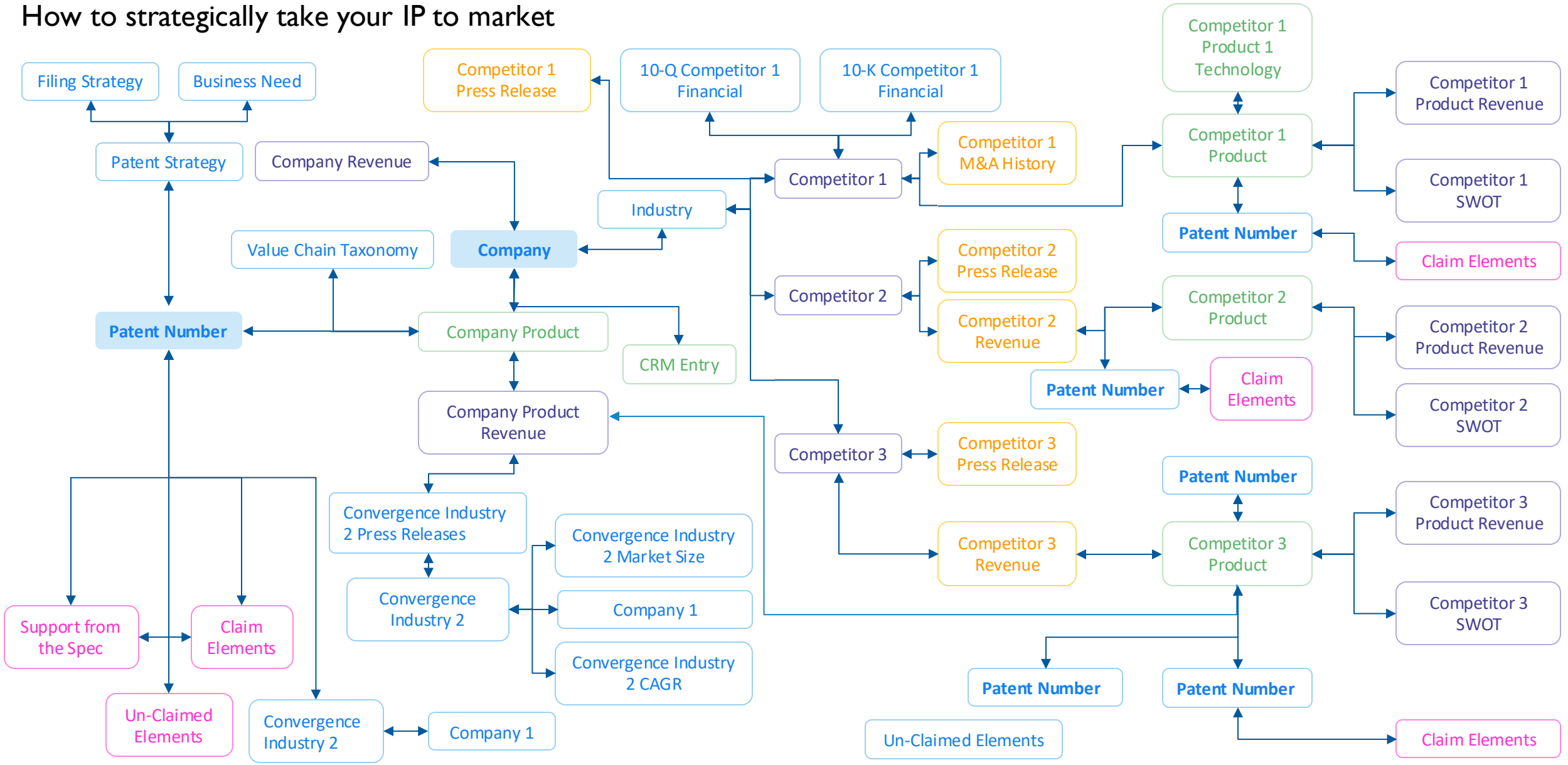
Data in the Innovation Ecosystem

Expanding the role of IP Data Science



A Broader Understanding of IP data

How to strategically take your IP to market



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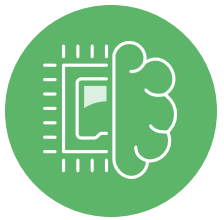
Ecosystem Needs

Reliably delivering solutions customers love is the surest form of competitive advantage

Connecting the dots

- Macroeconomic trends
- Technical opportunities
- Behaviors, technology stacks, pain points
- Adoption friction
- Buyer behaviors
- Candid communication



Extending existing AI technologies

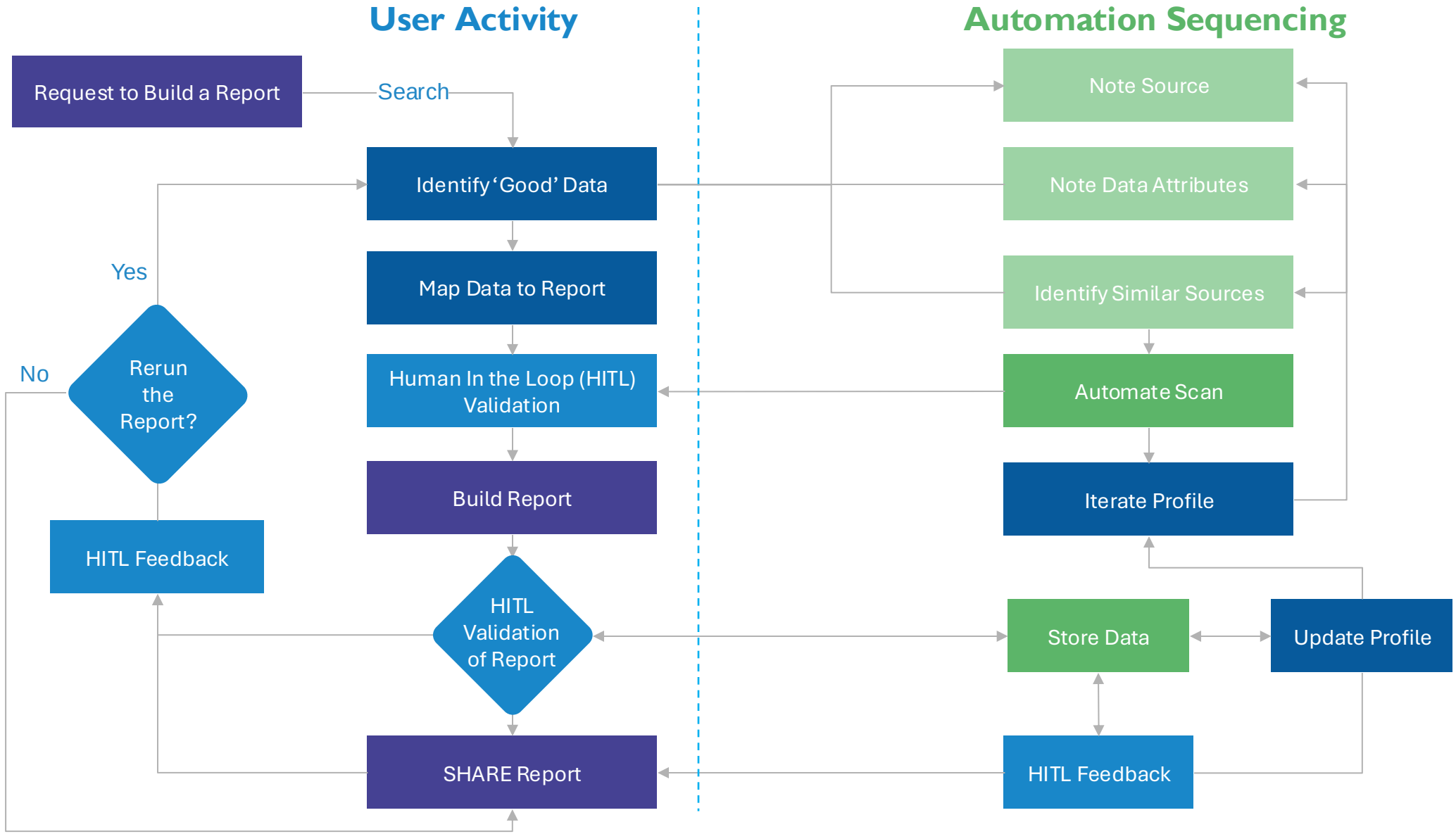
- Textual Search
- Classification Systems
- Generative AI Capabilities
  - Drafting
  - Summaries

Building on curated datasets

- Patent databases
- Scholarly articles

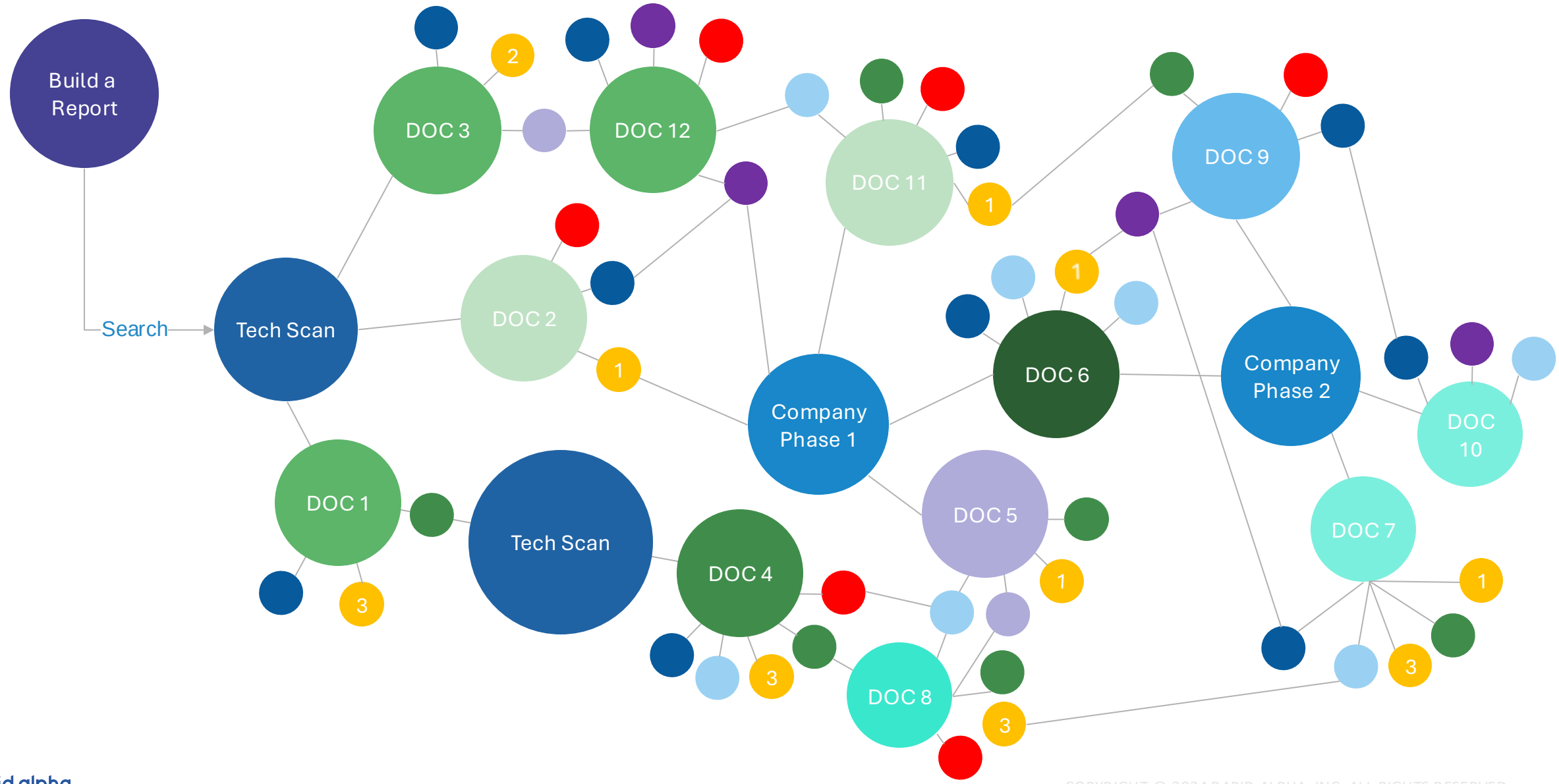
AI in Research and Evaluation

Automation and Data Parsing with You in the Loop



AI in Research and Evaluation

Going down the research rabbit hole



Venture Capital, C-Suite, Startups

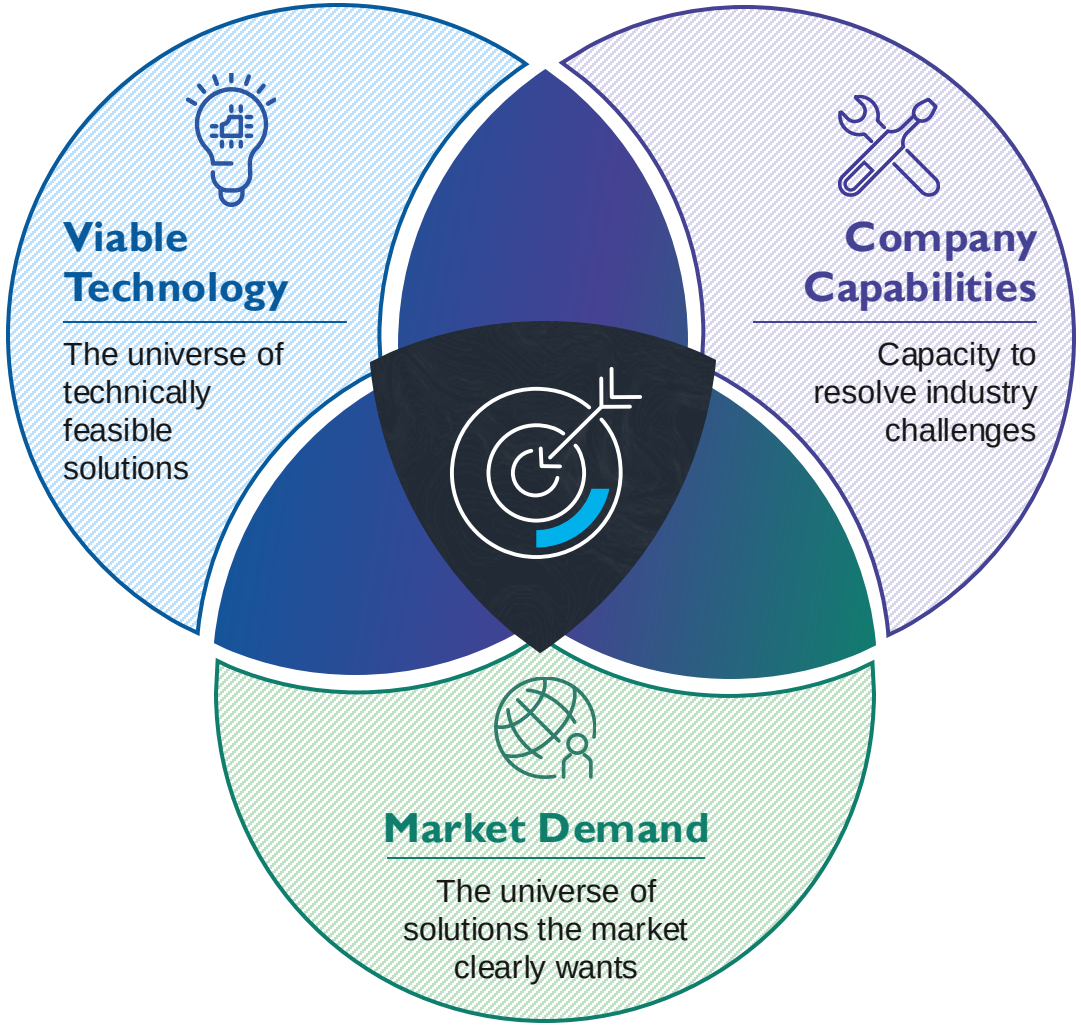
Different ecosystem players, all with the same needs

1. Is this a market worth investing in?
2. Is this market winnable?
3. Is now the time to win the market?
4. Is this the team to win the market?

Product-market fit

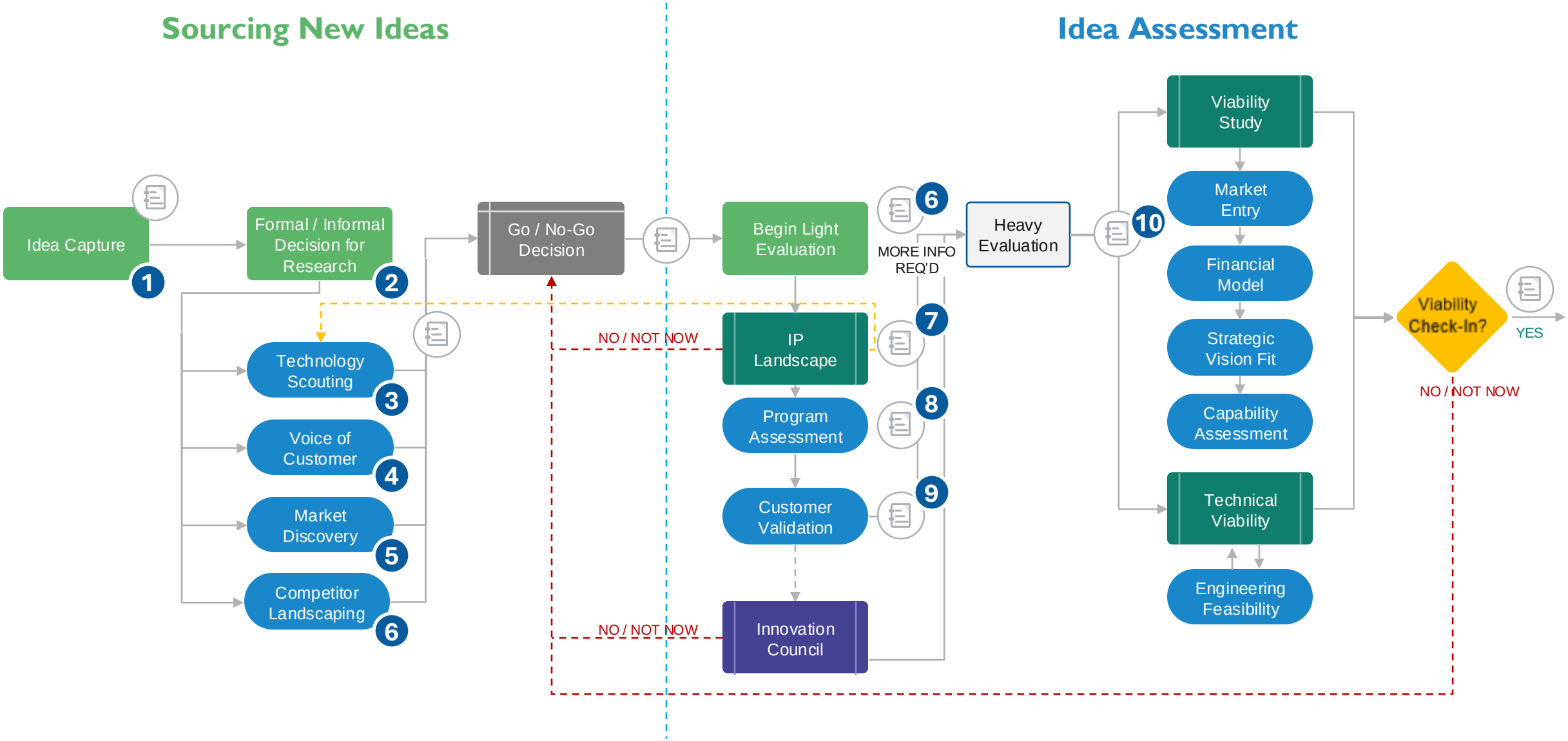
Reliably delivering solutions customers love is the surest form of competitive advantage

- Innovation creates new economic opportunities
- Innovation has the capacity to improve the quality of life
- Plays a key role in addressing Global Challenges



Data & Innovation Management

Systems with Room For Discovery



AI in Research and Evaluation

Portability of Data Across a Product's Life

Technology Landscaping Reports

- Tech Consortiums
- SME Identification
- Technical Capabilities
- Technology Forecasting
- State of the Art
- Technical Risk Assessment
- Solution Identification
- Ideation

Intellectual Property Landscaping Reports

- Strategic Prosecution
- Damages Modeling
- Standards Assessment
- Branding Impact Report
- Patentability
- Invalidity Report
- FTO
- Patent Sale
- Acquisition Search
- Royalty Benchmarking

Market Landscaping Reports

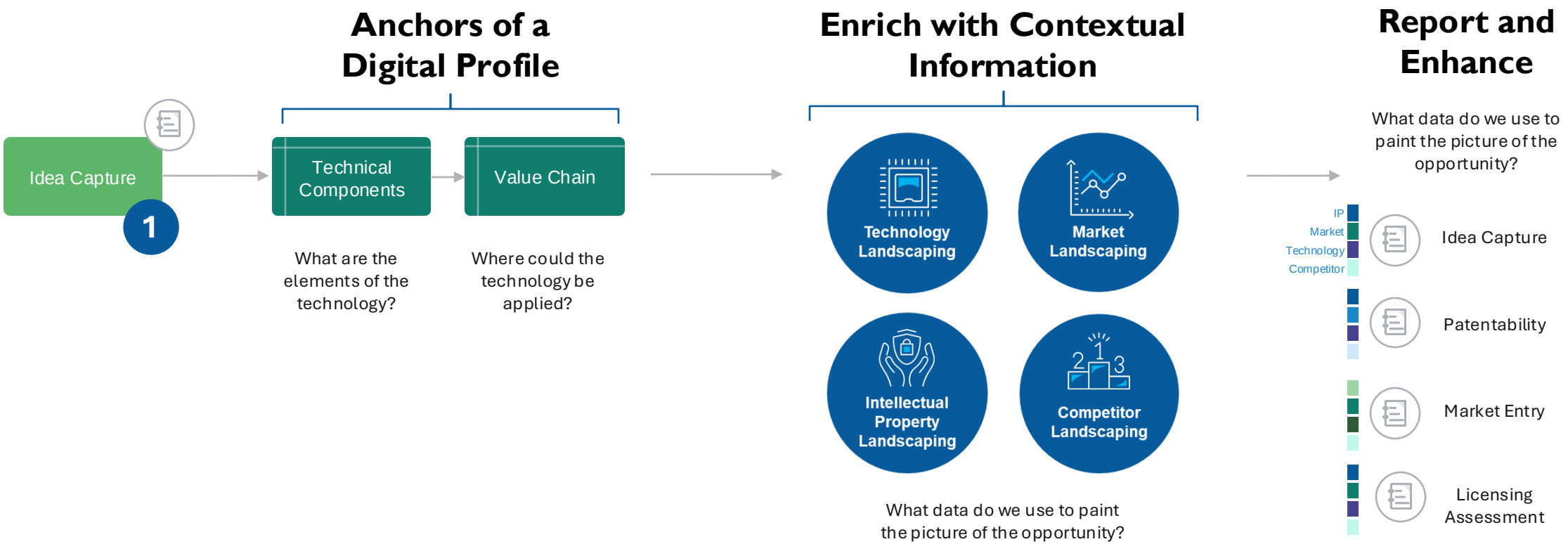
- Value Canvases
- Market Segmentation
- Pain Point Assessment
- Ecosystem Mapping
- Account Level Eminence
- S-Curve Assessments
- Trends Analysis
- Market Entry Report
- Growth Drivers

Competitor Landscaping Reports

- Value Chain Assessment
- M&A Assessment
- Financial Analysis
- Features Assessment
- Customer Assessment

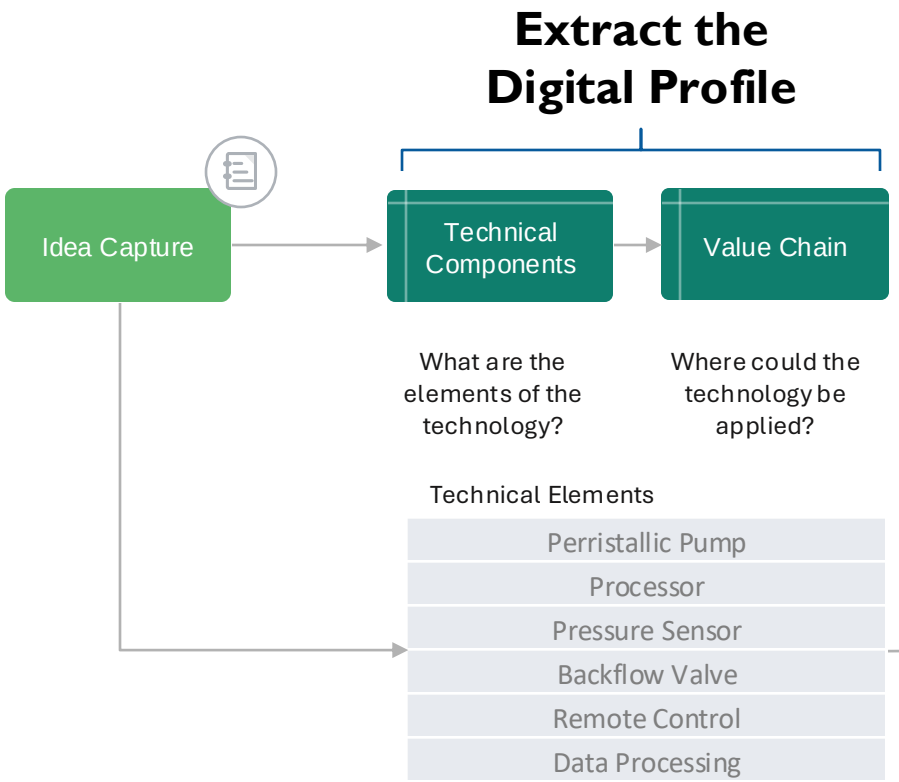
A Structure to Scale Information

Using unique identifiers and idea profiles to shepherd information across the innovation cycle



Human in the Loop

Optimization of an Idea Capture for AI Assisted Support



Human in the Loop Evaluation

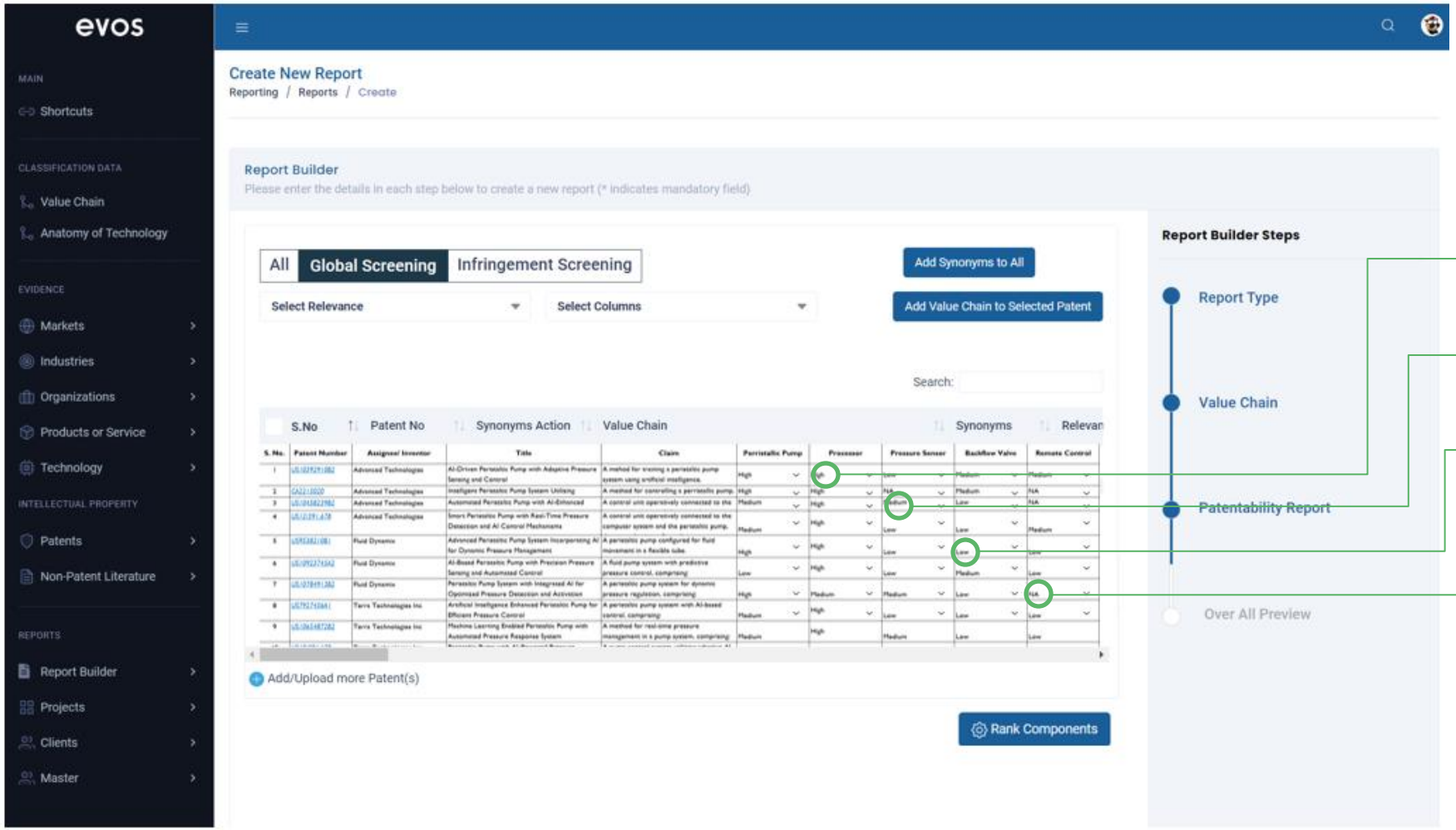
IPSCREENER by AutoMatch Technology

ASSET ANALYSIS |

S. No.	Patent Number	Assignee/ Inventor	Title	Claim	IP Screener Relevance
1	US10392910B2	Advanced Technologies	AI-Driven Peristaltic Pump with Adaptive Pressure Sensing and Control	A mehod for training a peristaltic pump system using artificial intelligence,	Relevant
2	CA2215020	Advanced Technologies	Intelligent Peristaltic Pump System Utilizing	A method for controlling a perristallic pump,	Relevant
3	US10458239B2	Advanced Technologies	Automated Peristaltic Pump with AI-Enhanced	A control unit operatively connected to the	Relevant
4	US12/391,678	Advanced Technologies	Smart Peristaltic Pump with Real-Time Pressure Detection and AI Control Mechanisms	A control unit operatively connected to the computer system and the peristaltic pump,	Relevant
5	US9538210B1	Fluid Dynamix	Advanced Peristaltic Pump System Incorporating AI for Dynamic Pressure Management	A peristaltic pump configured for fluid movement in a flexible tube.	Relevant
6	US10923745A2	Fluid Dynamix	AI-Based Peristaltic Pump with Precision Pressure Sensing and Automated Control	A fluid pump system with predictive pressure control, comprising:	Relevant
7	US10784913B2	Fluid Dynamix	Peristaltic Pump System with Integrated AI for Optimized Pressure Detection and Activation	A peristaltic pump system for dynamic pressure regulation, comprising:	Relevant
8	US7927456A1	Terra Technologies Inc	Artificial Intelligence Enhanced Peristaltic Pump for Efficient Pressure Control	A peristaltic pump system with AI-based control, comprising:	Relevant
9	US10654872B2	Terra Technologies Inc	Machine Learning Enabled Peristaltic Pump with Automated Pressure Response System	A method for real-time pressure management in a pump system, comprising:	Relevant
10	US10/391,678	Terra Technologies Inc	Peristaltic Pump with AI-Powered Pressure Detection and Smart Control Algorithms	A pump control system utilizing adaptive AI control, comprising:	Relevant

Human in the Loop

Move your data into one home, and add in information to repurpose your data at a later date



Note where your claim elements exist in discovered references

- **High** – Element is found in an independent claim
- **Medium** – Element is found in a dependent claim
- **Low** – Element is found in the Detailed Description
- **NA** – Neither the element or synonyms were found in the reference

Human in the Loop

Find new uses for your information

Feature Mapping

S. No.	Product Name	Company Name	Perristallic Pump	Processor	Pressure Sensor	Backflow Valve	Remote Control	Locking Mechanism	Electronic Components
1	Booster Control	Advanced Technologies	✓	✓	✓	✓			✓
2	Pressure Max	Fluid Dynamix	✓	✓	✓	✓	✓	✓	
3	TruForce	Terra Technologies Inc	✓	✓	✓	✓		✓	

Use competitor information to drive patent prosecution

Perform feature comparisons between your products and the products of others.

Build automations to explore anomalies.

Why are filings peaking and falling?

Are Assignees changing with time?

Do the topic areas in the claims change over time? If so, why?

Feature	Evaluation Filter	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Perristallic Pump	High	2	2	2	2	0	0	1	9	12	8	4	0	0	2	8	2
Processor	Medium	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Pressure Sensor	Medium	2	3	0	5	4	1	0	0	9	2	5	1	0	0	3	1
Backflow Valve	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Remote Control	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Data Processing	High	0	3	9	11	4	0	2	19	31	22	4	4	0	19	12	2

Human in the Loop

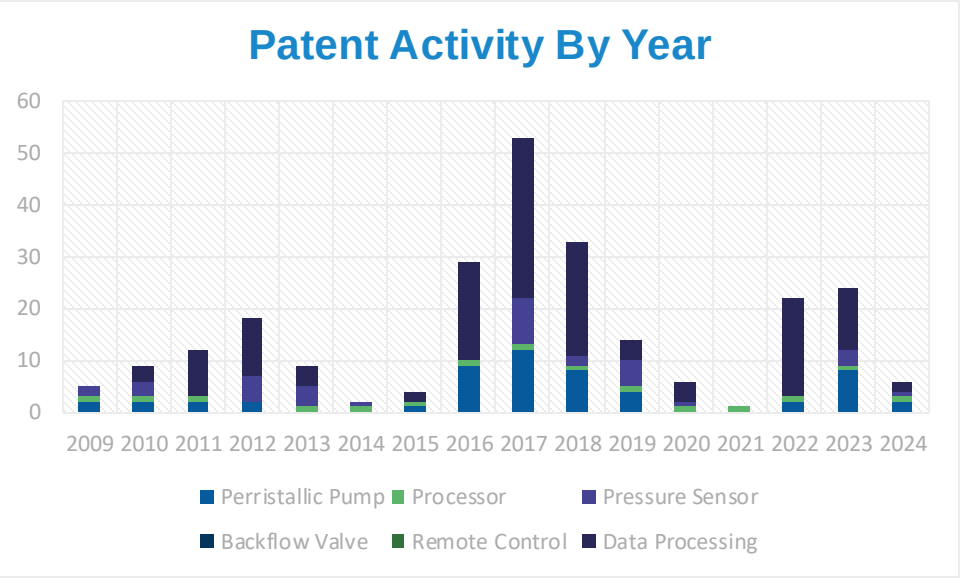
Feature Mapping to support competitive landscaping

- Modify "Evaluation Filter" to determine the first time a patent document discloses key elements you seek to adopt in a new product.

- FTO and patentability in one report
- Address higher order needs: Is NOW the time?

Who this type work benefits:

IP Managers, Patent Examiners, Subject Matter Experts



Innovation Program Assessments

Custom Go/No-go assessments

As ideas move to projects and ultimately products, the R&D process must

- Understand the types of projects the enterprise is best positioned to win in the market
- Improve its ability to predict what technologies and markets are most likely to achieve a necessary minimum Return on Investment
- Use information from program successes and failures to find and pursue projects more likely to succeed in the better understood market
- Balance the portfolio of product development initiatives for sustained competitive advantage

- Rubrics allow the business to understand the inherent risks and opportunities of each project
- Rubrics provide transparency in the project selection process
- They allow Subject Matter Experts to focus their ideation process to solve problems whose outcomes fit a known market demand

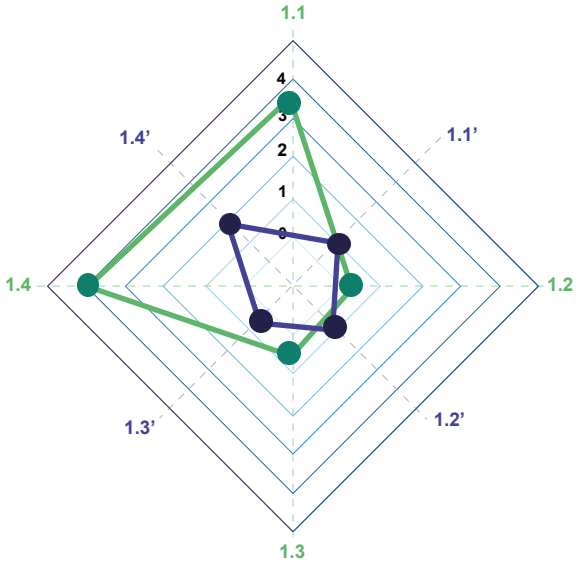
What constitutes a Rubric?

Rubrics are criteria that illuminate risks and opportunities inherent in a given development effort

	REF.	0	1	2	3	4
TRL of others	1.1	Idea Phase	Mathematical Modeling / Experimental Modeling	Experiments conducted in a controlled environment	System testing complete in the field and qualified	Successful permanent deployment of technology
Prior development attempts	1.2	Failed effort to develop the technology	No direct evidence of the impact of the technology found.	Technology improves performance of existing technologies in a single value chain.	Tech improves the performance of existing technologies and changes processes moving forward.	Technology alters business operations in a fundamental way.
Current tech adoption	1.3	Technology is widely used across the industry	Technology was adopted by industry fast followers	Technology was adopted by an industry first mover	Technology is being developed by industry players, but no evidence of adoption was found	No evidence of use in the industry was found.
State of competing technology	1.4	An alternative technology is an industry trusted solution	A competing technology with a TRL between 8 – 9 was found	A competing technology with a TRL between 5 – 7 was found	A competing technology with a TRL between 1 – 4 was found	No competing technologies were found

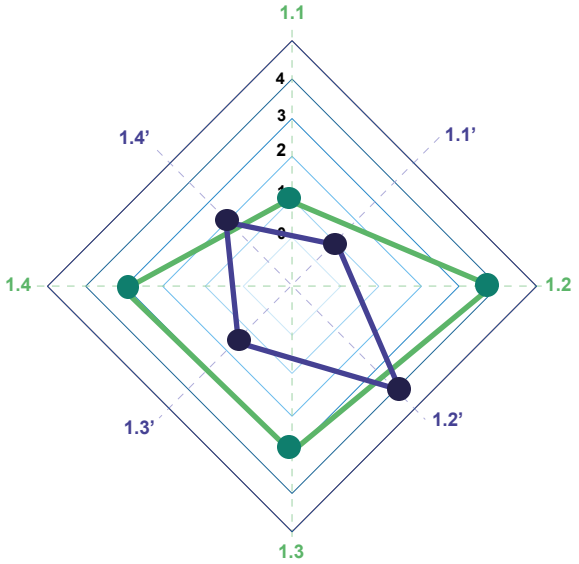
Rubrics to Test Assumptions

Primary Score Secondary Score



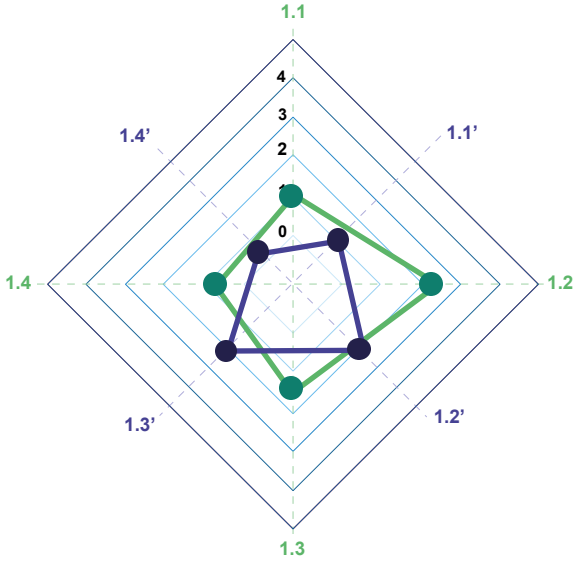
Tech Analysis

- State of 3rd Party Development
- Company experience developing similar TRL technology
- Identify existing technologies in the value chain that favor adoption /integration



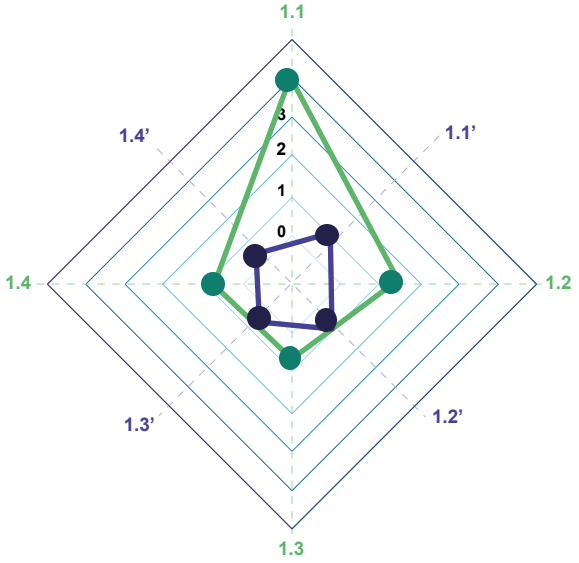
Market Analysis

- Attributes of market size and growth
- Who is competing?
- Who is primed for adoption?
- What problems are customers attempting to solve?



IP Diligence

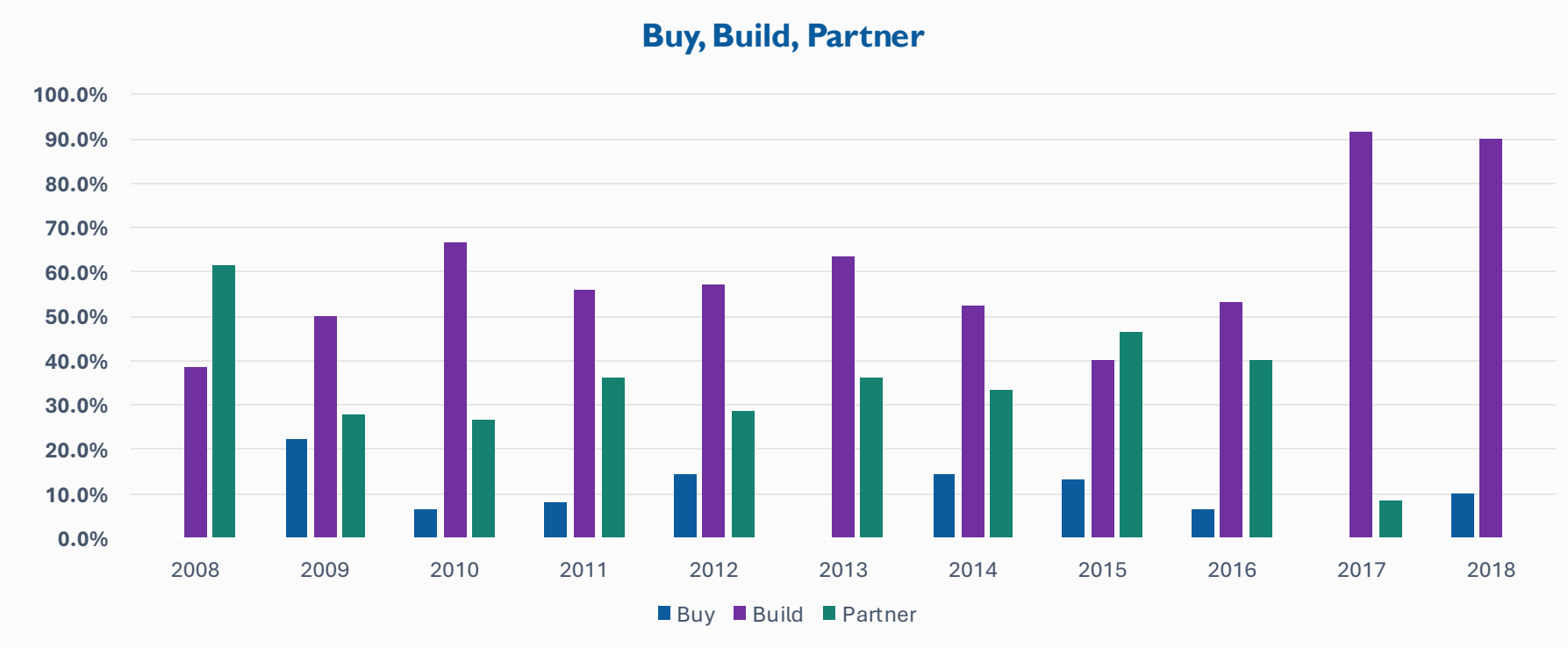
- What does ownership of ideas look like?
- Are there Freedom to Operate issues?
- What does the patent landscape say about the history of competition?
- Does the IP landscape underscore additional revenue opportunities?



Business Alignment

- Efforts should align with an overall corporate vision
- Some projects will provide an incremental step towards the company vision while others are bigger bets

Bringing Data Together to Predict Outcomes



Access Type	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Buy	-	4	1	2	1	-	3	2	1	-	1	15
Build	5	9	10	14	4	7	11	6	8	11	9	94
Partner	8	5	4	9	2	4	7	7	6	1	-	53
Total	13	18	15	25	7	11	21	15	15	12	10	162

While Roche prefers to **BUILD** innovation using in-house. Build accounts for **58%** of the innovation strategy.

PARTNERing is the second most preferred option. Partnering, often in the form of collaboration agreements and licensing accounts for **33%** of the innovation strategy.

The most expensive up-front option for accessing innovation is **Buy**, which is utilized to access innovation less than **10%** of the time.

Mirroring Practices that Deliver Results

	Pipeline Year											
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Radical*	**46**	**52**	**57**	**74**	**64**	**62**	**63**	**64**	**68**	**62**	**58**	**670**
Phase 1	28	30	33	43	31	28	33	38	39	37	35	375
Phase 2	13	15	16	21	23	25	21	15	18	15	11	193
Phase 3	4	7	8	7	7	8	8	8	8	9	9	83
Registration	**1**			**3**	**3**	**1**	**1**	**3**	**3**	**1**	**3**	**19**
Incremental*	**56**	**51**	**39**	**41**	**44**	**45**	**47**	**60**	**76**	**70**	**76**	**605**
Phase 1	2			2	2	8	11	18	26	24	21	114
Phase 2	11	10	8	7	13	11	12	11	11	9	10	113
Phase 3	35	30	25	28	22	20	20	28	33	32	37	310
Registration	**8**	**11**	**6**	**4**	**7**	**6**	**4**	**3**	**6**	**5**	**8**	**68**
Total	**102**	**103**	**96**	**115**	**108**	**107**	**110**	**124**	**144**	**132**	**134**	**1275**

- Signal Alerts: The number of Incremental Innovations exceeded Radical innovation between 2016- 2018
- Insight: The success rate in registration is always high for Incremental innovations (nearly 3.6x more successful)

The 2024 Innovation Paradigm

Incentivizing software services & content curators

Connecting Innovators and Developers

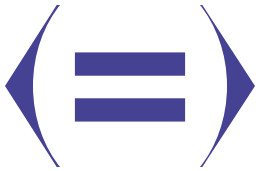
Leveraging networking effect for ideation, validation, delivery, and pricing

Portfolio targeted at developing a single dashboard to manage innovation

Access innovation though Buy, Build, Partner, Invest Strategy

Build a two-sided market place where

- Developers can access unparalleled data
- Get high quality & consistent inputs
- Have data to tune for quality outputs
- Have immediate access to pilots for new innovation
- Clear revenue splits & A/B testing feedback
- Build standards for data inputs, storage, enrichment, outputs
  - Process data
  - Reports
- Foster business models that incentivize data curation

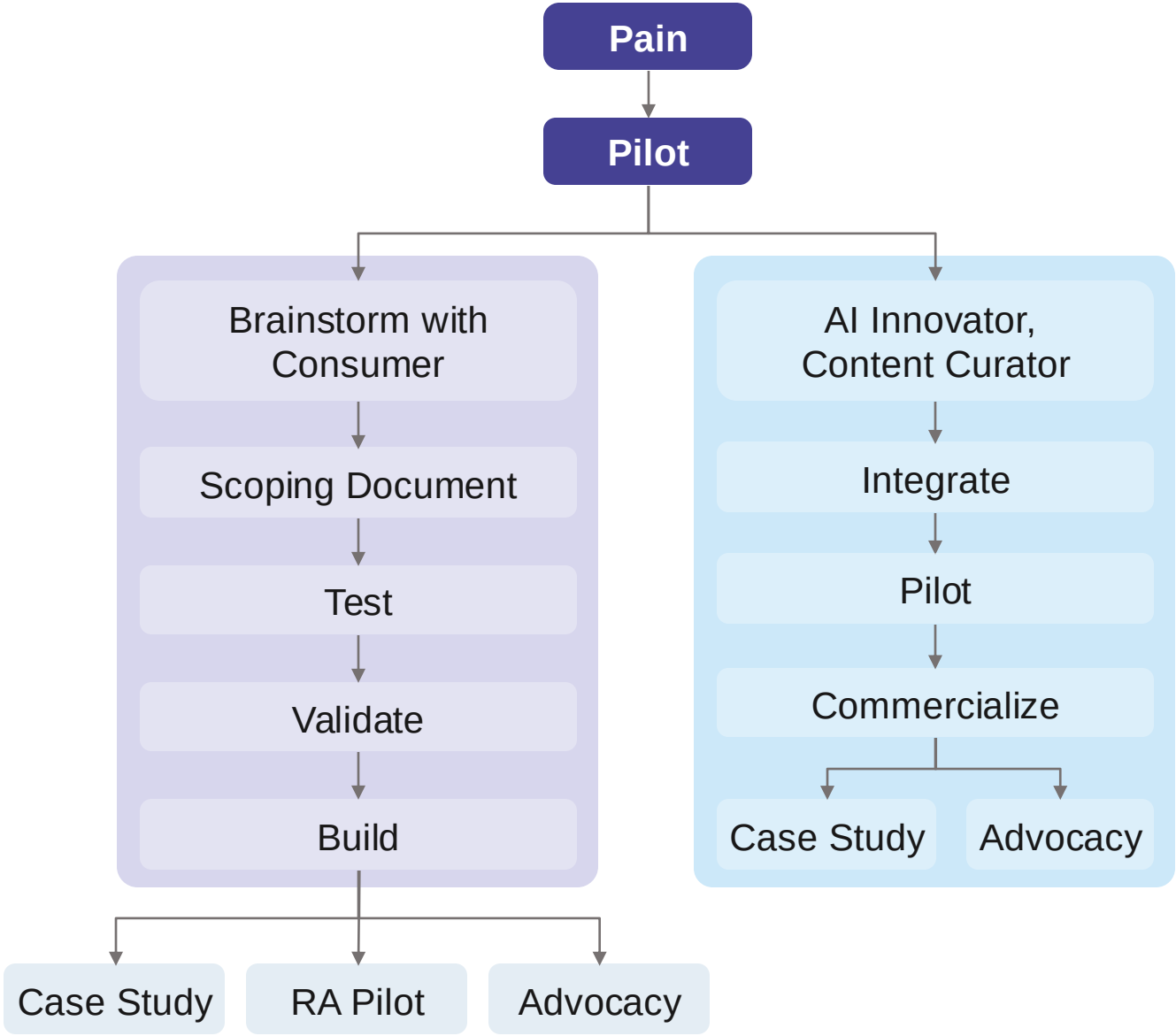


The innovation economy will have a single dashboard to:

- Manage the transition from idea to product sunset
- Balance a product portfolio of innovation projects to cerate **α** fast
- Develop & predictive understanding of how the market will respond to innovation initiatives
- A place to commercialize curated data sets that drive decision making
- Census tools & data sources to speed to revenue & growth

Two-Sided Market

A marketplace for innovators and AI pioneers to collaborate



Assess Ideas + Build a Portfolio

Evaluating which ideas to pursue by risk

Assess Ideas

- Select ideas for prioritization
- Balance Risk
- Develop a more holistic IP strategy

1

Individual Efforts

- Align individual ideas with overall objectives
- One and done, or Multi-generational technology
- Test assumptions

Program

2

Balance the Portfolio Mix

- Identify a mix of innovation you can bring to market
- Curate known issues
- Disseminate information ahead of the session

Portfolio

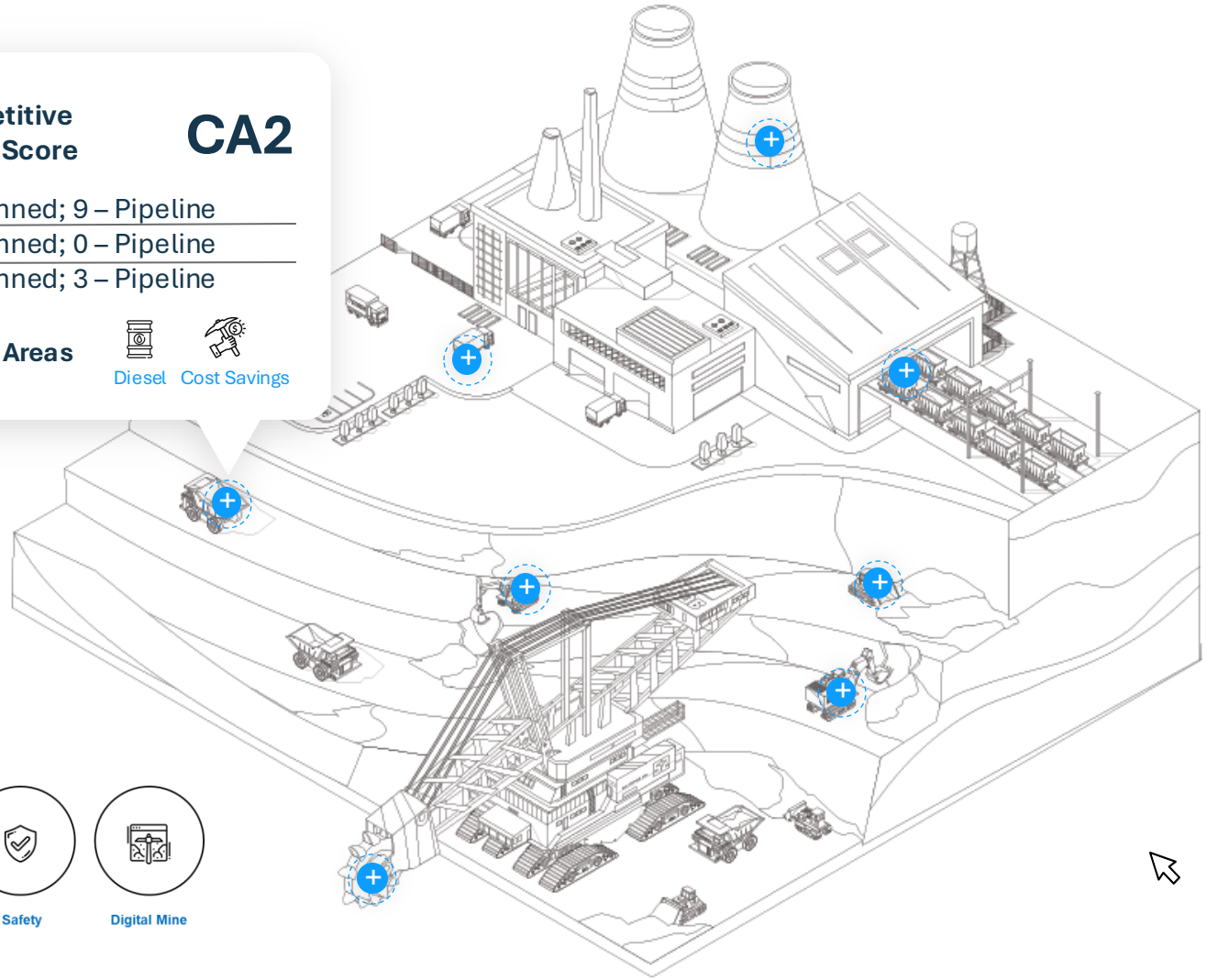
Innovation Visualizations

Value Chain

Net Competitive Advantage Score **CA2**

H1	3 – Planned; 9 – Pipeline
H2	1 – Planned; 0 – Pipeline
H3	1 – Planned; 3 – Pipeline

Top Impact Areas Diesel, Cost Savings



Visualize your opportunities:

- ✓ View your business in new ways
- ✓ Draw direct lines between your efforts and values
- ✓ Own your strategy, empower others with tactics

Sustainability · Diesel · Automation · Autonomy · Cost Savings · Power generation · Safety · Digital Mine

Innovation Mapping

Capture

Proper Capture creates an opportunity to combine data into rich visual platforms

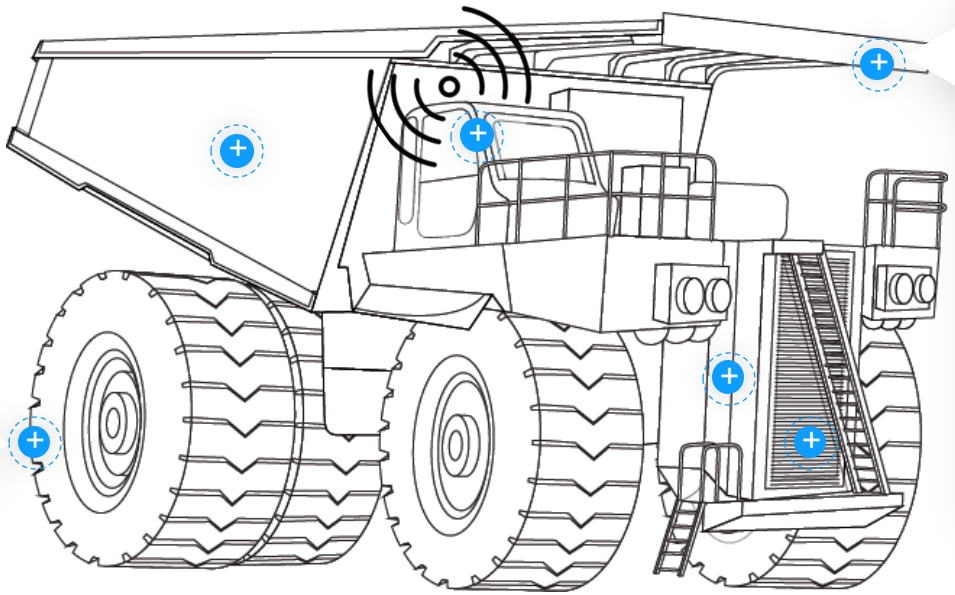
REQ: **3102A** Horizon: **H2**

Problem: Heavy Loads cause tires to overheat. Over-heating requires loads to be re-handled, costing money and drawing down resources.
Solution: New materials w/ heat tolerance while under load.

Vendor: BIS INDUSTRIES

Status: In-Development

Core Impact: Diesel, Cost Savings



REQ: **3103A** Horizon: **H1**

Problem: The weight of the tray reduces carrying capacity for ore while excessive weight decreases fuel efficiency.
Solution: Engineered materials.

Vendor: MINERAL RESOURCES

Status: Available for Purchase 12/2019

Core Impact: Diesel, Cost Savings, Sustainability

Characterize Innovation Opportunities

The project characterization step is a multi-disciplinary initiative that aligns potential projects with the company's product roadmap and vision. For example, project analysis may promote development initiatives for which the company has a demonstrated ability to overcome certain technical risks. The elements of the characterization that are scanned are taken from the Project Summary and include:

Project Summary — Document that provides context for the project; problem-solution approach statement, underlying assumptions, KPIs for success, team members across the enterprise

Technical Analysis — Elements of our technical solution, competing technologies, the current state of development (e.g. Technology Readiness Level (TRL)) of each, and pros/cons summary of internal v. external development options

Market Analysis — A profile of the in-sector and out-of-sector markets impacted by the technology including market characteristics: market size/growth, industry activities, driving trends, M&A activity, and competitive forces

IP Diligence — Patent landscape to inform the protectability of the technical solution approach, and provide a feedback loop to the technical and market analysis

Internal Alignment — Criteria and weighting that is specific to NCS (e.g., revenue increases, cost reductions, strategic advantage etc.)

A Rubric Approach to Characterizing A Project:

Portfolio Perspectives

Examining innovation portfolios from different angles

Competition Neutral
CA-1

[COMPANY] requires unrestricted use of the foreground technology where the technology would facilitate or enable the development of other possibly competition-critical systems but is not competition-critical unto itself. Control and ownership of the IP is not required provided that [COMPANY] gains the necessary rights to use the IP.

Competitive Head Start
CA-2

[COMPANY] gains a short-term competitive advantage in priority markets. Typically requires that [COMPANY] establish short-term IP control through a combination of development, in-licensing or cost-sharing. There is a recognition that [COMPANY] is willing to give up long-term IP control in exchange for monetary or technological contributions to the foreground technology.

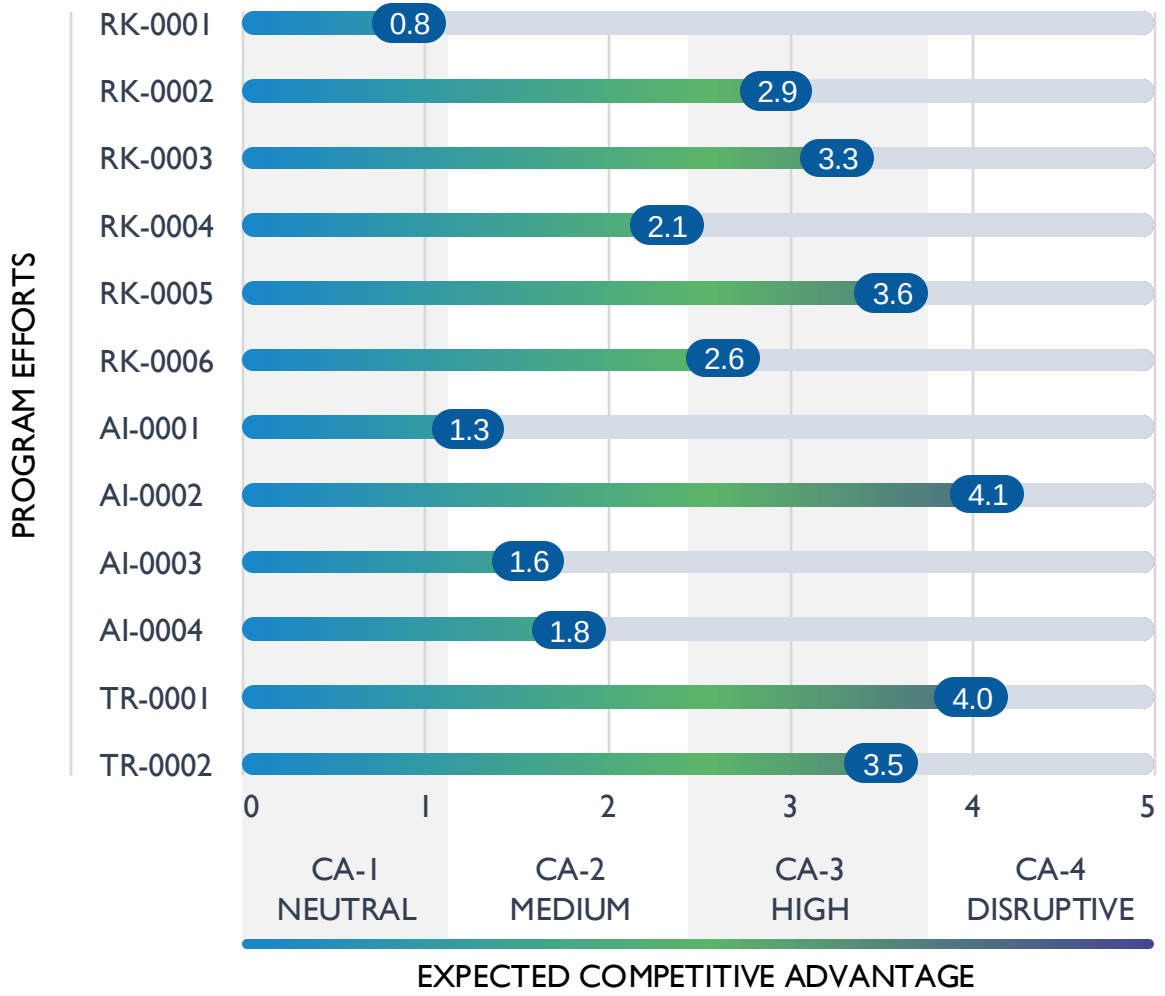
Sustainable Competitive Advantage
CA-3

[COMPANY] gains a long-term competitive position in priority markets. SCA requires that [COMPANY] establish long term rights, but not necessarily ownership of all constituent technologies.

Exclusive Ownership & Control
CA-4

[COMPANY] requires full rights and ownership including worldwide rights to make or have made, modify, sell or license this intellectual property without restriction.

Competitive Advantage Scores

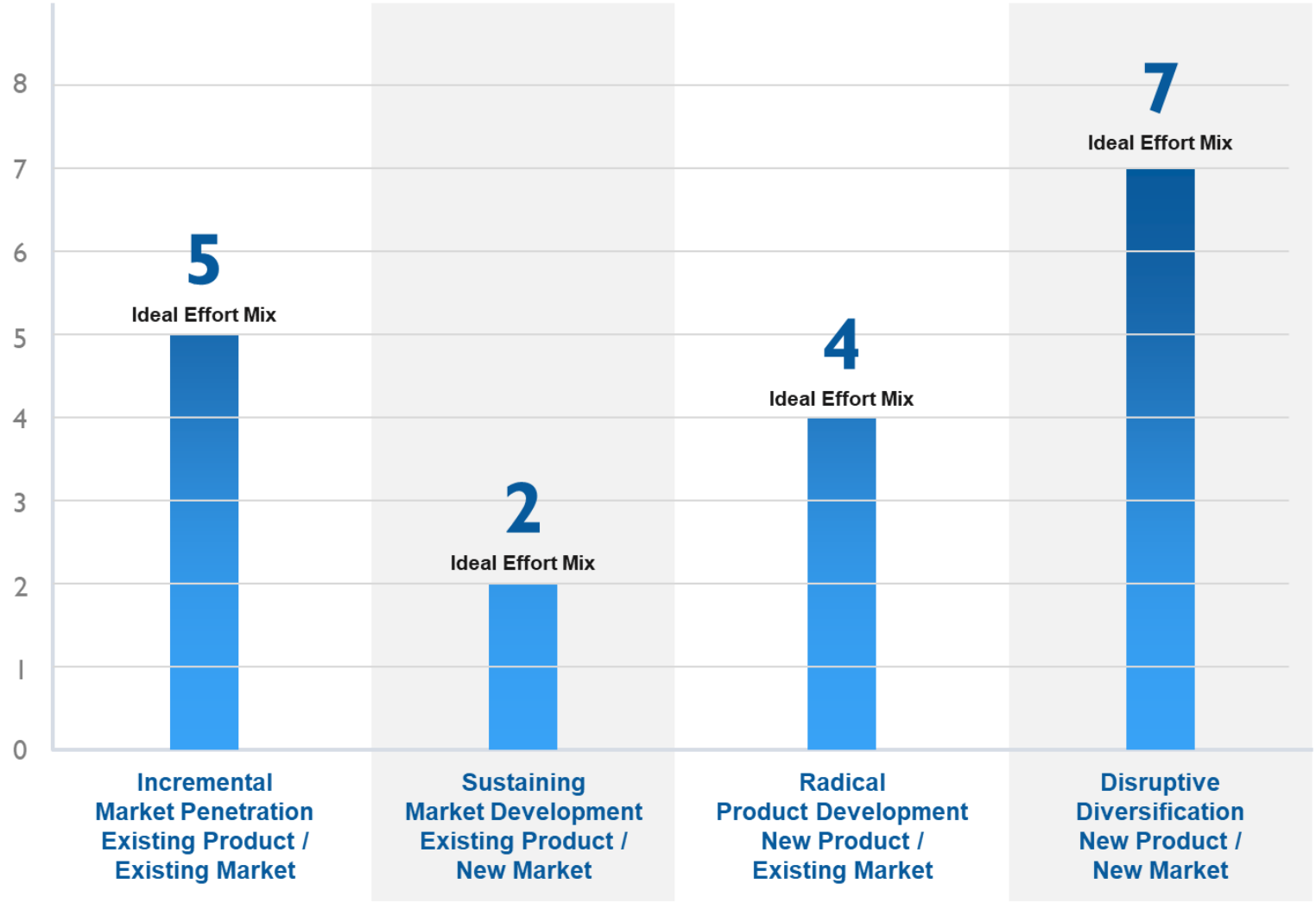


Alternative Portfolio Perspectives

Leverage data and classification techniques for clearer portfolio understanding

Triage

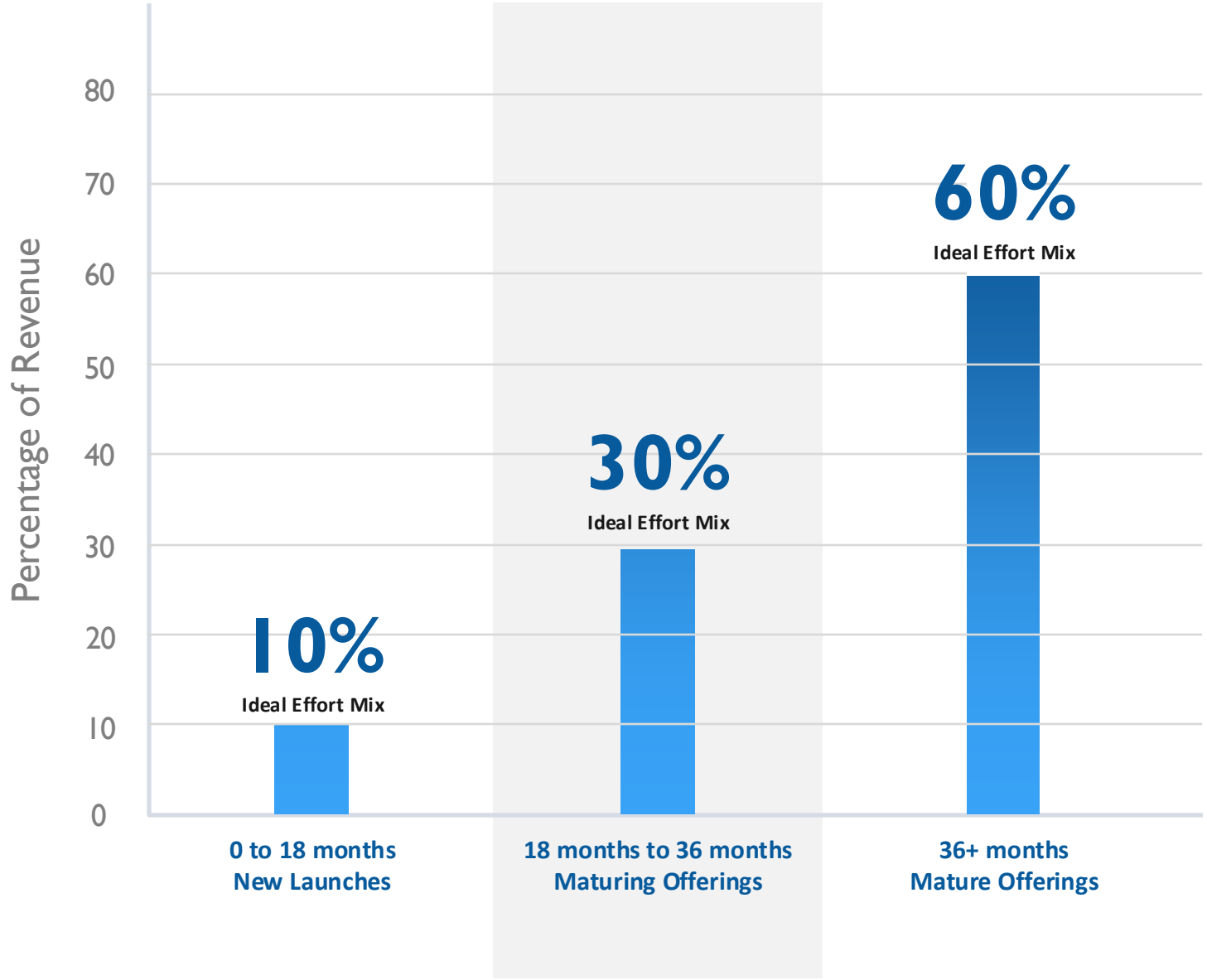
- Select ideas for prioritization
- Develop a more holistic IP strategy
- VOC input



Vitality Index

The vitality index provides and indication of how well innovation efforts are finding product-market fit within growth markets.

A variety of frameworks can be used to bucket innovation efforts by risk-type. A common tool is the Ansoff Matrix.

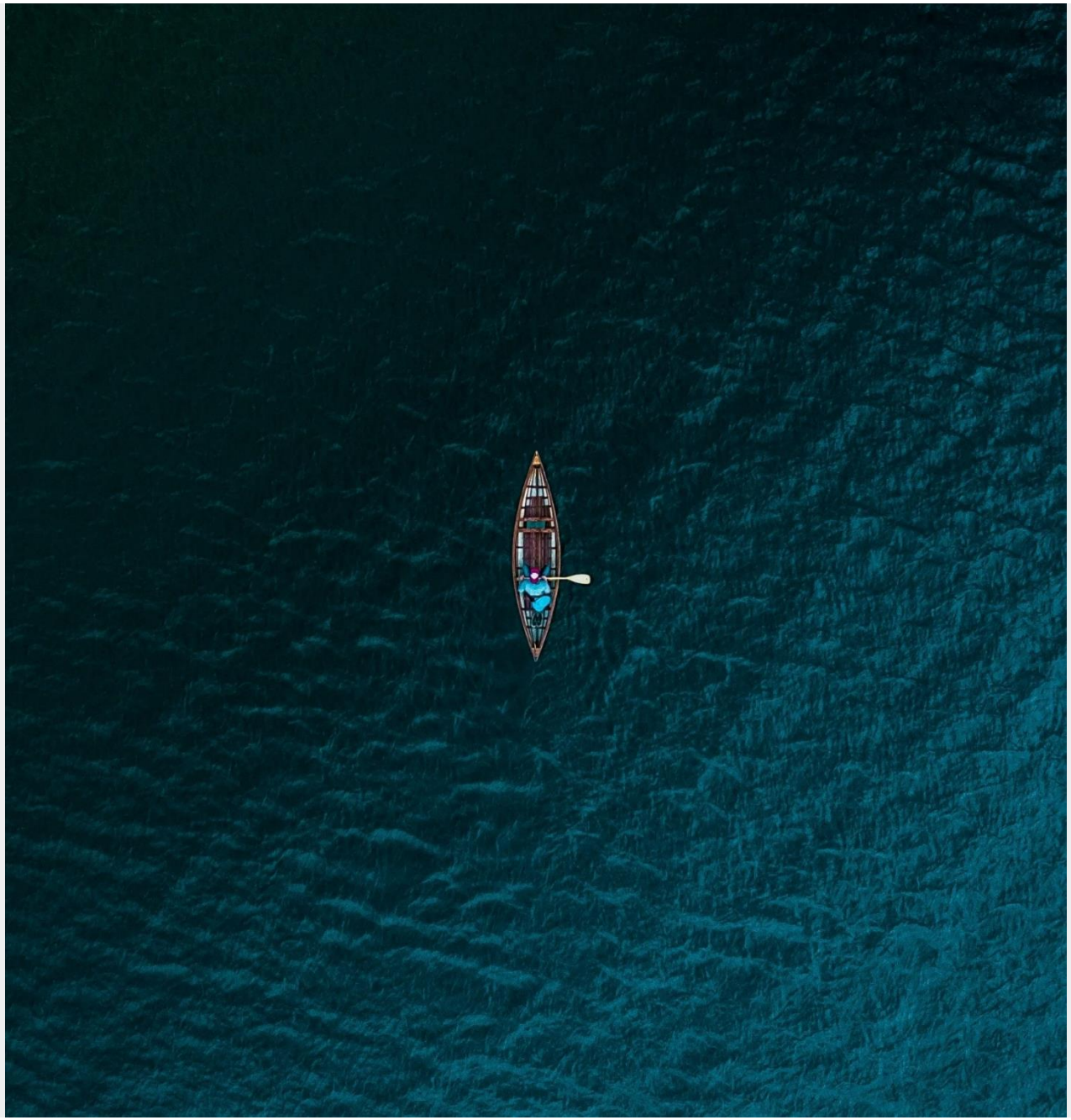


Questions

Thank you

Looking to discuss your innovation effort in detail?

Please use the contact information below to schedule a call or follow me on social media.



Calendar a call with me!

Matthew Wahlrab

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