iH²OPe PROJECT
*I*DEATION TO *H*2 *O*PPORTUNITY *P*ORTFOLIO

FINAL REPORT OUT

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iH²OPe – PILOT

The Challenge of Horizon 2:
Implications for Effective Opportunity Development

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AGENDA

- iH^{2}OPe Project Overview

- H2 Opportunity Development

- Advancing H2 Opportunities

- Conclusions

- Questions?

- Understand the weak points of Horizon 2 activities

- Highlight use cases of best practices for Horizon 2 portfolio management

- Build a roadmap with rationale for integrating practices

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The work is the result of the *Ideation to Horizon 2 Opportunity Portfolio* (iH^{2}OPe) Project, which explores leaders' assessment of the practices companies use to effectively manage H2 opportunities and facilitate decision-making satisfaction. The iH^{2}OPe project focused on Horizon 2 and involved a combination of extensive research, interviews with IRI member companies (senior portfolio managers, vice presidents, and senior directors) across industries such as software services, chemical manufacturing, consumer goods, packaging, and aeronautics.

iH^{2}OPe PROJECT OVERVIEW

GOALS, & KEY TAKEAWAYS

KEY TAKEAWAYS

- Implement a governance framework

- Opportunities come from anywhere

- Embrace an intrapreneurial culture

- Solicit leadership buy-in

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- H2 opportunity development is complex, characterized by conflict and risk due to ongoing learnings and pivots which requires a dedicated governance framework to successfully manage and transition H2 opportunities.

- While new opportunities originate from all horizons, H2 opportunities are unique in that successful identification of market adjacencies using existing resources or innovations can lead to brand extension and diversification of revenue streams. New opportunities can be identified via unexpected and pre-existing sources such as employees, suppliers,

affiliates, and customers.

- Best practices for leaders navigating H2 include a culture that embraces risk taking, cross-functional teams, a forward-thinking mindset, an intrapreneurship approach, and commitment to continuous improvement.

- Leadership buy-in and support is crucial to effective H2 execution.

H2 OPPORTUNITY DEVELOPMENT

OVERVIEW, FRAMEWORK & PORTFOLIO MANAGEMENT IMPLICATIONS

Opportunities are not projects, rather they are prospects to explore. Based on favorable innovations, situations, or circumstances. They can originate from anywhere, employees, suppliers, customers, …

Opportunities must be assessed via collaboration between key leaders and subject matter experts. This provides a full and accurate understanding of the opportunity as well as alignment with strategic intent (Whitehurst 2016; Knapp 2019). Once a decision is reached, owing to the collaboration, these same informed individuals can then be looped into the opportunity development process going forward.

WHAT/WHERE IS HORIZON 2?

Opportunity Diamond
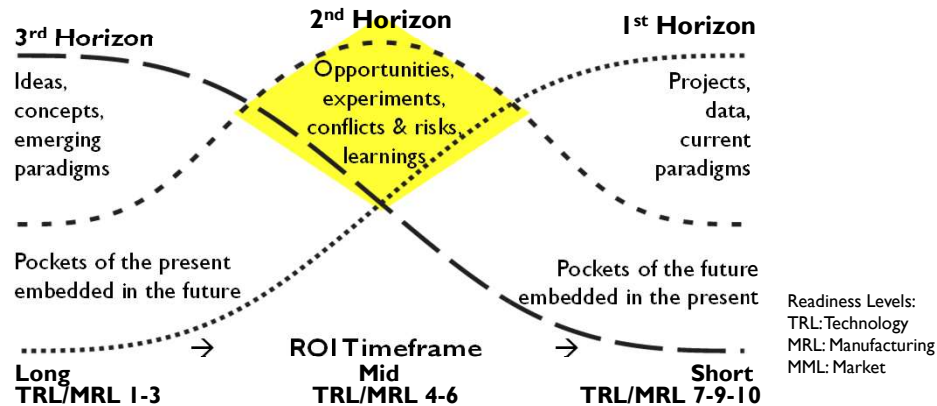
Horizon 2 is the Opportunity Diamond situated among the Three Horizons where the gem inside is a place for experiments and execution, but also conflict and risk given the ongoing learnings and pivots. H2 is not necessarily a space for inventions or even innovations, but rather for thoughtful and careful selection of those favorable innovations, situations, or circumstances that can lead to a viable business governed by structures for sound decision-making and development.

The Three Horizons (H3) Model has three components: Horizon 1 (H1), characterized by near-term projects within the current business planning cycle; Horizon 2

(H2), occurring 2–5 years prior to release and fitting between today's need for projects, production, and certainty and the uncertain future; and Horizon 3 (H3) comprising long-term concepts and emerging paradigms, nominally 5+ years in advance of market release (Blank 2019).

Horizon 2 (H2) is a unique period of opportunity development and executing this process correctly can make all the difference in a company's long-term success.

CHARACTERISTICS OF HORIZON 2

		iH²OPe	
Horizon / Component	3	2	1
ROI Timeframe	Long	Mid	Short
Business Scope	Future	Growth	Core
TRL/MRL(±)	1 – 3	4 – 6	7 – 9/10
Activity	Identify new market	Demonstrate opportunity	Fabricate product
Deliverable	Market concept corroborated	Prototype exhibited	Manufacturability demonstrated
Focus	Turning out innovations	Top-line growth	Bottom-line accountability
Role	Inventor	Intrapreneur/ Business developer	Implementor/ Fabricator
Mindset	Goals	Strategic	Tactical
Investment	$	$$	$$$$

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HORIZON 2 GOVERNANCE

3rd Horizon — Ideas, concepts, emerging paradigms

2nd Horizon — Opportunities, experiments, conflicts & risks, learnings

1st Horizon — Projects, data, current paradigms

Governance Gem Inside

Pockets of the present embedded in the future

Pockets of the future embedded in the present

Readiness Levels:
TRL: Technology
MRL: Manufacturing
MRL: Market

ROI Timeframe

Long — TRL/MRL 1-3

Mid — TRL/MRL 4-6

Short — TRL/MRL 7-9-10

Our research found that within the Horizon 2 Opportunity Diamond, there is yet another gem that manifests the operational aspects of Horizon 2. It is the Governance Gem, a crystal that provides the organizational framework. A number of our interviewees discussed their company's process for handling H2 opportunities, but few had recognized the requirements for a managerial framework to organize the decision activities within Horizon 2. Inviting a few select IRI members, we conducted several rounds of carefully guided discussions on the topics of:

- •-innovation portfolio management
- •-systems engineering perspective

- •-business systems planning and road mapping
- •-situationally dependent choice architecture focused on the "job to be done"

From these discussions, we architected a framework that is expansive, but also inclusive for management of any of the H2 types.

OPPORTUNITY GOVERNANCE FRAMEWORK

- Structure for governing H2 opportunities
- Situationally dependent choice architecture based the "job to be done"
- Responds to shifts in strategic intent owing to changes in technology, customers, and markets

> *"When leadership forms a separate governance structure that looks at the opportunities . . . this provides a framework for decisions that are harder to make at a business unit level and allows for disciplined business opportunity experimentation."* — IRI Member Company

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To address the challenges of H2, we identified a framework for effectively managing the complexities of H2 opportunity development.

The Opportunity Governance Framework (OGF) provides a structure or framework for the governance of opportunities within H2, organizing and allocating prospects based on consideration of scope, timescale, and availability of resources and personnel with the goal to improve decision-making satisfaction.

The OGF is a situationally dependent choice architecture focused on the "job to be done" (Christensen et al. 2003;

Houlihan 2020). The OGF evolves constantly: it addresses H2 opportunity challenges and responds to shifts in strategic intent owing to changes in technology, customers, and markets.
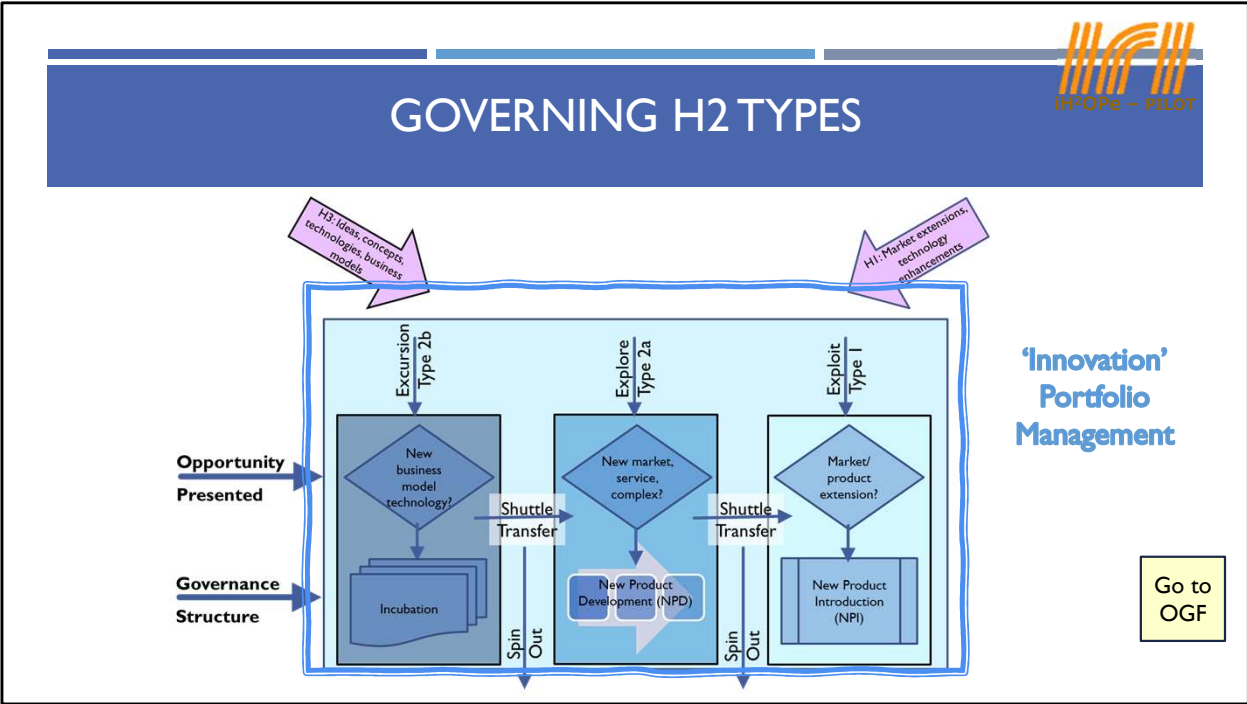
The very best companies designed their own governance structures to orchestrate and mature H2 opportunities. Interviewees from these companies detailed differentiated process flow to handle differing H2 types, essentially designing or choosing to architect their own proprietary management for these opportunities. As opportunities mature, there often is a transfer of knowledge, occasionally by shuttling key employees along the process thereby bringing tacit knowledge with them. Additionally, these companies realize some opportunities are less valuable or pertinent to the ongoing business and need to be spun out to outside interests, allowing the

organization to focus on key prospects.

H2 opportunities are not monolithic. (Euchner, 2020) Several interviewees reported that they encountered at least 2 different types of opportunities and each needed separate governance. (Figure 3) These can be referred to as "exploit" and "explore," or Type 1 and Type 2, respectively. They differ according to timelines, culture, leadership, investment, and risk (market, technology, team) (Simoudis 2017). Type 1 ('exploit') opportunities without cross-divisional constraints can be acted upon in the near-term business cycle with production maturation, an re-aligned business model, and moved to New Product Introduction (NPI). Scott, do you think we should keep this?

Yes. This is about abandoning failed efforts to save money and refocus. Some companies find this challenging.

We believe this important as this is about abandoning failed efforts to save money and refocus. Some companies find this challenging.

Type 2 opportunities involve additional management and resources, and the business opportunity is not immediately apparent, requiring more in-depth assessment based on their complexity, cross divisional

requirements and ability to integrate with existing suppliers. Within Type 2 opportunities we delineated two subcategories. These subcategories we identified as Type 2a and 2b. Type 2a ('explore') focuses on opportunities for new customers/markets or providing a new service and is best managed by the New Product Development (NPD), or for more involved cross-divisional applications, Project Management Center of Excellence (PMCoE) processes. Based on our interviews, we put forward a new category, Type 2b ('excursion'), which introduces technologies or systems that require a new business model. These 2b opportunities should be isolated from the accustomed divisional business environment and separately incubated as they develop and mature.

There is a lot of IRI discussion about portfolio management, especially 'innovation' portfolio management. We believe that a large portion of the decision-making for the corporate portfolio revolves around management of the various H2 opportunity types. The reasoning is simple. H3 concepts are just that, concepts that are in the process of being transformed into validated proof of concepts, TRL 3. The amount of resources devoted to H3 concepts is typically small and therefore not substantially material, and the number of concepts can be substantial, but many prove not to be viable. Therefore, the H3 consequential decision-making

is minimal. On the other hand, H1 projects are often incorporated into the current business cycle plan. The corporation has committed substantial resources and a projected schedule for H1 projects. Therefore, the decisions for H1 projects are mostly concluded. Finally, H2 opportunities are numerous, constantly evolving, and the committed resources are material. The H2 portfolio involves substantial decision-making and requires highly skilled management.

Nearly ubiquitous among interviewees was the use of a concept card ("one-pager" or Opportunity Canvas) template to consolidate H2 information and then track headway and assumption/risk validation all in one place (Stategyzer 2020). As one organization experienced, the concept card creates efficiencies in H2 development processes because it automates the capture and traceability of accompanying KPI metrics, updates, learnings, and milestones (Thiry 2008; Ries 2009). A corporate repository can serve both as storage to tack data extracted from the developing opportunity, but also to deliver up prepared tracking templates. A key objective is to select and apply according to the opportunity the right

metrics to be tracked on the concept card. Ohr (2015) suggests that success is defined differently in each horizon and the metrics should be adapted accordingly.

The H2 opportunity, because of experimentation and risk taking, places less emphasis on performance and budgetary metrics while more importance is placed on creation of viable prototypes demonstrating future potential. Pressure often exists to apply standard end product financial metrics (profits, revenue, gross margin, ROI, …) to all phases of new product develop, but these are lagging indicators and unsuitable for the uncertainty and fuzziness of H2 opportunities.

The very best H2 development insights are achieved by two distinct KPI metric categories that quickly provide validation of opportunity assumptions and increased learning. The first are forward indicator metrics, such as applying innovation accounting to the potential value of the opportunity, establishing proof of scaling, gaining traction in emerging markets, or creating a competitive advantage (Mathews et al.2007; Vallone 2021). The second includes metrics that measure opportunity development progress such as validated learning, learning velocity, and milestone accomplishment, which provide feedback to managers (Ries 2011).

ADVANCING H2 OPPORTUNITIES
TRANSITIONS & MANAGEMENT IMPLICATIONS

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TRANSITIONING OPPORTUNITIES

- Transitions are difficult and challenging
- Characterized by input-output relationship
- Cross-functional teams key to facilitating the process

> *"The inputs are where all the learning occurs during opportunity evaluation, and the outputs are how the learning is carried to business execution. What's intriguing is how often innovation management falls short in developing a transfer function that ensures the key learnings (capabilities) are part of the business execution team."* — IRI Member Company

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H2 leads must articulate an opportunity's current state of maturity and demonstrate how it will progress and transition through development stages culminating with a prototype (Ohr 2015). Cross-functional teams are key to facilitating development transitions between development stages (Richards 2012). The H2 end-deliverable is a successful prototype demonstrating maturity alignment across differing technical (TRL), manufacturing (MRL) and marketing (MML) scales (Terwiesch et al. 2008).

Transitions are one of the most difficult challenges because they:

    Assume new risks while shifting development

culture from experimentation to validated prototype
Teams adapt and adopt transitions in small
informational increments

Transitions are a transfer function with input-output
relationship:
- Input: learning and opportunity development
- Output: business execution, budgetary metrics

- Align Horizon 2 Processes
- Deliver More Satisfactory Decisions
- Focus on Effective Transitions
- Engage Cross-functional teams
- Support Opportunity Development Culture and Training
- Insist on Continuous Improvement

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There are five key implications for practitioners: 1) align H2 processes; 2) deliver more satisfactory decisions; 3) focus on effective transitions; 4) engage cross-functional teams; and 5) insist on continuous improvement.

Align Horizon 2 Processes

Success comes from recognizing that different opportunities require different management practices. Segmenting new product development projects into categories by maturity, by horizons for example, provides this managerial perspective. H2 opportunities are unique and demand a more intrapreneurial mindset and

management style that is premised on continuous experimentation and adjustments. H2 opportunities are not monolithic; they have differing time, resource, and risk attributes.

Deliver More Satisfactory Decisions

Companies can improve decision-making satisfaction by applying an analytical approach and having managers carefully review various opportunities (Kahneman et al. 2021.) Effective discussions can be encouraged by using a structured process such as with a prepared template like a concept card or opportunity canvas. The key assumptions and forward-looking metrics of the decision-making template of choice will serve as a blueprint for validation experiments and developmental targets (Ries 2019).

Focus on Effective Transitions

The best-performing organizations orchestrate and manage transitions between horizons by requiring new participants, re-prioritizing projects, and adjusting resources. These organizations use an organizational structure that provides clear maturity criteria and guidance to facilitate transitions. Each horizon stage requires a different style of management and inherently a different set of managers. We found that several companies strategically shuttle designated employees between stages, which provides continuity and tacit

knowledge transfer. One interviewee encouraged downstream business units to engage and sponsor upstream promising opportunities furnishing future development touchpoints.

Engage Cross-functional Teams

Though most executives recognize the importance of breaking down silos to help people collaborate across boundaries, it can be a struggle to make it happen. The companies in our study valued the importance of interfacing between functions, departments, and/or business units, perhaps through matrixed reporting or similar managerial structures. Our research revealed that cross-functional teams are typically used to generate new knowledge or to overcome barriers between departments and disciplines. For cross-functional teams to perform well, they need clear goals, direction, and accountability along with senior executive ownership, performance metrics, and a robust process for knowledge transfer.

Support an Opportunity Development Culture and Train Employees

The interviewees that participated in this study noted that developing the right culture entails promoting employee acceptance of opportunity development as a fundamental organizational value. The study participants indicated that their companies value the idea that opportunities can come from anyone and anywhere within or outside the

organization, not just from the top down. Successful opportunity development is a collaboration across business units and departments and is based on trust, transparency, inclusiveness, and communication. Managers must be open and willing to take risks, requiring a mindset that is comfortable with ambiguity and change as well as the capability to effectively navigate the unknown.

Insist on Continuous Improvement

Continuous improvement is imperative for any organization that wants to stay competitive. Interviewees cited use of Kaizen, Six Sigma, SCRUM, SAFe, and other Lean, Agile and continuous improvement techniques. Continuous improvement also requires leadership commitment to the process. Success comes from innovating what developers do (big and small) and engaging them in sharing knowledge and generating improvement ideas (Dewar et al. 2019).

- Opportunities are favorable innovations, situations, circumstances
- Craft viable prototypes by implementing development infrastructure
- H2 management is complex and challenging
- Provide H2 resources, processes, practices, and tools
- Build an organizational culture
  - facilitate transitions and cross-functional collaboration

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Horizon 2 is about recognizing when favorable innovations, situations, or circumstances become opportunities and engaging a development infrastructure to turn them into viable prototypes. Many leaders find the complexity of managing opportunities in H2 challenging. Employing a robust governance framework can help companies implement the right resources, processes, practices, and tools to move H2 opportunities to H1 more effectively. Leaders must recognize that achieving success in H2 requires a commitment to building an organizational culture that embraces failure, promotes decision satisfaction, facilitates effective transitions, and encourages cross-functional collaboration

H2 OPPORTUNITY DEVELOPMENT

The Challenge of Horizon 2: Implications for Effective Opportunity Development

Scott Mathews and Stephanie Hartwig

Questions?

SUMMARY

This whitepaper provides guidance on how to successfully implement a governance framework around Horizon 2 (H2) opportunities. H2 focuses on identifying and transforming favorable innovations into viable prototypes through a development infrastructure, with leaders often finding its management complexity challenging. Success in H2 necessitates a commitment to fostering an organizational culture that embraces failure, supports decision satisfaction, facilitates transitions, and encourages cross-functional collaboration.

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BACKUP SLIDES OF INTEREST

- Literature Review

- Concept Card Example (Sealed Air)

- Study Participants

- Our Hypothesis about H2

- The Horizon 2 Challenge

- What is Prototype Maturity

- Math behind Multi-stage Opportunities

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LITERATURE REVIEW

- Young, Rosenstiel, and Henderson (2020) *Long-term R&D strategy and planning*. RTM
- Baghai, Coley, and White (2000) *Alchemy of Growth*
- Terwiesch and Ulrich (2008) *Managing the opportunity portfolio*. RTM
- Moore (2007) *To succeed in the long term, focus on the middle term*. HBR
- Simoudis (2017) *The most critical horizon to the success of corporate innovation initiatives*
- Christensen, and Raynor (2003) *The innovator's solution*
- Kahneman (2011) *Thinking, Fast and Slow*
- Ries (2009) *Minimum viable product: a guide*. Startup Lessons Learned
- Strategyzer (2020) Canvases

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CONCEPT CARD EXAMPLE

Provided by Sealed Air for use by IRI Members

OPPORTUNITY CANVAS:

| TITLE: | Enter Text Here | DATE: MM/DD/YY |
| COLLABORATORS: | Enter Text Here | REV #: A |

WHAT'S THE PROBLEM?
List your top problems, pain points or Customer insights
Enter Text Here

2

HIGH LEVEL CONCEPT
State your solution in 6 words or less
Enter Text Here

3

GAME ENDERS
What are the highest risk technical and market challenges we need to prove first?
Enter Text Here

4

UNIQUE VALUE PROPOSITION
Clear, compelling statement of benefits from customer's perspective
Enter Text Here

6

WHY US?
What advantage do we have that others can't buy or copy?
Enter Text Here

10

KEY RESOURCES
Partners and internal resources
Enter Text Here

9

WHO CARES?
List your target customers and users
Enter Text Here

1

EXISTING ALTERNATIVES
List how these problems are solved today
Enter Text Here

DISRUPTIVE FUTURE
What future solutions might disrupt this space?
Enter Text Here

EARLY ADOPTERS
List the characteristics of your ideal customers
Enter Text Here

KEY METRICS
What measures will prove or disprove your "GAME ENDERS" experiments?
Enter Text Here

5

CONDITIONS FOR ENTRY
Favorable & Unfavorable Conditions: IP, Regulatory, Competition, Economic and Natural Environment?
Enter Text Here

8

SIZE OF THE PRIZE What estimates do you have about the financial impact of your solution?
Enter Text Here

7

NOTE: Format: **High-Risk Assumptions in Bold and Underline [CTRL+B & CTRL+U]**, **Medium-Risk Assumptions in Bold [CTRL+B]**, Low-Risk Assumptions in Normal text

STUDY PARTICIPANTS

Company	Participant
Agilent Technologies	Dr. John Gavenonis, VP and General Manager
Brunswick Corporation	John Bayless, Director, Strategic Programs Dr. John Reid, VP, Enterprise Technologies
GE Aviation	Dr. Martha Gardner, Executive Quality Leader
Henkel	Dr. Niamh O'Reilly, Global Innovation Portfolio Manager
John Deere	Dr. John Reid, Director, Product Technology & Innovation, ret.
Nestle R&D Network	Dan Quinn, Portfolio Manager
Sealed Air	Tim Dennison, Value Chain Innovation, ret. Lisa Perpall, Director, Corporate Strategy
SafeRock	Shah Karim, CEO
Sherwin-Williams	Mary Tuel, Technology Director Kent Young, Senior Director, Technology
Boeing Horizon X	Mark Ehrhardt, Principal, Applied Strategy & Innovation
Xerox Innovation	Tom Kavassalis, VP, Strategy & Alliances
	External Corporate Sponsor
NewEdge	Pam Henderson
Enrich Consulting	Dr. Richard Sonnenblick

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OUR HYPOTHESIS

- If H2 portfolio managers are less than satisfied with current planning and decision-making processes, then identifying best practices specific to the H2 timeframe can improve planning and decision-making satisfaction.

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THE HORIZON 2 CHALLENGE

The portfolio allocation problem
- H1 allotted sweeping budget; product delivery needs paramount
- H3 reserve for R&D
- H0 production cash already dispensed
- **H2 squeezed out**

The resources problem
- H1 resources aligned to current obligations
- H3 resources are transient to satisfy POC
- **H2 resources are unmet**

The managerial problem
- H1 managers promoted on near-term revenue results
- H3 managers cerebral stars, regales in the glory of inventions
- **H2 managers in no-man's land**

WHAT IS PROTOTYPE MATURITY

- A validated prototype is tested to these levels
- Technical Readiness Level (TRL) 1~9   6
  - ◆ A measurement system used to assess the maturity level of a particular technology   6
- Manufacturing Readiness Level (MRL) 1~10
  - ◆ a measure to assess the maturity of manufa 4 ring readiness
- Marketing Maturity Level (MML) 1~7
  - ◆ how ready your product or service is to take to market as a commercial offering[25]

MATH BEHIND MULTI-STAGE OPPORTUNITIES

- Yes, it's possible to calculate investment value of new opportunities
  - Many are unfunded because traditional financial metrics are used (profits, ROI, …)
    - These undervalue new opportunities because don't consider upside possibilities
  - Innovation accounting (option valuation) can better value opportunity potential
    - Even when there are risks and unknowns

Type 2   Type 1
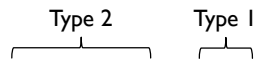
- Three-stage opportunity: H3→H2→H1, or H2b→H2a→H2

- The below valuation formula is for a three-stage option

$$C_0 = E\Big(if\big\langle\big(\tilde{S}_1 e^{-Rt_0} \geq \tilde{X}_1 e^{-rt_0}\big), if\{\big(\tilde{S}_2 e^{-Rt_0} \geq \tilde{X}_2 e^{-rt_0} + \tilde{X}_1 e^{-rt_0}\big),$$
$$\big[max\big(\tilde{S}_3 e^{-Rt_0} - \tilde{X}_3 e^{-rt_0}, 0\big) - \tilde{X}_2 e^{-rt_0} - \tilde{X}_1 e^{-rt_0}\big], -\tilde{X}_1 e^{-rt_0}\}, 0\big\rangle\Big).$$

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wikipedia.org/wiki/Datar-Mathews_method_for_real_option_valuation