

Management of Goal-Oriented Research

The Value Chain of Innovation

- Research
- Development
- Design
- Engineering

How to set the goals?

- User requirements (need vs. want)
 - Customer preferences
 - Sponsor views
 - Researcher strengths
-
- Alignment of stakeholders are very critical.

Goal Oriented Research and Development

- Stakeholders
 - Researchers/developers/engineers/etc.
 - Development manager
 - Sponsor
 - Regulators
 - Users

Some methodology for setting goals

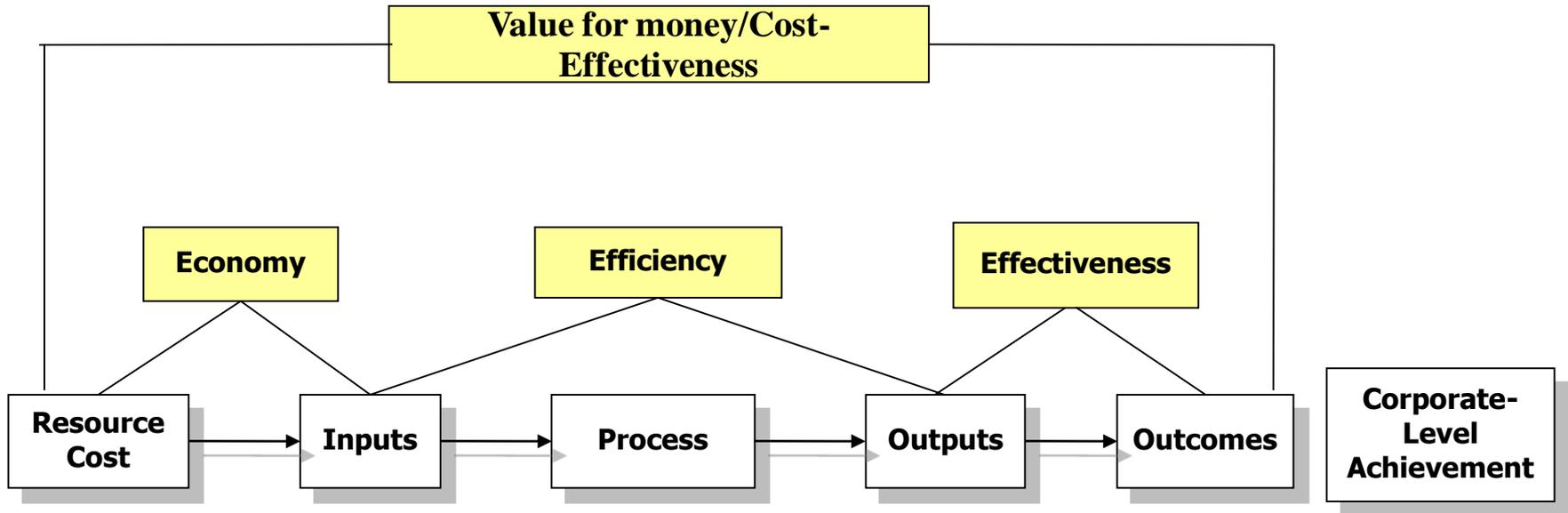
- Input-Output Model
 - Impact
 - Outcomes
 - Outputs
 - Process
 - Inputs
 - Resources

ตัวอย่างของการประยุกต์ใช้ในหน่วยงานต่าง ๆ

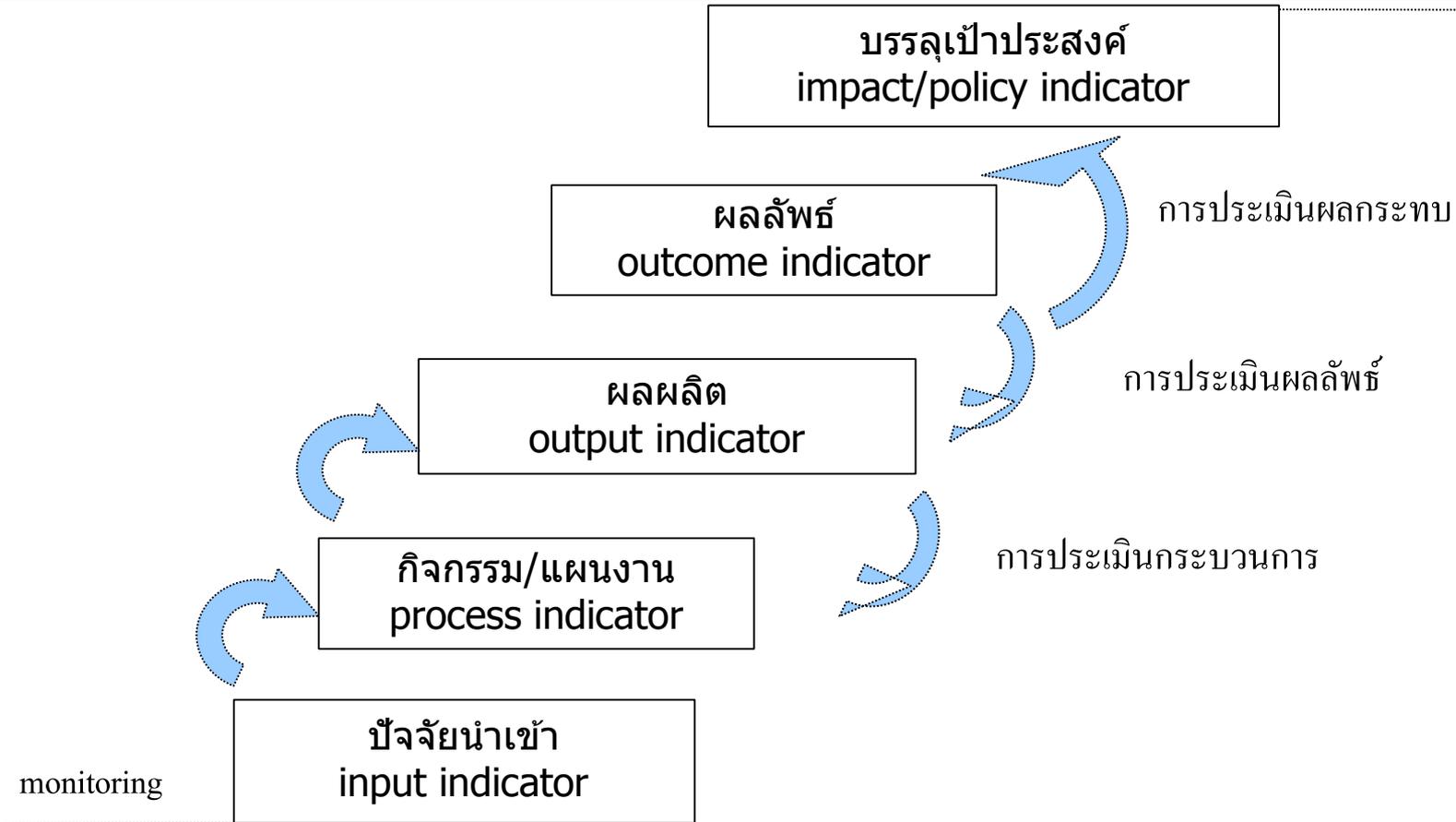
USA : Input-output Model

Input Process Output	Input Output Impact	Input Activity Throughput Consequence	Input Intermediate Output Throughput Output Outcome	Input Process Output Outcome Impact
<i>Butt & Palmer (1985) CIPFA (1984) HM Treasury (1986a,1987)</i>	<i>Audit Commission (1986)</i>	<i>Levitt and Joyce (1987)</i>	<i>Flynn (1986)</i>	<i>PMB SIG (2001)</i>

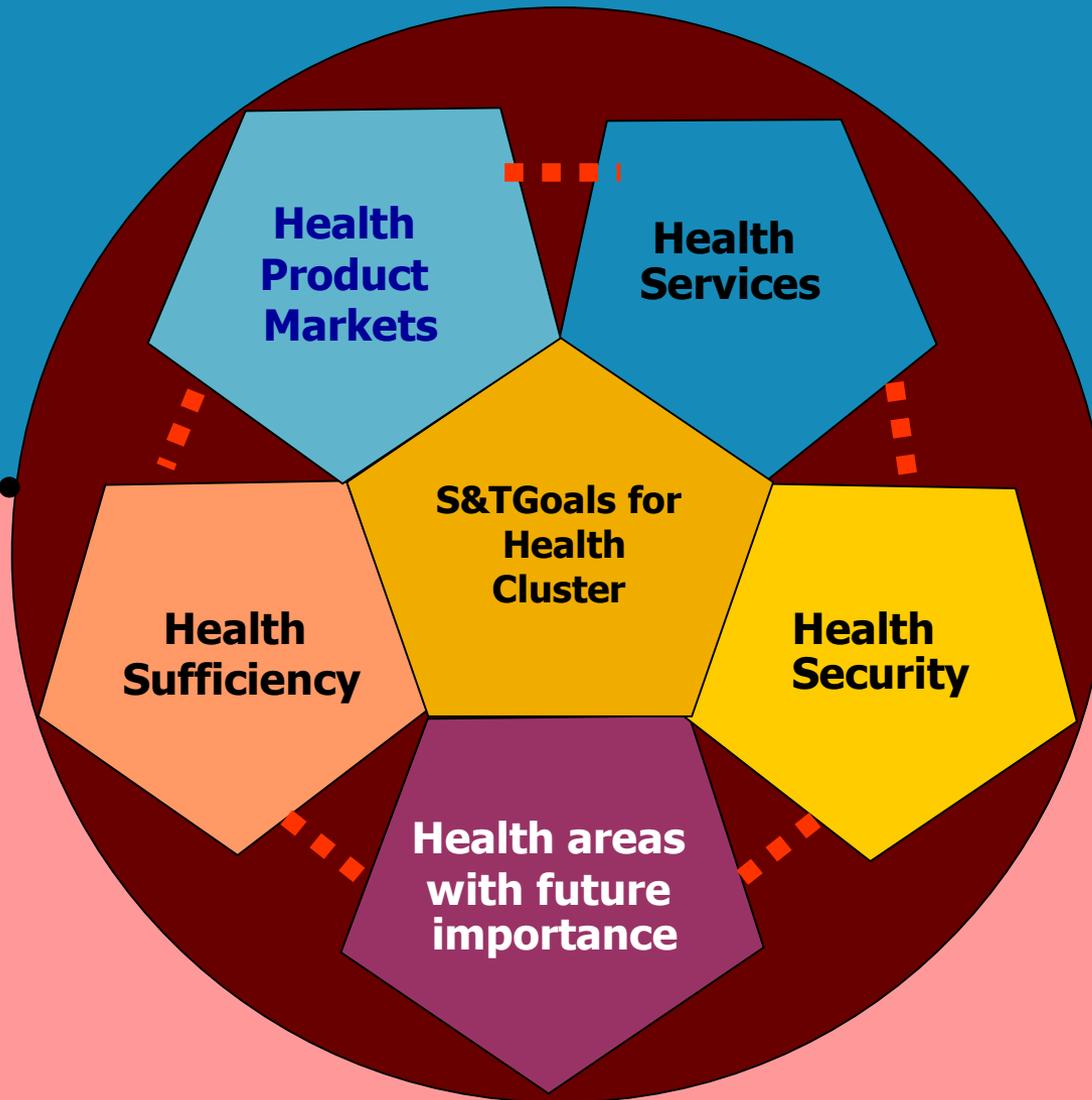
แนวคิด Logic Model



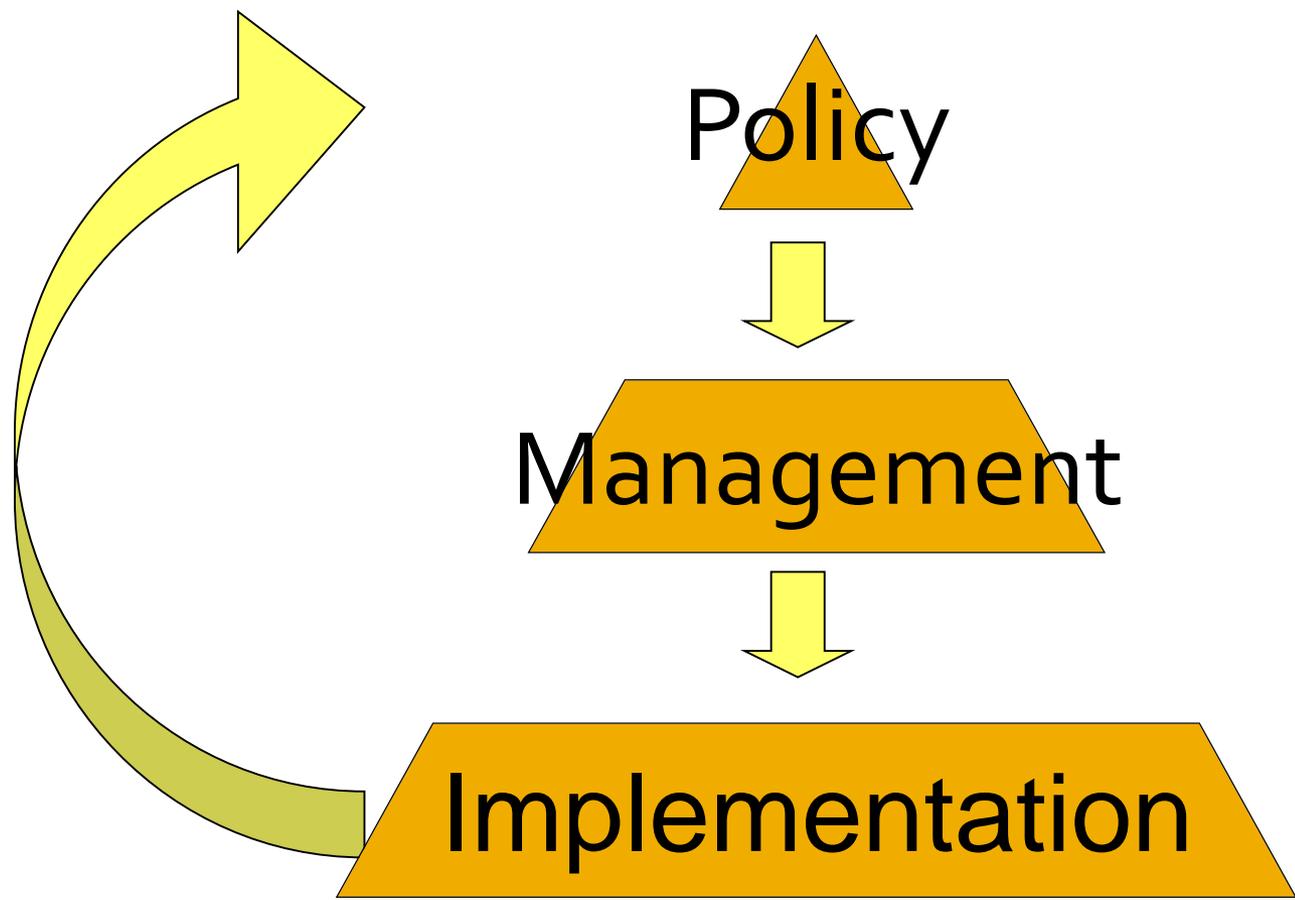
ความเชื่อมโยงของแนวคิดกับการติดตามและประเมินผล



S&T Goals for Health Cluster



Optimal System



Characteristics of Goal Oriented R&D

- Process
 - Physical science
 - Biological science
- Always Competitive “with times, competitors, etc.” Time line needed.
- Focusing.
- Do the hardest first.
- “Go-No Go” point
- “Kill the puppy” or “sell the puppy”.
- How to handle the “non-team”.
- How to handle profit sharing

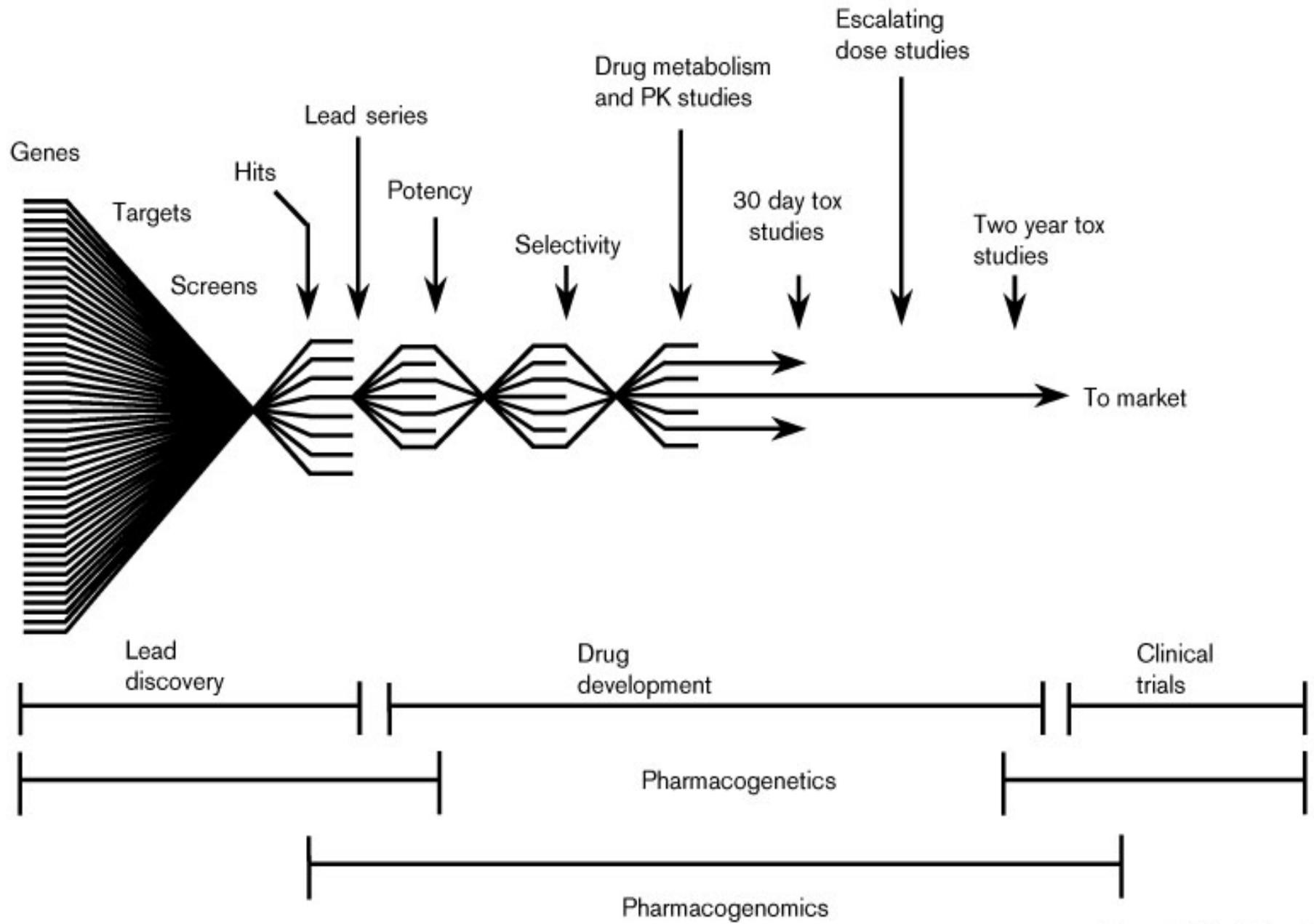
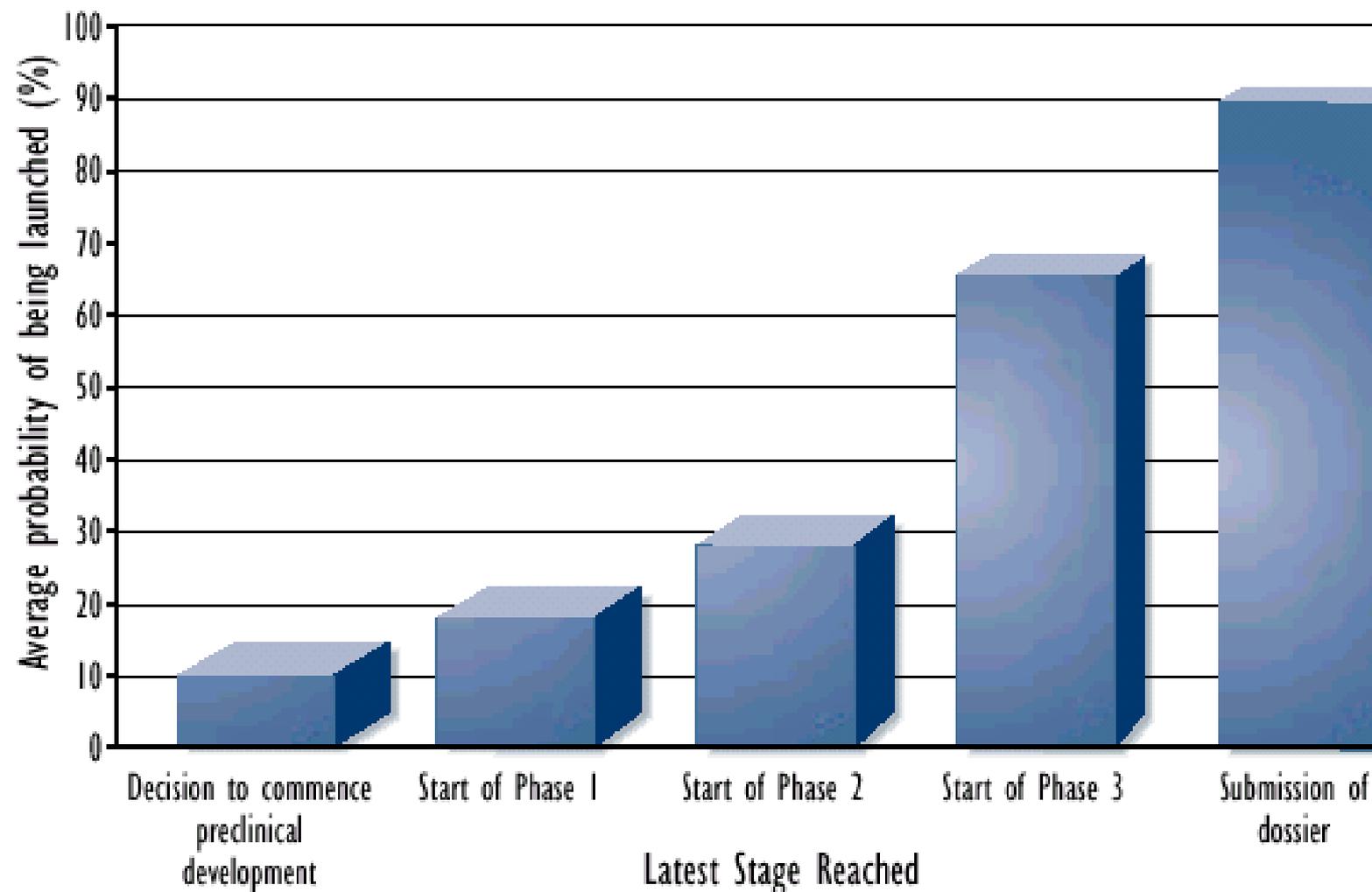


Figure 2 Positioning pharmacogenomics and pharmacogenetics in the drug discovery process

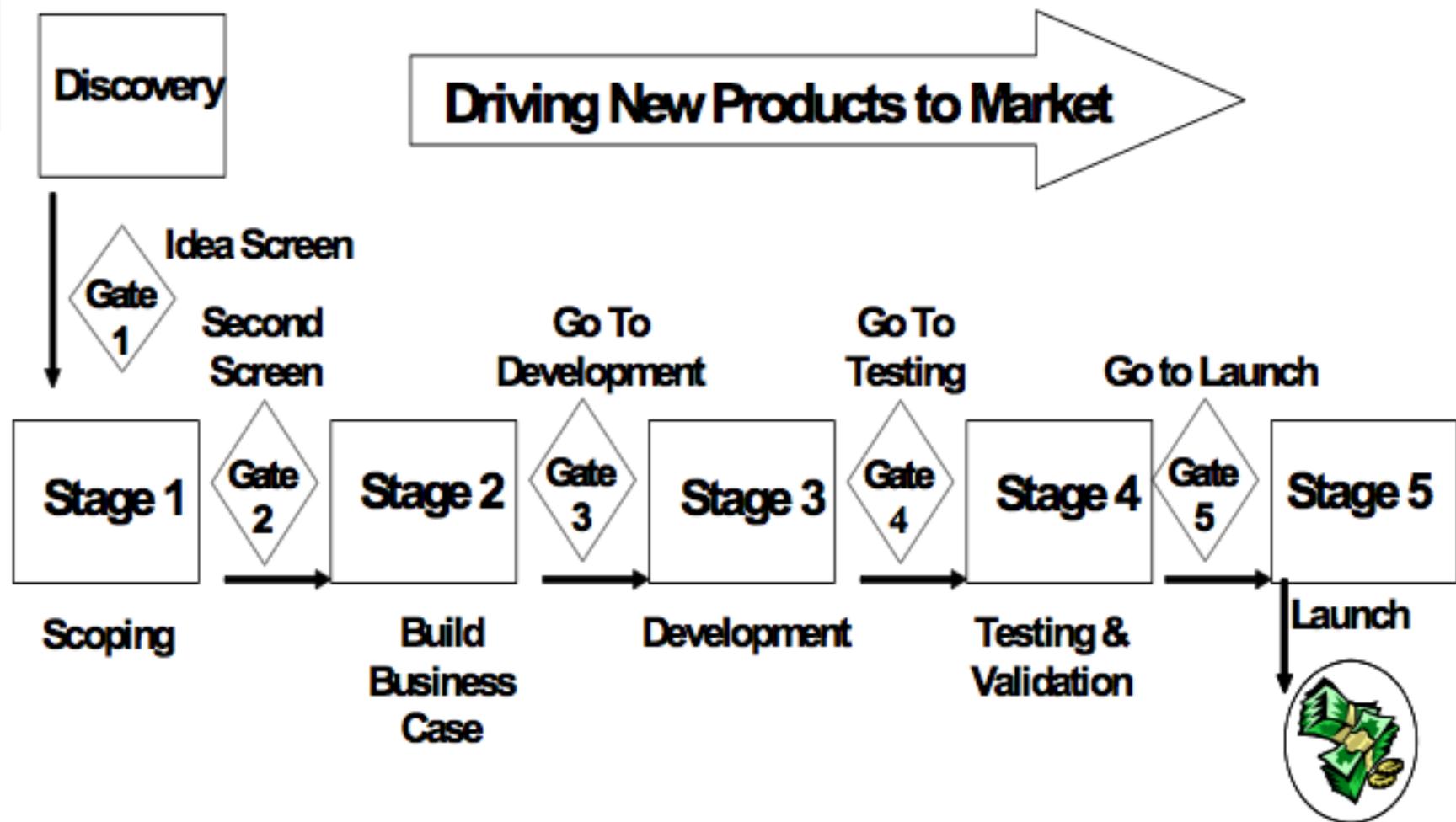
Figure 2: Attrition Data (Probability of Success)



Source: *CMR International/Scrip's Pharmaceutical R&D Compendium 2000.*

Methodology

- “Stage-Gate” –like protocols of decision making.
- Funding is always a problem. Continuous communication with sponsors.
- Stay focus but adaptive.



Stage-Gate[®] A five-stage, five-gate model along with Discovery and Post-Launch Review.

ช่วงดำเนินงาน (Stage)

- กระบวนการ Stage-Gate แบ่งช่วงการดำเนินงานออกเป็นช่วงที่แยกจากกัน เพื่อลดความเสี่ยงโดยทั่วไปประมาณ 4-6 ช่วง แต่ละช่วงได้ออกแบบให้มีการรวบรวมข้อมูลที่จำเป็นในการนำโครงการไปยังประตูต่อไปเพื่อการตัดสินใจ

ประตูตัดสินใจ (Gate)

- ประตูตัดสินใจมีไว้ควบคุมคุณภาพของงานในแต่ละช่วง โดยมีการกำหนดเงื่อนไขและผลงานส่งมอบล่วงหน้า
 - ผ่าน (go)
 - จบ (kill)
 - รอ (hold)
 - กลับไปทำมาใหม่ (recycle)

ทีมโครงการ (Project Team)

ทีมโครงการต้องเป็นการรวมผู้เล่นจากทุกหน่วยที่จำเป็น (a true cross-functional team) เช่น การตลาด วิศวกรรม วิจัยและพัฒนา ฝ่ายปฏิบัติการ

ผู้รักษาประตู (Gate Keeper)

ผู้รักษาประตูที่ทำหน้าที่ตัดสินใจโครงการ ณ แต่ละประตุนั้น เป็นเจ้าของทรัพยากรในช่วงดำเนินงานถัดไป เนื่องจากว่าทรัพยากรมาจากหลายส่วนงาน

Discovery

Stage 1

Stage 2

Stage 3

Stage 4

Stage 5

idea

Gate 1

Gate 2

Gate 3

Gate 4

Gate 5

idea

Scoping

Build business case

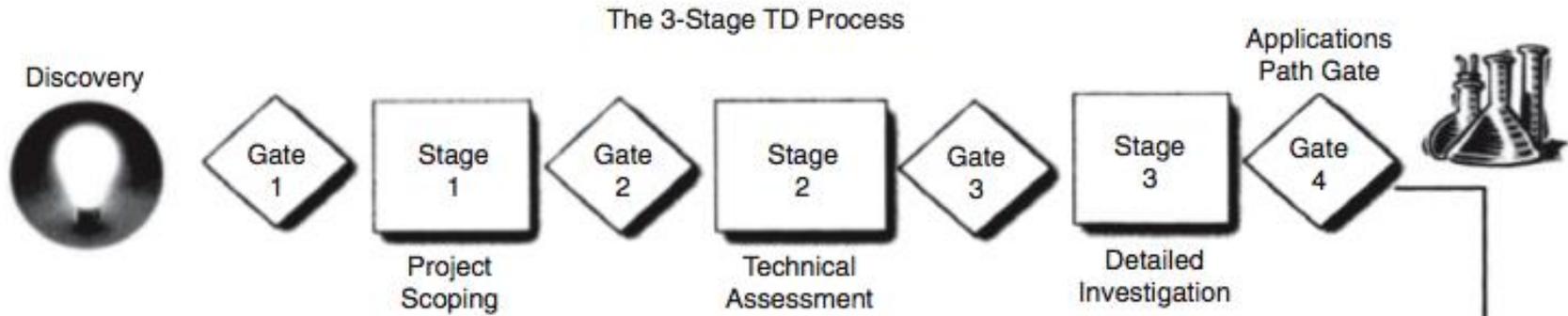
Development

Testing & Validation

Launch

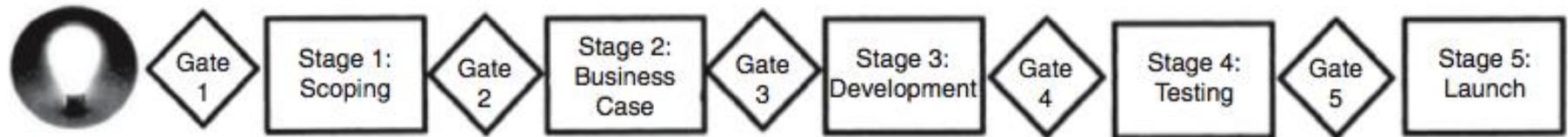
R&D Funnel

Technology Development Process



Project enters the NP Process at Gate 2 (sometimes Gates 1 or 3).

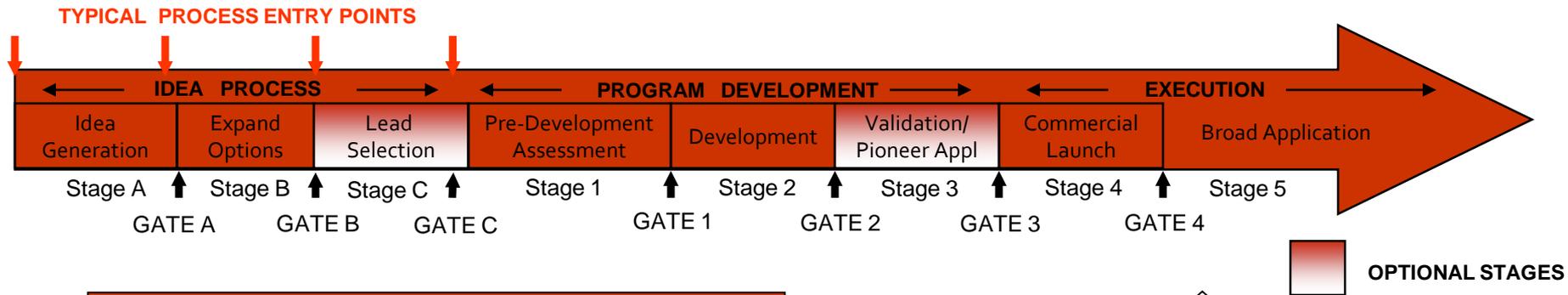
Product Development Process



The Standard 5-Stage, 5-Gate Stage-Gate® New Product Process

High Performing Innovation Process

An effective innovation process allows for multiple innovation paths, abbreviated or optional stages, but does not sacrifice discipline.



Stages

Integrated work tasks carried out in parallel to progress and ensure quality deliverables:

- Strategic Fit
- Market / Customer Attractiveness
- Business Incentives and Risks
- Technical Feasibility and Risks
- Competitive Advantage / Freedom to Operate
- Potential Program Showstoppers
- Legal / Regulatory Compliance
- Critical Factors for Success
- Plan to Proceed

Gates

Quality control checkpoints and key decision points to move good programs forward expeditiously

Gate Pass Criteria and Quality Checks

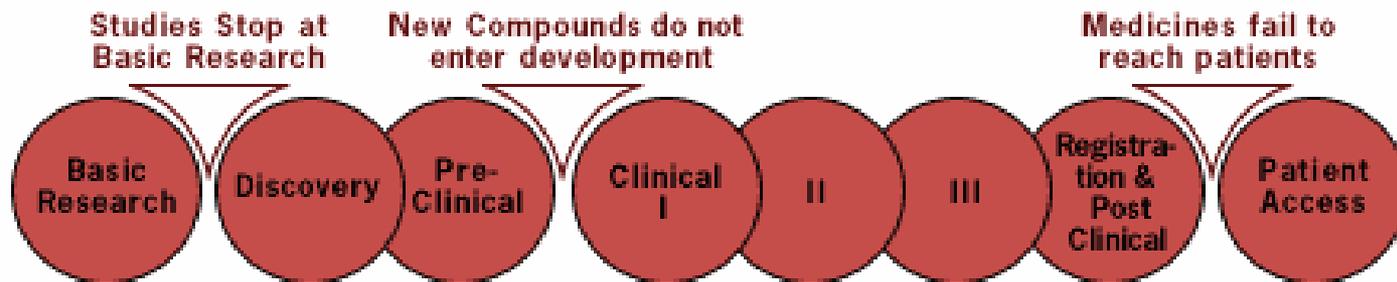
High performers execute a disciplined innovation process with consistent criteria for evaluating ideas and development.

Criteria	Description
Strategic Fit	<ul style="list-style-type: none"> – Alignment with Business strategy – Fit to business needs – Venture Philosophy
Market / Customer Attractiveness	<ul style="list-style-type: none"> – Where Applicable – # plants/regions
Business Incentives & Risks	<ul style="list-style-type: none"> – Benefits vs. Next Best Alternative – Uncertainties – Windows of opportunity
Technical Feasibility & Risks	<ul style="list-style-type: none"> – Probability of technical success – Key technical issues – Risk/Value Assessment
Competitive Advantage / Freedom of Operation	<ul style="list-style-type: none"> – Basis for business advantage – IP position – Freedom of Operation – Durability/longevity/robustness – Risks if not pursued

Criteria	Description
Potential Program Showstoppers	<ul style="list-style-type: none"> – Can be technical or business – Typically outside our control, e.g. market, legislative, availability of new superior alternative
Legal / Regulatory Compliance	<ul style="list-style-type: none"> – Legal, health, regulatory, environmental issues – SHE or other work processes – HAZOP for programs
Critical Factors for Success	<ul style="list-style-type: none"> – Considerations critical to successful program – Program management issues, e.g. availability of skills, vendor know-how, resolution of key issues, critical timing
Plan to Proceed	<ul style="list-style-type: none"> – Requirements of next stage – Objectives, priorities, resources, costs, issue resolution – Options and alternatives

Stage-Gate of Drug Development

Drug Development Pipeline



TECHNOLOGY READINESS AND ASSESSMENT

[TRL CALCULATOR](#)

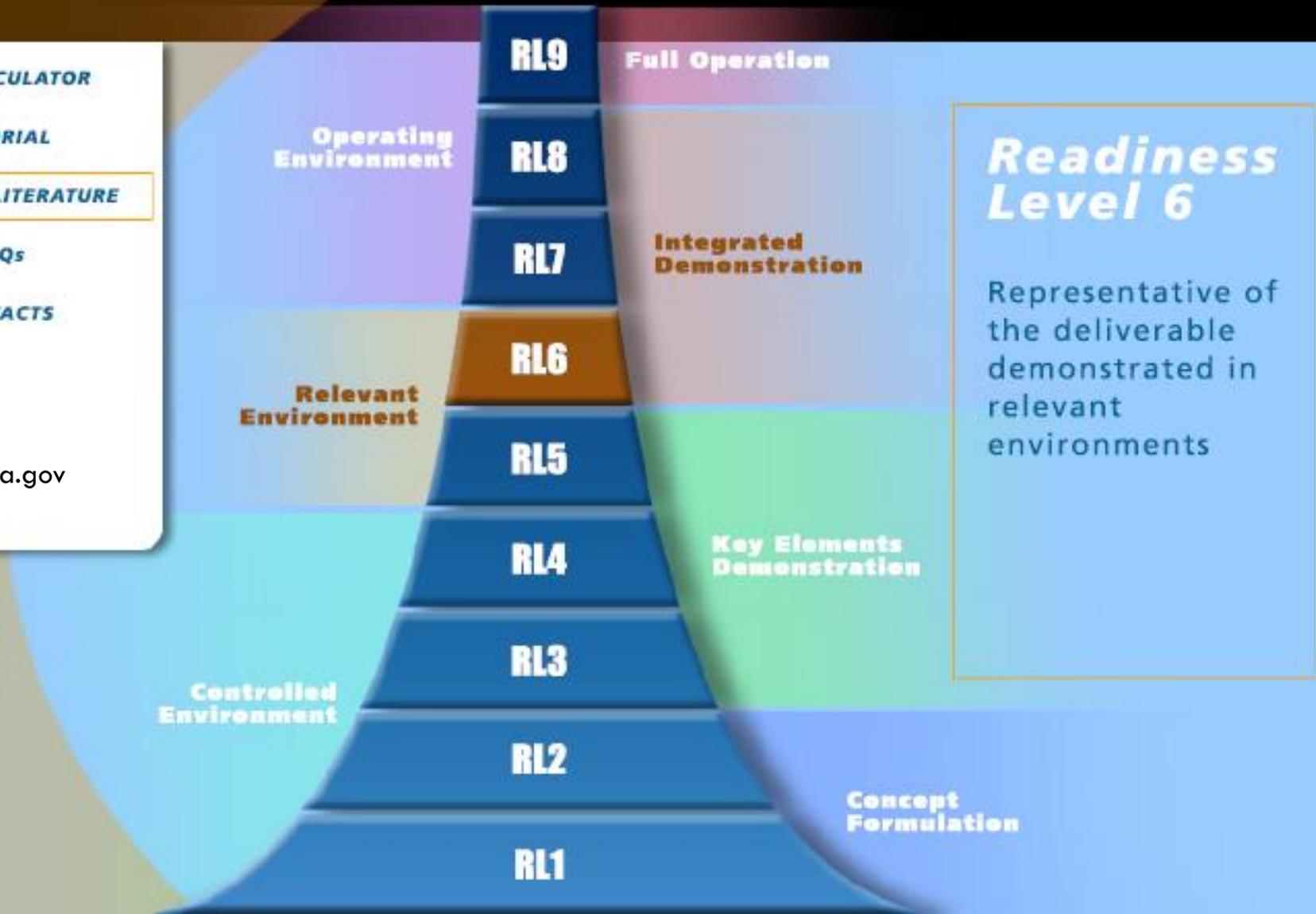
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[FAQs](#)

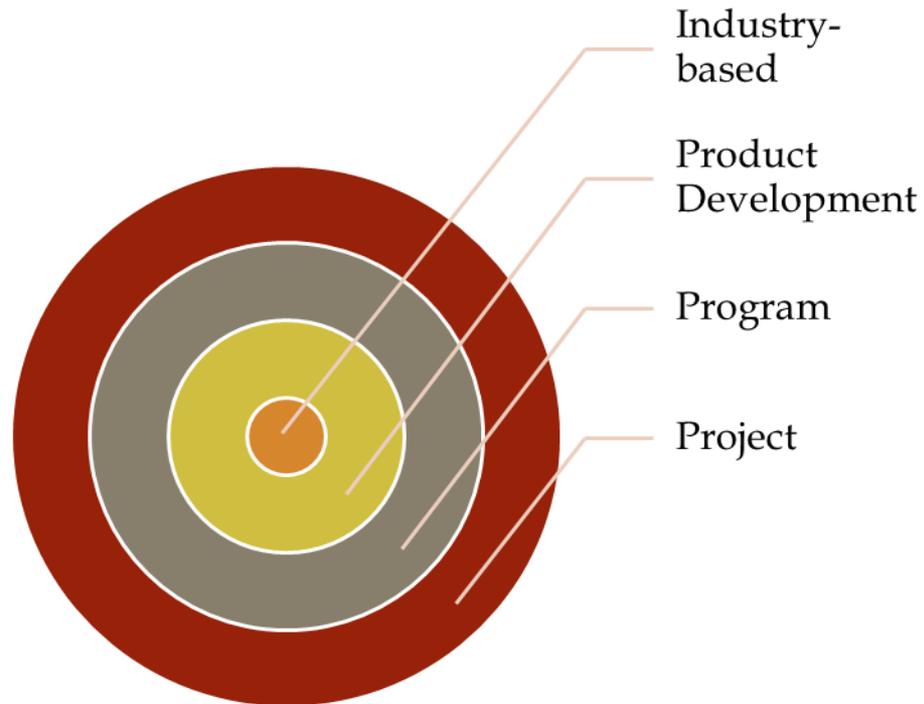
[CONTACTS](#)

<http://trl.sandia.gov>



- **TRL1 Basic Research** “Experimental data revealing useful information about the basic principles observed”
- **TRL2 Applied Research** “Model that explains the underlying science and how it could be applied to solve a particular application’s problem”
- **TRL3 Research Result** “Experimental or analytical demonstration that shows that the key elements of an approach are likely to be feasible”
- **TRL4 Research Demonstration (Lab demo)** “Experiment in a Laboratory”
- **TRL5 Research Prototype (Demo Unit)** “Looks like a Product, Hand-built by PhDs, Breaks a Lot”
- **TRL6 Engineering Prototype (Alpha Unit)** “Research Prototype that is Rugged and Repeatable”
- **TRL7 Flight / Field Prototype (Beta Unit)** “Engineering Prototype that is Reliable and Manufacturable”
- **TRL8 WR / Hi-Rel (Production Unit)** “Field Prototype that has cost “wrung out” (if applicable), and has completed qualification”
- **TRL9 Proven Product** “Product that has been used successfully in a system before and is being adapted for use in a similar application.

Development of R&D Management from Project-based to Product Development



Requirement of Product Development

