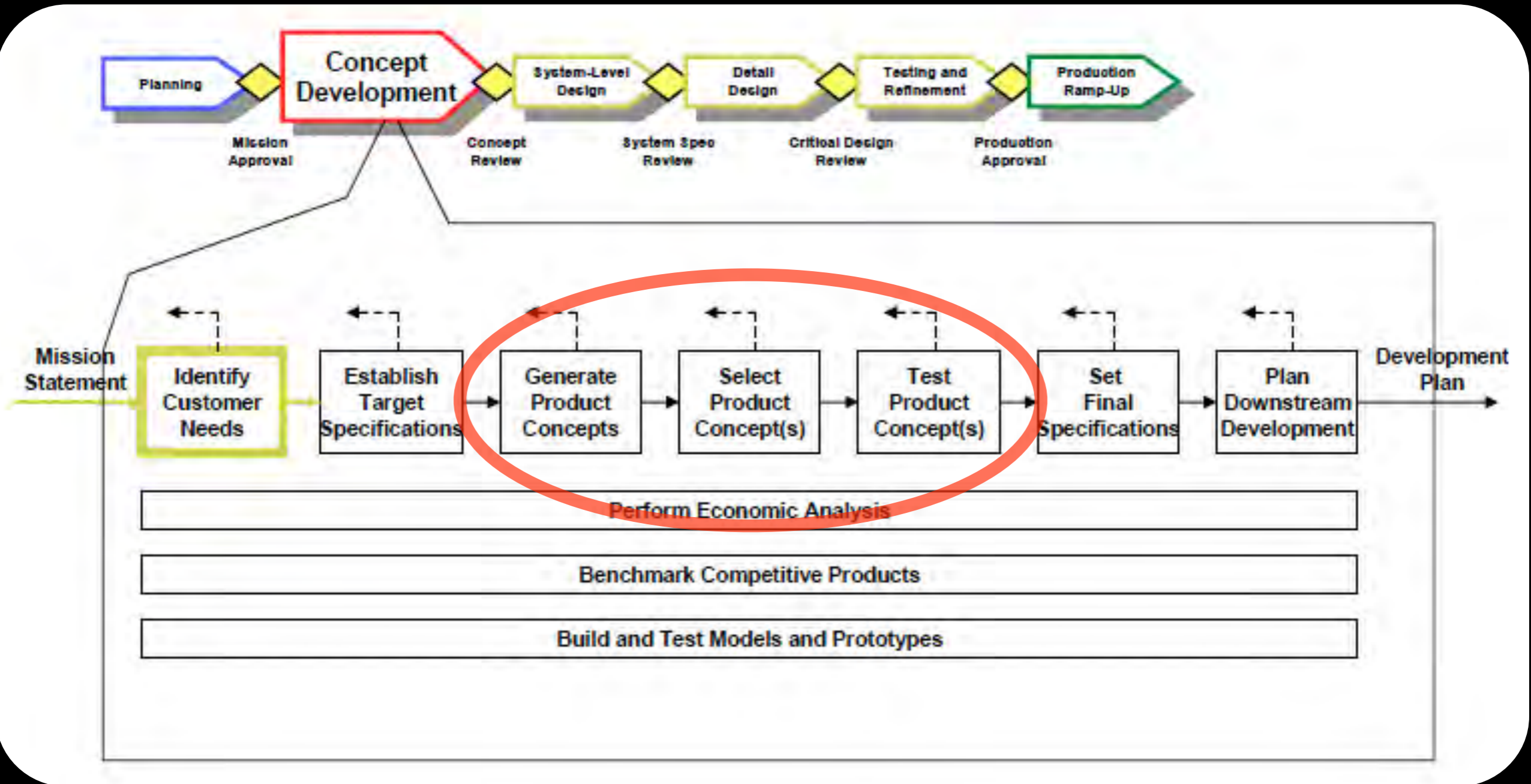


Introduction to
Product Design and Innovation

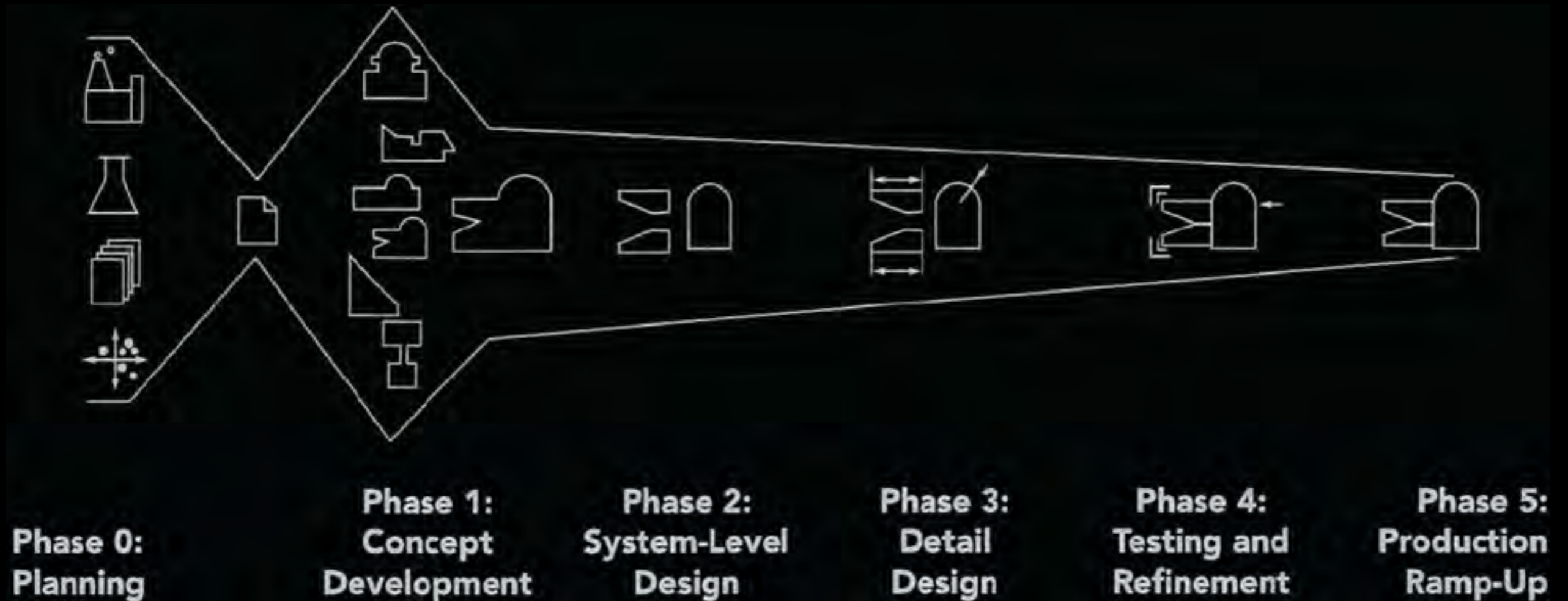
October 15th, 2014

Idea Generation & Concept Generation

Concept Development



Concept Development

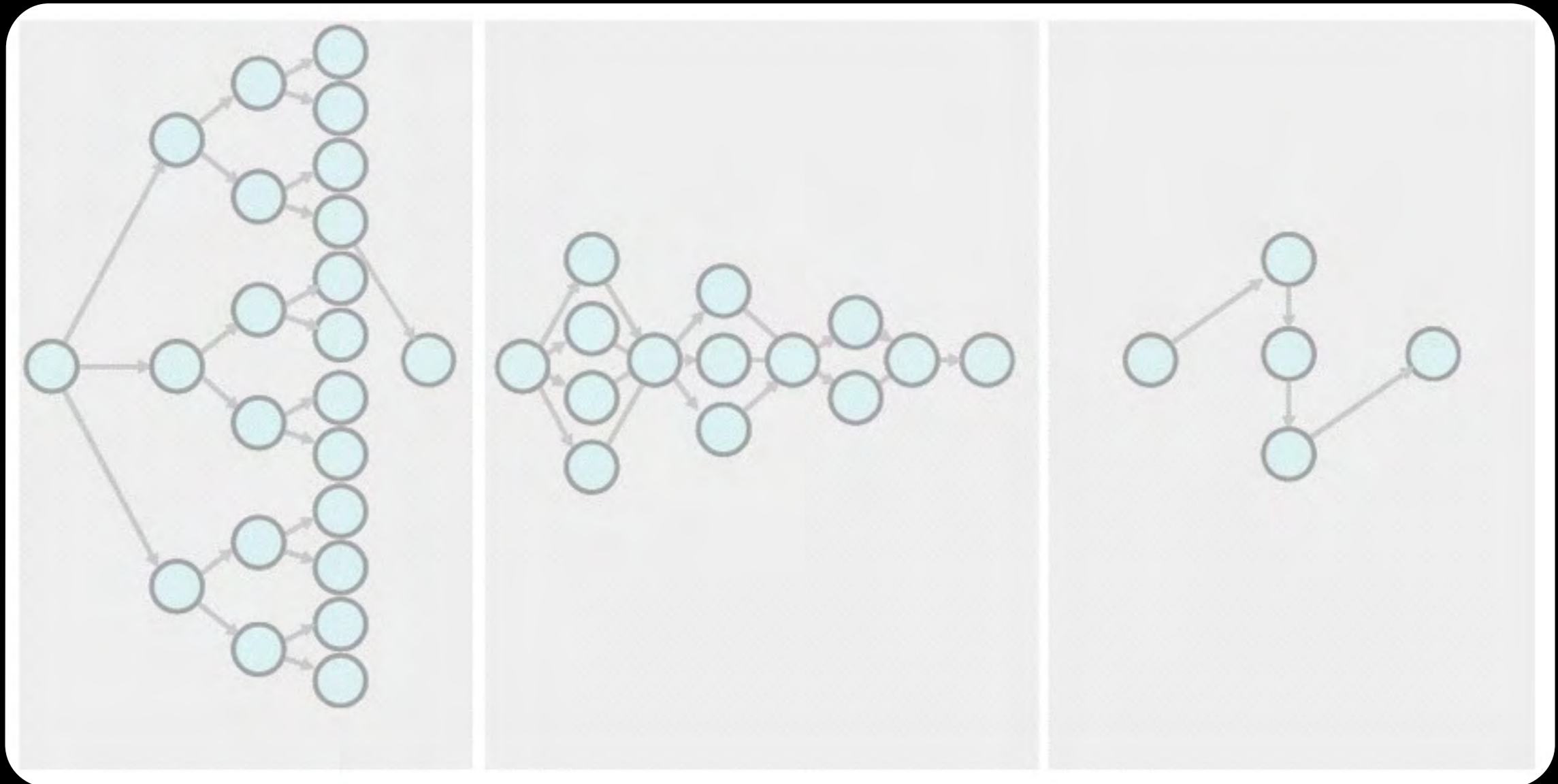


Concept Generation Strategies

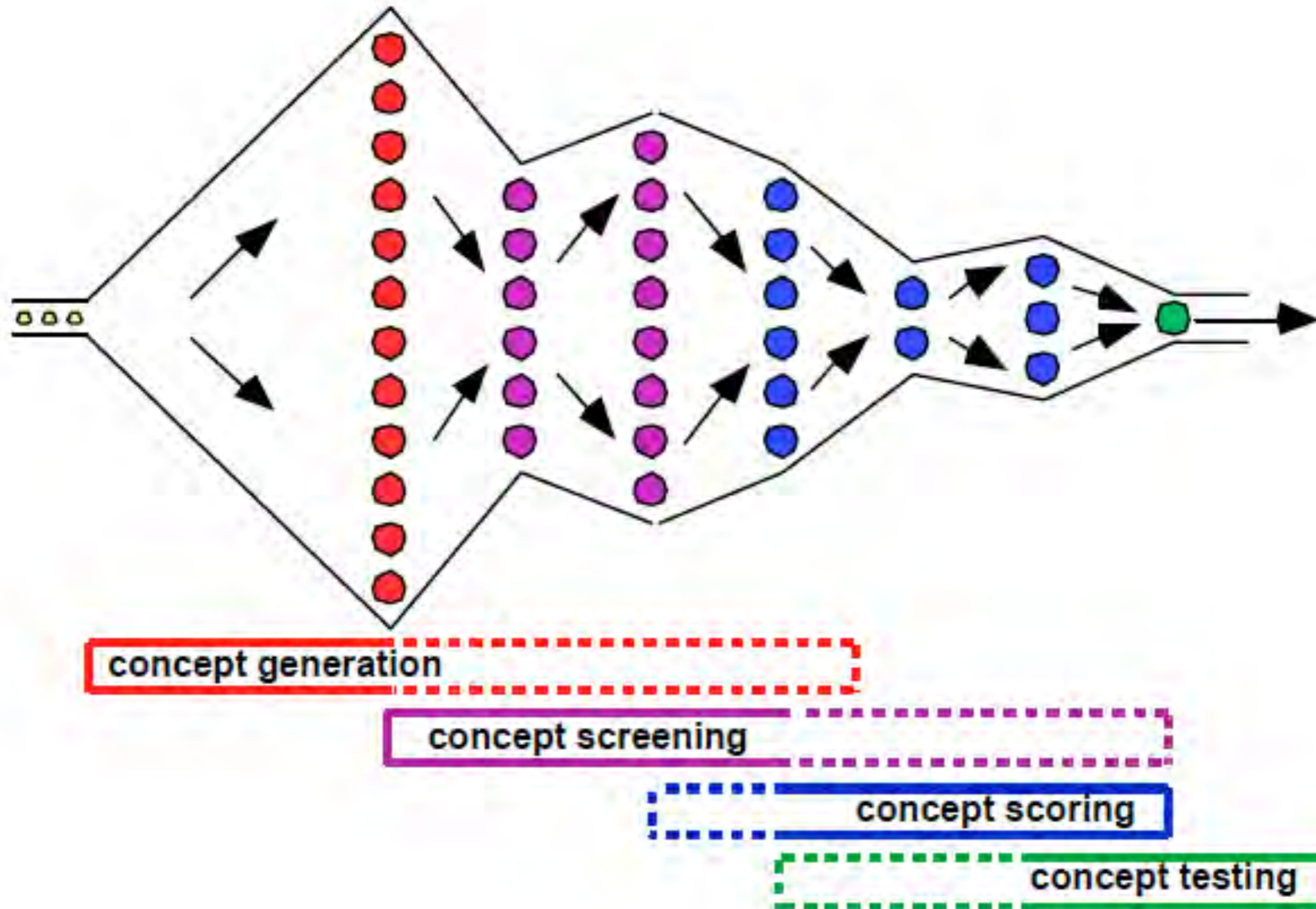
A) Excessive expansion

B) Balanced search

C) Unreasonable restriction

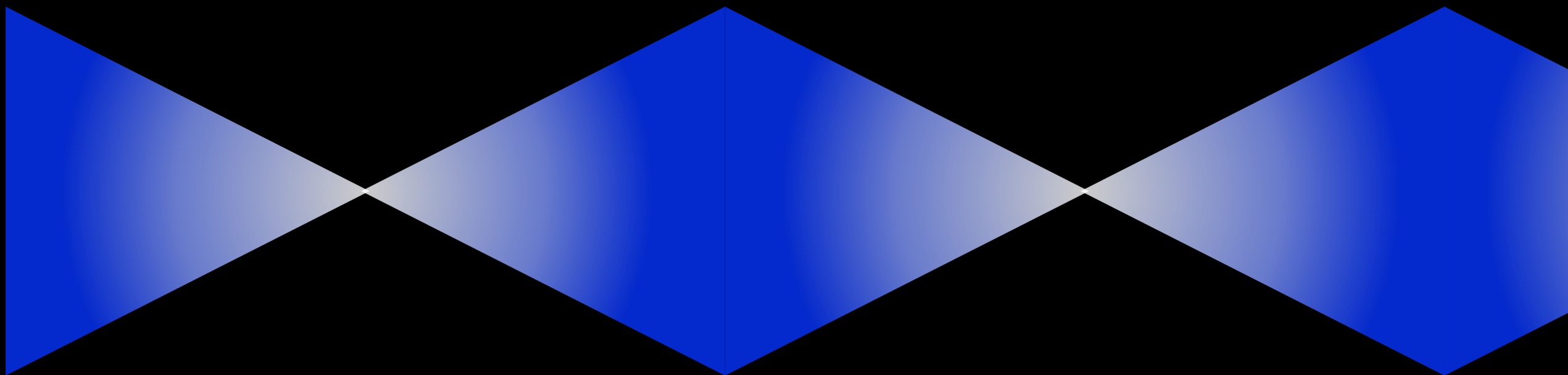


Concept Generation Strategies



Double X

- PDI Process is cyclic and iterative by nature
- Convergent $>$ (analytical) and Divergent $<$ (creative) phases require different tools and approaches



Analyze &
crystallize the
problem

Generate
solution
concepts

Screen &
select the best
concepts

Design details
for selected
concepts Etc.

C-K Theory

C-K Theory

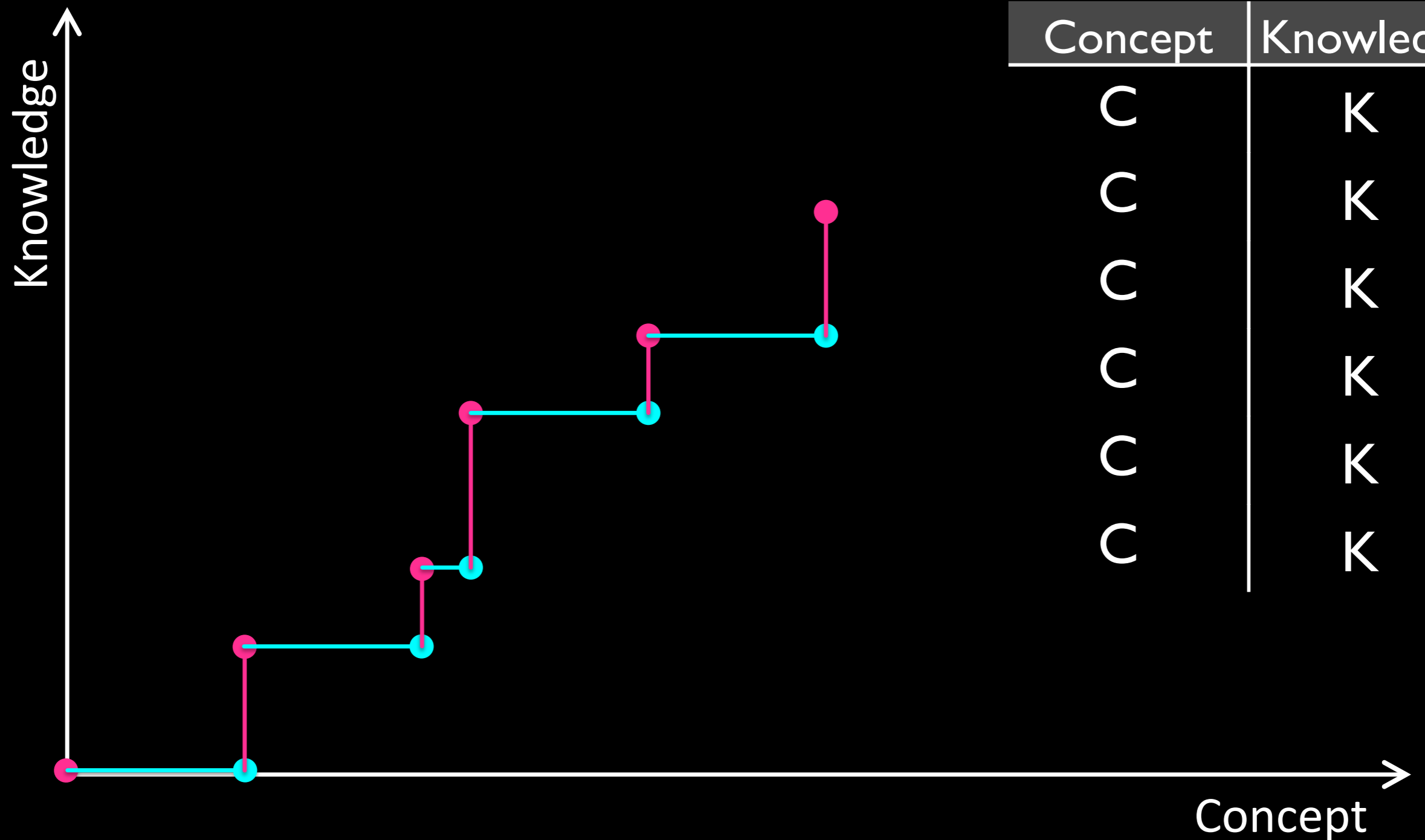
- Concept – Knowledge

Design Thinking

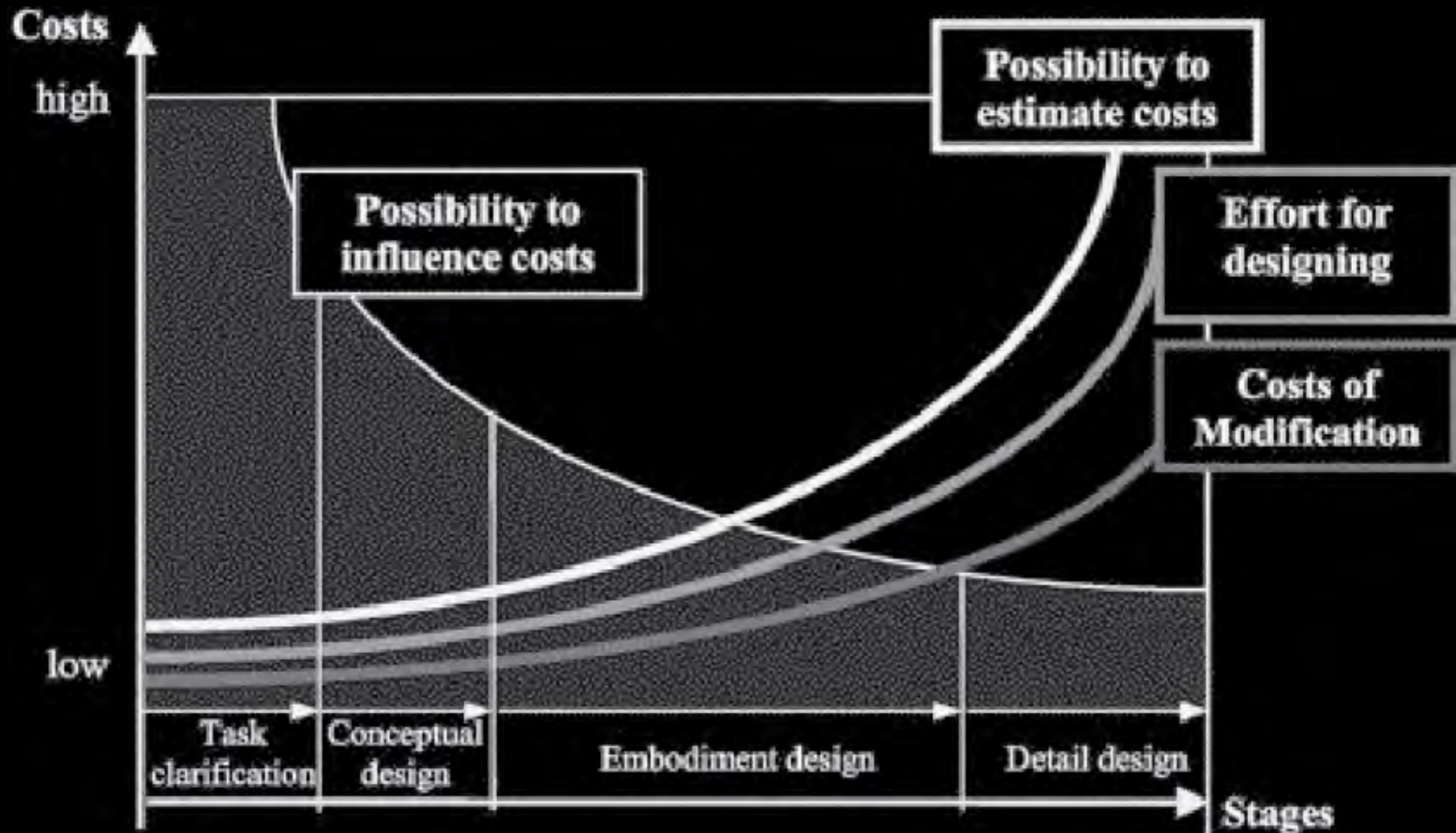
- Problem Space – Solution Space

Concept	Knowledge
C	K
C	K
C	K
C	K
C	K
C	K

C-K Theory



Product Development Costs

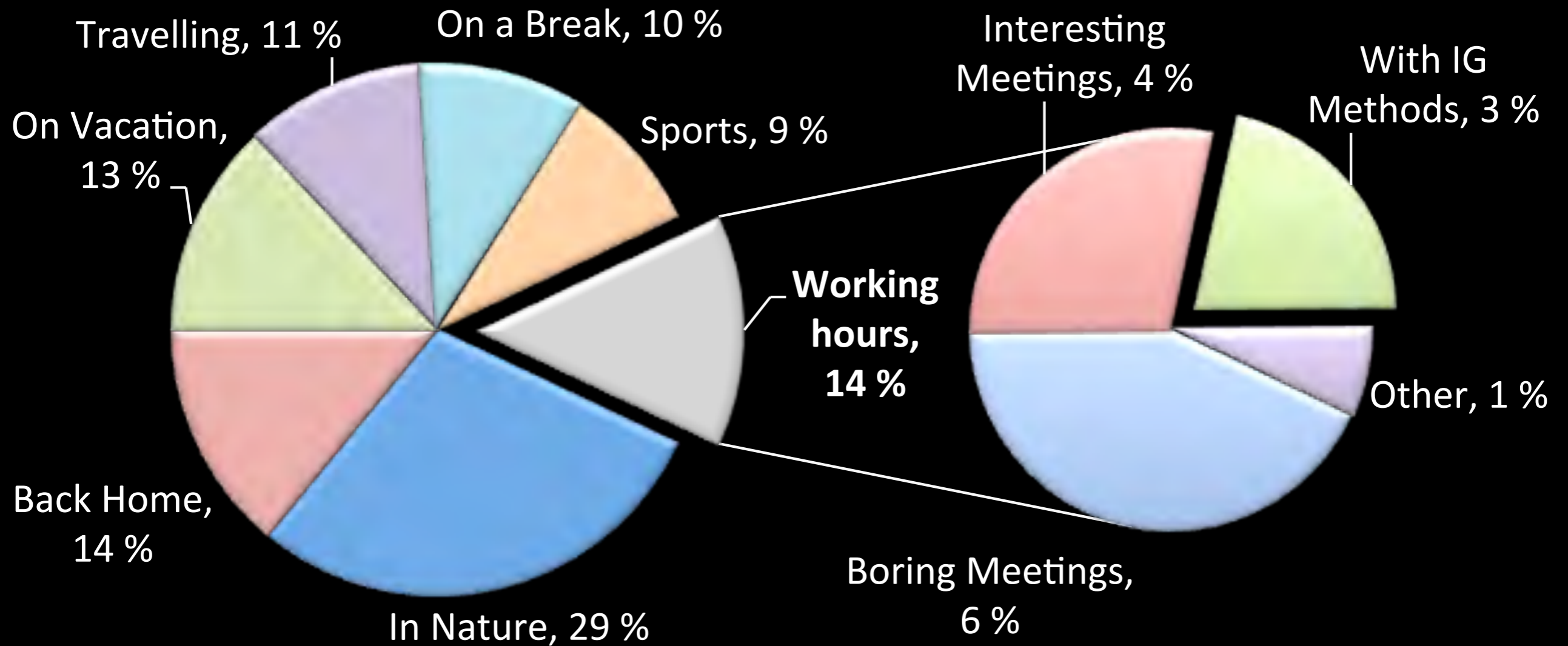


* Römer et. al., 2001

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Idea Generation

Where are product ideas born?



Why do we need offices and brainstorming?

- Management
- Knowledge Generation
- Knowledge Sharing
- Analytical Work

How to get started?

- Define the problem
- External & Internal Search
 - External – Existing Concepts
 - Benchmarking, Patents
 - Market research
 - Technology surveys
 - Internal – New Concepts
 - Brainstorming individually & in teams
- Reflect on results
 - SWOT – What we should build on?

Brainstorm Dynamics

- Warm up
- Stick to the topic
- Draw (write) ideas down – prefer graphics
- Abandon critique and rationality
- Encourage others
- Build on other ideas
- Quantity over quality
- Goal: to cover the entire solution space

Brainstorm Dynamics

Individual vs. group work

- Ideas from others can stimulate new ones
- Communication slows things down
- Individual work increases quantity
- Group work increases quality
- First individually, then in group
- Heterogeneous teams increase diversity

Time Constraints

- Too much time – ineffective
- Too little time – not enough to process
- Proper use of time pressure
- Time: not too little, not too much
 - Proper time pressure + small tasks

Stimuli

- Ideas from others can stimulate new ones
- Videos, magazines, interviews
- C-sketch
- Encourages miscommunication
- Benefits of individual and group work

Mall Experiment

- Three sets:
 - One with fixed and open cards
 - One with fixed and *special* cards
 - One with fixed, *special*, and open cards
- Mixture of stimuli and open cards produced most creative ideas

Mall Experiment

Toolkit 1

department store	department store	department store	department store
clothing store	clothing store	clothing store	clothing store
shoe store	shoe store	shoe store	shoe store
bookstore	bookstore	watches and jewels	stationery shop
movie theater	library	day care	chapel
café	café	restaurant	restaurant
sports shop	sports shop	cosmetics and perfumes	drugstore

Toolkit 2

department store	department store	department store	department store
clothing store	clothing store	clothing store	clothing store
shoe store	shoe store	shoe store	shoe store
bookstore	bookstore	watches and jewels	stationery shop
movie theater	library	day care	chapel
café	café	restaurant	restaurant
sports shop	sports shop	cosmetics and perfumes	drugstore
water amusement park	spa	amusement park	playground
fountain	bowling alley	downhill skiing center	sports hall

Toolkit 3

department store	department store	department store	department store
clothing store	clothing store	clothing store	clothing store
shoe store	shoe store	shoe store	shoe store
bookstore	bookstore	watches and jewels	stationery shop
movie theater	library	day care	chapel
café	café	restaurant	restaurant
sports shop	sports shop	cosmetics and perfumes	drugstore
water amusement park	spa	amusement park	playground
fountain	bowling alley	downhill skiing center	sports hall